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ESTONIAN ACADEMY OF SCIENCES
YEARBOOK

FACTS AND FIGURES

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ESTONICAE

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CONTENTS

FOREWORD	5
CHRONICLE 2018.....	7
MEMBERSHIP OF THE ACADEMY	12
GENERAL ASSEMBLY	15
BOARD.....	16
COUNCILS, COMMITTEES	18
ACADEMY EVENTS	25
ACADEMIA, MEDIA, SOCIETY	28
ACKNOWLEDGEMENTS TO MEMBERS OF THE ACADEMY AND FROM THE ACADEMY	30
PUBLICATIONS OF THE ACADEMY	34
INTERNATIONAL SCIENTIFIC RELATIONS	35
BIRTHDAYS	39
ESTONIAN ACADEMY PUBLISHERS.....	57
UNDER AND TUGLAS LITARATURE CENTRE OF THE ESTONAIN ACADEMY OF SCIENCES.....	58
ASSOCIATED INSTITUTIONS.....	64
ASSOCIATED ORGANISATIONS	73
<i>IN MEMORIAM</i>	93
FINANCIAL ACTIVITIES	97
DIRECTORY	100

FOREWORD

This year, the Academy celebrated its 80th anniversary. For a human, this is a respectable age, but an academy of such an age is still in its infancy. The need for an academy was a source of discussion ever since the beginning of Estonian statehood, though the idea was still thought to be premature a hundred years ago. Within twenty years, however, the young state managed to develop so quickly, and its active research community grow so rapidly, that a clear need for an academy emerged.

The longer-lasting an institution, the longer it takes to establish it. Nobody knows how long the negotiations and brainstorming lasted 80 years ago. The Academy was officially founded on Friday, 28 January 1938 when Konstantin Päts signed the Estonian Academy of Sciences Act “due to urgent national need”. The Act came into force after its publication in *Riigi Teataja* (the State Gazette) the following week, on 2 February 1938. As such, 31 January 2018 was a very fitting date to commemorate the founding of the Academy with a festive session in the Parliament of Estonia Conference Hall and with a gathering in the Academy building.

The first Members of the Academy were inaugurated two and a half months later, on 13 April 1938. A week later, on 20 April 1938, the very first symbolic General Assembly meeting of the Estonian Academy of Sciences was held in the Council Hall at the University of Tartu. This was a small step for the first Members of the Academy, but a big step for Estonia on its path towards becoming a modern state. As a way of celebrating this event with due dignity, the Academy decided to deviate from the tradition of holding General Assembly meetings on Wednesdays, and instead held a festive session of the General Assembly along with an accompanying conference Story of Estonian Thought at the Estonian National Museum on Friday, 20 April 2018.

The Academy’s central tasks have remained unchanged ever since it was founded. We are expected “to help, independently and with high academic professionalism, to resolve issues relating to the development of Estonian research and the social and economic development of the state”. One of the key aspects of this work is to consult the state. The Academy was inaugurated at the next General Assembly meeting that was held in the Hall of

the Estonian Chamber of Commerce and Industry (premises of the Kanut Guild at the time) on 22 October 1938. This day was commemorated with the international conference The Advisory Role of Academies in the Information-Rich Society, held on 22–23 October 2018.

* * *

2018 was also a year of hard work, new beginnings, and hopefully the establishment of several traditions, whether it be the appreciation of science, education and culture along with partners on the way towards Poska Academy (i.e. a lecture series by members of the Academy in Tartu Jaan Poska Gymnasium and in other gymnasiums across southern Estonia), or the sharing of academic thinking on theatre stages in cooperation with Von Krahl Theatre and Vikerraadio. The collective action “Life After Google” consisted of twelve lectures given on a theatre stage to a full house, with a spontaneously born pop-up end vignette by a Member of the Academy each time, a radio programme about each lecture, as well as a series of essays and opinion pieces that filled printed media.

The conference aimed at young scientists working and studying outside of Estonia is becoming a tradition. For a small nation, it is vital to maintain contact with our best young minds. We are positive that they will come back and bring with them a stockpile of experience, as long as we are able to offer them suitable work and income.

The foundation of such influential events which fill public spaces and guide research policy is the work that Members of the Academy do in the sphere that generally remains invisible to the public eye. This includes their work on all kinds of commissions, committees, advisory and decision-making bodies, but also as lecturers, authors of opinion pieces, presenters of in-depth presentations, journal editors and reviewers.

The classic Academy Yearbook reached its 50th volume last year. 23 of these volumes have been published since the restoration of Estonia’s independence. These pages have had to fit an increasing number of substantial stories, brilliant ideas and technical information about the activities of the Academy itself, Members of the Academy, and associated societies of the Academy. An ever-growing

interest towards the activities of the Academy inspired us to write pieces addressed to a wider audience about the different intricacies of our work.

It is no wonder, then, that last year saw the birth of *In Words and Images*, a publication that is somewhat more dynamic than the classic yearbook, and that uses a delicately humorous touch when addressing the less visible aspects of the Academy, which are nevertheless important for society. It sparked such great interest that most of the copies had flown off the shelves by autumn. Such a course of events encouraged us to issue two separate publications – one focusing on reports on our public activities, original content, and public interest articles about the activities of the Academy and its

Members, and another on facts, figures, and technical overviews of our activities.

We hope that such division will make things easier for those who are interested in the substantial activities of the Academy, whilst still offering enough joy of discovery for those who need facts, short and less passionate descriptions and technical information about the activities of the Academy and our partners.

28 February 2019

Tarmo Soomere

CHRONICLE 2018

January 5 – The Academy organised and hosted a conference, Greatest Challenges of the 21st Century, which brought together young Estonian scientists (see p. 25).

January 8 – As part of the students' science conference Poska Academy, the Academy started a lecture series "The way towards (Poska) Academy". The opening lecture "Trends in World Economy and Populism" was given by Member of the Academy Urmas Varblane (see *In Words and Images*, p. 54–55).

January 19 – The Academy hosted a discussion about possible topics for the 2018 Opinion Festival as part of the *TeaMe+* programme and under the initiative of the Estonian Science Journalists' Association.

January 22 – Members of the Academy Tarmo Soomere and Urmas Varblane paid a visit to Member of the Academy Mihhail Bronštein on the occasion of his 95th birthday.

January 24 – Presentation of the book "Väldi igavaid inimesi ja olukordi" (*Avoid boring people and situations*) written by Member of the Academy Jüri Allik was held in Tartu, in the premises of the first psychology laboratory and association founded by Emil Kraepelin 130 years ago.

January 25 – Upon the invitation of the Royal Society of Edinburgh, Secretary-General Jaak Järv participated in an international discussion that addressed academies' collaboration opportunities for solving global issues.

January 27 – On his 60th birthday, Member of the Academy Valter Lang presented his monograph *Lääne-meresooe tulemised* (The arrival of Baltic Finns) at the University of Tartu Art Museum.

January 30 – The Board at its meeting approved the Academy's Action Plan for 2018, and the division of tasks between Members of the Board. A decision was made to sign an Association Agreement with the Estonian Academic Agricultural Society and to start negotiations to conclude an Association Agreement with the Estonian Academic Oriental Society. The Board also decided to revoke Member of the Academy Andres Öpik from Tartu University Council and appoint a new Member of the Board Els Heinsalu, senior researcher at the National Institute of Chemical Physics and Biophysics (KBFI), and President of the Estonian Young Academy of Sciences.

January 31 – The Academy held its 80th anniversary celebration in the Parliament of Estonia Conference Hall

and in the Academy Hall (see p. 25 and *In Words and Images*, p. 4).

January 31 – Member of the Academy Raivo Uiibo represented the Academy at a seminar organised by the European Members of the International Council for Science, Open Data in Science: Challenges and Opportunities for Europe, in Brussels.

February 1 – Member of the Academy Raivo Uiibo represented the Academy at the workshop Ethical Aspects of Open Access: A Windy Road, held in Brussels by the Permanent Working Group on Science and Ethics of the European Federation of Academies of Sciences and Humanities (ALLEA).

February 5 – Members of the Academy Anu Raud and Jüri Allik gave presentations "My life in tapestries" and "What makes psychology interesting", respectively, as part of the lecture series "The way towards (Poska) Academy".

February 5 – The Academy hosted a discussion "Estonian PET Center: possibilities and perspectives" with participants from the North Estonia Medical Centre, East Tallinn Central Hospital, Tartu University Hospital, National Institute of Chemical Physics and Biophysics, and companies Aqua Pharmaceuticals and HK Nõustamise OÜ.

February 16 – A conference was held at the University of Tartu Institute of Physics to celebrate the 90th birthday of Member of the Academy Tšeslav Luštšiku (Cheslav Lushchik).

February 19 – Secretary-General Jaak Järv gave a presentation at a public ceremony of the Estonian Academic Agricultural Society.

February 27 – As part of the *TeaMe+* programme, the Academy hosted the Estonian Science Journalists' Association's seminar. President of the Association Priit Ennet gave a presentation "Recommendations of the Finnish Committee for Public Information (*Tiedonjulkistamisen neuvottelukunta*) for science communication", followed by a discussion on the representation of science journalism and scientific communication topics on Wikipedia.

March 1 – The Academy held a discussion on organising the March for Science on April 14 in Tallinn and Tartu as part of the *TeaMe+* programme.

March 5 – Members of the Academy Ene Ergma and Peeter Saari gave presentations "Space – far and near"

and “Is telepathy possible on gravitational waves?”, respectively, as part of the lecture series “The way towards (Poska) Academy”.

March 6 – President of the Academy of Sciences Tarmo Soomere and President of the Estonian Academic Agricultural Society Marko Kass signed an Association Agreement between the two institutions.

March 6 – The Board at its meeting approved the agenda for the General Assembly Annual Meeting, decided to change the rules for electing Members of the Academy and presented the changes to the General Assembly of the Academy to be approved.

March 16 – Members of the Academy Jüri Engelbrecht and Tarmo Soomere met the organising committee of the cultural and educational congress “Learning to be human”. They agreed upon the format and the agenda of the scientific culture day (held in the Academy Hall on 23 November 2018).

March 19 – The Estonian Science Journalists’ Association in collaboration with the Estonian Young Academy of Sciences and the Estonian Academy of Sciences organised the Language and Science Conference, held in the Academy Hall.

March 28 – The EU-PolarNet symposium was held in the Academy Hall at the initiation of the Estonian Polar Research Committee.

April 2 – Members of the Academy Urmas Kõljalg and Andres Metspalu gave presentations “The life of a naturalist” and “Personalised medicine already today”, respectively, as part of the lecture series “The way towards (Poska) Academy”.

April 12–13 – During the Young Scientists’ Festival held at the Estonian National Museum, the Academy rewarded talented young people with a special award (see p. 34 and *In Words and Images*, p. 105).

April 14 – The solo exhibition “Landscapes of my Fatherland” by Member of the Academy Anu Raud was opened at the Estonian National Museum, with nearly fifty tapestries on display from the 1968–2018 period.

April 17 – The Academy of Sciences and the Foresight Centre organised a joint discussion between scientists and the *Riigikogu* (the Parliament of Estonia), addressing the key topics for Estonia: the potential of wind power as a source of renewable energy, investments required for energy security, and issues related to the functioning of the gas market and the security of supply (see p. 26 and *In Words and Images*, p. 64).

April 20 – A General Assembly festive session was held at the Estonian National Museum. Laureate of the National Lifetime Achievement Award Member of the Academy Agu Laisk and Foreign Member of the Academy Jaan Valsiner gave scientific presentations. These were followed by an overview of the activities of the Academy

in 2017. In the second part of the meeting, the General Assembly approved the changes to the rules of electing Members of the Academy, approved the Academy’s budget implementation in 2017, and the 2018 budget.

April 20 – At the General Assembly festive session, President Tarmo Soomere presented the Estonian Academy of Sciences 80 postal stationery; a stamped postcard that Eesti Post issued in celebration of the Academy’s anniversary (see *In Words and Images*, p. 18–23).

April 20 – In addition to the classic (so-called “White”) yearbooks, the Academy issued a pilot edition of a Coloured Yearbook *Estonian Academy of Sciences. In Words and Images*.

April 20 – Under the leadership of the Academy, the conference Story of Estonian Thought was held to celebrate the first General Assembly meeting of the Estonian Academy of Sciences on 20 April 1938 (see page 25 and *In Words and Images*, page 23).

April 23–24 – President Tarmo Soomere participated in the European Academies’ Advisory Council (EASAC) Environment Steering Panel and Energy Steering Panel’s joint session at the premises of the Hungarian Academy of Sciences in Budapest.

April 27 – The Academy received a visit from its Foreign Member, Professor of Applied Mechanics at Budapest University of Technology and Economics (BME), and member of the Hungarian Academy of Sciences Gábor Stépán. During the meeting, the guest, along with President Tarmo Soomere and Member of the Board Jüri Engelbrecht, discussed the issue of pseudoscience, and compared science funding and factors affecting it in Estonia and in Hungary. They also spoke about the position of science in society. Tarmo Soomere gave the Diploma of Foreign Member to Gábor Stépán at Tallinn University of Technology where the guest gave a public lecture “Quantization and sensory threshold in balancing with delay”.

May 15 – The Board at its meeting decided upon the vacancies of seven Members of the Academy by field of study. It also decided to announce a competition for Research Professors, and elected a Selection Board. It decided to conclude an Association Agreement with the Estonian Academic Oriental Society. The Board also discussed the funding of societies associated with the Academy and confirmed the composition of the Under and Tuglas Literature Centre Council.

May 15 – The book *100 Years of Science in Estonia* (by Member of the Academy Jüri Engelbrecht and science historian Erki Tammiksaar) was presented in the Academy Hall.

May 16–18 – President Tarmo Soomere participated in the General Assembly of the European Federation of Academies of Sciences and Humanities (ALLEA) and gave a brief statement on the question of trust in

modern-day research consultancy during the conclusive panel discussion of the Conference Science in Times of Challenged Trust and Expertise: Shaping European Science Advice, organised alongside the General Assembly.

May 22 – Members of the Academy Agu Laisk and Ene Ergma gave presentations “How I became a scientist” and “Space – far and near”, respectively, to Võru County secondary school students in the Science Day programme at Võru Gymnasium.

May 27–30 – As an external expert invited by al Farabi Kazakh National University, President Tarmo Soomere participated in a discussion on the principles of the international curriculum in mechanics, and in drawing up a draft of the curriculum.

May 31 – The 80th birthday of Member of the Academy Gennadi Vainikko was celebrated at the University of Tartu Institute of Mathematics and Statistics.

May 31–June 1 – President Tarmo Soomere participated in a European Academies’ Advisory Council (EASAC) session in Vienna at the Austrian Academy of Sciences.

June 5 – Leaders of the Estonian, Latvian and Lithuanian Academies of Sciences met in Riga. They discussed the main theme of the next Baltic Conference on Intellectual Co-operation, and agreed upon further actions. They signed an Annex to the Trilateral Co-Operation Agreement which establishes a framework for joint activities for the next two years.

June 6 – Members of the Academy Agu Laisk and Arvi Freiberg gave presentations “How I became a scientist” and “The multiple facets of energy”, respectively, in the Science Day programme at Kilingi-Nõmme Gymnasium.

June 12 – The Board at its meeting had a discussion on the drawing up of a joint Framework of Reference for the Academy Committees and Council. Member of the Academy Karl Pajusalu introduced the events planned for the 2019 Year of the Estonian Language. Secretary-General Jaak Järv informed the Board about the idea of creating a network of co-operation of the societies associated with the Academy. President Tarmo Soomere informed the Board about the need to renew the Academy’s website, as well as about the course of preparations for two research policy conferences.

June 12 – The exhibition “Members of the Academy from monographs to tweets” (see p. 25 and *In Words and Images*, p. 24) was opened in celebration of the Academy’s 80th anniversary in the gallery of Tallinn University Academic Library. The joint publication *National Awards of the Republic of Estonia, 2018*, issued in collaboration with the Academy, the Ministry of Culture, and the Ministry of Education and Research was also presented.

June 12 – The Academy concluded an Association Agreement with the Estonian Academic Oriental Society.

June 26–27 – The Academy hosted government science advisors of European countries and representatives of the European Commission in the context of the 4th meeting of the European Science Advisors Forum (ESAF). The Estonian representative in the ESAF is Tarmo Soomere. On the first evening, former Vice-President of the European Commission Siim Kallas was invited to give a speech. On the second day, Member of the Academy Maarja Kruusmaa spoke about Estonia’s experience and prospects in IT development.

August 28 – The FuturICT 2.0 General Assembly was held in Tallinn, including reflections on understanding and managing complex, global, socially interactive systems (see p. 26 and in *Words and Images*, p. 47).

September 7 – The COST (Cooperation in Science and Technology) Information Day was held at the Academy. COST is Europe’s oldest research and technology cooperation programme.

September 14 – President Tarmo Soomere gave a presentation entitled “Estonian Academy of Sciences: Interlinking science and media” at the joint seminar for Baltic Academies of Science and Hamburg Academy of Sciences and Humanities held in Hamburg.

September 18 – Member of the Academy Toomas Asser spoke about study opportunities at the University of Tartu and gave a presentation entitled “On the brain and brain diseases” at the Poska Academy Conference.

September 24 – Members of the Academy Tarmo Soomere and Urmas Varblane gave a talk in the programme of the Science Day at Võru Gymnasium.

September 25 – The Board at its meeting decided to approve the Framework of Reference regulating the work of committees at the Estonian Academy of Sciences. The Energy Council was renamed the Energy Committee. President Tarmo Soomere gave an overview of the discussion about the principles of composing the Estonian Research Council Evaluation Committee. There was a discussion about publishing research findings in open access sources. A decision was made to start negotiations about concluding an Association Agreement with the Estonian Society of Sociologists.

October 8 – Upon the Prime Minister’s invitation, President Tarmo Soomere attended a dinner with the Earl and Countess of Wessex at The Academy Hall.

October 10 – The *Riigikogu* (the Parliament of Estonia) held its 5th research policy conference *Research as Estonia’s Driving Force. How does Science Protect Estonia?* (see p. 26). Member of the Academy Tarmo Soomere gave a keynote speech and chaired the discussion.

October 11 – President Tarmo Soomere participated in a meeting with European Commission DG Research and Innovation Director-General Jean-Eric Paquet at the Ministry of Education and Research.

October 12 – Member of the Academy Jaan Undusk gave a presentation at the research conference “Kotzebue Dialogs VII” (*Kotzebue-Gespräch VII*). The conference, which was held at Berlin-Brandenburg Academy of Sciences and Humanities, was dedicated to the famous German writer, dramatist and Estophile August von Kotzebue (1761–1819) who spent part of his life working in Tallinn.

October 12 – A conference dedicated to the 90th birthday of Member of the Academy Dimitri Kaljo was held at the Academy Hall.

October 19 – President Tarmo Soomere had a one-on-one meeting with US Science Envoy Professor Robert Langer (Massachusetts Institute of Technology).

October 20 – President Tarmo Soomere had a meeting with the Stanford Research Institute Corporate Strategy Executive Director Dennis Tsu and a Member of Parliament Anne Sulling.

October 22–23 – The Academy organised an international conference entitled The Advisory Role of Academies in the Information-Rich Society (see *In Words and Images*, p. 42–45).

October 24–25 – President Tarmo Soomere participated in the European Science Foundation Marine Board Autumn Plenary in Trieste (Italy).

October 29 – Member of the Academy Valter Lang gave a presentation “The arrival of Finno-Ugric peoples in Estonia” as part of the lecture series “The way towards (Poska) Academy”.

October 30 – President Tarmo Soomere had a meeting with a correspondent of *Nature* journal Quirin Schiermeier. They exchanged ideas about compiling an article on research in Estonia and on the role of the Academy of Sciences both historically and in modern society.

November 6 – The Board at its meeting approved the agenda for the upcoming General Assembly meeting. Overviews were given of member candidates’ discussions in divisions. The idea was put forward that the principles of electing Members of the Academy should be critically evaluated. President Tarmo Soomere gave a presentation about the Academy’s 80th anniversary conference The Advisory Role of Academies in the Information-Rich Society. The Board approved the draft letter to the Estonian Research Council with proposals about complementing the classification of publications. There was a discussion about the Estonian Academic Theological Society’s possible association with the Academy. The Board confirmed the dates for General Assembly meetings in 2019.

November 9 – The Academy held a member candidates’ conference (see *In Words and Images*, p. 60) where the collection *Teadusmõte Eestis IX. Teadus ja ühiskond* (Scientific Thought in Estonia IX. Science and Society) was also presented.

November 13 – Member of the Academy Ülo Niinemets gave a presentation entitled “Agriculture in the changing world” as part of the lecture series “The way towards (Poska) Academy”.

November 23 – The Academy hosted the Science Day “Reflections of studying and upbringing on different scientific fields” as part of the Estonian culture and education congress (see p. 26).

November 23 – Member of the Academy Hando Runnel presented his jubilee collection *Flight of the Blue Dragonflies* at the old University Café in Tartu.

November 23 – The 125th anniversary of the birth of Ernst Julius Öpik, a founding member of the Estonian Academy of Sciences and a founder of the Estonian school of astronomy, was celebrated at the hall of the University of Tartu. Members of the Academy Jaan Einasto, Ene Ergma and Arvi Freiberg represented the Division of Astronomy and Physics.

December 1–2 – “Science in 3 minutes” winter school was held in the old Heimtali Village School for the participants of the 4th contest of three-minute lectures (see *In Words and Images*, p. 98).

December 5 – The General Assembly at its meeting elected seven new Members of the Academy (see p. 12).

December 18 – The Board at its meeting approved the third year progress reports presented by Research Professors Anne Kahru, Kaupo Kukli and Rainer Kattel. New Research Professors were elected for the 2019–2021 period (Andres Merits, Toomas Rõõm, Dmitri Vinnikov). The Board also decided to award two Memorial Medals of the Academy in 2019 and approved the Action Plan for 2019.

December 18 – A Research Professors’ Mini Conference was held with presentations given by Research Professors Anne Kahru, Kaupo Kukli and Rainer Kattel (see p. 17 and *In Words and Images*, p. 58–59).

December 19 – A cross-party agreement was signed in the presence of President of Estonia Kersti Kaljulaid in Kadriorg, confirming that government funding of research, development and innovation (RD&I) expenditure would be increased to 1% of gross domestic product (GDP). President of the Academy of Sciences Tarmo Soomere and President of the Estonian Young Academy of Sciences Els Heinsalu signed the Agreement as representatives of Estonian researchers.

December 20 – The Minister of Justice Urmas Reinsalu and President of the Academy Tarmo Soomere signed a

cooperation agreement to create a Constitutional Law Endowment. The Ministry is going to contribute 300,000 euros per year to support the teaching of Constitutional Law and research in the field of Constitutional Law during the years 2018–2022.

December 20 – The Academy hosted a press conference where Member of the Academy Andres Metspalu announced that 100,000 new gene donors had provided a gene sample.

December 29 – In celebration of Member of the Academy Huno Rätsep's 91st birthday, a meeting was held at the Institute of Estonian and General Linguistics of the University of Tartu. The current state of the Estonian language and the organisation of the 2019 Year of the Estonian Language were discussed, among other topics. The Academy was represented by its members Karl Pajusalu, Haldur Õim and Urmas Varblane.

MEMBERSHIP OF THE ACADEMY

Seven new Members of Academy were elected by the General Assembly on 5 December 2018:



Marco Kirm – Exact Sciences



Jarek Kurnitski – Engineering



Kalle Kirsimäe - Geology



Anne Kahru – Ecotoxicology



Tiit Tammaru — Human Geography



Tiina Randma-Liiv – Social and Political Sciences



Anu Realo – Cultural Studies

The membership of the Estonian Academy of Sciences was composed of 77 Members and 20 Foreign Members as of 31 January 2019. Their distribution among the divisions was the following:

DIVISION OF ASTRONOMY AND PHYSICS

(16 Members, 6 Foreign Members)

M e m b e r s: Jaan Aarik, Jaak Aaviksoo (Head of Division), Jaan Einasto, Ene Ergma, Arvi Freiberg, Vladimir Hižnjakov, Marco Kirm, Tšeslav Luštšik, Ergo Nõmmiste († 11.04.2019), Martti Raidal, Enn Saar, Peeter Saari, Mart Saarma, Arved-Ervin Sapar, Gennadi Vainikko, Richard Villems.

F o r e i g n M e m b e r s: Jonathan (John) R. Ellis, Richard R. Ernst, Charles Gabriel Kurland, Jaan Laane, Jaak Peetre († 01.04.2019), Alar Toomre.

DIVISION OF INFORMATICS AND ENGINEERING

(19 Members, 4 Foreign Members)

M e m b e r s: Olav Aarna, Hillar Aben, Jüri Engelbrecht, Ülo Jaaksoo, Maarja Kruusmaa, Valdek Kulbach, Jarek Kurnitski, Jakob Kübarsepp (Head of Division), Rein Küttner, Ülo Lepik, Enn Lust, Leo Mõtus, Arvo Ots, Tarmo Soomere, Enn Tõugu, Raimund-Johannes Ubar, Tarmo Uustalu, Jaak Vilo, Andres Öpik.

F o r e i g n M e m b e r s: Steven R. Bishop, Michael Godfrey Rodd, Gábor Stépán, Esko Ukkonen.

DIVISION OF BIOLOGY, GEOLOGY AND CHEMISTRY

(24 Members, 5 Foreign Members)

M e m b e r s: Toomas Asser (Head of Division), Jaan Eha, Jaak Järv, Ain-Elmar Kaasik, Anne Kahru, Dimitri Kaljo, Mati Karelson, Kalle Kirsimäe, Ilmar Koppel, Urmas Kõljalg, Hans Küüts, Agu Laisk, Ülo Lille, Margus Lopp, Udo Margna († 17.05.2019), Jüri Martin, Andres Metspalu, Ülo Niinemets, Anto Raukas, Valdur Saks, Martin Zobel, Raivo Uiho, Mart Ustav, Eero Vasar.

F o r e i g n M e m b e r s: Ülo Langel, Pekka T. Männistö, Matti Saarnisto, Helmut Schwarz, Jānis Stradiņš.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

(18 Members, 5 Foreign Members)

M e m b e r s: Jüri Allik, Mihhail Bronštein, Mart Kalm, Valter Lang, Lauri Mälksoo, Karl Pajusalu, Arvo Pärt, Tiina Randma-Liiv, Anu Raud, Anu Realo, Jaan Ross, Hando Runnel, Huno Rätsep, Tiit Tammaru, Tõnu-Andrus Tannberg, Jaan Undusk, Urmas Varblane (Head of Division), Haldur Õim.

F o r e i g n M e m b e r s: Juri Berezkin, Cornelius Theodor Hasselblatt, Päiviö Tommila, Endel Tulving, Jaan Valsiner.

During 2018 on the whole Members of the Estonian Academy of Sciences proceeded with their research and academic activities.

Complementary to their principal occupation, various Members of the Academy acted as experts and advisers. Several Members serve in expert panels and councils of national significance:

- President's Academic Advisory Board – Peeter Saari, Richard Villems
- Board of President of the Republic's Cultural Foundation – Jaan Undusk (up to 24 September 2018)
- Government of the Republic Research and Development Council – Jaak Aaviksoo, Toomas Asser, Mart Saarma, Tarmo Soomere
- Government of the Republic Sustainable Development Committee – Margus Lopp
- National Science Prize Committee – Tarmo Soomere (Chair), Jaan Aarik, Toomas Asser, Maarja Kruusmaa, Valter Lang, Jüri Martin, Lauri Mälksoo, Ülo Niinemets, Karl Pajusalu, Tiit Tammaru, Eero Vasar (Vice Chair)
- Advisory Board of the Foresight Centre at the *Riigikogu* – Jaak Aaviksoo, Tarmo Soomere
- Board of the Estonian Research Council – Mart Ustav
- Evaluation Committee at the Estonian Research Council – Anne Kahru, Jaan Eha, Jarek Kurnitski, Jakob Kübarsepp, Richard Villems
- Estonian Science Communication Award Appraisal Panel at the Estonian Research Council – Ene Ergma (Chair)
- *TeaMe+* Programme Advisory Board at the Estonian Research Council – Tarmo Soomere
- Supervisory Board of Eesti Pank – Urmas Varblane
- Fiscal Council – Urmas Varblane

A considerable number of Members were involved in the work of expert panels reporting to a particular ministry. Ministry of Education and Research:

- Research Policy Advisory Committee – Ülo Niinemets and Ergo Nõmmiste;
- Working Group on the Internationalisation of Estonian Research and Steering Committee for the Internationalisation of Research 20 Programme – Jüri Engelbrecht;
- Programme Board of the National programme “Development of Values in Estonian Society (2015–2020)” – Olav Aarna and Jüri Engelbrecht;
- Estonian Lifelong Learning Strategy 2020 Steering Group – Olav Aarna;
- Estonian Science Communication Competition – Ene Ergma (Chairman of the Committee);
- Estonian National Contest for University Students Evaluation Committee – Jaan Aarik;

Ministry of Finance:

- Cohesion Policy Operational Programme Monitoring Committee – Tarmo Soomere (permanent member), Margus Lopp (substitute member);

Ministry of the Environment:

- Gene Technology Committee – Eero Vasar;

Ministry of Social Affairs:

- Advisory Professional Committee for Neurosurgery – Toomas Asser;
- Advisory Professional Committee for Cardiology – Jaan Eha;
- Advisory Professional Committee for Allergy and Immunology – Raivo Uibo;
- Health Research and Innovation Council – Eero Vasar.

Ministry of Economic Affairs and Communications:

- Estonian Space Affairs Council – Ene Ergma (Chairman).

Estonian Centres of Excellence in Research were headed by five Members of the Academy: Martti Raidal – Dark Side of the Universe; Ülo Niinemets – Ecology of Global Change: Natural and Managed Ecosystems; Enn Lust – Advanced Materials and High-Technology Devices for Energy Recuperation Systems; Andres Metspalu – Centre of Excellence for Genomics and Translational Medicine; Maarja Kruusmaa – EXCITE, Excellence in IT in Estonia.

Two Members of the Academy belonged to the decision making bodies of doctoral schools: Karl Pajusalu (Chairman of the Council) – Doctoral School of Linguistics, Philosophy and Semiotics; Enn Lust (Chairman of the Council) – Doctoral School of Functional Materials and Technologies.

Similarly to previous years, Members of the Academy were widely represented in international scientific organisations and editorial boards of scholarly journals.

Member of the Academy Agu Laisk was recognised with the National Science Prize for Outstanding Lifetime Achievements in Research and Development. Two Members of the Academy received an annual award of the National Science Prize within a specified category of research area: Jarek Kurnitski who was elected Member of the Academy in December 2018 in engineering science and Ülo Niinemets in geo- and biosciences (see p. 30–31).

Members of the Academy were also publicly acknowledged by various institutions, associations and organisations in 2018:

- Jüri Allik was awarded the European Association for Personality Psychology (EAPP) Life-time Achievement Award;
- Arvi Freiberg and Eve Oja were recognised with the University of Tartu Grand Medal;
- Vladimir Hižnjakov, Agu Laisk and Mart Ustav received the Decoration of the University of Tartu;

- Andres Metspalu was awarded the Estonian Society of Human Genetics Lifetime Achievement Award;
- Ülo Niinemets was acknowledged with the title of Honorary Doctor by Romanian Aurel Vlaicu University of Arad and named Laureate of the Year by the cultural weekly newspaper *Sirp*;
- Arvo Pärt was awarded the Gold Medal for Merit to Culture – Gloria Artis, the Republic of Poland's highest award in the field of culture; The Fryderyk Chopin University of Music granted him an Honorary Doctorate;
- Tiina Randma-Liiv - European Academy of Management (EURAM) conference, best paper award by the International Journal of Public Sector Management, Reykjavik, 2018;
- Anu Realo was elected President of the European Association for Personality Psychology (EAPP);
- Peeter Saari was recognised by the Estonian Research Council as one of the best Personal Research Funding (PUT) final report authors;
- Tarmo Soomere was awarded an Honorary Doctorate by Klaipėda University, and given a Badge of Honor of Tallinn Coat of Arms (for long-term contribution to the development of the City of Tallinn through a wide range of marine research);

Five Members of the Academy Anne Kahru, Urmas Kõljalg, Andres Metspalu, Ülo Niinemets and Martin Zobel were among the 17 Estonian scientific researchers to be incorporated in the list of the world's most cited researchers by Clarivate Analytics Web of Science in 2018.

Members of the Academy Jüri Allik, Anne Kahru, Urmas Kõljalg, Andres Metspalu, Ülo Niinemets, Martti Raidal, Anu Realo, Martin Zobel, Richard Villems, Jaak Vilo, as well as Erast Parmasto who has now passed away were incorporated among the scientists ranking in the top 1% by citations for field and publication year according to Essential Science Indicators.

Members of the Academy Anne Kahru, Maarja Kruusmaa and Anu Realo are listed among European top female researchers in the AcademiaNet portal (www.academia-net.org).

Estonia's Top Influencers list compiled by Estonian journalists includes Members of the Academy Arvo Pärt (7th position), Tarmo Soomere (83rd position) and Jaak Aaviksoo (93rd position).

Foreign Members continued to participate in the activities of the Academy and research institutions of Estonia in compliance with time-honoured collegial relationships, scientific collaborations and research alliances.

GENERAL ASSEMBLY

The General Assembly of the Academy was convened twice in 2018.

April 20 – Annual Meeting:

- Agu Laisk “Photosynthesis – black and white and colourful”
- Jaan Valsiner “From a small country to the big world”
- Reports from Heads of Divisions Jaak Aaviksoo, Jakob Kübarsepp, Toomas Asser, Urmas Varblane and President Tarmo Soomere on the activities of the Academy in 2017
- Changes to the rules of electing Members of the Academy
- Report from Secretary-General Jaak Järv on the Academy’s financial activities in 2017 and the 2018 budget
- Assigning member allowances for the period 1 May 2018 – 30 April 2019

December 5 – Meeting:

- Ülo Langel “On the way towards new pharmacology”
- Extension of the mandate of Board members until January 31, 2020
- On the structure of the Board of the Estonian Academy of Sciences
- Election of Vice-President
- Election of new Members

The first session of the General Assembly was organised as the Annual Meeting of the Academy and focused on summing up the activities of the Academy in 2017. Detailed data concerning the activities of the Academy in the financial year were presented in the Estonian Academy of Sciences Yearbook XXIII (50), which was sent to all Members in advance.

On the same date, 80 years ago, the first General Assembly of the Academy took place in the Council Hall of the University of Tartu. Therefore, this year’s General Assembly was also held in Tartu, at the Estonian National Museum (see *In Words and Images*, p. 18–23).

Acting Rector of the University of Tartu Tõnu Lehtsaar and Mayor of Tartu Urmas Klaas greeted participants of the General Assembly on the occasion of the anniversary of the Academy.

In keeping with tradition, the laureate of the National Science Prize of 2017 for Outstanding Lifetime Achievements in Research and Development, Member of the Academy Agu Laisk gave a presentation entitled “Photosynthesis – black and white and colourful”.

Foreign Member of the Academy Jaan Valsiner gave a presentation entitled “From a small country to the big world: an intimate science travelogue”.

Heads of Divisions Jaak Aaviksoo, Jakob Kübarsepp, Toomas Asser and Urmas Varblane gave an overview of the activities performed by their Divisions in 2017. President Tarmo Soomere gave an overview of the activities of the Academy as a whole. On the proposal of the Secretary-General Jaak Järv, the General Assembly approved the Academy’s 2017 annual report based on the reports and supplementary information in the Yearbook.

Member of the Academy Anu Raud gave the Academy a tapestry on the occasion of its 80th anniversary, and it was received by the President of the Academy.

President Tarmo Soomere explained the planned changes to the rules of electing Members of the Academy, which were then approved by the General Assembly, also considering proposals made on the day. Chairman of the Statutory Committee Jüri Engelbrecht and Secretary-General Jaak Järv outlined amendments to the Statutes of the Academy and the General Assembly approved the updated Statutes.

Secretary-General Jaak Järv reported on the implementation of the 2017 budget and presented the 2018 budget. Both were approved by the General Assembly.

Secretary-General Jaak Järv briefed the General Assembly on a plan for assigning member allowances for the period from 1 May 2018 to 30 April 2019. The General Assembly decided to keep distributing the allocated amount among all Members of the Academy on an equal basis.

In his concluding remarks, President Tarmo Soomere emphasised that considerable success had been reached in all the key work directions outlined four years ago.

In the second session of the General Assembly, which took place on 5 December, President Tarmo Soomere, in his opening words, briefly summarised the most important events of the Academy’s 80th anniversary year (see *In Words and Images*, p. 26–29).

Foreign Member of the Academy Ülo Langel gave a scientific presentation titled “On the way towards new pharmacology”.

The General Assembly decided to extend the mandate of the Board members until 31 January 2020. On the proposal of President Tarmo Soomere, the General Assembly decided to change the structure of the Board and approved the composition of the Board containing 17 members. Vice-Presidential elections were held and Member of the Academy Arvi Freiberg was elected as the new Vice-President.

Elections of new Members were the main agenda item. 22 submissions about 20 candidates had been received from various universities, research institutions, Members of the Academy, and one research society associated with the Academy to fill the seven announced vacancies. Following a secret ballot, Marco Kirm was elected Member of the Academy in Exact Sciences (candidates Els Heinsalu, Jaan Janno, Marco Kirm and Toomas Rõõm). Jarek Kurnitski was elected Member of the Academy in

Engineering (candidates Mario Kadastik, Jarek Kurnitski and Jaan Raik). The only submitted candidate in his field, Kalle Kirsimäe, was elected Member of the Academy in Geology, and the only submitted candidate in her field Anne Kahru was elected Member of the Academy in Ecotoxicology. Tiit Tammaru was elected Member of the Academy in Human Geography (candidates Hannes Palang and Tiit Tammaru). Anu Realo was elected Member of the Academy in Cultural Studies (candidates Kristin Kuutma, Mare Kõiva, Jaan Lahe, Rein Raud, Anu Realo and Peeter Torop). Tiina Randma-Liiv was elected member of the Academy in Social and Political Sciences (candidates Eiki Berg, Tiina Randma-Liiv, Ellu Saar).

In his concluding remarks, President Tarmo Soomere reminded the General Assembly that a new President and a new Board would be elected next year. Therefore, all Members had from this moment until the following summer to think about what an ideal Estonian Academy of Sciences would be like and which steps would lead us to it.

BOARD

The Board of the Estonian Academy of Sciences was composed of the following members in 2018:

President	Tarmo Soomere
Vice-President	Ergo Nõmmiste († 11.04.2019)
Vice-President	Mart Kalm
Vice-President from 5 December 2018	Arvi Freiberg
Secretary-General	Jaak Järv
Head of Division of Astronomy and Physics	Jaak Aaviksoo
Head of Division of Informatics and Engineering	Jakob Kübarsepp
Head of Division of Biology, Geology and Chemistry	Toomas Asser
Head of Division of Humanities and Social Sciences	Urmas Varblane
Non-executive Members	Jüri Engelbrecht
	Valter Lang
	Ülo Niinemets
	Karl Pajusalu
	Martti Raidal
	Peeter Saari
	Andres Öpik
	Eero Vasar

During the year, the Board held seven work meetings and four times the decision was passed under the procedure of electronic poll.

Since new Members were to be elected at the end of the year, various aspects of the elections were repeatedly placed on the agenda. President Tarmo Soomere considered it necessary to clarify the rules of electing Members of the Academy. The Board discussed the amendments and submitted them to the General Assembly for approval. Taking into account proposals made by different divisions, The Board decided to announce seven Member of the Academy vacancies: Exact Sciences, Engineering, Geology, Ecotoxicology, Human Geography, Cultural Studies, and Social and Political Sciences (one each).

The programme of celebrations in honour of the 80th anniversary of the Academy was discussed time and again. As 2019 marks the year when Estonian has been the official language for 100 years, discussions were held regarding celebratory events, and the Board approved the Academy's Action Plan.

As the Board found it expedient to enhance cooperation with the Estonian Academic Agricultural Society and the Estonian Academic Oriental Society, it agreed to conclude an Association Agreement with both societies. A decision was made to start negotiations to conclude an Association Agreement with the Estonian Society of Sociologists. Discussions were held on the funding of associated societies. The Board considered the Estonian Naturalists' Society's (ELUS) initiative to create a collaboration network between associated societies, and allocated targeted funding to ELUS to set up an online platform to do so.

In the reporting year, the Academy dedicated more attention to the work of its committees and councils. The Board recognised that committees were working efficiently and that their increasing level of activity was to be encouraged in every way. In order to improve collaboration between committees, the Board issued a Framework of Reference regulating the work of committees. In order to homogenise names, it was decided that the Energy Council would be renamed as the Energy Committee.

At the end of the year, Research Professors Anne Kahru, Rainer Kattel and Kaupo Kukli presented their reports on their third working year as Research Professors. In spring, the Board decided to announce a new competition for Research Professors, and elected a

Selection Board to evaluate the candidates. In December, new Research Professors were elected for the 2019–2021 period: Tartu University Institute of Technology Professor Andres Merits, National Institute of Chemical Physics and Biophysics Research Professor Toomas Rõõm, and Tallinn University of Technology Research Professor Dmitri Vinnikov.

The Board spent a significant amount of time discussing and making decisions about daily work issues. The Academy's Action Plan for 2018 was approved, as well as the Action Plan for 2019 at the end of the year. The implementation of the consolidated budget of the Academy in 2017 and the 2018 budget were reviewed and submitted to the General Assembly for approval.

With regard to Member of the Academy Eero Vasar's election as a Board Member, the Board reviewed the distribution of Board Members' work tasks. Information about the productivity of the Estonian Academy of Sciences sub-fund with the Estonian National Culture Foundation in 2018, as well as its investment results over the years, was considered. The principles of how to compose the Estonian Research Council's Evaluation Committee were discussed, and candidates for the Member of the Estonian Research Council's Evaluation Committee were nominated. The Board granted Member of the Academy Andres Öpik's request to be revoked from University of Tartu Council, and appointed a new Member of the Board Els Heinsalu, senior researcher at the National Institute of Chemical Physics and Biophysics (KBFI), and President of the Estonian Young Academy of Sciences.

The Board confirmed the composition of the Under and Tuglas Literature Centre Council (Chaired by Member of the Academy Jaan Undusk). It was decided that the Endel Lippmaa Memorial Lecture would be organised in 2020. There were discussions about disseminating information to society and about renewing the Academy's website. The Board talked about the possibilities of publishing research results in open access sources and suggested making use of the potential of the Estonian Research Information System (ETIS). The Board approved the suggestions to be made to the Estonian Research Council about complementing the classification of publications.

Regular meetings and negotiations of the Management Board to discuss organisational aspects of science policy as well as in-house matters continued.

COUNCILS, COMMITTEES

COMMITTEE ON METEORITICS

Set up in 1954

Chairman Jüri Plado, PhD

The Estonian Academy of Sciences Committee on Meteoritics is comprised of Jüri Plado (Chair), Juho Kirs, Tõnu Pani, Ulla Preeden, Sten Suuroja, Reet Tiirmaa and Siim Veski, as per the decision made on 14 March 2017 by the Board of the Academy.

In 2018, research in meteoritics was concentrated in the University of Tartu. Field work was carried out (i) in Moraske structures (Poland), where research was done on magnetic anomalies associated with craters and meteors (Jüri Plado and Argo Jõelet in collaboration with the Adam Mickiewicz University in Poznań), (ii) in the putative Puula crater (Finland) (Jüri Plado and Timmu Kreitsmann in collaboration with the Geological Survey of Finland), (iii) in the Tori round structure (Sweden) in order to investigate its origin and age (Jüri Plado and Argo Jõelet in collaboration with the University of Exeter, and (iv) in the Lonar crater (India) to assess the magnetic susceptibility of target rocks and post-impact sediments (Department of Geology of the University of Tartu, Kalle Kilk in collaboration with Karnataka University).

On May 23–25 the University of Tartu hosted the Annual General Meeting of the Stockholm University Astrobiology Centre.

On August 6–11, the Workshop / Summer school "Microsatellites in planetary and atmospheric research" was held at the University of Tartu as part of the activities of the Nordic Network of Astrobiology. The course provided students with an overview of research challenges faced by planetary and atmospheric science, and the potential of microsatellites to overcome them. The course was jointly organised by the Stockholm University Astrobiology Centre, the University of Tartu, the European Astrobiology Campus, and the Nordic Network of Astrobiology.

Research results were presented at three conferences: (i) The 81st Annual Meeting of The Meteoritical Society, 22–27 July 2018 in Moscow, (ii) The European Planetary Science Congress 2018, 16–21 September 2018 in Berlin, and (iii) The Lithosphere 2018 Symposium, 14–16 November 2018 in Oulu.

During the year, employees of the University of Tartu Natural History Museum, Department of Geology at the University of Tartu and Department of Geology at Tallinn University of Technology consulted approximately a dozen people on various meteoritics-related issues (the possible link of occasional findings to meteorites, the possible link of round structures to meteorite craters).

COMMITTEE ON NATURE CONSERVATION

Set up in 1955

Chairman Urmas Tartes, PhD

The Committee on Nature Conservation at the Estonian Academy of Sciences continued working on the premises of the Estonian University of Life Sciences in Tartu, and there were no changes in the membership of the committee.

At the beginning of the year, the committee sent a memorandum to the Minister of the Environment based on the conclusions made on the Presentation Day. This resulted in an animated discussion and provided valuable input to developing the terms of reference for the Forestry Development Plan. There was no presentation day organised in 2018, but the Committee was engaged in making preparations for the next presentation day (56th edition), which is again going to focus on problems in the forestry industry and be titled Estonian Forest 50+50.

The year 2019 marks the 30th year of presenting the Eerik Kumari Nature Conservation Award, named after the founder of the Committee on Nature Conservation. So far, 35 nature conservationists have received this honour. The 2018 Eerik Kumari Nature Conservation Award (along with the Gold Badge), which is the highest award in nature conservation, was bestowed on Eerik Leibak. President Kersti Kaljulaid presented the award on May 15 at Nõmme Sports Centre during the opening ceremony of Nature Protection Month. The laureate was also presented with Nature Protection Centre's volume *Protection of Fauna in the Estonian SSR* (1992, Ed. Vilju Lilleleht), dedicated to the memory of Eerik Kumari. Vaike Hang compiled an exhibition of the laureate's most important works, field work photos and other materials at the [Karl Ernst von] Baer House (from June to July 2018). The establishment of the Kumari café on the third floor of the Penijõe Museum in Matsalu is

still stalled. Since the necessary funds have not been allocated, construction work has currently been halted.

Secretary of the Committee Vaike Hang has been active at organising exhibitions at the Baer House. At the beginning of the year, an exhibition about University of Tartu geography lecturer Heino Mardiste's life's work was on show. From May to July, there was an exhibition of handwriting samples collected from over 300 people over several decades, from Baer's days up to the present day. In July, Ms Hang compiled an exhibition based on Estonia's well-known radio voice and nature conservationist Toomas Jürjado's home archive containing his radio performances, written pieces, wonderful photos, diaries and more.

In June and July, an exhibition held in honour of Jaan Eilart's 85th birth anniversary was available to explore. In celebration of the same, the Estonian Nature Society organised a Conference on Wheels for Jaan Einart in the Nature Omnibus. The journey started in the places where Mr Eilart spent his youth, and ended in Tartu with a stop at Raadi Cemetery and at the exhibition in honour of Eilart in the Baer House.

In December 2018, the Baer House opened the exhibition "Cultural history *ex libris* from Vaike Hang's collection". The same collection was partly exhibited at Tartu Public Library in October and November. Most of the *ex libris* had been made for naturalists (Gustav Vilbaste, Juhan Vilbaste, Harri Õiglane, Arvi Järvekülg, Eerik Kumari, Erast Parmasto, Vilju Lilleleht, Viktor Masing, Liivia Laasimer, Julius Tehver, Loit Reintam, Kuulo Kalamees, Rein Maran, Jaan Eilart, etc.). *Ex libris* artists represented included Günther Reindorff, Kaljo Põllu, Edgar Valter, Vive Tolli, Riho Lahi, Lembit Lepp, Eduard Maaser and Guara Muuga, among others.

Tartu Environmental Education Centre hosted the exhibition "In war and peace with mosquitoes", arranged by Urmas Tartes.

The daily work of Committee members mainly involves nature conservation or closely related activities. Some of the active retirees still carry on their activities under the auspices of this committee. Vilma Kuusk continued to monitor protected plant species on the coastal meadow in Pärnu. Toomas Frey gave several interviews and wrote a number of articles on forestry. Urmas Tartes delivered nature education lectures in Iisaku Nature Centre and at the Environmental Education Centre Conference, and participated in the work of the evaluation panel of the photo contest "Notice me", organised by the Vapramäe-Vellavere-Vitipalu Foundation. He was a member of the Kumari Award committee and continuously represented the Academy in the Council of MTÜ Loodusajakiri (NPO Nature Magazine). A considerable amount of time was

spent on the forestry discussion held at the beginning of the year.

ESTONIAN POLAR RESEARCH COMMITTEE

Set up in 1993

Chairman Rein Vaikmäe, Professor Emeritus

The European Polar Board (EPB) is a non-governmental strategic expert body that coordinates the interests of member states in planning research in the polar regions and optimising the use of correlative infrastructures in Europe. EPB advises the European Commission in these issues. Until 2015, the EPB was an expert panel at the European Science Foundation (ESF) and from 2015 it is an independent legal entity that is registered with the city government of Hague (the Netherlands). Estonia is a member of the EPB since 2001 with the Estonian Polar Research Committee (hereinafter EPRC) as the national point of contact.

As the most important substantive activity, the EPB contributed to the implementation of the Horizon 2020 project EU-PolarNet – "Connecting Science with Society" that is being carried out during 2015–2020. The objective of the project is to develop an integrated European Polar Research Programme. The project aims to bring together policymakers, business and industry leaders, local communities of polar regions, scientists, etc. Tallinn University of Technology's Institute of Geology represents Estonia in that consortium. In March 2018, Tallinn hosted the third plenary meeting of the project. The entire EPRC team contributed towards the event, with Rein Vaikmäe being the main organiser. Media coverage of the session through Estonian Public Broadcasting and its portals was reasonably thorough, but in addition to those interested in the field, the only participant in the public seminar held in the Academy Hall (and aimed at the wider public and primarily at politicians), was the Ministry of the Environment Research Advisor.

By the end of summer 2018, white papers for the European Polar Research Strategy were finished as part of the project. EPB member states had an internet-based public discussion on these, which in Estonia was mediated by the EPRC. Unfortunately, participation was not very active here. The documents in question have received input from scientists, business leaders and local communities of polar regions. The final document must be finished by 2020 and is intended to provide input for R&D projects in the EU's next Climate and Environment Framework Programme. At the European Parliament on 26 September 2018, EPB and EU-PolarNet Steering Committees presented the documents in question.

According to currently available data, the new Framework Programme is going to have a significantly larger budget for planning research in polar regions (primarily but not exclusively in the Arctic). However, seen as both the composition of the EP and the EC is going to change next year, it is impossible to estimate to what extent currently planned activities will be carried out. Nevertheless, having a strategy document of the field is an important starting point and source material.

The EPRC continued to engage in promoting the polar research domain in 2017. It also mediated the unofficial offer made by the Alfred Wegener Institute for Polar and Marine Research to Estonian polar researchers to participate in German polar expeditions and in the work of the research vessel *Polarstern* under favourable financial conditions.

Member of the EPRC Priit Tisler is participating in the Finnish Antarctic expedition FINNARP, which started at the end of November 2018. He acts as head of the expedition and head of the Aboa research station. The current research mainly focuses on general and specific questions of meteorology and a study of the properties of snow and ice.

Various Estonian tour operators have engaged or are in the process of engaging our polar experts (Enn Kaup, Andres Tarand, Erki Tammiksaar) as tour guides when taking tourist groups to Antarctica.

In its November meeting, the EPRC decided to support the Estonian Polar Club's initiative to start making preparations for the 200th anniversary of Antarctica's first sighting in 2020 and organising an international polar research conference in celebration of this date.

Estonian participation in the work of the EPB has enabled our scientists to contribute directly and effectively to drafting and designing research and development strategies and specific research programmes in the domain of European polar research. This opens up the possibilities for our relatively small, but active and high-level groups of scientists (from the University of Tartu, Tallinn University of Technology, Tallinn University, Tartu Observatory, National Institute of Chemical Physics and Biophysics and others) to participate in international cooperation, and it ensures the logistical support and access to the expensive and unique infrastructure. An active and constructive participation in the work of the EPB has helped create a positive image of Estonia in that internationally prestigious area. Such international visibility will hopefully support our scientists' participation in more research and technology programmes in the field of polar research, especially in projects planned as part of Horizon 2020. The EPRC is also pleased to report that several active and promising young people have joined the circle of polar researchers in recent years, which allows

us to have a more optimistic outlook about the future of the field than we had some time ago.

ENERGY COMMITTEE

Set up in 1998

Chairman Arvi Hamburg, Professor

The purpose of the Energy Committee is to make suggestions and give assessments as an impartial and competent expert group, in order to foster knowledge-based policymaking in the energy sector.

The Energy Committee held four meetings in 2018: on 23 April, 26 September, 15 October and 14 December.

During the 23 April meeting, the Committee discussed the topics addressed at the 17 April meeting between the Estonian Academy of Sciences and the European Commission Joint Research Centre, and at the subsequent joint meeting of the Economic Affairs, Rural Affairs, Environment, and National Defence Committees of the *Riigikogu* (the Parliament of Estonia). Participants of the meeting reached the following positions:

- Renewable energy must be regarded in the comprehensive context of electricity systems. Temporary support schemes must be technology neutral. Innovative hydrogen technologies and second generation biofuels are primarily usable in the transport sector.
- The security of supply of natural gas can be ensured by constructing a regional liquefied natural gas (LNG) terminal. The regional gas market can function on the condition that the Baltic States and Finland establish a common market framework.
- Desynchronising the Baltic States from the BRELL (Belorussian-Russian-Estonian-Latvian-Lithuanian) transmission network and synchronising them with the Synchronous grid of Continental Europe is a geopolitical decision. Implementing this technically and economically costly project implies a systematic scientific analysis to define the level of energy security, security of supply, and immunity. The analysis should also include an assessment of the possible impact of the increased service price on macroeconomics. Since the studies carried out thus far provide neither solutions nor answers to the aforementioned systematic problems, the Energy Committee is not in favour of changing the synchronous area.

The second issue that was on the table for the Energy Committee was that of the level of research and development work and the contribution of different parties. Participants of the meeting arrived at the following positions:

- In order for collaboration to be productive between all stakeholders, we expect the state to foster an environment that favours a technology push, and after this, a market pull from business leaders.
- Research funding must be followed by prototype testing and a justified distribution of marketing costs between stakeholders.

The main subject of the session on September 26 was leaving the Integrated Power System/Unified power system of Russia (IPS/UPS), disconnecting from BRELL and joining the Synchronous grid of Continental Europe. The Energy Committee remained of the position that synchronisation of the connected power systems of the European mainland and BRELL would allow for optimising the operation of the power systems of connected states. The other topic discussed was the development of hydrogen energy and the opportunities it provides. The Committee stated that implementing hydrogen technology would have a significant potential in the future, among other aspects in reaching climate policy goals.

The main subject of the session on 15 October was “PÕXIT” (*põlevkivi* – oil shale + exit), i.e. the exit of oil shale energy. In 1990, the capacity of oil shale power plants was *ca* 2600 MW, having decreased to approximately 1950 MW by 2018, with an estimate of only 660 MW by 2030. Participants of the meeting reached the following positions:

- The Estonian oil shale industry complies with all EU and Estonian environmental regulations.
- No replacement capacities are being developed in Estonia or its neighbouring regions.
- The Energy Committee does not support the “PÕXIT” plan to stop producing oil shale energy because the existing policies and development plans have already established a framework to reduce the environmental impact of oil shale production as required.

During the 14 December meeting, the Committee discussed the possible developments of nuclear energy in Estonia and the rest of the world. Since the world is faced with an increase in energy consumption, a growing population and global warming, the Committee stated the following:

- The energy market must change.
- Nuclear energy is the only genuine possibility to reduce greenhouse gases.
- The regulation of nuclear energy differs across countries, and overregulation is a concern.

The Energy Committee considers it possible to develop nuclear energy in Estonia, and insists that preference must be given to Generation IV reactors.

The Energy Committee has tasked itself with the following:

- Coordinating energy sustainability through the Estonian Science and Technology Pact.
- Drawing up an *Energy Encyclopaedia* in collaboration with partners.
- Carrying out an operative analysis of the Energy Committee’s position on decisions affecting energy management, and making it public.
- Organising discussions about the wider context of energy management with the committees of the Academy and with associated societies.

COMMITTEE ON PHYLOGENY AND TAXONOMY

Set up in 2007

Chairman Urmas Kõljalg, Member of the Academy

The Committee on Phylogeny and Taxonomy represents Estonia in the Consortium of European Taxonomic Facilities (CETAF AISBL, <http://www.cetaf.org>). CETAF is a network coordinating European research and development of collections related to biological diversity and geosciences. In Estonia, the Committee on Phylogeny and Taxonomy plays essentially the same role as CETAF in Europe. The Committee coordinates the work of natural sciences collections, including their digitisation.

The CETAF AISBL 43rd General Assembly took place at the Natural History Museum in London on 25–26 April. Estonia was represented with the right to vote by Urmas Kõljalg, Member of the Academy and Chairman of the Committee. The most important agenda points included the presentation and the approval of the report on 2017 expenditure; activity reports by the Secretariat and a general report on the period of April 2017 – April 2018; activity reports by CETAF working groups, and a working plan for 2018–2019. There was a thorough discussion on open data e-services that are being developed as part of different projects. Reference was also made to the developments of the Estonian Research Infrastructures Roadmap item “Natural history archives and information network” (NATARC).

The CETAF 44th General Assembly took place at the Slovak Academy of Sciences Institute of Botany (Bratislava, Slovakia) on 14–15 November. Estonia was represented by Member of the Academy Urmas Kõljalg. The CETAF 45th General Assembly is set to take place in Tartu in May 2019. Decisions were made that CETAF would join the Convention on Biological Diversity Consortium of Scientific Partners, become a member of the International Union of Biological Sciences, and collaborate with the Biodiversity Heritage Library on digitising older literature.

A decision was made to draw up a white paper on the structure of the Estonian biodiversity information system in 2019, which would be presented to the Government after consultation with partner organisations. Members of the Committee on Phylogeny and Taxonomy are going to participate in the Expert Council of the Collections of Humanities and Natural Sciences at the Ministry of Education and Research. The council is going to be chaired by Olle Hints, Vice-Chairman of the Committee on Phylogeny and Taxonomy. The task of the Expert Council is to make suggestions to the Government on improving and funding the work of natural science archives.

COMMITTEE ON MARINE SCIENCES

Set up in 2007

Chairman Tarmo Soomere, Member of the Academy

In 2018 the Committee followed the regular routine of remote meetings and exchanges of information in their daily work. Members of the Committee were regularly kept up to date about the information received from the European Marine Board (EMB). The EMB's communication mainly included systematised information about the work of the EMB itself and its published visionary documents, but also about information collection rounds, new and completed marine science projects, media events and new information materials. The possibility of contributing to recommendations for the European Commission is very important from the perspective of research consultancy. The Committee on Marine Sciences made a number of recommendations, among others to amend the Bioeconomy Strategy, to develop the innovation system (including the implementation of the Clean Oceans Initiative) in April 2018, and to evaluate the activities of the European Maritime and Fisheries Fund (EMFF) in June and July 2018. The Committee urged the European Commission to include Mission Ocean in the the next funding period's framework programme.

EBB newsletters provided regular information about specific actions (including the drawing up of opinion and vision documents) and events. Three electronic surveys / negotiations were held:

- January 13 – the report of the Committee on Marine Sciences for 2016 was sent to members of the Committee for review and supplementation.
- An electronic survey was initiated by the EMB Working Group on Research Vessels.
- Electronic survey: recommendations and amendments to the EMB's official statement (Future Science Brief 4: Enhancing Europe's Capability in Marine Ecosystem Modelling for Societal Benefit).

Since the year 2017, European Commissioner for Maritime affairs and Fisheries Karmenu Vella has held a more personal small meeting with members of the European Marine Board at least once a year. Heads of the biggest marine institutes were invited to the meeting on 10 July 2018 to discuss the future of European Marine Science.

The spring plenary session of the Committee on Marine Sciences primarily focused on the values of marine ecosystems. The session accepted Klaipėda University's request to have their membership suspended for two years in relation to national reforms across the higher education sector in Lithuania. Since Latvia and Finland do not participate in the work of the EMB, it means that Estonia's vote is all the more important now. In the Autumn Plenary held in Trieste (Italy) on 24–25 October with the participation of Tarmo Soomere, the European Marine Board accepted the GEOMAR Helmholtz Centre for Ocean Research Kiel (*Helmholtz-Zentrum für Ozeanforschung Kiel GEOMAR*) and the CETMAR Foundation (*Centro Tecnológico del Mar*), which unites Spain's leading marine science centres, as new members. It was decided that leading marine science complexes or laboratories could also be members of the European Marine Board. As of 31 December 2018, the EMB has 33 members from 18 countries.

The Committee on Marine Sciences remains of the opinion that the success of the Committee's work must be assessed based on how much marine science and its achievements catch the interest of the media. Although all members of the Committee have a busy schedule in their professional positions or representing Estonian science as a whole, the Committee managed to have some coverage of marine science and sea-related topics on nearly all TV and radio channels and newspapers. Furthermore, the Chair of the Committee gave numerous lectures and presentations on the spheres of popular science and science policy at various seminars and conferences.

As the contact person of the European Marine Board and representative of the Estonian Academy of Sciences, the Chair of the Committee on Marine Sciences Tarmo Soomere participated in the European Academies' Science Advisory Council's (EASAC) Environmental and Energy Panels' joint meeting at the Hungarian Academy of Sciences (Budapest, 23–24 April 2018). Kalle Olli participated in the Horizon 2020 MARINA project's (www.marinaproject.eu) working meeting "Institutionalisation of Responsible Research and Innovation (RRI): what, who and how" at the Science Centre AHHA in Tartu on 18 September 2018.

Indirectly, the Committee also participated in policy-making. Namely, the operation of the Geological Survey of Estonia fits within the Committee's remit.

Alvar Soesoo was elected its Director and Tarmo Soomere is a substitute member of its advisory board. Vice-Chair of the Committee on Marine Sciences Professor Kalle Olli is one of the official representatives of Estonia in the European Joint Programming Initiatives (JPI) Oceans, Climate, and Water.

On 20 November 2018 the Research and Development Council, of which Tarmo Soomere is a member, looked at suggestions made by the Estonian Research Council's Research Infrastructures Committee about compiling the Estonian Research Infrastructures Roadmap. Support was given to the suggestion made by Tallinn University of Technology, Baltic Workboats AS and NGO Association of Estonian Marine Industries to include the Naval Architecture and Hydrodynamics Infrastructure in the list of roadmap objectives. The Research and Development Council shared the opinion of the Research Infrastructures Committee that it constitutes an important field for Estonia and that Estonia could find a niche in it, but that the scientific expertise of the infrastructure needs to be strengthened considerably.

Tarmo Soomere was elected member of the Baltic Earth Initiative's Science Steering Committee and participated in its 11th meeting in Helsingör (Denmark) on 10 June 2018 and in its 12th meeting at Tallinn University of Technology on 28 November 2018.

Tarmo Soomere was invited to be a member of the Scientific Advisory Board of the Baltic Sea Science Congress "Making Connections for the Future" (held on 19–23 August 2019 in Stockholm, Sweden), and he participated in a meeting of its Steering Committee on 9–10 April 2018.

In view of an increase in the percentage of base funding allocated to research and the research funding agreement of 18 December 2018, there is an ever increasing need to develop the Committee into an assembly that focuses on coordinating and consolidating the activities of different areas of marine, lake and coastal sciences and unifying their voice on the Estonian research landscape.

STANDING COMMITTEE ON MEDICAL SCIENCE AND HEALTH STRATEGY

Set up in 2011

Chair Eero Vasar, Member of the Academy

In 2018 the Standing Committee on Medical Science and Health Strategy along with the Faculty of Medicine of the University of Tartu (UT) attempted to advise the Ministry of Social Affairs in the fields of research and development and innovation. Three major meetings were held. Two of these were organised by the Ministry and the third as part of the Faculty of Medicine's anniversary events.

A conference entitled Estonian Health Research, Development and Innovation Strategy: State of Affairs and Future was held on 12 October as part of the anniversary of the Faculty of Medicine of the UT. Discussions included the situation of funding medical research and the implementation of the Estonian Health Research, Development and Innovation Strategy for 2015–2020. Presentations were given by Research Adviser for Health Policy at the Ministry of Social Affairs Angela Ivask, Dean of the Medical Faculty of the UT Professor Margus Lember, Vice-Dean for Science at the Medical Faculty of the UT Professor Külli Kingo, Chairman of the Board of the North Estonia Medical Center (PERH) Agris Peedu, Chairman of the Board of the East Tallinn Central Hospital Ralf Allikvee, Chairman of the Board of the National Health Insurance Fund Rein Laane, long-term Chairman of the Board of the Tartu University Clinicum Foundation, and professor Eero Vasar. It was noted that Estonia's medical community was worried that implementation of the developed and approved strategy as a whole had not started yet. The Research and Innovation Council of the Ministry of Social Affairs had been tasked with the discussion and approval of the implementation plan of the strategy but up to that moment the Council had not been put into operation sufficiently.

Medical scientists lack information about research conducted on the basis of the needs of the health system. Regardless of the official knowledge-based information, opinions based on belief are unfortunately spreading in the society, causing a negative impact on people's health. The situation in medical science funding is alarming, similarly to all fields of science in Estonia. Science funding by the State fails to reach the target of 1% of gross domestic product. Changes in the grants application system of the Estonian Research Council have increased researchers' uncertainty and competition for grant funding has increased. Medicine is a field that should ensure stability, and yet it has failed to do so due to insufficient funding in this field of research. Such developments will inevitably lead to a significant reduction in the scientific community and hinder the entry of talented young people into science. It is time for the institutions concerned to realise that maintaining and developing Estonia's scientific research competence is of paramount strategic importance and has a direct impact on the health of Estonian people and through them to Estonia's economic development.

On 8 October the Ministry of Social Affairs organised the first meeting of the Health Research, Development and Innovation Council with the following agenda items:

- Maris Uuetoa, "Introduction of the initial version of the Public Health Development Plan 2020–2030"

- Angela Ivask, “Estonian Health Research, Development and Innovation Strategy 2015–2020 and its implementation”
- Silja-Riin Voolma, “National Personalised Medicine Programme”
- Krista Kruuv, “Clinical flagship projects of personalised medicine”
- Discussion about health research and innovation activities and the role, tasks and rules of procedure of the Health Research, Development and Innovation Council.

It proved impossible to cover all the agenda items because immediately before the start of the meeting, representatives of the Ministry of Social Affairs saw the need to present their understanding in relation to infotechnology and databases. Unfortunately, the entire meeting was largely limited to this discussion of a topic supporting business ambitions that had not been part of the agenda.

The next meeting of the Health Research, Development and Innovation Council was planned for January 2019. It is hoped that the Ministry of Social Affairs is going to take the initiative and become more consistent in speaking up for the targeted funding of health research and development. As for now, unlike developed science-oriented countries, Estonia belongs to the group of countries where the funding of medical and health research is not included in national priorities. The main task of the Standing Committee on Medical Science and Health Strategy is to work for the sake of substantially greater funding in medical sciences.

COUNCIL FOR ESTONIAN CENTRES OF EXCELLENCE IN RESEARCH

Set up in 2012

Chairman Andres Metspalu, Member of the Academy

The state expects its scientists to contribute to local entrepreneurship and has listed this as one of the conditions for raising the public funding of research and development and innovation to 1% of gross domestic product. A percentage is never a good indicator because it can be measured differently. Instead the focus should be on actual funding sums. Another important input for the public debate is the public opinion of how researchers work and how science is done. This is one of the reasons why the work of Estonian Centres of Excellence should be more widely publicised. This is where Estonia’s top scientists work. It is also the part of research that is the most directly linked to possible new outputs to business, medicine and environmental protection. Not many people are aware of this.

There are nine Centres of Excellence in Estonia. In 2018, two public information days were organised by the Centre of Excellence for Genomics and Translational Medicine.

On 25 May the first information day was held in Tartu in the main hall of the Omicum building. The Information Day had 177 attendees. Heads of the nine Centres of Excellence introduced the work done so far with the aim of demonstrating how top level science can already be put into use today and even more so in the future to improve daily life and thus benefit people.

A day before the event (on 24 May 2018) *Tartu Postimees* published an article to introduce the event: <https://tartu.postimees.ee/4493218/teadlaste-raskekahurvagi-ootab-inimesi-tanavalt>

The information day was also covered by TV3’s programme *Seitsmesed uudised* (News at seven) on 24 May. After the information day (on 30 June 2018), a comprehensive article by Andi Hektor was published in *Novaator*: <https://novaator.err.ee/843114/teadlanelgitab-kuidas-alusteadus-meie-nutitelefonijouab>

Another article in which Martti Raidal introduced the activities of the Centre of Excellence Dark Side of the Universe was published on 19 June 2018 in the online portal *Estonian World Review*: <https://www.eesti.ca/valgustame-tumeainet-teaduslik-analuus-estli/article51817>

On 5 October a similar Centres of Excellence joint information day was held in Tallinn at the Academy Hall. There were 59 attendees, and all nine Centres of Excellence were represented again. The fascinating interdisciplinary presentations covered a variety of fields, such as the construction of nearly zero energy buildings and deep integrated renovation (Centre of Excellence in Zero energy and resource efficient smart buildings and districts), and the complex yet unnoticeable IT systems whose secure solutions are developed at the Estonian Centre of Excellence in ICT Research. There was a discussion on why botany has started to be positioned at the forefront of botanical sciences and how it could help solve the major challenges that humanity is facing – securing food and energy safely whilst inflicting minimal damage on the environment.

A separate presentation was dedicated to introducing new opportunities in cancer diagnostics and cures. There was talk of the identity studies focusing on Estonians as a forest people, carried out by researchers at the Centre of Excellence in Estonian Studies. Presentations were also given by physicists who are carrying out research on Dark Matter and Dark Energy of the Universe, as well as those who are exploring innovative composite hierarchical self-organising materials.

ACADEMY EVENTS

ANNIVERSARY EVENTS

January 31 – The Academy held its 80th anniversary celebration in the Parliament of Estonia Conference Hall. President of Estonia Kersti Kaljulaid opened the public ceremony and presentations were given by Erki Tammiksaar (“The birth of contemporary science in Estonia”), Karl Pajusalu (“Estonianness and the Academy”) and Tarmo Soomere (“The Academy contributing towards a seamless society”).

April 20 – The Story of Estonian Thought Conference was held. It was an opportunity to discuss the past and think about the future. Symbolically, the conference was held at the Estonian National Museum that documents Estonia’s values and intellectual achievements. Speakers at the conference included experienced researchers like literary scholar Jaan Undusk and philosopher Ülo Matjus, but also younger experts like archaeologist Ester Oras. Naturally, a presentation was also given by Member of the Academy Hando Runnel, who has done an immense piece of work in collecting Estonian stories of thought. The first book in this series was published in 1995. As of 01 May 2019, 147 volumes of essay collections have been published in the *Eesti mõttelugu* (Story of Estonian thought) book series by Ilmamaa Publishing House. Each text is a reflection of its period in time, and they are all united by the Estonian language and their connection with the Estonian cultural sphere. All authors of the *Eesti mõttelugu* series have been influenced by the wider context, i.e. their connection with the European story of thought or thought traditions (or with those of the rest of the world). The list of authors is respectable and the themes cover a variety of subjects – folklore and theology, literary science and philosophy, politics and history, exact sciences and cultural history, not to mention essayism itself. On the one hand, this is a collection of intellectual history, and on the other hand, it is fascinating to consider the book series within the wider scientific context along with the development trends of the story of thought around the world. The ideas expressed in the series have certainly played a greater or lesser role in shaping Estonia.

June 12–August 25 – the gallery of Tallinn University Academic Library hosted the exhibition “Members of the Academy from monographs to tweets. Estonian Academy of Sciences 80”. The exhibits included books, papers and popular science articles from newspapers. Only Members of the Academy in Fine Arts Arvo Pärt and Anu Raud were represented by a CD and tapestries, respectively.

October 22–23 – The Academy organised and hosted an international conference entitled The Advisory Role of Academies in the Information-Rich Society that focused on the opportunities and issues related to the advisory role of Academies in modern society (see *In Words and Images* pp. 42–45).

November 9 – The collection *Teadusmõte Eestis IX. Teadus ja ühiskond* (Scientific Thought in Estonia IX. Science and Society) was presented in the Academy Hall. The book is a sequel to the collection *Teaduskultuur* (Scientific Culture) published in 2013 as part of the same series.

CONFERENCES

January 5 – The Academy organised and hosted the second young Estonian scientists’ conference, this time called Greatest Challenges of the 21st Century. The conference was organised by young Estonian researchers in collaboration with the Estonian Academy of Sciences and the Estonian Young Academy of Sciences. President of Estonia Kersti Kaljulaid gave an inspiring and thought-provoking opening speech. The conference continued with fifteen young researchers (PhD students, postdoctoral researchers, independent researchers) from different research fields working both in Estonia and abroad presenting their research.

March 19 – Academy Hall was the venue for the Language and Science Conference. The event was convened by the Estonian Science Journalists’ Association in collaboration with the Estonian Young Academy of

Sciences and the Estonian Academy of Sciences. Language issues were discussed by Andra Siibak, Arko Olesk, Hannes Tõnisson, Innar Liiv, Kais Allkivi, Marju Raju, Peep Nemvalts, Piret Pappel and Tiit Kändler.

October 10 – The *Riigikogu* (the Parliament of Estonia) held its 5th research policy conference *Research as Estonia's Driving Force. How does Science Protect Estonia?* The conference focused on Estonia's future and on the role of science in shaping and protecting it. President of the Academy Tarmo Soomere participated with a presentation. The conference was organised by the Estonian Research Council, the Cultural Affairs Committee of the *Riigikogu*, Universities Estonia, the Estonian Academy of Sciences, the Estonian Young Academy of Sciences and the Ministry of Education and Research.

October 12 – A conference dedicated to the 90th birthday of Member of the Academy Dimitri Kaljo was held at the Academy Hall.

November 9 – The Academy held a member candidates' conference where all candidates had the opportunity to introduce themselves and their research.

December 18 – Academy Hall was the venue for a Research Professors' Mini Conference. The agenda included presentations by three Research Professors: 1) "Innovation in the public sector: From Machiavelli to artificial intelligence" by Rainer Kattel, 2) "Magnetic and electrical performance of atomic layer deposited nanocomposites" by Kaupo Kukli, and 3) "Risks and benefits of synthetic nanoparticles" by Anne Kahru.

LECTURE BY FOREIGN MEMBER GÁBOR STÉPÁN

On 27 April Foreign Member and Professor of Applied Mechanics at Budapest University of Technology and Economics Gábor Stépán gave a public lecture "Quantization and sensory threshold in balancing with delay" at Tallinn University of Technology. The lecture was about balancing mechanisms and robots, and provided valuable insight into the high-level research done at Budapest University of Technology and Economics and the way in which it brings together theoretical research and practical outputs.

SEMINARS

August 28 – Academy Hall was the venue for the open seminar "Understanding and managing large social systems". It covered a wide range of topics: blockchain

technology in agriculture, smart social relationship management, the possibilities of mobile positioning in analysing migration and segregation, big data management at state level, issues of human relations management technologies, etc. Keynote speakers were Professor Anna Carbone (Politecnico di Torino), Professor Stefan Klauser and Dr Marcus M. Dapp (ETH Zürich), Dr Anto Aasa (University of Tartu) and Professor Egils Ginters (Riga Technical University).

November 23 – Science Day "Reflections of studying and upbringing on different scientific fields" was held in the Academy Hall as part of the Estonian culture and education congress held in Tallinn and Viljandi on 23–25 November. The keynote speaker at the Science Day was Dr Alberto Zucconi, Treasurer of the World Academy of Art and Science and Secretary-General of the World University Consortium. Representatives of different scientific fields conversed in the three discussion panels. The main questions of the Science Day were the following: What are the major challenges in education and upbringing from the perspective of humanities, natural and social sciences? How do or should different sciences form a starting point for designing the content of education and teaching? How do different fields of Estonian science support people's ability to live and function in an increasingly complicated world?

The congress was aimed at analysing connections between the state of affairs and future developments in the three main dimensions of Estonia's intellectual development – sciences, arts and education. The congress was organised by the Estonian Education Forum and Estonian Culture Chamber in collaboration with the Estonian Academy of Sciences.

MEETINGS AND DISCUSSIONS

April 17 – The Academy of Sciences and the Foresight Centre organised a joint discussion between scientists and five standing committees of the *Riigikogu* (the Parliament of Estonia) at the Academy House and the *Riigikogu* Conference Hall. The aim was to discuss Estonian energy and power supply issues, addressing the key topics for Estonia: the potential of wind power as a source of renewable energy, investments required for energy security, and issues related to the functioning of the gas market and the security of supply. Public opinions about the current relevance of these topics were presented. Specialists from the European Commission's Joint Research Centre gave an overview of the surveys carried out for the European Commission and of the recommendations based on the latter. The discussion on

energy issues continued at the joint meeting of the standing committees of the Parliament at the *Riigikogu* Conference Hall. The central topics were the risks related to the operation of the gas market and the synchronisation of the Baltic electricity grid with those of the EU.

May 22 – Members of the Academy Agu Laisk and Ene Ergma gave presentations “How I became a scientist” and “Space – far and near”, respectively, to Võru County secondary school students in the programme of the Science Day at Võru Gymnasium.

June 6 – Members of the Academy Agu Laisk and Arvi Freiberg gave presentations “How I became a scientist” and “The multiple facets of energy”, respectively, in the programme of the Science Day at Kilingi-Nõmme Gymnasium.

September 24 – Members of the Academy Tarmo Soomere and Urmas Varblane gave an overview of the work principles of the Estonian Academy of Sciences in the programme of the Science Day at Võru Gymnasium. In addition, Tarmo Soomere spoke about the effect of climate change on Estonia’s windy beaches. Urmas Varblane talked about economic science, populism and Brexit.

December 1–2 – The “Science in 3 minutes” winter school was held in the old Heimtali Village School for participants of the 4th contest of three-minute lectures. Member of the Academy Anu Raud gave a tour of the old village centre, followed by inspirational talks by Members of the Academy Tarmo Soomere and Maarja Kruusmaa. A practical presentation and camera training were led by experienced crew members of the “Rakett 69” TV programme – producer Kaspar Kaljas and director Indrek Simm.

SERIES OF LECTURES – THE WAY TOWARDS (POSKA) ACADEMY

January 8 – As part of the students’ science conference Poska Academy, the Academy started a lecture series “The way towards (Poska) Academy” where Members of the Academy give lectures to young people. The opening lecture “Trends in World Economy and Populism” was given by Member of the Academy Urmas Varblane

February 5 – Member of the Academy Anu Raud gave a presentation “My life in tapestries”. She had her tapestry *Tower*, inspired by her time at the Academy, with her (see the image of the tapestry on the cover of *In Words and Images*). The other presented tapestry *Letter to ancestors* (see *In Words and Images*, p. 22) now adorns one of the

rooms of the Academy. Member of the Academy Jüri Allik’s presentation was titled “What makes psychology interesting”.

March 5 – Members of the Academy Ene Ergma and Peeter Saari gave presentations “Space – far and near” and “Is telepathy possible on gravitational waves?”, respectively, as part of the lecture series “The way towards (Poska) Academy”.

April 2 – Members of the Academy Urmas Kõljalg and Andres Metspalu gave presentations “The life of a naturalist” and “Personalised medicine already today”, respectively, as part of the lecture series “The way towards (Poska) Academy”.

October 29 – Member of the Academy Valter Lang gave a presentation “The arrival of Finno-Ugric peoples in Estonia” as part of the lecture series “The way towards (Poska) Academy”.

November 13 – Member of the Academy Ülo Niinemets gave a presentation entitled “Agriculture in the changing world” as part of the lecture series “The way towards (Poska) Academy”.

ROUNDTABLE OF SCHOLARLY SOCIETIES ASSOCIATED WITH THE ACADEMY

Held on 23 May 2018 on the premises of the Estonian Naturalists’ Society

The Academy values the activities of scholarly societies and aims to support the synergy that is born from the collaboration between associated societies. The Estonian Naturalists’ Society alone has nearly 1500 members, and the Estonian Association of Engineers as many as 3500. Altogether, over 5000 people are estimated to participate in the work of these associated societies. This means that societies constitute a considerable representation of science-based thought in its broadest sense in society at large.

The work of societies has historically had an enlightening nature. It has contributed significantly towards the formation of our cultural space as a whole. Scholarly societies are doing impressive work to this day. With coordinated collaboration, they could have an even stronger position and an even wider resonance in society.

The fantastically located building of the Estonian Naturalists’ Society in the heart of Tartu could grow into a scholarly societies’ action centre and even act as the Tartu base for the Estonian Academy of Sciences. This, however, would entail a thorough renovation and targeted reconstruction of the building.

Communication about the work of different societies is paramount. The Academy can only support this indirectly, whereas adequate substantial contribution must come from the scholarly societies themselves. A good starting point might be to increase communication between naturalists' societies and to integrate their activities.

A proposal was made at the round table to create a joint news feed via the websites of different societies. This requires a system that would aggregate the information found on each society's website. The news feed should be attractive enough to also be compelling to traditional journalism. An increase of interest towards the work of

scholarly societies would also increase their visibility at the political level.

The building of the Estonian Naturalists' Society has every possibility of evolving into a small but comfortable and functional science and conference centre. Scholarly societies as well as the Academy itself could use it as premises for organising different events. The building could even be the headquarters of a possible umbrella organisation of societies associated with the Academy, uniting the different generations represented in scholarly societies from students to retired researchers who need a meeting place and joint events in order to build rapport.

ACADEMIA, MEDIA, SOCIETY

In addition to celebratory anniversary events, the communications activities of the Academy could be characterised by a change that is the result of many years of hard work. While the focus had thus far been on building trust, the Academy is now assuming an increasing advisory function. The substantive shift is marked by the conference on the advisory role of Academies in the information-rich society held in October (see *In Words and Images*, p. 42–45), as well as by intensive preparations for the international seminar and workshop Towards Bridging Science and Decision-making scheduled for early 2019. The event will be held in collaboration with the Foresight Centre, a think tank at the *Riigikogu* (the Parliament of Estonia) in the framework of the action Science meets Parliaments – Science meets Regions, launched by the European Commission Joint Research Centre (JRC). Dialogue between science and society, and the symbiosis between academia, media and society are both complicated phenomena. Academia plays an increasingly important role in both, which is an indication of academia's substantial responsibility, rather than a privilege.

The Academy of Sciences is a partner in the EU financed Science Communication Programme *TeaMe+* for the 2016–2020 period, participating in the implementation of the 7th project activity – developing the next generation of science and shaping societal development processes (including different policies).

LIFE AFTER GOOGLE

12 lectures at Von Krahl Theatre | 12 radio broadcasts on Vikerraadio

The series of lectures Life after Google was jointly organised by Von Krahl Academy, the national radio channel Vikerraadio and the Estonian Academy of Sciences. It comprised twelve lectures given on the stage of the Von Krahl Theatre and twelve radio programmes inspired by them on Vikerraadio. The lecture series aimed to deliberate life in Estonia and in the world in 25 years' time. President of the Academy Tarmo Soomere provided an academic reflection at the end of each lecture (see also *In Words and Images*, p. 56–57).

The lecture series included the following lectures and programmes:

- 4 September – Kaupo Vipp, “The Global and the Local” (broadcast on 10 October)
- 5 September – Mart Noorma, “Space” (broadcast on 6 October)
- 6 September – Asse Sauga, “Values and Money” (broadcast on 29 September)
- 25 September – Rea Raus, “Me/Earth” (broadcast on 15 December)
- 26 September – Ringo Ringvee, “Spirituality and Religion” (broadcast on 13 October)
- 27 September – Kristjan Port, “Health” (broadcast on 3 November)

- 28 October – Saale Kareda, “Society that Values People and Nature” (broadcast on 10 November)
- 17 October – Sten Tamkivi, “Work” (broadcast on 17 November)
- 18 October – Mihkel Kangur, “Environment” (broadcast on 27 October)
- 23 October – Jaan Aru, “Human” (broadcast on 1 November)
- 6 November – Jaak Vilo, “IT and Technology” (broadcast on 24 November)
- 7 November – Oliver Laas, “Artificial Intelligence and Transhumanism” (broadcast on 8 December)

SCIENCE IN 3 MINUTES

In 2018 the Estonian Academy of Sciences organised for the fourth time the contest of three-minute lectures for doctoral students and young scientists from public universities and research institutes. The contest was moved from autumn to the beginning of the next year to provide more time for internal training and preliminary contests at universities and research institutions. The event culminated with a gala night on 8 February 2019 in the Academy Hall.

The year 2018 was filled with preparations, preliminary contests and training. On 1–2 December the “Science in 3 minutes” winter school was held in Heimtali Museum. Finalists of the new season of three-minute lectures were completely removed from their ordinary surroundings and comfort zones. The aim of the training was to get to the very essence of each presentation so as to define and give resonance to the true message that is worth sharing with the world in three minutes. Members of the Academy Anu Raud, Maarja Kruusmaa and Tarmo Soomere, as well crew members of the “Rakett 69” TV programme Kaspar Kaljas and Indrek Simm were there to provide support and inspiration to the participants (see also *In Words and Images*, p. 98–101).

The abovementioned activities were funded by TeaMe+ and the European Regional Development Fund.

The collection *Science in three minutes II* is in the making and is going to be published in summer 2019.

POSTIMEES. (ACADEMY) OPINION. CULTURE

For the third year in a row, the Academy in cooperation with the daily newspaper *Postimees* continued to publish a column in the weekend cultural annex of the daily entitled *AK: Arvamus. Kultuur* (AK: Opinion. Culture). The articles, written by Members of the Academy interpret relations between science and society in Estonia and the rest of the world. 20 opinion articles altogether were published during 2018, namely:

- Karl Pajusalu, “The time of Estonian language” (*Postimees AK*, 29 December 2018, pp. 6–7)
- Andres Metspalu, “What do we actually want to do with 200,000 gene samples?” (*Postimees AK*, 15 December 2018, pp. 4–5)
- Tarmo Soomere, “Witch’s broom on a hairy football or why order a shaken cocktail” (*Postimees AK*, 24 November 2018, p. 6)
- Peeter Saari, “Getting a Nobel Prize is not rocket science” (*Postimees AK*, 27 October 2018, p. 8)
- Raivo Uiibo and Tarmo Soomere, “The prize of science championships: public health” (*Postimees AK*, 20 October 2018, p. 4)
- Martin Zobel, “Is post-truth inevitable?” (*Postimees AK*, 13 October 2018, p. 7)
- Peeter Saari and Tarmo Soomere, “Predators devouring a researcher’s wallet, and Plan S” (*Postimees AK*, 15 September 2018, pp. 6–7)
- Enn Tõugu, “How to pick the fruits of science tree?” (*Postimees AK*, 25 August 2018, p. 9)
- Enn Tõugu, “The shiny front and the dark alleyways of science” (*Postimees AK*, 16 June 2018, p. 8)
- Jaan Ross, “Why do people listen to sad music?” (*Postimees AK*, 9 June 2018, p. 7)
- Tarmo Soomere, “Drawing straws to find the leading scientists of the future” (*Postimees AK*, 19 May 2018, p. 8)
- Maarja Kruusmaa, “State as an invention” (*Postimees AK*, 5 May 2018, p. 6)
- Enn Tõugu, “Where are the alpha females of our science?” (*Postimees AK*, 5 May 2018, p. 6)
- Jakob Kübarsepp, “Changes in research must start at PhD level” (*Postimees AK*, 31 March 2018, p. 9)
- Andres Öpik, “The number of researchers is growing but the amount of resources remains unchanged. Six questions about choices in research” (*Postimees AK*, 24 March 2018, p. 9)
- Jüri Allik, “What do we want the University of Tartu to be like?” (*Postimees AK*, 10 February 2018, pp. 6–7)

- Martin Zobel, “Wildlife in the changing environment” (*Postimees AK*, 3 February 2018, p. 6)
- Ülo Niinemets, “A ‘small’ contribution to predicting the future of the world” (*Postimees AK*, 27 January 2018, p. 10)
- Tarmo Soomere and Erki Tammiksaar, “The invisible pillars of Estonian culture and self-consciousness” (*Postimees AK*, 20 January 2018, p. 7)
- Arvi Freiberg, “Paradox in the perception of science” (*Postimees AK*, 13 January 2018, p. 8)

ACKNOWLEDGEMENTS TO MEMBERS OF THE ACADEMY AND FROM THE ACADEMY



NATIONAL SCIENCE PRIZE

Based on nominations from the National Science Prize Committee, the Government of the Republic of Estonia by Order No. 27 of 8 February 2018 conferred

SCIENCE PRIZE FOR OUTSTANDING LIFETIME ACHIEVEMENTS IN RESEARCH AND DEVELOPMENT

to member of the Academy Agu Laisk

“... when I was in my third year of school, I came across a secondary school physics book that described electrical phenomena. I was most excited about the machine with glass disks that was supposed to give out 5 cm long sparks. My grandfather helped me build one of these and surprisingly enough, even the sparks were there. This is where I first became drawn to the idea of becoming a ‘professor of physics’...”



ANNUAL AWARD IN ENGINEERING
to Member of the Academy Jarek Kurnitski

for the cycle of works “System boundaries and technical solutions for nearly zero energy buildings”.

NATIONAL CULTURE AWARD

Based on nominations from the National Culture Prize Committee, the Government of the Republic of Estonia by Order No.29 of 8 February 2018 conferred

**NATIONAL LIFETIME ACHIEVEMENT
AWARD FOR CULTURE FOR LONG-TERM
DISTINGUISHED ACTIVITY**

to Member of the Academy Anu Raud

“I feel as if God was with me. Joy. Excitement. I am outside, in the countryside. What a morning, behold! Thank you for this day! Sun above my head, fatherland beneath me, and flowers and birds so close...”



**ANNUAL AWARD IN BIO- AND
GEOSCIENCES**

to Member of the Academy Ülo Niinemets

for the cycle of works “Mechanisms of acclimation and adaptation of photosynthesis: from canopy gradients to global rules”.



RESEARCH PAPER PRIZES FOR UNIVERSITY STUDENTS

Since 2016 the Academy's Student Research Paper Contest has been merged with the National Contest for University Students organised by the Estonian Research Council. The representative of the Estonian Academy of Sciences on the Appraisal Panel of the National Research Paper Contest for University Students was Jaan Aarik. A new Appraisal Sub-Panel was formed to determine the best papers and nominate candidates for the special prizes awarded by President of the Estonian Academy of Sciences – the π -prizes. The sub-panel included Jaan Aarik (Chairman), Mati Karelson, Agu Laisk, Andres Metspalu, Lauri Mälksoo, Tõnu-Andrus Tannberg, Jaan Undusk, Gennadi Vainikko and Urmas Varblane. The laureates were announced at a prize award ceremony that was held in the Academy Hall on December 11.

Special Prize for the Most Elegant Paper ($\pi \times 1000$ euro – 3141.59 euro) was bestowed on Gaspar Epro for his PhD thesis “Retention of mechanosensitivity and gait stability of a triceps surae muscle-tendon unit in older adults: combined longitudinal investigation over 1.5 years and long-term training intervention” (German Sport University Cologne, supervised by Professor Kiros Karamanidis and Professor Gert-Peter Brüggemann).

Special Prize for an Unconventional Paper ($\pi \times 500$ euro – 1570.80 euro) was granted to Liiri Oja for her PhD thesis “Who is the ‘Woman’ in Human Rights Law: Narratives of Women’s Bodies and Sexuality in Reproduction Jurisprudence” (European University Institute, supervised by Professor Martin Scheinin).

Special Prize for Auspicious Scintillating Sparks ($\pi \times 250$ euro – 785.40 euro) was granted to Aune Altmets for her bachelor’s thesis “Gas chromatographic analysis of hemp drugs and the pharmacological profile of cannabidiol contained in them” (Tallinn Health Care College, supervised by Laine Parts and Kaie Eha).

Letters of Appreciation were awarded to:

- Tanel Sõrmus for his elegant master’s thesis “Light-regulated inhibitors of cAMP-dependent protein kinase” (University of Tartu, supervised by Dr Kaido Viht);
- Alejandro Guerra Manzanatez for his elegant master’s thesis “Application of full machine learning workflow for malware detection in Android on the basis of system calls and permissions” (Tallinn University of Technology, supervised by Dr Hayretdin Bahsi and Dr Sven Nõmm);
- Danel Ahman for his elegant PhD thesis “Fibred Computational Effects” (University of Edinburgh, supervised by Professor Gordon Plotkin);

- Lisbeth Neevits for her unconventional master’s thesis “Evaluating melanoma treatment costs based on Estonian Health Insurance Fund database – possibilities for decreasing costs with early detection supported by teledermoscopy” (Tallinn University of Technology, supervised by MSc Priit Kruus and MSc Riina Hallik).
- Johanna Ross for her unconventional PhD thesis “From Aira Kaal to Mari Saat: The Soviet Estonian Female Bildungsroman and Its Reading Modes” (University of Tartu, supervised by Professor Arne Merilai and Dr Sirje Olesk).
- Katrin Petritšenko for her auspicious bachelor’s thesis “The implementation of two-photon absorption spectroscopy in meta-organic compounds: changes in the electrical dipole moment of electron transfer depending on the polarity of the solvent” (Tallinn University of Technology, supervised by Dr Aleksander Rebane).
- Helen Asuküla for her auspicious bachelor’s thesis “Gravitational waves in the general theory of relativity and in scalar-tensor theories of relativity” (University of Tartu, supervised by Dr Piret Kuusk).

Letters of Appreciation were also granted to supervisors of the prize winning papers.

ESTONIAN SCIENCE COMMUNICATION AWARD

The Estonian Science Communication Award is an annual state award that has been granted since 2006. Its primary focus is on acknowledging members of the general public who have popularised science in Estonia and attracting more attention towards activities that introduce and foster research and technology in the society. Funded by the Ministry of Education and Research, the prizes are jointly awarded by the Estonian Academy of Sciences and the Estonian Research Council. The competition was held for the 13th year in 2018. The Appraisal Panel was chaired by Member of the Academy Ene Ergma.

The Tiiu Sild Memorial Lifetime Achievement Award for long-time systematic communication of science and technology was conferred on Mihkel Zilmer, researcher of medical biochemistry and medicine who has been introducing the principles of science-based nutrition and popularised both his own research results and those of other researchers for over 40 years.

Grand Prize in the category “Best researcher, journalist, teacher communicating science and technology” was awarded to science journalist Priit Ennet, Chair of the

Estonian Science Journalists' Association who has been presenting the weekly science show *Labor* (The Lab) on the national radio channel Vikerraadio since 2005, along with the popular Morning Science News.

Motivation Prize was bestowed on zoologist and pedagogue Aivo Tamm who is remarkably successful at sparking and maintaining students' interest for natural sciences through after-school activities.

In the category "Activities/series of activities communicating science and technology"

- Grand Prize was awarded to Elva Gymnasium's Mini Science School led by teachers Evelin Toom and Külli Korol;
- Motivation Prize was conferred on the School of Interesting Biology for conducting environmental experiments at kindergartens.

In the category "Science and technology communication via audiovisual and electronic media"

- Grand Prize was awarded to Piret Pungas-Kohv from the Estonian Fund for Nature, author of the idea and screenwriter of the series of educational films on mires *Ah soo!* (double meaning in Estonian – I see! or Oh, mire!);
- Motivation Prize was conferred on the *Zooloo-gid 2.0* online blog led by Randel Kreitsberg and Tuul Sepp.

In the category "Science and technology communication via printed media"

- Grand Prize was awarded to the journal *Eesti Loodus* (Estonian Nature) (editor-in-chief Toomas Kukk);
- Motivation Prize was conferred on Ülar Allas and Tanel Tenson (University of Tartu) for the series of articles "Antibiotics and drug resistance".

In the category "Best new science and technology communication initiative"

- Grand Prize was awarded to the nature watching marathon, organised by Märt Kose and Veljo Runnel (University of Tartu Museum of Natural History and Botanical Gardens);
- Motivation Prize was conferred on the non-formal learning sample curriculum "Playful mathematics with a LEGO EV3 robot in 4th to 6th forms" led by Janika Leoste and her team.

The total amount of the competition's prize money in 2018 was €21,500, whereof the Tiiu Sild Memorial Lifetime Achievement Award was worth €6,500, accompanied by Stanislav Netchvolodov's brass tabletop sculpture "The Möbius strip". Every prize recipient is entitled to use the Nationally Recognised Science Communicator logo image, which is a prestigious token of quality and reliability in this area.

Results of the competition were announced and prizes were handed over during the science communication conference Science in Social Media – Between Entertainment and Noise?, held on 21 November at Dorpat Conference Centre.

L'ORÉAL-UNESCO BALTIC FELLOWSHIP

The L'Oréal-UNESCO "For Women in Science" global partnership was founded in 1998. It awards a fellowship to a female researcher with a doctoral degree under 40 years of age working in the field of life and environmental sciences, physical sciences or engineering. The aim is to recognise and promote talented women in science, to reduce gender inequality, and to inspire the next generation of women. Since the launch of the programme twenty years ago, 2525 female researchers from 115 countries have received support for building their careers. Since 2005, 46 researchers from the Baltic States, primarily from Latvia, have been awarded the fellowship. Estonia and Lithuania joined the programme in 2017.

Estonian candidates submitted 26 applications this year. These were evaluated by a five-member jury established by the Estonian Academy of Sciences, including: Members of the Academy Ergo Nõmmiste (Chair), Jaan Aarik and Ain-Elmar Kaasik, Academy Research Professors Anne Kahru, Malle Krunks and Tiina Nõges, as well as the 2017 laureate Els Heinsalu, President of the Estonian Young Academy of Sciences. The €6,000 fellowship was awarded to Karin Kogermann, Associate Professor and Senior Researcher at the University of Tartu Faculty of Medicine. Her research



focuses on improving wound care for chronic wounds, and she is currently working on designing and developing multicomponent antibacterial nanofibrous dressings for advanced wound care. As a wife and mother of two, Dr Kogermann highly values the support and understanding of her family and friends, which allows her to successfully combine personal and professional life. She is also a Founding Member of the Estonian Young Academy of Sciences.

The L'Oréal-UNESCO fellowship programme is run in partnership with the Academies of Sciences of the Baltic States and National Commissions for UNESCO.

The Estonian, Latvian and Lithuanian winners were announced at the official ceremony that was held on 5 June 2018 at the Latvian Academy of Sciences in Riga.

NATIONAL CONTEST OF YOUNG SCIENTISTS

The annual Young Scientists' Festival was organised by the Estonian Research Council on 12–13 April 2017 at the Estonian National Museum in Tartu. The final judging round of the National Contest of Young Scientists and the award ceremony are the main events of the festival. The awardees of national and special prizes were selected from

among the poster presentations of the best projects that had been chosen in the qualifying round. The Estonian Academy of Sciences awarded its special prizes to the following five contestants:

- Alex Savolainen (Tartu Kristjan Jaak Peterson Gymnasium) for the project “Aluminium-air battery – simple and cheap construction”;
- Karl Robert Kuum (Tartu Hugo Treffner Gymnasium) for the project “Determining age-associated changes in gene expression in human skeletal muscles using the real-time PCR-method”;
- Daniil Vaino (Narva Pähklikmäe Gymnasium) for the project “Operating computers and other devices using the assistance of brain rhythms and electrical activity”;
- Aleksandra Lilleorg (Tallinn Secondary School of Science) for the project “Bulgakov’s *The Master and Margarita*: Differences between the 1968 and the 2010 editions, and their underlying reasons”;
- Emilia Rozenkron (Saaremaa Co-Educational Gymnasium) for the project “On the *in vitro* rearing and polyethylene degradation ability of the greater wax moth (*Galleria mellonella*) and the lesser wax moth (*Achroia grisella*)”.

The jury of the Academy was chaired by Secretary-General Jaak Järv.

PUBLICATIONS OF THE ACADEMY

Books published by the Academy in 2018:

Estonian Academy of Sciences Yearbook XXIII (50) in Estonian and English.

Estonian Academy of Sciences. In Words and Images in Estonian and English. This was the pilot edition of what is hopefully going to be an annual publication. It is an entertaining, yet in-depth overview of the activities of the Academy which aims to be accessible to any interested

readers. The collection consists of shorter and longer texts, interviews, historical reflections, glossaries and accounts on some of the more hidden aspects of the Academy's work.

Eesti Vabariigi preemiad 2018 (Awards of the Republic of Estonia) is a compilation of articles presenting recipients of the Science, Culture and Sports Awards and the F.J. Wiedemann Language Prize through brief

biographical sketches and reflections of their major achievements.

The collection *Teadusmõte Eestis IX. Teadus ja ühiskond* (Scientific Thought in Estonia IX. Science and Society) is a sequel to the collection *Teaduskultuur* (Scientific Culture) published in 2013 as part of the same series. It addresses three main themes: how researchers

work, how research is organised, and the role of science in society. The key concepts include the need for knowledge for the benefit of society, values, trust, communication, and researchers themselves with their goals and opportunities.

Electronic versions of all the publications are available at www.akadeemia.ee.

INTERNATIONAL SCIENTIFIC RELATIONS

The Estonian Academy of Sciences represents Estonia in several international scientific organisations bringing together science policy makers and researchers with high level of excellence on transdisciplinary issues.

The International Science Council (ISC) was created in 2018 as the result of a merger between the International Council for Science (ICSU) and the International Social Science Council (ISSC). Estonia is a Founding Member of the new organisation (and member of the ICSU since 1992). The ISC brings together natural and social sciences (see *In Words and Images*, p. 38–39).

The InterAcademy Partnership (IAP) was founded in 1993 (then the Inter-Academy Panel) as a global network of academies. In cooperation with member organisations, it aims to advise the general public and decision-making bodies on the scientific aspects of global challenges.

The European Federation of Academies of Sciences and Humanities, All European Academies (ALLEA) was founded in 1994 and brings together academies of European countries. Its aim is to exchange information and experience between academies to achieve excellence and high ethical standards in science, and to independently address scientific strategy

and policy issues at the European level. At the end of 2018, for example, ALLEA published an initial response to Plan S (see *In Words and Images*, p. 65).

The Estonian Academy of Sciences is a founding member of ALLEA. Vice-President of the Academy Jüri Engelbrecht was the President of ALLEA during the 2006–2011 period. Member of the Academy Raivo Uibo is a member of the Permanent Working Group on Science and Ethics.

The European Academies' Science Advisory Council (EASAC) is comprised of individual members authorised by the academies. Estonia became a member in 2004. EASAC aims to use the combined competence of academies to advise the top EU bodies and politicians on making decisions requiring independent scientific expertise. Tarmo Soomere is a member of the EASAC Environmental Steering Panel and Member of the Academy Enn Lust is part of the EASAC Energy Steering Panel. The Academy communicates EASAC's research reports to Estonian policy-makers and stakeholders.

The following EASAC reports were published in 2018: *Opportunities for future research and innovation on food and nutrition security and agriculture* (28 November 2018); *Opportunities for soil sustainability in Europe* (26 September 2018); *EASAC and the New*

Plant Breeding Techniques (20 July 2018); *Findings and recommendations from the Smart Villages Initiative 2014–2017* (25 June 2018); *Commentary on Forest Bioenergy and Carbon Neutrality* (15 June 2018); *Vaccination in Europe* (18 April 2018); *Extreme weather events in Europe* (22 March 2018); *Negative emission technologies* (1 February 2018).

EASAC and ALLEA together with their partner organisations have signed a Memorandum of Understanding to pull together timely, independent and evidence-based scientific expertise for the highest policy level in Europe. For this purpose, the consortium initiated the project “Science Advice for Policy by European Academies” (SAPEA) that gained funding within Horizon 2020 and is a part of the European Commission Scientific Advice Mechanism (SAM).

The International Union of Academies (*Union Académique Internationale*, UAI, founded in 1919) unites academies across the world that are engaged in Humanities and Social Sciences. It promotes joint research (including joint projects) and fosters the publication of research findings. The Estonian Academy of Sciences became a member in 1998. Jaan Undusk is the Estonian delegate of the Academy in the UAI.

The European Science Foundation (ESF, founded in 1974) originally united science institutions of European countries, coordinated scientific collaboration at the European level and supported interdisciplinary research and frontline science. During the years 2000–2011, Estonia had two member organisations in the ESF – the Estonian Academy of Sciences and the Estonian Science Foundation. In 2011, the organisation was restructured to become a consultancy firm, meaning that the Academy has not been a member of the ESF since 2012. The European Marine Board and the European Polar Board, which used to be expert panels of the ESF, are now independent legal entities and Estonia continues to participate in their activities.

The Academy continued supporting the contacts of the Estonian scientific community with international scientific unions (giving priority to ISC (formerly ICSU) member organisations) and scientific organisations.

The Academy provides support to international mobility of researchers.

Scientific exchange programmes are the practical output of bilateral cooperation agreements and are available to all Estonian scientists. The scientific exchange programme is run on the traditional cost-sharing principle: living expenses of visiting researchers in the host country are covered by the receiving party, which in Estonia is the Estonian Academy of Sciences.

In 2018, the Estonian Academy of Sciences hosted 51 researchers in Estonia for 339 days. Estonian scientists

made use of the exchange programme 59 times for a total of 425 days.

The Academy is involved in the pan-European EURAXESS Services Network (formerly called ERA-MORE). The Estonian network’s activities are coordinated by the Estonian Research Council.

Cooperation agreements with partner organisations (with the date of signing the currently valid (framework) agreement in brackets):

- Austrian Academy of Sciences (12 November 2007)
- Azerbaijan National Academy of Sciences (27 October 2016)
- Bashkortostan Academy of Sciences (23 June 2012)
- The British Academy (04 August 2011)
- Berlin-Brandenburg Academy of Sciences and Humanities (16 May 2002)
- Bulgarian Academy of Sciences (02 April 1996)
- Georgian National Academy of Sciences (19 October / 1 November 2012)
- Royal Flemish Academy of Belgium for Science and the Arts (26 March 2004)
- Chinese Academy of Sciences (26 May 2000)
- Spanish National Research Council (19 June 2001)
- Israel Academy of Sciences and Humanities (19 July 1995)
- National Research Council of Italy (23 April 2004)
- Lithuanian Academy of Sciences (12 November 1991)
- Council for the Lindau Nobel Laureate Meetings and the Foundation Lindau Nobel Prizewinners Meeting (02 June 2016)
- Royal Society of London (30 October 1991)
- Latvian Academy of Sciences (12 November 1991)
- Macedonian Academy of Sciences and Arts (16 December 1996)
- Montenegrin Academy of Sciences and Arts (17 October 2005)
- Polish Academy of Sciences (17 June 1996)
- French Academy of Sciences (22 March 1994)
- Royal Swedish Academy of Letters, History and Antiquities (28 February 2017)
- Royal Swedish Academy of Sciences (17 November 2005)
- Romanian Academy (06 April 2016)
- Slovak Academy of Sciences (28 November 1993)
- Slovenian Academy of Sciences and Arts (28 April 1997)
- Finnish Academy of Science and Letters (10 March 1992)
- Swiss Academy of Natural Sciences (18 September 1989)
- Academy of Sciences of the Republic of Tajikistan (04 June 2012)

- Tajik National University (04 June 2012)
- Czech Academy of Sciences (04 April 2017)
- National Academy of Sciences of Ukraine (02 October 2000)
- Hungarian Academy of Sciences (20 June 1995)
- National Academy of Sciences of Belarus (01 March 2002)
- Russian Academy of Sciences (17 February 1993); complementary memorandum on cooperation in earth sciences (30 March 2012)

OVERVIEW OF ACTIVITIES

January 25 – Upon the invitation of the Royal Society of Edinburgh, Secretary-General Jaak Järv participated in an international discussion that addressed academies' collaboration opportunities for solving global issues.

January 31 – Member of the Academy Raivo Uibo represented the Academy at the seminar “Open Data in Science: Challenges and Opportunities for Europe”, held in Brussels by the European Members of the International Council for Science.

February 1 – Member of the Academy Raivo Uibo represented the Academy at the workshop “Ethical Aspects of Open Access: A Windy Road”, held in Brussels by the Permanent Working Group on Science and Ethics of the European Federation of Academies of Sciences and Humanities (ALLEA).

April 13 – President Tarmo Soomere gave a presentation “Reflections of climate change in nearshore and coastal processes in the Baltic Sea” at the Future of Coastal Research Colloquium (University of Greifswald, Germany).

April 23–24 – President Tarmo Soomere participated in the European Academies' Advisory Council (EASAC) Environment Steering Panel and Energy Steering Panel's joint session at the premises of the Hungarian Academy of Sciences in Budapest.

May 16–18 – President Tarmo Soomere participated in the General Assembly of the European Federation of Academies of Sciences and Humanities (ALLEA) and gave a brief statement on the question of trust in modern-day research consultancy during the conclusive panel discussion of the conference Science in Times of Challenged Trust and Expertise: Shaping European Science Advice, organised alongside the General Assembly.

May 27 – As an external expert invited by al-Farabi Kazakh National University, President Tarmo Soomere participated in a discussion on the principles of the international curriculum in mechanics, and in drawing up a draft curriculum.

May 31–June 1 – President Tarmo Soomere participated in a European Academies' Advisory Council (EASAC) session at the Austrian Academy of Sciences in Vienna.

June 5 – Leaders of the Estonian, Latvian and Lithuanian Academies of Sciences met in Riga. They discussed the main theme of the next Baltic Conference on Intellectual Co-Operation, and agreed upon further actions. They signed an Annex to the Trilateral Co-Operation Agreement which establishes a framework for joint activities for the next two years.

June 5 – The Latvian Academy of Sciences hosted the official gala where winners of the L'Oréal-UNESCO “For Women in Science” Baltic Fellowship were announced. The Estonian awardee of the fellowship was Karin Kogermann, Associate Professor and Senior Researcher at the University of Tartu Faculty of Medicine (see p. 33–34).

June 24–29 – The 68th Lindau Nobel Laureate Meeting was held. The Academy nominated three young scientists to the international contest, and for the first time, the organisers of the Lindau Meeting accepted all three Estonian nominees to participate in the conference among 600 young talents from 84 countries, and 39 Nobel Laureates. The Estonian participants were Uku Haljasorg (postdoctoral researcher, Weizmann Institute of Science, Israel), Kristi Huik (postdoctoral researcher, National Institute for Health, USA), and Liis Lemsalu (Junior Researcher, National Institute for Health Development).

June 26–27 – The Academy hosted government science advisors of European countries and representatives of the European Commission in the context of the 4th meeting of the European Science Advisors Forum (ESAF).

July 4 – International Science Council (ISC) was founded in Paris as the result of a merger between the International Council for Science (ICSU) and the International Social Science Council (ISSC) (see *In Words and Images*, p. 38–39).

July 9–14 – The global event EuroScience Open Forum (ESOF) was held in Toulouse, France. Estonia presented on personalised medicine, smart urban space, e-health, and cybersecurity. The ESOF 2018 Programme Committee was chaired by Andres Metspalu, Member of the Academy and Director of the Estonian Genome Center at the University of Tartu (see *In Words and Images*, p. 102–103).

August 28 – The General Assembly of *FuturICT 2.0*, funded by the FLAG-ERA Network was held in Tallinn with reflections on understanding and managing socially interactive systems (see p. 26 and *In Words and Images*, p. 47).

September 7 – The COST (Cooperation in Science and Technology) Information Day was held at the Academy. COST is Europe's oldest research and technology cooperation programme. President Tarmo Soomere gave a

welcome speech at the event. President of the COST Professor Sierd Cloetingh praised the level of activity of Estonian researchers and emphasised the importance of the Tallinn Call for Action (drawn up during Estonia's presidency) in organising Europe's research landscape. Professor Anu Toots of Tallinn University, Professor Jaanus Harro of the University of Tartu and Professor Kuldar Taveter of Tallinn University of Technology shared their experience of participating in the COST. The Information Day was organised by the Estonian Research Council in collaboration with the EURAXESS Estonia Network.

September 13 – President Tarmo Soomere gave a presentation entitled “A small sea under heavy pressure” at the New Baltic Sea Generation Conference (Stockholm, M/S Baltic Queen).

September 14 – President Tarmo Soomere gave a presentation entitled “Estonian Academy of Sciences: Interlinking science and media” at the joint seminar for Baltic Academies of Science and Hamburg Academy of Sciences and Humanities held in Hamburg, Germany.

September 20 – President Tarmo Soomere gave a presentation “Concealed changes in waves and winds that may lead to an ecological deadzone of shelf seas”

at the Alexander von Humboldt-Kolleg Conference entitled Sustainable Development and Climate Change: Connecting Research, Policy and Practice (held in Belgrade, Serbia).

October 22–23 – The Academy organised and hosted an international conference on the Advisory Role of Academies in the Information-Rich Society. The European Federation of Academies of Sciences and Humanities (ALLEA) gave a thorough account of the conference on its website: <https://www.allea.org/tallinn-conference-delves-on-the-advisory-role-of-academies-in-the-information-rich-society/> (see *In Words and Images* p. 42–45).

October 24–25 – President Tarmo Soomere participated in the European Science Foundation Marine Board Autumn Plenary in Trieste (Italy). The Estonian Academy of Sciences is a Founding Member of the Marine Board.

December 6–8 – President of the Academy Tarmo Soomere and Member of the Academy Jüri Engelbrecht participated in the 100th anniversary celebrations of the National Academy of Sciences of Ukraine in Kiev.

BIRTHDAYS

95

MEMBER OF THE ACADEMY
MIHHAIL BRONŠTEIN



Mihhail Bronštein was born on 23 January 1923 in St. Petersburg. In 1940 he graduated from Leningrad Secondary School No.11 and enrolled in the Leningrad Institute of Chemistry and Technology. His studies were interrupted by war. After demobilisation in 1946, he proceeded to study economics at Leningrad State University and completed his undergraduate studies in 1949, majoring in political economy. His Master of Science dissertation and Doctor of Science thesis were both defended at the same university, in 1954 and in 1965, respectively. He obtained Professorship in 1967 and was elected Member of the Estonian Academy of Sciences in the specialty of political economy of agriculture in 1975.

The academic career of Mihhail Bronštein began at the University of Tartu, where he started in 1949 as a lecturer and progressed to the position of Professor and Head of the Department of Political Economy. He has also served as Senior Researcher at the Estonian branch office of the Central Economic Mathematical Institute of the Academy of Sciences of the USSR and the Institute of Economics of the Academy of Sciences of the ESSR (1980–1986), and Counsellor for Economic affairs at the Estonian Embassy in Moscow (1992–1995). In 1993 he became Professor Emeritus of the University of Tartu.

The studies of Mihhail Bronštein have primarily been concerned with macroeconomics, agricultural

economics, economic relations between countries, and ecology. The topics he has examined in greater depth are related to industrial development of agriculture in the Estonian SSR, measures for optimising natural resource management and the framework of economic evaluation. His key accomplishments include: creating an incentive system for Estonian agriculture (price formation, remuneration of work, combining corporate and private ownership), evaluating natural resource potential in Estonian agriculture and elaborating a mechanism for fostering regions in an unfavourable position. He is the author of over 400 research articles, as well as a great number of analytical writings on economic issues in the print media.

The contribution that Professor Bronštein made to preparing and executing the first economic reforms after Estonia regained independence was highly consequential, and so was his role in the formation of the Baltic Economic Bridge concept. He is a member of the International Union of Economists (IUE) and the International Association of Agricultural Economists. In 2006 Mihhail Bronštein was recognised with the 3rd class Order of the White Star.

When speaking about things that bring joy into everyday life, he names reading books, going to the theatre and concerts, fitness walking, and formerly also skiing.



90

MEMBER OF THE ACADEMY
TŠESLAV LUŠTŠIK

Tšeslav Luštšik was born on 15 February 1928 into a family of Polish descent, being a third-generation resident of St. Petersburg. After a short and hard childhood he graduated from secondary school in 1946 with a gold medal and enrolled in the Faculty of Physics of Leningrad State University. At University he heard lecture courses by outstanding Members of the Academy and Professors and in his fourth year at the University started research in thin films and ionic mono-crystals in the laboratory of Feodor Klement, belonging to the School of Academician A.N.Terenin. He defended his Candidate of Science (today equivalent to PhD) dissertation on thermo-activation spectroscopy of crystals at Leningrad University in 1954 and his Doctor of Science thesis on the results from the study of excitonic, electron-hole and ionic processes of alkali halogenid crystals at Leningrad State Institute of Optics in 1964. In the same year he was elected Member of the Estonian Academy of Sciences in physics of solids and in 1968 he was awarded Professorship in experimental physics and physics of solids.

In 1954 Tšeslav Luštšik started his long lasting career at the Institute of Physics and Astronomy of the ESSR Academy of Sciences in Tartu as Senior Researcher at the Sector of Experimental Physics. As a next step, he headed the Sector of Physics of Ionic Crystals for more than 30 years (1960–1993) and was concurrently Head of Department during the period 1974–1990. From 1994 through 2004 he continued his studies in grant based Senior Researcher and Leading Researcher positions. Since 2005 he has been working as Senior Researcher Extraordinary for research projects led by the Laboratory of Ionic Crystals.

Professor Luštšik is an experimental physicist, whose main research areas are concerned with physics, radiation

physics, optics and spectroscopy of solids. From among research results obtained by himself and his students in the area of solids, he highlights the studies which have been focused on elementary processes causing irreversible radiation damages in crystals. At present, he is involved in identifying opportunities for dramatic increase of radiation-resistance in inorganic materials with wide-ranged restricted area that are a necessary component for nuclear radiation sensors and for the future thermonuclear power engineering.

The School of Isolator Crystal Physics founded by Professor Luštšik in Tartu as well as in Latvia, Russia, Kazakhstan and Kyrgyzstan has gained international renown. He is the author or co-author of nearly 400 research publications, among them 3 monographs and 3 large chapters in omnibus volumes. Fifty Doctor of Science (PhD) dissertations in Physics and Chemistry have been defended under his supervision. By now, many of these graduates have proceeded to become also Doctors of Science in Physics and Mathematics, whereas quite a few of them have been elected to Estonian, Latvian and Russian Academies of Sciences.

His outstanding contribution to science has been recognised on several occasions, incl. ESSR State Prize (as research team member) in 1959, the Medal of the Estonian Academy of Sciences in 1988, and the National Science Prize of for Outstanding Lifetime Achievements in Research and Development in 2004. In 2006 Tšeslav Luštšik was awarded the 3rd class Order of the White Star, and in 2008 the University of Tartu Grand Medal.

MEMBER OF THE ACADEMY
DIMITRI KALJO

Dimitri Kaljo was born on 12 October 1928 in Haapsalu. He spent his childhood on Saaremaa Island until the family moved to Tallinn in 1933. He graduated from Gustav Adolf Grammar School (then Tallinn Secondary School No. 1) in 1948. His further path in life was largely determined, when he happened to join the Gustav Adolf Natural Science Circle working at his school. Dimitri Kaljo graduated from the University of Tartu in 1953, specialising in geology. He continued to study palaeontology at a doctoral level and defended his Candidate of Science (today equivalent to PhD) dissertation “Tetracoralla of Baltic Ordovician and Llandovery, their habitat and development” in 1956. His Doctor of Science thesis on the topic “Stratigraphy of Baltic Silurian (experience of ecostratigraphic analysis)” was defended in 1978 at the Geology Institute of the Russian Academy of Sciences (then Academy of Sciences of the USSR). Dimitri Kaljo was elected a Member of the Estonian Academy of Sciences in 1983 and was awarded Professorship in 1986.

During 1956–1957, Dimitri Kaljo worked as an assistant at the University of Tartu Mineralogy Department. In 1957, he started his professional career at the Institute of Geology of the Academy of Sciences of the ESSR (starting from 1997 the Institute of Geology at Tallinn University of Technology) in the position of Scientific Secretary. He became Head of the Geology Sector in 1959 and Director for Research in 1965. Thereafter, for the following couple of decades (1969–1989), he worked as Director of the institute. In that period the Institute of Geology attained a leading position in the Baltic States and gained renown in the Soviet Union and North-Europe. During 1990–2006 Dimitri Kaljo was occupied at the same institute as Head of the Bedrock Division, and during 2007–2016 as Senior Researcher. Presently he works as Specialist at the Department of Paleontology and Stratigraphy.

The main research areas of Dimitri Kaljo fall within the scope of palaeontology and stratigraphy. He has examined a variety of topics, including the taxonomy of Ordovician and Silurian tetracorals, their habitat, changes in their biodiversity and causes of those changes; Silurian lithofacies of Baltoscandia and paleogeographic evolution of the basin. He is the author of over 300 research



publications and has supervised four doctoral theses. Dimitri Kaljo is the editor-in-chief of the *Estonian Journal of Earth Sciences*.

A talented research organiser, Dimitri Kaljo has been Head of the Academy’s Division of Biology, Geology and Chemistry (1990–1999) and Coordinator for International Relations (1991–2004). He has worked on several expert bodies at national and international levels. He has been a Member (since 1969) and Chairman (1981–2005) of the Estonian National Commission on Stratigraphy, Chairman of the Commission of Estonian Mineral Resources (1991–2010) and Chairman of Estonian National Committee for Geology (since 1992). In 1976 Dimitri Kaljo became an active member of the International Commission on Stratigraphy (ICS) Subcommission on Silurian Stratigraphy (ISSS) in the International Union of Geological Sciences, has been Chair of the ISSS (1984–1992) and corresponding member (since 2005). He has likewise been Vice-President of the International Association for the Study of Fossil Cnidaria and Porifera (1983–1988) as well as the International Paleontological Union (1989–1996).

He has twice received the National Science Prize as research team leader – for series of studies on the Silurian in Estonia (1972), and for application of isotope to the study of evolutionary history in the Paleozoic (2001). In 2009 he was granted the National Science Prize for Outstanding Lifetime Achievements in Research and Development.

In 2002 Dimitri Kaljo was awarded the 4th class Order of the White Star.



85

MEMBER OF THE ACADEMY
ARVED-ERVIN SAPAR

Arved Ervin Sapar was born on 7 February 1933 in the parish of Rakvere, the village of Paatna, to a farmer's family. In 1952 he graduated from Rakvere Secondary School No. 1 and in 1957 from the Faculty of Mathematics and Natural Sciences at the University of Tartu, specialising in physics. In 1965 he defended at the same university his Candidate of Science (today equivalent to PhD) dissertation in physics and mathematics, which offered model solutions for describing changes in the Universe filled with matter and radiation. In 1989 he was awarded the Doctor of Science degree in physics and mathematics at Leningrad State University based on his studies aimed at generalisation of kinetics equations and research the extraatmospheric spectra of hot stars. Arved Sapar was awarded Professorship in 1990 and in the same year he was elected a Member of the Estonian Academy of Sciences.

After graduation from the University in 1957 Arved Sapar started working as Junior Researcher at Institute of Physics and Astronomy of the Academy of Sciences (since 1973 Institute of Astronomy and Atmospheric Physics). In 1968 he continued as Senior Researcher and in 1986 as Head of Laboratory of Theoretical Astrophysics. In 1991–1993 he was Chief Researcher and in 1993–2003 Head of Department of Astrophysics at the same Institute (since 1995 the Tartu Observatory). Since 2003 Arved Sapar has been working as Senior Researcher.

Interest in cosmology and research of extra-atmospheric star spectra, structure of star atmospheres and processes therein served as an incentive for Arved Sapar to join the

US Goddard Centre of Cosmic Flights in 1978, where he observed, with the help of satellite International Ultraviolet Explorer the extraatmospheric ultraviolet spectra of stars. In 1981 he was a visiting research fellow at Heidelberg University, delivering lectures on star plasma kinetics. A favourite direction of his research has been the use of equations underlying astrophysics and their generalisation. Presently, too Arved Sapar is engaged in model calculations of structure of star atmospheres and star spectra and in research of physical processes evidenced in star atmospheres.

In 1976–1991 Arved Sapar was Head of the Task Force “Physics of Star Atmospheres” of the USSR, in 1976–1994 he was a member of the organising committee of the Commission of International Astronomical Union and in 1989–1993 Co-chairman of the Astronomical Union of the USSR, and Bureau and Board Member of the Eurasian Astronomical Union evolved on its basis. He is a founding member of International Astronomical Union (IAU) and European Astronomical Union.

For a quarter of the century Arved Sapar was editor and editor-in-chief of publications of Tartu Astrophysics Observatory. He has published about 200 scientific articles, he is author or co-author of five monographs and he has been supervisor of ten doctoral and two master's theses.

In 1986, Arved Sapar was awarded the Medal of the Academy and in 2006 the 4th class Order of the White Star.

In his younger years, he used to indulge in bodybuilding, and later his interests have lied in artificial languages.

FOREIGN MEMBER
RICHARD R. ERNST

Richard R. Ernst was born on 14 August 1933 in Switzerland in the small town of Winterthur to an architect's family. In 1956 he graduated from Zürich University of Technology (ETH-Zürich) as Master of Science in chemistry, in 1962 he defended at the same University his doctoral degree in engineering on apparatus building and was thereafter Researcher at the Laboratory of Physical Chemistry. In 1963–1968 he worked for Varian Associates, an apparatus building company of Palo Alto, located in the US Silicon Valley district. He was chiefly engaged in automating spectroscopic experiments. In 1968 Richard R. Ernst returned to Zürich and continued research work at ETH-Zürich, moving forward along his career path from Privat-docent (unestablished University Lecturer) to Professor (1976). He has worked as Visiting Professor at Harvard University, delivered guest lectures at various universities in the United States, Canada and Germany. He has been Professor Emeritus since 1998.

Research achievements of Professor Ernst in chemical physics are fundamental, especially so in the area of stochastic resonance methods, Fourier' multidimensional spectrometry and Fourier' tomography. He has developed innovative physical theories and methods, combining them with all possibilities of modern experimental and computational technology. His physics-centred theoretical and applied studies have been replenished, within recent decades, by many applications in molecular biology and research of solids. He has released over 350 research publications and he is author of several inventions and co-owner of patents. The core of his research has been reflected in the monograph published in 1987 "Principles of nuclear magnetic resonance in one and two dimensions" (co-authors G. Bodenhausen and A. Wokaun), providing a comprehensive review on physical bases of multidimensional spectrometry. Richard R. Ernst's studies have significantly influenced development of the science of chemistry and they have also been implemented in other areas – he belongs to the ten most often cited physicists and chemists in the world.

Besides his research and pedagogical activities Richard R. Ernst has long participated in the work of the Swiss

Research Foundation and the Swiss Research Council, he has been President of the ETH-Zürich Research Council (1990–1995) and a member of the University Council (1998–2006). He has sat on editorial boards of numerous scientific journals, incl. *Journal of Magnetic Resonance* (since 1974), *Magnetic Resonance Imaging* (since 1982), *Molecular Physics* (1983–2003). He is a member of quite a few scientific academies and societies (Royal Society of London, US National Academy of Sciences, Swiss Academy of Engineering, German Academy Leopoldina, Russian Academy of Sciences, Indian Academy of Sciences, American Physical Society, etc.), and Honorary Doctor of several universities. In 2003 he was elected a Foreign Member of the Estonian Academy of Sciences in physical chemistry.

In 1991, Richard R. Ernst was awarded the Nobel Prize in Chemistry for his outstanding achievements in developing methods of nuclear magnetic resonance spectroscopy (NMR-spectroscopy). He has been granted other prestigious science prizes, incl. the Benoist Prize (1986), the Ampere Prize (1990), the Louisa Gross Horwitz Prize (1991). Since 2012 ETH-Zürich Magnetic Resonance Research and Experimental Laboratory has carried the name Richard R. Ernst Magnetic Resonance Facility.

At present, the attention of Richard R. Ernst is chiefly focused on issues related to the study and restoration of Central-Asian paintings. He has delved into Raman spectroscopy for the purpose of analysing and identifying the pigments used in ancient pieces of art. The Nobel Laureate is a frequent lecturer on issues concerning the social responsibility of researchers and teachers – a topic close to his heart.



Jānis Stradiņš was born on 10 December 1933 in Riga. He graduated from the Latvian University in 1956, defended his Candidate of Science (today equivalent to PhD) thesis at Moscow University in 1960 and reached the degree of Doctor of Sciences in chemistry at the Latvian Academy of Sciences in 1968. He has been awarded an Honorary Doctorate by the University of Latvia (1989), Latvian Academy of Sciences (1992, in history of science), Latvian Agricultural University (1999) and Riga Stradiņš University (2007).

For more than half a century, the research career of Jānis Stradiņš has been closely related to the Latvian Institute of Organic Synthesis, where he has worked as Researcher (1957–1961), Head of the Laboratory of Physical Organic Chemistry (1961–2006) and Chief Researcher (since 1993). His other affiliations include: University of Latvia (1972–1976 Professor of Physical Chemistry, since 1990 Professor of History of Science, since 2008 Chief Researcher) and Riga Stradiņš University (1992–2000 Chief Researcher).

Jānis Stradiņš is among the most often cited and best known Latvian scientists whose studies are widely recognised by colleagues at home and abroad. His main area of interest in chemistry is molecular electrical chemistry of organic compounds. At the Latvian Institute of Organic Synthesis he has been primarily involved with development of polarographic techniques of analysis for identifying organic compounds. He has likewise made a notable contribution to creating of new original medicines (Furagin, Solafur, Methindione, etc.). As a historian of science, Jānis Stradiņš has been especially fascinated with the historical development of chemistry, pharmacy and medicine. He has examined the history of the Baltic

States, focusing on the history of Riga, the formation of scientific relations and establishment of research centres in the three Baltic republics, etc. His publications comprise 7 monographs and over 300 scientific articles on electrical chemistry, and 20 monographs and over 250 scientific articles on history of science.

In 1973 Jānis Stradiņš was elected a Member of the Latvian Academy of Sciences. He has successively been Vice-President (1992–1998), President (1998–2004) and Chair of the Senate (since 2004) of the Academy. At the same time, he strove to enhance scientific cooperation between the Baltic States and the Nordic countries. He helped to revive the traditional Baltic Conferences on Intellectual Cooperation, established the Association of Science History and Philosophy of the Baltic States and has been its President (1990–1991, 1993–1996, 2001–2003, 2006–2008) and Vice-President. Jānis Stradiņš is a member of the European Academy of Sciences and Arts (Salzburg, Austria) and German Academy of Natural Sciences Leopoldina, a corresponding member of Saxon Academy of Sciences and the Baltic Historical Commission (Göttingen), and a foreign or honorary member of numerous research institutions, societies and unions. He has been recognised with prestigious science prizes and state decorations, incl. the Three Stars Order of the Republic of Latvia (1995), the National Order of the Legion of Honour, France (2001), the Order of Merit of the Italian Republic (2004). He was granted Medal of the Baltic Academies of Sciences in 1999. On proposal of the Estonian Academy of Sciences, the President of the Republic of Estonia honoured him with the Order of the Cross of Terra Mariana, 3rd Class in 2004.

The Estonian Academy of Sciences elected Jānis Stradiņš in 1998 its Foreign Member in physical chemistry and science history.

MEMBER OF THE ACADEMY
VLADIMIR HIŽNJAKOV

Vladimir Hižnjakov [Hizhnyakov] was born on 25 May 1938 in Russia, in the Rostov Region to a family of intellectuals descending from the native Don and Kuban Cossacks. After the Second World War his family moved to Estonia. In 1955 he graduated with Silver Medal from Tapa Railway Secondary School. V. Hižnjakov proceeded to study at the University of Tartu, in the Faculty of Mathematics and Natural Sciences and graduated *cum laude* in 1960, majoring in theoretical physics. He enrolled in a doctoral programme at the Institute of Physics and Astronomy of the Estonian Academy of Sciences and defended his Candidate of Science (PhD) today equivalent to dissertation on the theory of quasi-linear spectra at the University of Tartu in 1966. This work laid the foundation to the theory of phonon-free, i.e. purely electronic line theory, which he later complemented. He later defended his second doctoral thesis (Doctor of Science) on the theory of resonance secondary radiation at the same university in 1972.

Vladimir Hižnjakov was elected Member of the Estonian Academy of Sciences in 1977.

In 1963 Vladimir Hižnjakov proceeded to work at the Institute of Physics and Astronomy of the Estonian Academy of Sciences (present-day Institute of Physics), where he has worked ever since holding the positions of Junior Researcher, Senior Researcher, Chief Researcher and Head of Laboratory. In 1973 he went for a longer period on a scientific mission to the University of California, in 1977 to the Institute of Physics of Solids in Tokyo, and in 1983 to the University of Arizona. In 1987 Vladimir Hižnjakov became Chief Researcher at the Institute of Physics and established collaborative relationships with researchers of universities in Stuttgart, Bonn, Ulm and Zürich, taking high temperature superconductivity as their main topic. As a result of cooperation, scores of publications were released, incl.

also jointly with a Nobel Prize Laureate K.A. Müller, who discovered high temperature superconductivity.

In 1976 Vladimir Hižnjakov started his lecturer career at the University of Tartu, where he has delivered main courses like electrodynamics and quantum mechanics and special courses on radiation quantum theory, non-linear optics and Green functions. In 1982 he was awarded Professorship and worked in 1993–2003 as Professor of Theoretical Physics at the University of Tartu. He is the author of over 300 research publications; 12 doctoral theses and 3 master's theses have been defended under his supervision.

Professor Hižnjakov has worked for five decades in the field of theoretical physics. Besides making an outstanding contribution to high temperature superconductivity he has studied optical properties of solids and spectrography, theory of impurity centres of crystal, hot luminescence, non-linear optics, and quantum optics.

The outstanding scientific accomplishments of Vladimir Hižnjakov have been recognised on several occasions. He has been among recipients of Estonian National Science Prizes in 1965, in 2003, and in 2011, when granted the Outstanding Lifetime Achievement Award. He was elected Meritorious Scientist of Estonia in 1986 and awarded the Annual Prize of the Estonian Physical Society in 1995. The 3rd class Order of the White Star was bestowed on him in 2001.

Member of the Academy Vladimir Hižnjakov's research has been rewarded with the National Science Prize three times – in 1965, 2003 and 2011.

The long-standing favourite leisure time of Professor Hižnjakov has been mountaineering (his highest peak is Mount Kazbek). He is also keen on skiing, having participated in numerous Tartu Ski Marathons, and cycling. His literary preferences include historical literature and Russian poetry.



80

MEMBER OF THE ACADEMY
AGU LAISK

Agu Laisk was born on 3 May 1938 in Tartu. His early interest in exact sciences and modern subjects deepened while he was studying at Hugo Treffner Gymnasium, which he graduated from in 1956. He enrolled at the University of Tartu, Department of Physics and graduated in 1961, holding a diploma of physicist/teacher of physics. He then took a doctoral programme at the Institute of Physics and Astronomy in Tõravere, where his studies were concerned with radiation properties of the plant canopy, under supervision of Juhan Ross. The Candidate of Physics and Mathematics (PhD today equivalent to) degree was awarded to Agu Laisk in 1965 for his dissertation “Propagation of Solar Radiation in Plant Canopy in Relation to Photosynthetic Production”. While preparing the dissertation the former physicist developed into a biologist. He defended his doctoral thesis (Doctor of Sciences) on the topic “Kinetics of Leaf Photosynthesis and Photo-breathing” in 1975 at the Timiryazev Institute of Plant Physiology of the USSR Academy of Sciences.

For nearly thirty years, the professional career of Agu Laisk was related with the Institute of Physics and Astronomy, where he started in 1964 as Junior Researcher, later becoming Senior Researcher and Head of the Laboratory of Biophysics. In 1992–2013 he worked at the Institute of Molecular and Cell Biology at the University of Tartu, where he became Professor, Head of the Department of Plant Physiology, and finally Senior Researcher. From 2002 to 2005 he was at the University of Tartu as a Research Professor of the Estonian Academy of Sciences, and since 2003 he bears the title of Professor Emeritus of the University of Tartu. Agu Laisk has been Senior Researcher of Plant Physiology at the Tartu

University Institute of Technology since 2014 and is currently a Project Manager at the same institute.

In 1994, Agu Laisk was elected a Member of the Estonian Academy of Sciences.

Agu Laisk is an outstanding researcher of plant photosynthesis. His research deals with the question “What determines the rate of photosynthesis?”. To answer the question, researchers led by Agu Laisk have designed the fastest photosynthesis measurement system in the world and the most complex photosynthesis model, and achieved a number of ground-breaking results in the research of the photosynthesis process. Underlying his success has been, upon opinion of the Member of the Academy, the well-oiled work of his team and the unique apparatus building basis, which has been elaborated at his laboratory. In 2010 the achievements of the team were recognised with an Innovation Prize by the International Society of Researchers of Photosynthesis. Thrice the work of Agu Laisk has been awarded the National Science Prize (1985, 1999 and 2018 – Outstanding Lifetime Achievement Award).

In 2001 Agu Laisk was awarded the 4th class Order of the White Star.

Aside from teaching and research, Member of the Academy Agu Laisk has always found time for music in his life. He is passionate for jazz music and saxophone, and his high level performance at different events can be enjoyed up to this day.

MEMBER OF THE ACADEMY
HANDO RUNNEL

Hando Runnel was born on 24 November 1938 in Järva County. He received secondary education at Tartu Secondary School No. 1 and Paide Secondary School, from which he graduated in 1956. In 1957–1962 he studied agronomy at the Estonian Agricultural University.

In 1966–1971 he worked on the editorial board of the literary magazine *Looming*, and since 1971 he has been a freelance writer. In 1992–1993 he was the first Professor of Fine Arts at the University of Tartu, one of the restorers of the Faculty of Theology in 1991, and member of two consecutive Boards of Governors of the University of Tartu in 2004–2008. In 1992 he established the Ilmamaa Publishers, is currently Chairman of the Supervisory Board and editor-in-chief of the series *Eesti mõttelugu* (Story of Estonian thought). Since 1995, 147 (as of 01 May 2019) substantial volumes have been published, consisting of some of the most valuable Estonian texts in history.

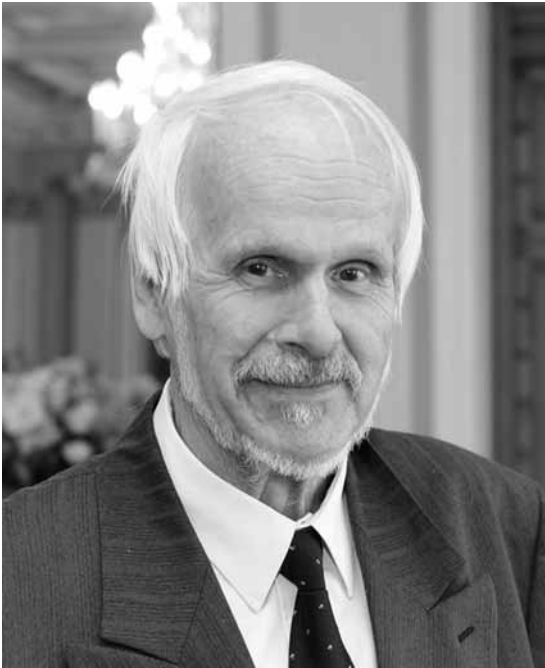
Hando Runnel was elected a Member of the Academy in 2012.

Since the publication of his first poetry collection *Maa lapsed* (Children of the Land) in 1965, Hando Runnel has been one of the leading figures of Estonian literature and has become a bearer of national identity through literature. He has written national political poetry, distinctive children's literature and essays, as well as plays. He is an active public figure and organiser of literary events. His deeply thought-through, strongly national poetry that pays tribute to Estonian thought is familiar to all Estonians, regardless of their age. Runnel's literary criticism, essays and socially poignant publicistic pieces are rather rough, however, and are invariably characterised by due attention toward the object and an analytical perspective. The

portraits of Jaan Kross, Mati Unt, Ilmar Laaban, and others are among the best essay writings in Estonian.

Hando Runnel has been a member of the Estonian Writers' Union since 1969 and he has been repeatedly elected to the Board. He was a member of the Estonian Congress in 1990–1992 and Constitutional Assembly in 1991–1992. He is one of the founders of the University of Tartu award for contribution to national identity in 2003 and a long-term member of the jury. He has also participated in the work of the Ernst Jaakson Memorial Fund scholarship committee.

Hando Runnel's work and outstanding activities in introducing and promoting Estonian national thought have been recognised with the Juhan Smuul Literary Prize (1988, 1989), an annual award of Literature (1992), the Estonian National Culture Foundation Lifetime Achievement Award given by the Cultural Endowment of Estonia (2006), and the Gustav Suits scholarship (2007). In 1997 he was awarded the 4th class Order of the National Coat of Arms and in 2006 the 2nd class Order of the White Star. Hando Runnel was named Honorary Citizen of Tartu in 2002. Last year, he was presented with a freedom rock for his contribution to restoring Estonia's independence.



80

MEMBER OF THE ACADEMY
GENNADI VAINIKKO

Gennadi Vainikko was born on 31 May 1938 in the town of Kontupohja, Karelia. The war tossed the family to and fro, but finally they managed to get settled in Estonia. His parents often changed their place of residence and jobs, consequently Gennadi Vainikko has been to different schools, graduating from Kehra Secondary School in 1956 with a Golden Medal. He then enrolled at the University of Tartu, Faculty of Mathematics, which he graduated from in 1961. His master's thesis was conferred a high prize and monetary reward by the USSR Ministry of Education in a student paper contest. In 1961–1964 he continued his studies in a doctoral programme and in 1964 he defended his Candidate of Physics and Mathematics (PhD) thesis at the University of Tartu on the topic “On the Accuracy of the Galerkin Method”.

In 1964, Gennadi Vainikko worked one year at the University of Tartu as an assistant at the Department of Mathematical Analysis and moved thereafter to Voronezh University, where he was Assistant Professor at the Department of Mathematical Analysis in 1965–1967. In 1969 he obtained at the same university a doctoral degree (Doctor of Science) in physics and mathematics on the topic “On Approximation of Linear and Non-linear Operators and Approximate Solution of Operator Equation”. In the years 1970–1994 he worked at the University of Tartu as Head of the Numerical Analysis Department and was awarded Professorship in 1971. During the years 1973–1993 Gennadi Vainikko delivered longer lecture cycles as a guest lecturer at universities in Germany, the USA, Finland, Latvia, Russia and South Korea. In 1993–2003 he continued his pedagogical career at Helsinki University of Technology as Professor and in 2003–2004 as Senior Researcher at the Department of

Mathematics of Tallinn Pedagogical University. Since 2005 he has held the position of Senior Researcher at the Institute of Applied Mathematics at the University of Tartu, and in 2006 he became Professor Emeritus of the University of Tartu.

The research activities of Gennadi Vainikko have been involved with functional analysis, incl. theory of approximate methods (first and foremost those related to discretisation of tasks), projection methods, non-correct tasks, reverse tasks, qualitative theory of integral and pseudo-differential equations and numerical methods, and tasks of mathematical physics (in the first place radiation propagation). He has supervised over thirty doctoral theses, been the author or co-author of numerous pioneering monographic works, several textbooks and nearly 300 scientific publications.

Gennadi Vainikko was elected a Member of the Estonian Academy of Sciences in 1986. In the complicated transitional years of research reform in the period 1990–1994 he held the position of Vice-President at the Academy. He was awarded the honorary title of Merited Scientist of Estonia in 1989; in 1998 he was awarded the 3rd class Order of the White Star and Medal of the Academy. He has also been decorated with the University of Tartu Grand and Small Medal, in 2011 he was awarded National Science Prize in Exact Sciences and in 2017 the Outstanding Lifetime Achievement Award.

In his spare time Member of the Academy is known for his passion for sports, having finished at least 15 Tartu Marathons. For nearly a quarter of a century, he has enjoyed choir singing in the “Gaudeamus” male choir of Tartu. Gennadi Vainikko also has a fancy for concerts and theatre.

MEMBER OF THE ACADEMY
ANU RAUD



Anu Raud was born on 10 May 1943 in Moscow. Her father was the poet, novelist and dramatist Mart Raud, and her mother Valda Raud was a translator. Warm, supportive and rich in spirit, her family supported her development into a versatile and creative personality. In 1961 Anu Raud graduated from Tallinn Secondary School No. 22 and started working as an artist at Tallinn Machine Factory Teras. Driven by her great interest for nature, her parents' support and interior designer Olga Maasik's recommendation, she went on to study textile art at the Estonian Academy of Arts (the Estonian State Art Institute at the time). There, she established a very good connection with Professor Mari Adamson. Working as a designer at the legendary Estonian Folk Art and Craft Union UKU (1967–1970) and collaborating with other professional artisans there, her interest and passion for folk art increased even further.

During the years 1970–1972, Anu Raud was a postgraduate student at the Art History Department of the Estonian Academy of Sciences Institute of History. From 1972–1995, she worked as a Senior Teacher and Assistant Professor at the Estonian Academy of Arts. During the 1994–2001 period she was Professor and Head of the Farm Design and Estonian Native Crafts Department at the Viljandi Culture Academy. Between 2001–2006 she was Professor at the Folk Art Chair of the Estonian Academy of Arts. In 2006, she became Professor Emeritus.

Anu Raud was elected a Member of the Estonian Academy of Sciences in 2016.

Anu Raud is one of the most unique creators in Estonian art. She has delved into our folk art heritage for her entire conscious life and used what she has found there as a starting point for analysis in her work as a teacher, tapestry artist, writer, museum founder and farmer. Anu Raud's tapestry art is of symbolic significance where important permanent values have been put into the form of visual native language. Her work shows respect

for heritage, her closeness to rural life, love for home, and signs of the lifecycle of our ancestors. Anu Raud has been teaching the next generations of Estonian textile artists since 1972, supervising folk art students at the Estonian Academy of Arts, University of Tartu Viljandi Culture Academy and Tartu Art College. She stands out as an inspiration and guide for an entire generation of textile artists that honour their ancestors' heritage. The small textile museum room opened at Anu Raud's father's farm in 1991 has grown into the Heimtali Museum, which she presented as a gift to the Estonian National Museum on the occasion of the centenary of the Republic of Estonia.

Anu Raud has received numerous awards and prizes in recognition of her work. These include the annual Kristjan Raud Prize (1978, 1994), the Estonian National Culture Foundation Prize (1992), the Estonian Rebirth Award of Jakob von Uexküll (1994), the Viljandi Culture Award (1995), the Oskar Loorits Prize for collecting folk art (1997), as well as the Annual Award (2000) and grant (2003) of the Estonian Cultural Endowment, the Estonian Rye Association's Cornrake Cultural Prize (2002), the University of Tartu Award for Promotion of Estonian National Thought (2013), etc. Anu Raud received the 3rd Class Order of the White Star in 1998 and the National Outstanding Lifetime Achievement Award this year.

As a person, Anu Raud is known for her good sense of humour, warm heart, down-to-earth attitude and love for her home. One of the main goals in her life is to keep the Heimtali Museum open for creative people, to make it last and live on, longer than herself. She wishes for her family farm to be a cosy, lovely and human place, enriched with art and intellectual values, where people can come and enjoy spending time.



75

MEMBER OF THE ACADEMY
VALDUR SAKS

Valdur Saks was born on 3 September 1943 in Kiviõli. His father was a mining engineer, general manager of Kiviõli and Kohtla-Järve oil factories. His childhood however passed in Võrumaa, where the family had to hide after the war, fearing deportation to Siberia. This is where he also started school. Later, the family was able to return to Kohtla-Järve and Valdur Saks graduated from Kohtla-Järve Chemistry Polytechnic School in 1962, thereafter from the Faculty of Chemistry at Moscow University in 1967 and a doctoral programme in 1970. In 1971 he defended at the same institution his Candidate of Science dissertation in Chemistry titled “Stabilising of oxidizing phosphorylation system at its functioning” and in 1981 at Moscow Cardiocentre his doctoral thesis (Doctor of Science) in Biology “Role of the system of creatine kinases in intracellular energy transfer and regulation of cardiac muscle contraction”.

In 1970–1971 Valdur Saks worked as Junior Researcher in the Physics Laboratory at the Institute of Cybernetics of the Estonian Academy of Sciences and in 1971–1972 he continued as Junior Researcher at the Department of Chemistry of Moscow University. In 1972 he moved to work at the Laboratory of Cardiac Metabolism of the Moscow Institute of Cardiology, which soon evolved into the Russian Centre of Excellence for Cardiology in Moscow. Until 1981 he was Senior Researcher and Research Team Leader for Bioenergetics, in 1981–1993 Head of the Laboratory of Bioenergy and since 1986 also Professor.

From 1993 Valdur Saks worked as Head of the Laboratory of Bioenergetics at the National Institute of Chemical Physics and Biophysics, being one of the

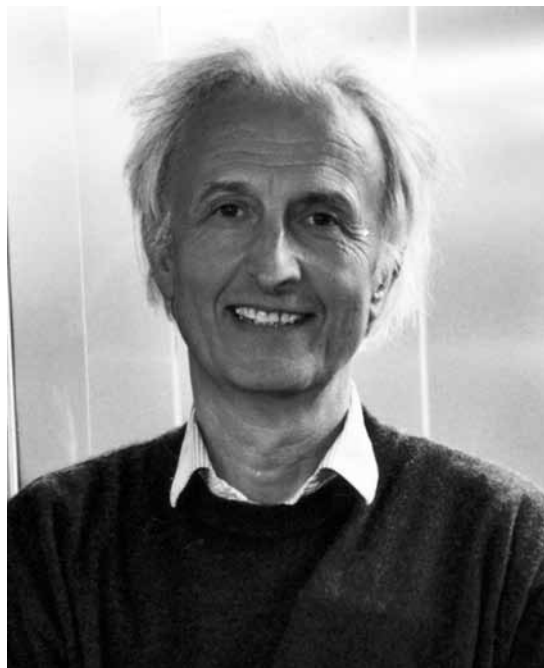
founders of the laboratory. Presently he is Leading Researcher of National Institute of Chemical Physics and Biophysics. From 1975 to 1978 Valdur Saks participated for short periods in cooperation programmes with the University of Pennsylvania (Philadelphia, USA). In 1978–1981 he worked at John Hopkins University (Baltimore, USA), in 1981–1993 at the Université Paris-Sud (Orsay, France); in 1994–1997 he was repeatedly Professor at the Cardiac Cell Physiology Laboratory of Joseph Fourier University (Grenoble), where he has been since 1997 Professor in Ordinary.

In 1993 Valdur Saks was elected a Member of the Estonian Academy of Sciences.

The main areas of research studied by Valdur Saks are bioenergetics of muscle cell, systems of energy transfer of cells, ischemia of cardiac muscle cell and mechanisms of protection against it. He has established an international cardiac bioenergetics school and research direction of molecular system bioenergetics. In cooperation with the US, French and Swiss researchers he has created the theory of intracellular energy transfer through polyfermentative systems, where creatine kinases hold the crucial position. He has also cooperated with Canadian, German and Italian research institutions.

The scientific contribution of Valdur Saks has been recognised by the USSR State Prize (1978), the UNO and UNICEF International Health Research Prize “Research for Development” (1988) and the Estonian National Science Prize in geo- and biosciences (as research team leader, 2008). In 2006 he was awarded the 4th class Order of the White Star.

FOREIGN MEMBER OF THE
ACADEMY
HELMUT SCHWARZ



Helmut Schwarz was born on 6 August 1943 in Germany in the town of Nickenich, situated in the district of Mayen-Koblenz. In 1971 he graduated from Berlin University of Technology with diploma in chemistry. In 1972 he defended the degree of Doctor of Natural Sciences in organic chemistry at the same University and in 1974 acquired the right to deliver lectures. Four years later H. Schwarz was nominated to the position of Professor of Theory and Practice in Mass Spectrometry of Berlin University of Technology. Since 1983, he has been working at the same University as Professor in Organic Chemistry. He has delivered lectures, as a guest Professor, at many universities of the world, incl. Cambridge (United Kingdom), Jerusalem and Haifa (Israel), Lausanne (Switzerland), Canberra (Australia), Innsbruck (Austria), as well as in Paris and Strasbourg (France).

Professor Schwarz is one of the most outstanding and most often cited scientists in the domain of molecular chemistry, whose research activities embrace the areas from fundamental chemistry to reactions important from the point of view of industry, and from unique experimental research to high level theoretical treatments. He has published approximately 800 research articles. The range of topics having attracted his attention is remarkably wide, representing the issues of organic, inorganic and physical chemistry. The main avenues of research of H. Schwarz are metal-catalytic activation of industrially important C-H, C-C and C-Si bonds by transition metals, precious and other metals and their derivatives, the original creation and study of several compounds that are universally deemed impossible to synthesise, research on the design of novel catalysts and mechanisms of their operation, research of important elementary reactions, development and implementation of new mass-spectrometry technologies, etc.

Besides research and work on faculty, Professor Schwarz has held important administrative posts, e.g. Vice-President of the Berlin-Brandenburg Academy (1998–2003), Vice-President of the German Research Foundation DFG (2001–2007), President of the Humboldt Foundation (Humboldt-Stiftung) (2008–2017). Helmut Schwarz is a member of numerous scientific academies (the Leopoldina, Music Academy Erfurt, Berlin-Brandenburg Academy of Sciences and Humanities, Göttingen Academy of Sciences and Humanities, Academia Europaea, American Academy of Arts and Sciences, etc.) and Honorary Doctor of several universities around the world. He has been the editor or an editorial board member of several international journals for chemistry (currently *Advances in Physical Organic Chemistry*, *Journal of the American Chemical Society*). Among the global scientific community he is also known as a competent expert in science policy.

His contacts with Estonian researchers date back to the year 2000, when close scientific cooperation was established in physical organic chemistry and for study of catalytic reactions and gas-phase ionic-molecule reactions. In 2002 Helmut Schwarz was elected Foreign Member of the Estonian Academy of Sciences.

Helmut Schwarz has been awarded worthy science prizes (e.g. van Hoff, Leibniz, Max-Planck, J.J. Thomson, Lise Meitner-Alexander von Humboldt, V. Prelog, F.H. Field and J.L. Franklin, Otto Hahn, Erwin Schrödinger, and Blaise Pascal memorial prizes/medals). In 2011 he was awarded the Officer's Cross of Order of Merit of the Federal Republic of Germany and Medal of the European Academy of Sciences in chemistry; in 2012 he was granted Lichtenberg Medal of the Göttingen Academy of Sciences.



70

MEMBER OF THE ACADEMY
ARVI FREIBERG

Arvi Freiberg was born on 28 June 1948 in the village of Kuremäe in Ida-Viru County. Due to his father's job, the family often had to move, and he graduated from secondary school in 1966 in Paide. His further study aspirations included technical specialisations and physics. He chose semiconductor material technology at Tallinn University of Technology, from which he graduated in 1971. He defended his first doctoral (Candidate of Physics and Mathematics) thesis "Peculiarities of the electron-phonon interactions and influence of defects in the spectra of molecular impurities in alkali-halide crystals" at the Institute of Physics of the Estonian Academy of Sciences in 1976, and his second Doctor of Physics and Mathematics thesis "Picosecond spectrochronography and relaxation processes in condensed molecular media" at the Institute of Physics of the Latvian Academy of Sciences in 1986.

After graduating from Tallinn University of Technology, Arvi Freiberg started work at the Institute of Physics of the Estonian Academy of Sciences (University of Tartu Institute of Physics since 1997) where he has been an engineer, junior and senior researcher, research director, director, head of the institute, head of laboratory and head of section. Since 2003, Arvi Freiberg has been Professor of Biophysics and Plant Physiology and Head of Chair.

Arvi Freiberg's research activities have included photobiophysics (including primary processes of photosynthesis), biospectroscopy (including under high pressure), and ultrafast and selective spectroscopy of condensed matter. Furthermore, he has researched the field of biosciences and environment (e.g. biotechnology,

molecular biology, cell biology, biophysics, and economic and technological research relating to bio- and environmental sciences).

Member of the Academy Arvi Freiberg has held various public and administrative posts such as Chairman of the Tallinn University of Technology Board of Governors, Member of the University of Tartu Council, and Member of the University of Tartu Institute of Physics Council. He has also been a member of numerous research conference programme committees and expert bodies. Since 2018, Arvi Freiberg has been a member of the Selection Board for electing Research Professors.

The first Biophysics master's programme was opened in Estonia under Arvi Freiberg's initiative. He has supervised seven PhD theses. Many of his former students have become professors abroad. He has published over 200 research articles.

In 2005, Member of the Academy Arvi Freiberg was named "Author of the year" by the Estonian popular science journal *Horisont* (Horizon). In 2006, he was granted the National Science Prize for Exact Sciences (as research team leader). The University of Tartu awarded him with the Small Medal in 2013 and in 2014, he received the Australian Research Council International Collaborative Award.

Member of the Academy Freiberg is keen on sports – he often goes skiing in winter and plays tennis in summer. He also enjoys reading fiction, and his view on science is that even complicated matters should be explained clearly enough for non-specialists to be able to understand them.

MEMBER OF THE ACADEMY
JAAK JÄRV

Jaak Järv was born on 5 November 1948 to a servants' family in post-war Tartu. He acquired basic education at Tartu Secondary School No. 10, where he became interested in chemistry as early as in Year 6. He graduated with a certificate of Secondary Education from Tartu Secondary School No. 5, having studied in the same legendary chemistry class as several of today's Members of the Academy, professors and doctors of sciences. Jaak Järv graduated from the University of Tartu Chemistry Department in 1972, having defended his doctoral (PhD) thesis "Studying the specificity and the reaction mechanism of acetylcholinesterase using the methods of chemical kinetics and quantitative structure-activity relations" at the Institute of Chemistry of the Estonian Academy of Sciences. He went on to acquire his degree of Doctor of Chemical Sciences at Moscow University's Faculty of Chemistry, having defended the thesis "Kinetic Mechanisms of Receptor-Ligand Interaction. Muscarinic Acetylcholine Receptor" in 1990. He was awarded Professorship in 1991 and was elected Member of the Academy of Sciences in natural sciences in 1997.

Jaak Järv's work has been closely related to the University of Tartu Chemistry Department for nearly half a century. In 1972, he started his career path there as Junior Researcher, and proceeded to work as a Senior Teacher after finishing his postgraduate studies. He later held the post of Associate Professor in 1982–1983, Deputy Prorector on Research in 1983–1991, Scientific Supervisor at the Bioorganic Chemistry Laboratory in 1985–1991, and Dean of the Faculty of Physics and Chemistry in 1998–2003. Since 1991, he has been Professor of Organic Chemistry at the University of Tartu, and Head of Chair since 2008. Since 2007, he has been editor-in-chief of the proceedings of the Estonian Academy of Sciences, and Chairman of the Board of the Estonian Academy Publisher. In 2017 he became Secretary-General of the Academy.

The primary study areas in the fruitful research carried out by Jaak Järv have been research into the specificity and mechanisms of biocatalysis and receptor processes using chemical kinetics and other physico-chemical research methods. He has supervised 27 doctoral theses, as well as dozens of master's and bachelor's theses. He has published over 250 research articles, including 12 chapters in monographs and collections. He is the author of one university textbook and took part in translating two university textbooks into Estonian.

Jaak Järv is a member (and in 2004–2011 president) of the Estonian Biochemical Society, Member of the Board of the Estonian Chemical Society and a member of various foreign professional associations. From 1996–2013 he was a Member of the Council of the Federation of European Biochemical Societies (FEBS), rising to the position of Chairman of FEBS Advanced Courses Committee for the 2011–2013 period. Jaak Järv was an Expert at the European Commission's Research Infrastructures Committee in 2003–2013. He has also been awarded two Honorary Doctorates – in 1991 by the University of Eastern Finland and in 1996 by Uppsala University (Sweden). He has twice been decorated with the National Science Prize (in 1987 and 2000). In 2009, Jaak Järv was awarded the the 3rd class Order of the White Star.

Jaak Järv is interested in creating study materials for teaching natural sciences at schools. His other leisure activities include art and cooking. He is a member of Tartu Rotary Club.



70

MEMBER OF THE ACADEMY
MATI KARELSON

Mati Karelson was born on 27 December 1948 in Tartu. He graduated from the legendary chemistry class of Tartu Secondary School No. 5 in 1964 along with four other future Members of the Academy. He considered pursuing further studies in either physics or chemistry, opting for the latter and graduating from the Chemistry Department of the University of Tartu in 1972, specialising in organic chemistry. In 1975, Mati Karelson defended his doctoral (PhD) thesis on the “Applicability of electrostatic models in organic chemistry”.

After finishing his studies, Mati Karelson worked as a Junior and Senior researcher at the Department of Organic Chemistry of the University of Tartu. From 1975–1992, he was a Senior Researcher, Head of Sector and Head (since 1988) of the Laboratory of Chemical Kinetics and Catalysis. From 1992–2004, he was Professor of Theoretical Chemistry at the University of Tartu, from 1996–2014 Adjunct Professor at the University of Florida, from 1999–2002 Director of the Centre of Strategic Competence at the University, and 2004–2014 Professor of Molecular Technology at Tallinn University of Technology. Mati Karelson took on a Professorship in Molecular Technology at the University of Tartu in 2005.

Mati Karelson was elected Member of the Estonian Academy of Sciences in 2007.

An internationally renowned chemist and pioneer of the molecular design and molecular technology fields in Estonia, Mati Karelson mainly focuses on the following themes in his research: quantum theory of condensed systems, reactivity of chemical compounds, quantitative structure-activity relationships, modelling of technological properties and processes of chemical compounds, the chemistry of heterocyclic compounds, artificial intelligence in chemistry, molecular technology and biomedical

chemistry. He has used molecular descriptors to create computational systems that make it possible to predict the properties of chemical compounds and materials. Among other topics, he is researching the possibilities of using computer software to determine the effects of chemicals so as to save laboratory animals’ lives. Mati Karelson has also worked actively on strengthening collaboration between science and entrepreneurs.

Member of the Academy Mati Karelson has been an active member and head of a number of councils and committees. As such, he was member of the Committee of Senior Officials and Estonian National Coordinator of the European Cooperation in Science and Technology Association (COST) in 1996–2001. He was Chairman of the Board of Tartu Science Park during the years 1997–2002, Advisor on R&D to the Prime Minister of Estonia in 2005–2014, and member of the Advisory Board of the President of Estonia.

Mati Karelson was awarded the National Science Prize for his monograph “Molecular Descriptors in QSAR/QSPR” in 2001. He also received the 4th class Order of the White Star in 2006 and was named Honorary Citizen of Tartu in 2008. His achievements in chemistry were recognised by the Estonian Academy of Sciences in 2014 with the Wilhelm Ostwald Medal.

Aside from science, Member of the Academy Dr Karelson has a close relationship with visual arts. His artist wife Tiia Karelson has compiled their family art collection, which includes over 150 works of art from graphics to sculpture.

MEMBER OF THE ACADEMY
RAIVO UIBO

Raivo Uibo was born on 21 December 1948 in Tartu. He acquired his secondary education from the legendary chemistry class of Tartu Secondary School No. 5 in 1964 along with four other future Members of the Academy. He continued his studies at the Faculty of Medicine of the University of Tartu, graduating in 1973 with a master's degree in Medicine.

Raivo Uibo defended his doctoral (PhD) thesis in Medicine at the University of Tartu in 1978, focusing on the causes of gastritis, especially on its cellular aspects. He successfully proved that functionally different parts of the stomach receive different immune responses. An opportunity to further his studies in Finland presented itself to Raivo Uibo in 1978. There, his primary focus was research into the autoimmune reactions of the liver. As part of his project, he developed a novel method of detecting antibodies and reached a doctoral degree in Medicine and Surgery at the University of Tampere in 1990.

Raivo Uibo was elected Member of the Estonian Academy of Sciences in 2003.

During the years 1973–1979, after graduating from university, Raivo Uibo worked as Senior Lab Assistant and Junior Researcher at the Central Med Research Laboratory of the University of Tartu. He then went on to work as Head of the Laboratory of Immunology at the Institute of General and Molecular Pathology from 1979–1992 and Head of the Centre of Molecular and Clinical Medicine of the University of Tartu Faculty of Medicine. Raivo Uibo has been Professor of Immunology since 1992 and Head of Office of the Institute of

Biomedicine and Translational Medicine since 2014 at the University of Tartu.

Raivo Uibo's research interests include autoimmunity, molecular and cellular aspects of autoimmune diseases, immune mechanisms in diabetes, immune mechanisms in coeliac disease, clinical immunology, and immunology of the human reproductive system. In addition to his in-depth research into the causes and progression of autoimmune diseases, as well as the possibilities of diagnosing them, Raivo Uibo's significant contribution to clinical immunology is the founding of an organisational and practical base in Estonia, along with participation in international collaboration in the field. In 1984, he was the initiator of the Estonian Society for Immunology (now the Estonian Society for Immunology and Allergology), and the opening of the University of Tartu Residency programme.

Raivo Uibo is a Member of the Editorial Board of various international research organisations and journals. He has supervised 17 PhD dissertations, and authored over 200 research publications, including two monographs and three university textbooks.

The National Science Prize has been awarded to Raivo Uibo twice (in 1995 and 1999). In 2001, he received the 3rd Class Order of the Red Cross.

Aside from his research, Member of the Academy Raivo Uibo takes pleasure in hiking with his family and frequenting visual art exhibitions. One of his main hobbies is cooking.



50

MEMBER OF THE ACADEMY
MARTTI RAIDAL

Martti Raidal was born on 26 February 1968 in Paide. He graduated from the Nõo Gymnasium in 1986 and from the University of Tartu in 1992 with a master's degree in physics. In 1995, he achieved a PhD in theoretical physics at the University of Helsinki. The Estonian Academy of Sciences elected him to be a Member of the Academy in 2011.

In 1996–1997, Martti Raidal worked at the University of Valencia, 1998–1999 at the DESY Laboratory in Hamburg, in 2000–2001 at the University of California in Riverside, and in 2011, at the European Organization for Nuclear Research (CERN). Martti Raidal holds the position of Research Professor at the National Institute of Chemical Physics and Biophysics, and also heads the Centre of Excellence “Dark Side of the Universe”. During the 2009–2012 period, he was a Research Professor at the Estonian Academy of Sciences.

In his research, Member of the Academy Martti Raidal's fields of interest are theoretical and experimental particle physics, astroparticle physics and cosmology. He is the leader of the Estonian research team working at CERN. The team is currently participating in the Compact Muon Solenoid (CMS) experiment, mainly investigating top quarks – the heaviest elementary particles. The main goal of the experiment is to look for evidence of physics beyond the standard model. Furthermore, Martti Raidal has contributed significantly to the development of implementing the distributed computing concepts grid and cloud in research computers, as well as to the creation

of distributed computing research infrastructure in Estonia and the rest of Europe.

Martti Raidal is the founder of a new research direction in Estonia – experimental particle physics. He has supervised six successful master's and doctoral theses in this field. Having published over 150 research articles, Member of the Academy Martti Raidal is one of the most frequently cited Estonian researchers of the modern day.

In 2005, Martti Raidal's work was recognised with the National Science Prize in Exact Sciences.

ESTONIAN ACADEMY PUBLISHERS

Established in 1994

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In 2018 Estonian Academy Publishers continued regularly issuing seven peer-reviewed open access scientific journals.

All journals have an international editorial board. In the Estonian Research Information System administered by the Estonian Research Council, all journals have been placed in the category 1.1. The journals were published in collaboration with Estonian universities.

All scientific articles of the journals have been supplied with the doi-indexes (Digital Object Identifiers) which allow them to be more easily found in online searches. Published texts are distributed also by well-known electronic publishers and portals EBSCO, C.E.E.O.L., The Gale Group Inc., ProQuest LLC, H. W. Wilson (merged with EBSCO), Digital Publication with the Leading Asian Distributor (Airiti Inc.) and Join CNKI Scholar (China). All seven journals issued by the Publishers have been included in Elsevier BV Bibliographic Database SCOPUS® that is used in many countries as the benchmark of efficiency of research. Six journals are reflected in the

database of Thomson Reuters Web of Science® Core Collection that is often used as the basic source of bibliometric information for research evaluation:

Acta Historica Tallinnensia

Estonian Journal of Archaeology

Estonian Journal of Earth Sciences

Proceedings of the Estonian Academy of Sciences

Oil Shale (incl Current Contents®)

Trames. A Journal of the Humanities and Social Sciences

Two journals are in the database ERIH: *Estonian Journal of Archaeology*; *Linguistica Uralica*.

The Publishers produce the following electronic versions of the articles for the aforementioned portals: pdf-files, sgml-files of two types, xml-files of three types and a special file for the electronic library C.E.E.O.L.

In 2018, in total 171 pieces of writing were released in 23 issues of seven journals, of them 154 scientific articles and 17 short pieces of writing. Electronic versions of the

Title	Number of issues per year	Total volume of pages	Format of journal
<i>Acta Historica Tallinnensia</i>	1	132	168×240
<i>Estonian Journal of Archaeology</i>	2	180	168×240
<i>Estonian Journal of Earth Sciences</i>	4	270	210×285
<i>Linguistica Uralica</i>	4	320	168×260
<i>Oil Shale</i>	4	386	168×255
<i>Proceedings of the Estonian Academy of Sciences</i>	4	402	210×285
<i>Trames</i>	4	424	168×240
Total:	23	2114	

articles were published prior to the release of hard copies of the journals. Articles in the journals *Proceedings of the Estonian Academy of Sciences* and *Estonian Journal of Earth Sciences* were published immediately after the layout of the articles was finalised.

The number of authors totalled 448, of whom 169 were Estonian authors and 279 foreign authors. The majority of articles appeared in English, except the journal *Linguistica Uralica*: there were also 24 contributions in Russian (58% of the volume), and two in German (2% of the volume). Since the majority of authors of this journal are linguists of Russia's Finno-Ugric peoples, the prevalence of the Russian language is natural and important.

Articles of *Acta Historica Tallinnensia* appeared either in Estonian (with comprehensive summaries in English) or in another language (with summaries in Estonian). In humanities, articles commonly have one to three authors, whereas in Sciences, it is not uncommon for one article to have up to ten authors.

Two special issues of journals were released in 2018: *Estonian Journal of Earth Sciences* 2018, 67/1: Special issue Devonian and Its Fossil World, dedicated to the memory of Elga Mark-Kurik. Edited by Dimitri Kaljo.

Proceedings of the Estonian Academy of Sciences 2018, 67/2: Special issue on polymer science. Guest Editor Andres Öpik.

Besides journals, one book was also released in 2018: *Emakeele Seltsi aastaraamat* 62 (The Yearbook of the Estonian Mother Tongue Society), editor-in-chief Mati Ereht. Format 143 × 215, 312 pp., hard cover. Full text of the book is also available on the Publishers' website.

The digitalisation of the Estonian Academy Publishers' scientific journals was completed in 2018. It is now possible to access the publications of the Estonian Academy of Sciences of the period 1952–1991 via the Academic Library of Tallinn University. Full texts of later publications are available in full and easy to find using a search engine such as Google.

UNDER AND TUGLAS LITERATURE CENTRE OF THE ESTONIAN ACADEMY OF SCIENCES

Founded in 1993 (the Affiliate Museum in Nõmme, formerly named the Friedebert Tuglas House Museum, was founded in 1971).

Personnel: 18, including 12 researchers

Address: Roosikrantsi 6, 10119 Tallinn, ESTONIA, utkk@utkk.ee

Museum Department: Väikese Illimari 12, 11623 Tallinn, ESTONIA, tuglas@utkk.ee
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Director: Jaan Undusk, Tel.: +372 372 644 3147, jaan@utkk.ee

Academic Secretary: Marin Jänes, +372 644 3147, marin@utkk.ee

Under and Tuglas Literature Centre of the Estonian Academy of Sciences (Literature Centre) is an institution of research and development of the Estonian Academy of Sciences. Its mission is to study Estonian literary culture from the historical and theoretical perspective, within the context of the historically multilingual Baltic literary space and world literature, as well as to promote cultural and literary thought in line with global modern trends (discourse analysis, rhetorical and narratological models of culture, postcolonial theory and the theory of cultural transfer, the “entangled history” approach, memory and gender studies).

In addition to fiction and theatrical texts, the Centre’s research covers numerous formats of historiographical, philosophical, publicistic and scholarly expression in the Estonian and German languages to the extent that they used to play a decisive role in the Baltic literary space in earlier times, together with the texts that proved to be important within the European history of ideas and have influenced mentality on a wider scale as well as locally, in the Baltic States. Within the scope of theoretical background research, the Pan-European history of certain underlying concepts and mindsets is studied (tradition of antithetic thinking, concept of infinity, decadence, soliloquy-style writing, grotesque).

Within its development activities, the Literature Centre publishes original studies and source materials of Estonian national literature and written word in Humanities, maintains a collection of books and art of historical value, and organises conferences, exhibitions and other events of cultural importance. The Museum Department of Literature Centre in Nõmme administrates the legacy of the writer and Member of the Academy Friedebert Tuglas and other collections (including the book and art collection of Friedebert Tuglas; the book and art collection which formerly belonged to Artur Adson and Marie Under, and which arrived in Estonia in 1996; the art collection of the Foundation for Estonian Arts and Letters; and the book and art collection of Paul Reets) as well as the house and the adjoining garden, which is of high dendrological value. It also organises lecture tours and hosts researchers and visitors.

The major areas of research of the Literature Centre:

- Estonian literature and culture in the 20th century (including the works of F. Tuglas, M. Under and A. Adson),
- Older Estonian and Baltic German literary culture in the 13th to 19th centuries and the role of the German and Latin culture of the Baltics in the formation of modern Estonian culture,
- Mechanisms of cultural identity in Estonian literary culture (autogenesis, cultural transfer and entanglement),

- Baltic literary space and literary relations between Estonia, Latvia and Finland,
- Underlying rhetorical and discourse studies for the description of European and Estonian culture,
- Drama and theatre research.

Since 2014, the Literature Centre has been addressing the institutional research topic “Entangled literatures: Discursive history of literary culture in Estonia” (2014–2019, Principal Investigator Jaan Undusk). Within the scope of the research topic, the Literature Centre is studying the emergence and development of Estonian literary culture, which is viewed as a historically entangled process involving national, status-related, cultural, colonial and other stimuli for action (*histoire croisée*), in which various criss-cross patterns, resistances and inertias play a significant role. The character of research is discourse-based: *inter alia*, such areas of discourse important in historically multi-lingual Baltic society, such as history, religion, language, environment, etc., are used as the basis for analysis. In collaboration with an international body of authors, the history of literary culture of the 13th to 19th centuries in Estonia (and Latvia) is being rewritten as a whole to include the rich German component. Modernity is viewed as a way of life formed in a tense relationship with national aspirations and emphasising 167 emancipation, which highlighted the decadent, the *nouveau riche*, the artist and other symbolic figures; tropes related to the above (autonomy, time, infinity) are also addressed. Post-Soviet fiction, theatre and cinema are studied as factors of the memory culture of recent history.

In 2017, the Literature Centre also started the coordination of a new research project (2016–2019, Principal Investigator Kristi Viiding, Senior Researcher Thomas Hoffmann) that focuses on the Latin correspondence of syndic David Hilchen – one of the central humanists of Livonia and a key figure in law and education in Riga in the early modern period – which to date has been unexplored and never printed. The single humanist written corpus of North-Eastern Europe to have preserved in greater volume is the basis for studying the development of written legal argumentation and its reception in court procedures and private relationships of the early modern period; the reception of antiquity in its diversity; humanist education models; confessional and military conflicts in the region; and social networking patterns among leading European humanists. In 2018, as one of the most important outcomes of the project in collaboration with the National Library of Poland, the first part of the catalogue on Hilchen’s correspondence during the years 1577–1603 was published. It was made available on Early Modern Letters Online (EMLO) – an online

platform developed by the University of Oxford and currently containing the letters of over one hundred 16th to 18th century writers and humanists from all around Europe. It allows people to visualise Hilchen's correspondence network and compare it to other European correspondence of the time.

Creating an online platform and filling it with unique historical textual materials is also the focal point of the project "Electronic corpus of Latin inscriptions of Estonia" (Project Manager K. Viiding), which is part of the national programme "Estonian language and cultural memory II (2014–2018)". The project coordinated by the Literature Centre strives to set up a high-level international online platform CEILE (*Corpus Electronicum Inscriptionum Latinarum Estoniae*), using a German example of a technical and structural solution and presentation criteria (Epigraf, Greifswald), but filling it with currently lost Latin epigraphic text material from the Estonian territory. This will allow a systematic scientific use of the thus far very sporadic epigraphic materials that did not have translations or commentaries. The database will enable the use of various search methods and will therefore also provide a good collection of sources for researching the history of ideas, prosopography, onomastics, and history of language and foreign-language poetry in the Estonian territory during different periods.

The Museum Department of the Literature Centre continued the implementation of the research project "Intellectual legacy of Friedebert Tuglas, Marie Under, Artur Adson and their fellow thinkers in the spatial-temporal context" (2014–2018, Project Leader Elle-Mari Talivee) within the national programme "Estonian Language and Cultural Memory II". The project aims to transfer the heritage of the Tuglases, Under and Adson, which is at the Literature Centre's disposal, as a historical and cultural legacy of the Estonian nation to the general public by preparing and printing academically edited publications, organising art exhibitions, conferences, seminars and cultural events as well as the work of museum educators. One of the most significant goals of the project is the completion of the "Collected Works" series of Friedebert Tuglas, edited textual-critically and supplemented with scholarly prefaces and commentaries. As part of the latter, Tuglas' monograph *Ado Grenzstein's Departure* (edited by Elle-Mari Talivee) was published as the 14th volume of the collected works. It explores a controversial character in our cultural history and offers insight into the censorship situation in the late 19th century Russian Empire and the Governorate of Livonia. The Literature Centre also published Under's collection of discourses in prose *Väiksed vaatlused* (Little Observations), comprised of essays, opinion pieces and reviews written by Under in Estonia and later in exile, complete with a

thorough commentary and a foreword (edited by Õne Kepp).

In order to maintain and organise the Literature Centre's collections of scientific-cultural value, "The scientific collections of the Under and Tuglas Literature Centre (Collections of Cultural History)" project was continued in 2018. The project "Development of the Museum of the Under and Tuglas Literature Centre into a modern international research centre" (2015–2020, Project Leader Elle-Mari Talivee) within the programme "Institutional Development Program for Research and Development. Institutions and Higher Education Institutions" (ASTRA), financed by the European Regional Development Fund, continued as well. The project implies the organisation of international science events and exhibitions to introduce the Literature Centre's collections, as well as the improvement of the conditions of use of the collections and their availability to both Estonian universities and researchers and the international research community. In 2018, we continued to focus on the digitisation of museum objects, adding digital images and describing the digital collection in the Museum Information System MuIS (Kri Marie Vaik, Marianne Lind and Urve Sulg). During the year 2018, the Museum Department digitised over 1,000 pages of correspondence and more than 10 photos. In collaboration with photographer Toomas Tuul, a large part of the art and object collection of Tuglas was digitised. The Museum Department also continued to add digital images to the MuIS, and by the end of the year, it had information about 27,381 museum objects belonging to the collections of the Literature Centre.

The Literature Centre issued several important scholarly publications in 2017. In addition to the aforementioned publications – Tuglas' monograph *Ado Grenzstein's Departure* and Under's collection of discourses in prose *Väiksed vaatlused* (Little Observations) – the first volume of the series of research on Baltic literary culture "Baltische literarische Kultur" initiated and edited by Senior Researcher of the Literature Centre Martin Klöker was published. The series was opened by a collection of articles by an Osnabrück Germanist Klaus Garber entitled "Mare balticum. Studien zur Kultur- und Bibliotheksgeschichte des Ostseeraums". The series is issued under the auspices of the Under and Tuglas Literature Centre and published by LIT Verlag Publishers. As a result of many years of collaboration, the same publishing house also published the lengthy anthology "Politische Dimensionen der deutschbaltischen literarischen Kultur" as a joint publication of the Baltic History Commission and the Literature Centre, compiled and edited by Jaan Undusk in collaboration with Liina Lukas and Michael Schwidtal. The anthology is a

collection of articles by Estonian, Latvian and German authors about the political aspects of Baltic German literary culture during the 17th–20th century, and also includes articles by three specialists of the Literature Centre: Martin Klöker explores the political orientations of occasional literature in the 17th century, Ulrike Plath addresses the enlightenment theology of Karl Gottlob Sonntag, and Jaan Undusk focuses on the semi-failed legal revolution in society at the beginning of the 19th century.

Legal and political history are also at the core of the article by Thomas Hoffmann and Hesi Simets-Gross published in the journal *Forschungen zur baltischen Geschichte* entitled “Freiheit und deren Beschränkung durch Leibeigenschaft in Livland: Römischrechtliche Vorbilder und deren Einfluss im Landrechtsentwurf (1599) David Hilchens (1561–1610)”, which is about the role of *Institutes of Justinian* by the Eastern Roman emperor Justinian I in *Livonian Land Law* compiled by David Hilchen. There is also an article entitled “Verse texts in the Latin inscriptions of Estonian ecclesiastical space: meter and prosody” by K. Viiding et al. previously published in the journal *Studia Metrica et Poetica*, in which the authors analyse Latin verse from the years 1549–1738 found in Estonian Lutheran churches (170 verses in total). Jaan Undusk’s article “Eucharist as the central theological problem of Reformation” published in *Looming* journal is dedicated to the 500th anniversary of the Reformation and looks at Martin Luther’s fight against magical elements in the teaching of the Roman Catholic Church and his debates with the rationalist semiotics of the Swiss religious reformers. For Luther, religion was, first and foremost, a test of a person’s mystical capability.

The year 2018 was not only rich in articles on the early written word – articles about other research fields of the Literature Centre were also published. The Centre’s employees published a total of 14 research articles in Estonian and 11 articles in other languages. The article “To be and to work as an Estonian” by Eneken Laanes, published in *Keel ja Kirjandus*, for instance, deals with the relevance of the idea of nation in the contemporary Estonian public debate about language, culture and belonging. Rein Undusk’s article “Literature, nation, state: Estonia on the eve of its anniversary” published in the collection *Eesti rahvuse kestmisest* (On the endurance of the Estonian Nation) focuses on the manifestation of the function of statehood in Estonian literature. In its collection *Scientific Thought in Estonia IX. Science and Society* (compiled and edited by Jüri Engelbrecht), the Estonian Academy of Sciences published Jaan Undusk’s article “The historian as someone who adapts and stands fast”, which follows the peculiar scientific career of the

Danish-Estonian researcher Vello Helk who operated in two national cultures and on their border at the same time.

A total of 27 research reviews, abstracts and translations of academic pieces of writing were published. These include, for instance, Elle-Mari Talivee’s review of Vahur Afanasjev’s novel *Serafima and Bogdan* entitled “Serafima and Hariton” which received the Ants Oras Award for literary criticism. Jaan Undusk’s review of Henning von Wistinghausen’s “Freimaurer und Aufklärung im Russischen Reich. Die Revaler Logen 1773–1820” entitled “Freemasonry and cultural history” published in the *Tuna* journal is also worth a mention. *Tuna* also published Jaan Undusk’s German into Estonian translation of Hans Graubner’s article “Between adapting and resistance. Königsberg’s enlighteners in Livonia: Hamann, Lindner, Herder”. The culture newspaper *Sirp* published Undusk’s translation of Ulrich Kronauer’s article “Carl Gustav Jochmann – personality and world view” along with a foreword.

In 2018, the Literature Centre organised a number of scientific events of international significance. On 13–16 March, the COST Action IS1310 Reassembling the Republic of Letters: Digital framework for studying European intellectual history was held in Tallinn (main organiser Kristi Viiding). Researchers from across Europe were taught how to collect, harmonise and prepare epistolary metadata of the early modern period to be digitally published in the pan-European databases Early Modern Letters Online (EMLO) and Women’s Early Modern Letters Online (WEMLO), and how to use the existing EMLO and WEMLO databases. The training was delivered by Miranda Lewis and Charlotte Marique from Oxford.

On 16–20 May, the Literature Centre partnered with the University of Tartu in the joint organisation of the 9th Conference in Legal History in the Baltic Sea Area: Law and Economics in Urban and Rural Environment that took place in Tallinn, Sagadi and Tartu. The aim of the international conference was to analyse how legal phenomena affect the respective economic environment and vice versa. The conference also served to commemorate the 770th anniversary of granting the Lübeck town ordinances to Tallinn (then Reval), and provided an opportunity to take a closer look at the world’s largest collection of the Lübeck Law manuscripts in the Tallinn City Archives.

On 26–27 May, the Baltic History Commission convened in Göttingen for the 71st time, with Senior Researcher of the Literature Centre Martin Klöker being one of the main organisers. In addition to Martin Klöker, Jaan Undusk, Kristi Viiding and member of the Scientific Council of the Literature Centre Cornelius Hasselblatt were among the 14 researchers that presented at the event.

On 13–14 September, the Literature Centre, in partnership with Tallinn University Centre for Landscape and Culture, Tallinn University Centre for Environmental History, and the Association for Literary Urban Studies, organised an urban literature workshop *Narva, an Industrial Border City. Literary Reflections. Symposium in literary urban studies* (in English), followed by an audience day to reflect upon the seminar outcomes (in Estonian) (main organisers Elle-Mari Talivee, Anu Printsmann, Kadri Tüür, Jason Finch). The workshop and the audience day were held in Narva and featured over twenty presentations by researchers from Estonia and abroad (Russia, Finland and the United Kingdom), and participants had the opportunity to visit the former Krenholm Manufacturing Company.

On 8–9 October, the first Baltic Conference on the Environmental Humanities and Social Sciences (BALTEHUMS) took place in Riga (Estonian organisers Ulrike Plath, Kadri Tüür and Linda Kaljundi), with the Literature Centre being a partner of Tallinn University Centre for Environmental History in its joint organisation. The conference was the first opportunity for Baltic enthusiasts of environmental history and related disciplines to come together, find important common ground and possibilities for joint projects.

On 14 November, Tallinn University School of Humanities and the Estonian Writers' Union celebrated the birthday of the writer, literary scholar and Member of the Academy Jaan Undusk with an international conference entitled *Personality and World View* (main organiser M. Jänes). After the event, which was held in the room with a black ceiling at the Writers' House in Tallinn, the Literature Centre published a collection of theses on the basis of the presentations (edited by M. Jänes).

In addition to international conferences and symposiums, the Literature Centre also organised a number of scientific events in Estonia. On 24 March, the conference *Our Home Region in Folklore and Literature* was held in partnership with the Kehra Jaam NGO. A discussion was held at the Museum Department of the Literature Centre on 14 June about the interest and ability of art to address historical violence. The seminar “Child in Literature 5: Why we Need Classics” was held jointly with the Estonian Children's Literature Centre on 23 October.

Regular scientific seminars of the Literature Centre's researchers also continued in 2018. 12 February saw T. Hoffmann and K. Viiding's scientific seminar entitled “Written legacy of the Livonian humanist David Hilchen: legal historical, linguistic, and literary historical aspects”. On 14 May, L. Kaljund and U. Plath held a scientific seminar on “Baltic serfdom discourse from the perspective of the history intertwined during the long 19th century”,

and R. Undusk's scientific seminar on 30 November was on “Cultural entwinement and the Jesuits: don Iñigo, don Quijote and others”.

In 2018, the employees of the Literature Centre gave 55 scientific presentations, of which 39 were given at international conferences. Among others, the following conferences featured our speakers: The 9th Conference in Legal History in the Baltic Sea Area. Law and Economics in Urban and Rural Environment in Tartu and Tallinn (T. Hoffmann), The 71st Göttinger Historikertreffen der Baltische Historische Kommission in Göttingen (M. Klöker, J. Undusk, K. Viiding), *Gutshöfe und große Politik. Lebenswelt und Verflechtungen des baltischen Adels in Oeversee* (M. Klöker), the conference of the scientific network *Narrative and Memory: Ethics, Aesthetics, Politics in Fårö* (E. Laanes), The 2018 AABS Conference at Stanford University: The 100th Anniversary of Baltic Independence in Stanford (E. Laanes), *Narva, an Industrial Border City. Literary Reflections. Symposium in literary urban studies in Narva* (M. Lind, Aare Pilv, E.-M. Talivee, J. Undusk, K. M. Vaik), The First Baltic Conference on the Environmental Humanities and Social Sciences (BALTEHUMS) in Riga (M. Lind, E.-M. Talivee, U. Plath), Seminar on the occasion of the exhibition *Konrad Mägi (1978–1925)* in Rome (A. Pilv, J. Undusk), *Image of the Self in Lviv* (A. Pilv), The Twelfth European Social Science History Conference in Belfast (U. Plath), *The City: Myth and Materiality in London* (E.-M. Talivee), “August von Kotzebue als historische Persönlichkeit. Kotzebue-Gespräche VII“ Berliinis (J. Undusk), The 17th Congress of the International Association of Neo-Latin Studies in Albacete (K. Viiding), and Networks, Poetics and Multilingual Society in Early Modern Baltic Sea Region. Finnish Literature Society in Helsinki (K. Viiding).

The following events in Estonia are notable in terms of the participation of Literature Centre employees in conferences: the Estonian Literary Museum's 8th Literary Science Summer School “Patriotism and national thought” (Mirjam Hinrikus); University of Tartu School of Theology and Religious Studies Collegium of Science and Religion's 15th spring school (A. Pilv); Tallinn Literary Centre's conference *Who is Miss Kurella? 140 years since Tammsaare was born!* (E.-M. Talivee); the Estonian Writers' Union forum The Babel Library entitled “*Hüüdjaja hääl*” (The Voice Crying) (E.-M. Talivee); and the joint conference of the Estonian Academy of Sciences and the Estonian National Museum entitled *Story of Estonian Thought* (J. Undusk). In addition, the Literature Centre took part in organising various events aimed at the general public. For example, it acted as a partner of the HeadRead Literary Festival's joint reading activity “Literary Tallinn”, as well as in the Literary Street Festival (E.-M. Talivee).

Along with the Estonian Writers' Union, Marie Under's birth place in Koidu street was marked, and a memorial bench installed with the support of donations and community members.

The Museum Department of the Literature Centre also continued with public lectures and literary events (with E.-M. Talivee, K. M. Vaik and M. Lind as the main organisers on behalf of the Literature Centre). On 27 March, the anniversary of Marie Under's birth was celebrated with a poetry reading. On 19 May, writer Reeli Reinaus gave a presentation, the Researchers' Night Festival took place on 27 September, and on 4 October, the Literature Centre celebrated its 25th anniversary as an independent research organisation with a symposium. Throughout the year, the Museum Department held three exhibitions: Henrik Visnapuu's book exhibition, Heino Kivihall's calligraphy exhibition inspired by F. Tuglas' impressionist novel *Felix Ormusson*, as well as a nude art exhibition "Hot!" comprising paintings and graphic sheets belonging to the cultural collections of F. Tuglas and P. Reets. For the 47th time, laureates of the Friedebert Tuglas Short Story Award were announced. The panel, with Kri Marie Vaik as the Literature Centre's representative, selected Armin Kõomäe's short story *Goglomov* and Lilli Luuk's short story *Auk* (The Hole) as the laureates. Since it was the anniversary year of the Republic of Estonia, this year's laureates were announced at the Hall of the Estonian Academy of Sciences.

Exhibitions, literary events, lectures, excursions and other activities brought an exceptional number of visitors to the Museum Department of Literature Centre in 2018: the former home of Marie Under, Artur Adson, Friedebert Tuglas and his spouse Elo Tuglas attracted over 700 of those interested in literature over the year. The museum's activities also ensured the involvement of the local community; for example, it took part in the Long Night of Museums 2018 "Party in the Night", giving the residents of Nõmme an opportunity to see the writers' home. The rate of participation in the "Let's do it!" communal action was also remarkable and ensured that spring works in the museum's garden were completed in one go.

The Literature Centre's collaboration with other research and development institutions was extensive. Over thirty researchers visited the Museum Department of the Literature Centre in 2018 for their research purposes, having referred to nearly 2,400 units from the Literature Centre collections. In relation to the large-scale digitisation and the creation of a website that brought together the different databases, there was a surge in the remote use of the collections. Users took interest in nearly 5,500 museum objects in 2018, and files related to them were accessed over 220,000 times in total. The Literature Centre continued its close collaboration with foreign

researchers as well, for example in May and June, President of the Association for Literary Urban Studies and Associate Professor of the Åbo Akademi University Jason Finch worked at the Museum Department as a visiting scholar. The Literature Centre's employees participated in supervising, reviewing and evaluating bachelor's, master's and doctoral theses in universities in Estonia and abroad. As lecturers, our employees gave lecture courses and seminars in Tallinn University, the Estonian Academy of Music and Theatre, Tallinn University of Technology and the Free Academy (T. Hoffmann, Piret Kruuspere, E. Laanes, U. Plath, J. Undusk, K. Viiding). The Literature Centre also takes part in the work of the Research Board of the Academic Library of Tallinn University, the National Library of Estonia and the Estonian Literary Museum, as well as in the Doctoral Committee of the Estonian Academy of Music and Theatre (J. Undusk). Undusk was also Chairman of the Panel of the Jaan Kross Literary Prize, Chairman of the Panel of the Cultural Endowment for Translated Literary Thought (issued for the first time in 2018), and Member of the Committee of the University of Tartu award for contribution to national identity. Eneken Laanes is Deputy Chairman of the Cultural Endowment for Literature, Member of the Cultural Endowment Council, and an awardee of the *Keel ja Kirjandus* Article Award. Ulrike Plath is a Chairman of the Council and Member of the Board of Tallinn University School of Humanities, Member of the School Study Collegium and collaborator of the Editorial Board of Tallinn University Press. Elle-Mari Talivee was Member of the Panel of the Cultural Endowment for Literature Awards and Member of the Panel for the Estonian-Latvian Language Prize. In addition to the aforementioned Ants Oras Award for literary criticism, she also received the Gustav Suits' scholarship for young literary scholar. Aare Pilv was awarded the Estonian Cultural Endowment's Award for Poetry and Gustav Suits Poetry Award, and was named the "Bearer of Culture of Tartu". K. Viiding was Member of the Panel of Latin of the Translators' Section of the Estonian Writers' Union 2018 translation contest, Member of the Panel of the Jozef IJsewijn Prize awarded by the International Association of Neo-Latin Studies (IANLS) and was also elected Secretary-General of the IANLS.

The Literature Centre also took part in a number of fiction and theatre panels. Its employees are members of a variety of academic publication panels and provide peer-reviews of contributions to a number of journals.

ASSOCIATED INSTITUTIONS

Estonian Academy of Sciences Act passed by the *Riigikogu* (Parliament) in 1997 stipulates that research, development and cultural institutions and scientific societies whose activities and objectives conform to those of the Academy may associate themselves with the Academy. The association is effected under bilateral agreements that specify the aims, tasks and commitments for the parties.

Surveys of the activities of such institutions have been published in the Academy Yearbook since 1998.

Reviews on the 2018 activities of the institutions associated with the Academy have been presented in the chronological order of their association date:

Tartu Observatory	p. 65
Academic Library of Tallinn University	p. 66
Institute of the Estonian Language	p. 67
Estonian Literary Museum	p. 68
Estonian National Museum	p. 69
Estonian Crop Research Institute	p. 70
Art Museum of Estonia	p. 71

TARTU OBSERVATORY

Associated with the Estonian Academy of Sciences since
8 May 1998

Founded in 1808

Personnel: 86, including 47 academic staff

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The Tartu Observatory Space Research Centre, having operated under different names and in combination with a variety of academic disciplines for over 70 years, joined the Faculty of Science and Technology of the University of Tartu on 1 January 2018. It remains an independent institute without any major changes in its organisational structure or staff. Research continues in the following complementary fields: galaxy physics, cosmology, astrophysics, remote sensing, and space technology. To comply with the university structure, two new professors took on positions at the Observatory – Professor of Astronomy Elmo Tempel and Professor of Space and Defence Technology Mart Noorma.

The national science funding continued to support three institutional research topics and one centre of excellence:

- Galaxy evolution in the hierarchical Universe (principal researcher Gert Hütsi)
- The role of dark matter filaments in large-scale structure and assembly of galaxies (principal researcher Elmo Tempel)
- Variability and evolution of massive stars in the Gaia era (principal researcher Indrek Kolka)

The Centre of Excellence “Dark Side of the Universe” operated in coordination with the National Institute of Chemical Physics and Biophysics.

Further, four personal research grants and two post-doctoral grants were funded for internships at the Massachusetts Institute of Technology in the United States and at the CEFREM (Centre of Education and Research on Mediterranean Environments) in France.

Among international projects, it is worth pointing out the extensive Horizon 2020 (H2020) technology development project HYPERNETS. Tartu Observatory space technology and optics laboratories teams are developing a new spectroradiometer which is being tested in the most extreme conditions on Earth: in Antarctica, the Namib desert, the Argentinian rainforest, and, of course, on the test sites of our environmental observatory at Järvselja. As partner of the Estonian company

Milrem, Tartu Observatory participates in the NUTIKAS programme’s project “Applied research for developing remote sensing control and security system sensors and software algorithms”. These new research directions rely on the outstanding quality of the laboratories that have been developed over a long time and that have achieved accreditation by the Testing Centre of the University of Tartu.

The international collaboration network of astronomers working at Tartu Observatory is expanding considerably thanks to the H2020 project POEMS, which will entail a number of team internships and study visits over the next four years. The international cooperation projects (FP7: MULTPLY and AHEAD; H2020: EOMORES; ESA: MVT and FRM4SOC; IIS EOI; FPCUP) and the three INTERREG projects in the field of space technology and remote sensing (Test4SME, SpaceTEM and BalticSatApps) will continue. At the end of the year, an agreement was signed with the Estonian Research Council to conduct remote sensing applied research as part of the RITA programme.

After a three-year pause, Estonia was again a proud participant in a space mission, with the ESEO satellite (carried by the SpaceX Falcon 9 launcher and equipped with camera systems developed by students of the University of Tartu) reaching orbit on 3 December 2018.

Last year also stands out for the visit of NASA astronaut Heidemarie Stefanyshyn-Piper and her very inspiring and emotional meeting with a number of employees and students in Tõravere.

The official opening ceremony of the space theme park “Seeing the invisible, feeling the unknown”, built in the courtyard of Tartu Observatory last autumn, was held along with a family day, with over 500 participants. Throughout the year, the observatory welcomed over 5,000 schoolchildren visiting as part of active learning programmes and excursions.

The traditional international Summer Academy, as well as another Science Task Force, supported by the Tartu Hansa Rotary club took place. University students had the opportunity to participate in the international summer school “Microsatellites in planetary and atmospheric research”, jointly organised by Tartu Observatory, the Institute of Ecology and Earth Sciences, the Nordic Network of Astrobiology and the European Astrobiology Network Association. Over twenty different seminars, information days and conferences were held in total.

The 125th anniversary of the birth of Ernst Julius Öpik, a founding member of the Estonian Academy of Sciences and a founder of the Estonian school of astronomy, was celebrated with a symposium at the hall of the University of Tartu.

Liisi Jakobson defended his doctoral thesis entitled “Mutual effects of wind speed, air temperature and sea

ice concentration in the Arctic and their teleconnections with climate variability in the eastern Baltic Sea region”.

90 different types of articles were published, 43 of which appeared in international peer-reviewed journals.

A comprehensive overview of the activities of Tartu Observatory has been published in the Tartu Observatory Yearbook 2018 and also in the traditional publication Observatory Calendar 2019.

ACADEMIC LIBRARY OF TALLINN UNIVERSITY

Associated with the Estonian Academy of Sciences since
17 June 1998

Founded in 1946

Personnel: 86, including two researchers

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Director: Andres Kollist, Tel.: +372 665 9401,

Fax: +372 665 9400, andres.kollist@tlulib.ee

Number of registered users: 41,948

Number of copies in the circulating collection:
2,647,853

The year 2018 saw a number of events organised on early printed books, as well as the 10th Bibliography Day, openings of major exhibitions, various library activities and book fairs. Fruitful collaboration continued with partners from Estonia and abroad. At the end of the year, the Council unanimously voted for Andres Kollist to continue as the director of the institution.

Under the aegis of the Centre for Early Printed Books, the series of presentation days was continued. In the context of the lecture series “Introducing the Baltica Collections”, the Head Specialist of Research and Communication Harry Liivrand introduced the photo collection and library calendar “800-year-old Tallinn in photos taken a century ago”.

Baltica scholars gave presentations about their research findings within the series of lectures “Researcher in the Baltica Reading Room”. In April, PhD Dorothee Goetze (Germany) gave a lecture entitled „An overlooked island? Historiography on early modern Saaremaa“ in English. In May, PhD Denise von Weymarn-Goldschmidt (Switzerland) gave a presentation “De mortuis nil nisi bene oder was uns die Todesanzeigen der ‘Revalschen Wöchentlichen Nachrichten’ über die deutschbaltische Gesellschaft der Jahrhundertwende (18./19. Jh.)” in German. The Baltica scholarship to international researchers is designed to attract scholars from outside Estonia

to the cultural-historical Baltica collections. At the end of the year, the Council of the Centre of Excellence in Educational Innovation (CEEI) Research Fund decided to continue awarding the Baltica scholarship until the year 2021.

On 16 February, the 10th Endel Annus Bibliography Day “Republic of Estonia 100: Nation and Bibliography” was held, dedicated this year to the centenary of the Republic of Estonia. The Library was represented by long-term employees of the Estonian Expatriate Literature Centre Aita Kraut and Juta Laasma, as well as the editor-in-chief of the *Estonian Retrospective National Bibliography* Tiit Reimo, all of whom gave presentations. The Bibliography Award was presented jointly with the Estonian Librarians Association at the end of the event.

From 12 June to 16 September, the library gallery displayed the exhibition “Members of the Academy from monographs to tweets. Estonian Academy of Sciences 80”, held jointly with the Academy of Sciences, curated by Harry Liivrand and designed by Rene Haljasmäe. The Embassy of Spain, The Embassy of Romania, the National Archives of Latvia and Turku City Library contributed towards organising the exhibition.

On 12 October, the research conference Kotzebue Dialogs VII (*Kotzebue-Gespräch VII*) was jointly organised with the Berlin-Brandenburg Academy of Sciences and Humanities. The Academic Library was represented with presentations by Harry Liivrand, Aira Võsa and Kairit Kaur.

The Library held numerous tours for various target groups: university students, international students, high school students, lecturers, experts. The Library hosted visitors from various foreign countries. Cooperation continued with Tallinn German Gymnasium, Haabersti Russian Gymnasium, Tallinn English College, Gustav Adolf Grammar School, Rocca Al Mare School, International School of Estonia, Tallinn University of Technology, and Haapsalu Vocational Education Centre.

At the international conference BOBCATSS held in Riga from 24–26 January, the Best Poster Award was bestowed on Jaana Tõnisson, Public Relations Officer the Academic Library, for her poster presentation “What students actually do in the library?”, which was based on a survey carried out among readers. The workshop she held jointly with Aira Lepik (Tallinn University) and Maris Nool (Tallinn University of Technology) won the Best Workshop Award.

In May and December the Night Library events were organised in cooperation with university students. The Study Centre was open until 11 pm. The centre was visited by over 200 readers per week during both periods. The event was sponsored by the companies Löffbergs,

Bambona, and Sense. In September, Researchers Night took place at the Academic Library of Tallinn University with a presentation of the exhibition room, repositories and digitalisation centre of the Centre for Early Printed Book. Subject librarian Tambet Teder gave a lecture on plagiarism.

In 2018, the Compatriots Programme of the Ministry of Education and Research allocated €3,010 to the Estonian Expatriate Literature Centre for the project “Preservation and making available of cultural heritage of Estonians in exile”. The extra funds made it possible to bibliograph exile articles to the Database of Estonian Articles (ISE). The Centre of Retrospective Estonian National Bibliography received a €17,000 grant from the national programme “Estonian language and cultural memory” for their project “Composition and editing of the Estonian retrospective national bibliography: Estonian Foreign Books 1508–1830”. The Baltica and Rare Books Conservation Department was given €6,000 in support of their project “Registering, describing and creating a joint database of Estonian parchment fragments from the Middle Ages”.

Open research data and open publishing were continuously worked on. The Academic Library developed two manuals aimed at researchers and doctoral students: “Managing research data” and “Open Access: publishing articles”.

From September 2018, a mobile version of the online catalogue ESTER (developed by the ELNET Consortium) became available for library users. The mobile version of the catalogue automatically adapts to the size of computer, tablet or phone screen. The Academic Library provided continuous input and feedback to the developers throughout the entire process.

The development of the digitisation centre continued and work processes were improved. The functions and design of the digital library ETERA were also enhanced. All digitised materials are made available through ETERA, and at the end of year, 50,277 items were accessible. ETERA was used 67,099 times in 2018, with 37% of the visits being new 63% repeat visits.

Academic Library is a member of international organisations Bibliotheca Baltica (Association of Libraries of Baltic Countries), CERL (Consortium of European Research Libraries), EAHIL (European Association for Health Information and Libraries), ICOM (International Council of Museums), IFLA (International Federation of Library Associations), LIBER (Association of European Research Libraries), HIBOLIRE (Nordic-Baltic-Russian Network on the History of Books) and Nonprofit Organisation Consortium of Estonian Libraries ELNET

INSTITUTE OF THE ESTONIAN LANGUAGE

Associated with the Estonian Academy of Sciences since 11 May 1999

Founded in 1947

Personnel: 72, including 13 researchers, 40 lexicographers, terminologists, language planners, computer linguists, and software developers

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Director: Tõnu Tender, Tel.: +372 617 7500,
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Academic Secretary: Jelena Kallas, Tel.: +372 617 7513, jelena.kallas@eki.ee

The institute has seven departments.

The Department of the History and Dialects of the Estonian Language and the Finno-Ugric Languages (Head Tiina Laansalu) carried out the projects “Power relations and identity in the 16th to 18th century written Estonian language” and “Completion of the concordance of Estonian Bible translations”. Compiling and editing of the Dictionary of Estonian Dialects, the Scientific Etymological Dictionary and dictionaries of small regional dialects were continued. The compilation and editing of the Estonian-Erzya web dictionary was completed. The Archive of the Estonian Dialects and Finno-Ugric Languages was supplemented and organised.

The Department of Language Resources and Technology (Head Tõnis Nurk) developed and maintained dictionary writing systems and terminology management software (EELex, Termeki, Multiterm). The projects EKI-ASTRA, “Centre of Estonian Language Resources (CELR) Federated Content Search” (in partnership with the CELR Consortium), “Estonian language online collections for the 4th to 9th year of school”, and “Estonian-Russian dictionary environment” were carried out. The new dictionary and term base system Ekilex was developed, along with the dictionary portal Sõnaveeb, which is based on it.

The main work of the Department of Speech Research and Technology (Head Meelis Mihkla) included speech research and development of Estonian speech synthesis and its applications. The Estonian speech synthesis interface Sapi5 was developed for the Windows platform, along with a speech synthesis learning environment and a synthesised voice for the Kihnu dialect. The projects “Speech styles, sentence prosody and phonological variation: description, theory

and modelling”, “The Centre of Excellence in Estonian Studies – CEES”, “Expressive and diverse Estonian speech synthesis and “Labelling of the voice box, Stage 2” were carried out.

The Department of Language Planning (Head Peeter Päll) published *The Dictionary of Standard Estonian ÕS 2018, Commented edition of The Dictionary of Orthography ÕS 1918* (online dictionary), and online version of *The Dictionary of Estonian Place Names. The Handbook of Standard Estonian* was completed in its main part (to be published in 2019). The Department continued compiling the book of Estonian surnames. The database of new words and meanings and the database of personal names were supplemented, as well as the online versions of the *Dictionary of Foreign Words, The Advisory Dictionary of Document Language* and *The Dictionary of Estonian Place Names*. Efforts were made in the fields of EU language planning and clear language use.

The Dictionary Department (Head Margit Langemets) issued the *Dictionary of the Estonian Language 2018* and the *Estonian Collocations Dictionary 2018*. The Department continued compiling the *Dictionary of Word Associations in Estonian*, the *Finnish-Estonian Dictionary* and the *Estonian-Mandarin Basic Dictionary*. Within the framework of the EKI-ASTRA project, the Department participated in the development of the new dictionary and term base system Ekilex and the dictionary portal Sõnaveeb, which is based on it.

The main work of the Terminology Department (Head Tiina Soon) was targeted at multilingual term bases Esterm and Militerm, Connecting Europe Facility’s project “eTranslation TermBank”, the dictionary of education and upbringing and the dictionary of hobby education. Within the framework of the EKI-ASTRA project, the Department participated in the development of the new dictionary and term base system Ekilex. A user survey was conducted with the aim of acquiring data about user experience and developing a public web interface for Ekilex. The Department also participated in the work of terminology committees and consulted on terminology.

The Personnel and Administration Department (Head Kai Oro) continued the Ministry of Social Affairs and the EU project “Family-Friendly employer”. New remuneration principles were developed, and job descriptions were updated. Internal training sessions and a summer seminar were organised for the employees.

ESTONIAN LITERARY MUSEUM

Associated with the Estonian Academy of Sciences since 11 May 1999

Founded in 1909 as the Archival Library of the Estonian National Museum

Personnel: 113, including 40 researchers, 13 librarians and bibliographers

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The Centre of Excellence in Estonian Studies primarily focused on the following two important ideas. 1) “Let us be European but also become Estonian”, including a) comprehensive analyses that are about to be completed and that place the story of Estonia’s national formation in a wider cultural-dynamic context of Europe; b) the validation of earlier research results (from the 19th and early 20th century) – critical division between nationally sensitive and nationally neutral or less sensitive topics; c) recent case studies. 2) “On the move” – transcultural and intercultural aspects of migration and questions that have arisen due to the European migrant crisis.

All twelve research teams have achieved remarkable results. 68 publications were included in journals featured on Web of Science and ERIH PLUS, and 102 elsewhere. Two major interdisciplinary Annual Conferences of the Centre of Excellence were held, along with 21 conferences, 25 seminars and 15 presentations at research forums. Around 250 presentations were given at international research events abroad. The year also saw the publication of 12 international peer-reviewed journals, 26 collections and monographs.

Over 80 popular science articles were published, and the Centre of Excellence participated in a number of events aimed at the general public, appeared in the media and presented at training sessions (over 200 times in total).

Estonian Folklore Archives researched Estonian and Finno-Ugric folklore, folklore communication and the role of folklore collections in scientific and cultural history. Researchers found that culture is transmitted both naturally and within institutional frameworks as a deliberate process. In the latter case, (inappropriate) avoidance, suppression or disdain play an equally important role as valuing. The process is affected by the ruling ideologies, moral values, socio-political

circumstances, fashion, and expressions of belonging or individuality. The result of the process is the manifestation of a constantly renewed socio-cultural reality, whether it is based on the past or rejects it.

Since the aforementioned factors are relative rather than absolute, cultural phenomena may have to face controversial attitudes, and national, communal and institutional values are formed during the very process. As such, runic songs can be regarded either as worthless tavern songs or as treasures of the national culture. Violence in folk culture might originate from the valuable awareness of repressed feelings and be a way of expressing them, yet it is unsuitable to be presented as part of cultural heritage. Soviet folklore and scientific writing are simultaneously expressions of collaborationism and national resistance. A railway is a familiar part of landscape, whilst representing an imposition on memory landscape and nature. The plurality and variability of representations and interpretations characteristic of culture (including folklore) allows society to react to current events using examples from the past and to adapt to the changing reality.

The Department of Folkloristics carried out a national-level campaign for collecting Estonian school lore among approximately four thousand Estonian- and Russian-speaking schoolchildren. Participants had to fill out a questionnaire divided into eight thematic blocks. These covered verbal types of lore, social practices, and values. The initial analyses suggested a diversification of hobby culture and an increased effect of social media, but also revealed an interesting range of self-balancing techniques.

Web surveys did not reveal significant differences between online and offline behaviours and values. Communication styles were also defined looking at different aspects of everyday speech. A comparative analysis of Estonian and Slovenian swearing expressions allowed narrowing down three main categories where the counterpart is verbally sent.

The creation of the material aspects of religion (including sacred sites and vernacular sculptures/architecture) is affected, in addition to the precepts of the cultural domain, also by the conventional framework in synergy with personality and the individual's knowledge.

The Estonian Cultural History Archives continued to analyse communication networks in fiction and biographical literature throughout the Estonian story of thought and cultural history. Analyses of the global literary communication and acculturation of Estonia's Western diaspora allowed a new paradigm for researching today's migrant crisis and translational movements to be developed. Another new paradigm was

created for researching national culture in late-Soviet Estonia (in the 1970s and 1980s), making it possible to explain the formation of a material intimacy sphere in the tension field of Soviet colonialist rhetoric and national values. Researchers brought to light the strong effect that the Soviet equality policy and the ideology of neoliberalism had on the reception of gender today. They also analysed the role of location-based subjectivity in transmitting the exile experience in fiction and autobiography. In order to apply the methods of Digital Humanities to studying archive sources, researchers created a labelled text corpus of the correspondence between Semper and Barbarus in the KORP database.

ESTONIAN NATIONAL MUSEUM

Associated with the Estonian Academy of Sciences since 21 December 2006

Founded in 1909

Personnel: 142, including 13 researchers

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Director: Alar Karis, Tel.: +372 736 3003

Director for Research: Pille Runnel, Tel.: +372 736 3013, pille.runnel@erm.ee

The year 2018 was rich in awards and international activity for the Estonian National Museum. In May, it was named Europe's most innovative museum of 2018 in the context of the European Museum of the Year Award for its museological approach and was decorated with the Kenneth Hudson Award. In October, the Estonian National Museum was selected as one of five finalists in receiving the Luigi Micheletti Award of the European Museum Academy, awarded for an innovative approach in culture and science museums. The National Museum was visited nearly 200,000 times in 2018, bringing the total number of visitors to over half a million since the museum was opened. Visitors were mainly interested in seeing permanent and temporary exhibitions, attending cultural and educational events (nearly 700 organised), educational programmes (over 600), and guided tours (over 1,500).

The research work of the museum focused on studies of Estonian and Finno-Ugric ethnology and museology. The National Museum manages two research projects and participates in four international cooperation projects (themes include food culture, modern everyday life and the studies on Finno-Ugric peoples). During the year, three scientific conferences were held, including the annual

conference of the International Council of Museums organised jointly with the Council's International Committee for Museums and Collections of Ethnography (ICME), bringing 150 experts of the field to the National Museum in October.

The food culture research and development project funded by the EU Structural Funds' ASTRA programme was by far the most prominent in the context of Estonian ethnology. Meetings of the international food studies network were held in Estonia, researchers participated in key conferences, and articles were published in research journals. Researchers collaborated with Estonian food producers, small businesses, the Ministry of Rural Affairs and universities in gathering data, developing entrepreneurship and introducing heritage-based food culture. Members of the food project research team were honoured with the Cultural Endowment of Estonia Award of the folk culture target capital for research and popularisation of food culture.

The exhibition "DIY Estonia" was opened at the Estonian National Museum in 2018 as part of an ongoing joint research and cooperation project between more than 30 organisations, including several Estonian museums, in the course of which materials about the daily culture of the 1990s were gathered. The outcomes of the project are going to be presented in the coming years.

Researchers of the Estonian National Museum presented at 20 conferences abroad and 9 in Estonia. 12 scientific articles and 35 popular science articles were published (themes included memory studies, studies of the Soviet period, migration studies, museum studies, history of science and folk culture). Estonian National Museum researchers gave 14 popular science presentations and introduced the exhibitions and development activities of the museum to professional visitors on more than 100 occasions. In addition, the museum collections were supplemented, employees participated as experts in programme councils and committees, research was supervised, more than 70 lectures were held at universities and in-service training on museology was offered.

ESTONIAN CROP RESEARCH INSTITUTE

Associated with the Estonian Academy of Sciences since 23 September 2008

Founded in 1920

Personnel 142, including 45 researchers

Address: J. Aamisepa 1, Jõgeva, 48309 Jõgevamaa, ESTONIA

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Director: Mati Koppel, Tel.: +372 77 66 903,

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The Estonian Crop Research Institute is a state research and development institution in the area of governance of the Estonian Ministry of Rural Affairs. As per the statute, the Institute carries out applied and basic research, breeds new crop varieties and operates as a seed centre. It also ensures maintenance breeding of registered varieties and preserves plant genetic resources. The Institute provides research support to the advisory system, for policymaking and state supervision.

Breeding activities in 2018 yielded the registration of two new varieties: sheep's fescue Kihnu, suitable as one component for lawns established to drier soils with light texture and modest fertility, and barley Tuuli with a good yield potential and suitable for production in organic and conventional farming.

In February, the first deposit to the Svalbard Global Seed Vault from the institute's gene bank collection was made, for long-term storage. The 133 packages contained the seeds of 26 plant varieties, including Estonian-bred varieties, ancient varieties and seeds collected from nature.

On 11 May, former researcher of the Estonian Crop Research Institute Jaanika Edesi defended her doctoral thesis at the University of Oulu on "The effect of light spectral quality on cryopreservation success of potato (*Solanum tuberosum* L.) shoot tips in vitro". Jaanika started her research at the Estonian Crop Research Institute and one of her supervisors was Plant Biotechnology Department Researcher Katrin Kotkas.

The Institute participated in three international research projects in 2018. The EU FP7 project on Healthy Minor Cereals has its focus on the less widespread cereal species in Europe – winter rye, oat, spelt, emmer and einkorn wheat. The issues under research are the suitability of the varieties in different environments, sustainable cultivation technologies for production at different levels of intensity, and the development of novel grain products. The three-day concluding seminar of the project was held in Tartu.

The INTERREG project for the Baltic Sea region, entitled Baltic Slurry Acidification, aims to introduce more efficient use of acidification methods in order to reduce the loss of nitrogen in slurry produced from animal husbandry. In the context of the project, an international seminar was held in Väätsa, introducing different acidification technologies and their advantages to Estonian agricultural producers.

The INTERREG project for the Baltic Sea region, entitled Manure Standards, aims to compile guidelines and create software solutions based on the mutually accepted standards in the Baltic Sea region to help better assess the amount and characteristics of manure produced. Such tools are important both for the producer and state levels to ensure a more accurate amount of nutrients and to plan legislative instruments regulating manure handling.

An important moment in developing international relations was the opening of a potato plant breeding laboratory in Shenyang, China, jointly with the Liaoning Academy of Agricultural Sciences. This is an important step in strengthening the cooperation between breeders from the two countries.

As a significant step in the development of the Estonian Crop Research Institute, the construction of a cereal crop breeding centre began in Jõgeva. The new centre is going to be opened in autumn 2019, complete with state-of-the-art laboratories for processing breeding material and carrying out cereal crop quality studies.

ART MUSEUM OF ESTONIA

Associated with the Estonian Academy of Sciences since
9 June 2015

Founded in 1919

Personnel: 146

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Member of the Board: Sirje Helme,

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The Art Museum of Estonia Foundation (AME) collects, preserves, studies and introduces Estonian and foreign art to the public.

The largest undertaking of the Art Museum of Estonia was the project that brought to life the heritage of the Estonian-born renaissance painter Michel Sittow. A high degree of international collaboration resulted in the large-scale exhibition “Michel Sittow. Estonian Painter at the Courts of Renaissance Europe”, as well as several

publications introducing the life and work of Sittow, and the symposium Stories of Michel Sittow’s Life and Art. Facts and Fables. The latter brought together studies and presentations by the most renowned international specialists on Sittow’s creation and European art of his time, laying a foundation for future studies on Sittow’s legacy.

The centenary of the Republic of Estonia was also celebrated through other large international projects of the Art Museum of Estonia, generating knowledge and putting Estonian art in context: there were exhibitions “Border Poetics. Estonian Art 1918–2018 and Wild Souls. Symbolism in the Art of the Baltic States”, and publications to accompany them, as well as preparations for the international conference Symbolist Art and the Baltic Sea Region set to take place in early 2019.

The Art Museum’s second big event was the Kumu Art Museum’s autumn conference Lost and Found Spaces: Displacements in Eastern European Art and Society in the 1990s, paired with the exhibition “The X-Files [Registry of the nineties]”, but providing a much wider coverage of research objects and topics, theoretical and discursive approaches. There was also a seminar entitled Leonhard Lapin. Art. Architecture. Text, dedicated to the phenomenon of one multifaceted creator.

The Kumu Art Museum’s autumn conference forms part of the research project “The Mythical / Material Nineties” (2017–2019). Other research projects under way at the Art Museum of Estonia include the exhibitions “Christian Ackermann – Tallinn’s Pheidias, Arrogant and Talented” (2016–2020) on Estonia’s Baroque era and “The Modern Woman – New Identities” (2017–2020) juxtaposing the activities of Estonian and Finnish female artists, as well as the creation of the database “Forgotten Heritage – European Avant-Garde Art Online” (2016–2018) that highlights the overlooked modernist art of the Estonian post-World War II era and attempts to increase its international (research) visibility.

Several publications continued to research and introduce old and new Estonian art: *In the Beginning There Were ... Köler and Weizenberg, Konrad Mägi, Leonhard Lapin: Void and Space, Andres Tolts: Landscape with Nature Morte, Kaarel Kurismaa: Yellow Light Orchestra, Gunnar Neeme: Under the Southern Cross – an Estonian Artist in Australia*. The expression of different discourses of Estonia’s history in art and visual culture has been mapped and analysed in *History in images – image in history: national and transnational past in Estonian art* and in *The Art of Money and Estonia 1918–2018*. Estonian art research contributed to international art research through the following publications: *In the Roman style: Mannerist graphic art in Estonian collections, Aivazovski:*

In pursuit of the Ideal and Saved sanctity: Icons from the Collection of Nikolai Kormashov. All the aforementioned publications accompanied respective exhibitions, complementing and broadening the experiences offered by the exhibitions. Finally, the book *Rode Altarpiece in Close-Up* compiled the outcomes of the research and conservation project carried out in 2013–2016 that attracted international attention and received awards for the popularisation of research.

The publication of the bilingual peer-reviewed journal *Proceedings of the Art Museum of Estonia* continued with special issue 13, *Papers on the collections of the Art*

Museum of Estonia. The editor-in-chief of *Proceedings* is Merike Kurisoo. In 2019, the position will be taken over by Ivar-Kristjan Hein. The series of publications introducing the archival holdings of the Art Museum of Estonia resulted in two publications in 2018: *Lost Estonian sculptors: Linda Sõber (1911–2004) and Endel Kübarsepp (1912–1972)* and *Well-known, but still Unknown Estonian Printmaker Agathe Veeber (1901–1988).*

ASSOCIATED ORGANISATIONS

Organisations whose activities and objectives comply with those of the Academy, may associate with the Academy. Association is effected in the form of a bilateral agreement, specifying the aims, duties and commitments of the parties.

Reviews on the 2017 activities of the organisations associated with the Academy have been presented in the chronological order of their association date:

Estonian Naturalists' Society	p. 74
Estonian Geographical Society	p. 75
Society of Estonian Areal Studies	p. 76
Estonian Mother Tongue Society	p. 77
Estonian Union of the History and Philosophy of Science	p. 79
Estonian Learned Society in Sweden	p. 80
Estonian Literary Society	p. 81
Learned Estonian Society	p. 82
Estonian Musicological Society	p. 82
Estonian Physical Society	p. 83
Estonian Association of Engineers	p. 84
Estonian Biochemical Society	p. 85
Estonian Semiotics Association	p. 85
Estonian Society of Human Genetics	p. 86
Estonian Chemical Society	p. 87
Estonian Society for the Study of Religions	p. 88
Estonian Economic Association	p. 89
Estonian Society of Toxicology	p. 90
Estonian Academic Agricultural Society	p. 91
Estonian Academic Oriental Society	p. 92

ESTONIAN NATURALISTS' SOCIETY

Associated with the Estonian Academy of Sciences since 23 January 1998

Founded in 1853

Membership: 13 honorary members, 655 active members, 67 trustees

Divisions: 23

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As of 31 December 2018, the Estonian Naturalists' Society (ENS) had 23 divisions: sections of anthropology, botany, entomology, geology, forestry and theoretical biology; the Commission of Lakes, the Estonian Theriological Society, the Estonian Malacological Society, the Estonian Meteorological Society (formerly the section of amateur meteorologists), the Estonian Mycological Society, the Estonian Society of Amateur Science and the Jakob von Uexküll Centre. The society also comprises commissions performing special tasks for natural sciences education, the history of natural sciences, the library, Estonian plant names, and observation networks; there is also the assembly of honorary members, the Estonian ecology assembly, the round table for nature conservation and the commissions for botanical rarities and Estonian environmental terminology.

In 2017, the ENS gave seven public presentations: "What is there to study in Lake Võrtsjärv all the time?" (Peeter Nõges, 25 January), "Historical overview of my years of work at Estonian forestry research institutions" (Ülo Tamm, 29 March), "Still bodies of water in Estonia: where, what are they like, and how many are there?" (Henn Timm, 26 April), "Studying rare genetic diseases – diagnostics and research" (Sander Pajusalu, 31 May), "Geneticist Mart Viikmaa remembered" (Sulev Kuuse, Lauri Laanisto, Oive Tinn and Aavo-Valdur Mikelsaar, 27 September), "How I used to run a zoo of *Freshwater Oligochaeta at the limnology centre*" (Tarmo Timm, 25 October) and "Grigori Levitski and Estonian Naturalists' Society during 1901–1905" (Tõnu Viik, 29 November).

The Baer Day (5 March) featured the presentations "Ancestors' embryos, or who laid the first egg?" (Oive Tinn) and "Karl Ernst von Baer's herbarium and the present day" (Toomas Kukk, Thea Kull).

The fourth book in the series "Classics of Natural Science" was published, titled *Pathfinders in Genetics*,

by Mart Viikmaa, edited by Lauri Laanisto, Mart Niklus and Oive Tinn.

On 8 February, the Estonian Society of Amateur Science organised a round table on the possibilities of amateur science in modern-day Estonia in order to map the interests of different stakeholders. In collaboration with the University of Tartu Natural History Museum, the Society organised the international BioBlitz nature observation marathon, which is aimed at mapping biological diversity (15–16 June). To ensure that the event was a success, training sessions were held in Pärnu (11 April), Tallinn (12 April) and Tartu (18 April). The Estonian nature observation marathon took place in the building and garden of the Estonian Naturalists' Society on 16 June.

The theoretical biology department held its 44th Spring School on Ecosystemics in Harjumaa from 27–29 April. 20 scientific presentations were given, and the annual collection *Schola Biotheoretica XLIII. Ecosystemics* was published.

The geology department collaborated with the University of Tartu Earth Resources Centre and Department of Geology, the Doctoral School of Earth Sciences and Ecology, and Tallinn University of Technology Department of Geology in organising the 14th Autumn School entitled "Earth Crust Vision" in Viljandimaa from 12–14 October. 13 presentations were given and the annual collection *Schola Geologica XIV Earth Crust Vision* was published.

The Estonian Theriological Society held its Autumn School entitled "Changes in theriofauna in the Republic of Estonia" in Lääne-Virumaa from 14–16 September, featuring 19 presentations and two workshops.

The section of anthropology organised the Auli Day on 26 October in collaboration with the Centre for Physical Anthropology. Five presentations were given.

The Estonian Mycological Society's autumn mycology camp took place from 20–23 September on Naissaar Island. Journal *Folia Cryptogamica Estonica Vol. 55* (<http://ojs.utlib.ee/index.php/FCE/issue/view/988>) was issued in collaboration with the University of Tartu. In the section of botany, the meeting of moss researchers with 23 participants took place on 2–3 June in Mulgimaa. Issue 21 of the online journal *Samblasõber* (Moss Connoisseur) was published (https://sisu.ut.ee/sites/default/files/samblasober/files/samblasober_21_01.pdf). The Estonian Meteorological Society held a gathering of amateur meteorologists and thunder observers in Pärnumaa on 18 July, during which eight papers were presented. The members of the Estonian Malacological Society performed work within the national monitoring sub-programme "Land mollusc monitoring".

The ENS library continued to organise the library collection and enter data into the electronic catalogue

ESTER. The library continued to exchange publications with other libraries in Estonia and abroad.

Field work continued for several ongoing species inventories in 2018. These were primarily ordered by the Estonian Environmental Board. National monitoring of land molluscs, medicinal leeches, Siberian flying squirrels and small mammals was ordered by the Environment Agency through public procurement procedures. The Environmental Investments Centre funded one of Estonia's largest Odonata inventory projects to this day, aimed at mapping the species composition of this insect group and their distribution in 24 pool bogs in Central and Northern Estonia.

On 28 February, the ENS held the Estonian premiere of the nature film *D'autres terres plus douces* (Free like a crane) (trailer: https://youtu.be/h_5dmd1fkEQ) and on 26 March, the environmental evening entitled "What is the environmental impact of meat consumption?".

ESTONIAN GEOGRAPHICAL SOCIETY

Associated with the Estonian Academy of Sciences since 27 January 1998

Founded in 1955

Membership: 180 members, 16 honorary members, 5 foreign members

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President: Mihkel Kangur, Tel.: +372 619 9800, mihkel.kangur@tlu.ee

Academic Secretary: Tiit Vaasma, Tel.: +372 619 9828, egs@egs.ee

The Estonian Geographical Society (EGS) is an organisation that unites geographers and people interested in geography. The main areas of activity of the Society are the publication of specialised printed matter, research, organisation of scientific events and dissemination of knowledge in geography. The EGS Youth Club (EGSY) takes care of the continuity of activity of the Society. Their traditional activities are aimed at engaging young people in joint academic activities and getting to know Estonia's geographical conditions. In many cases, these activities complement university field work.

In 2018 the EGS published a collection dedicated to the memory of Vello Tarmisto, Member of the Academy and Founding Member of the EGS, as well as its first and long-term president: Järvet, A. (editor). *Eesti Geograafia*

Seltsi aastaraamat 42 (Yearbook of Estonian Geographical Society, Vol. 42). Tallinn, 2018, 412 pp.

The 63rd year of activity of the EGS was opened with a celebration of the 100th anniversary of the birth of Vello Tarmisto at the Estonian Academy of Sciences on 10 January. Kalev Kukk and Andrus Ristkok gave interesting presentations, introducing Tarmisto's life, his career as a researcher, and the early days of the EGS and the Society of Estonian Areal Studies.

At the general meeting of the Estonian Geographical Society (15 April 2018), science journalist and lecturer at the Baltic Film and Media School of Tallinn University Arko Olesk spoke on the topic "How useful is (science) communication?".

The Jaan-Mati Punning Scholarship was presented to PhD Oliver Koit at the General Assembly. His doctoral thesis, defended at Tallinn University School of Natural Sciences and Health, was titled "Surface water and groundwater interaction in shallow karst aquifers". Oliver Koit plans to use the €1,000 scholarship to upgrade his research equipment. The scholarship is funded by Tartu Cultural Endowment Jaan-Mati Punning Foundation and awarded in partnership with the Estonian Geographical Society to final year bachelor's, master's and doctoral students and postdoctoral researchers in order to support them in reaching their research targets in the field of natural geography and related fields.

The annual bus excursion took participants to Mulgi-maa (7–9 August). Members of the EGSY went hiking on the Pakri Islands (9–10 June) and on a bicycle trip along the small roads in the South of Saaremaa Island. At five KoKoKo club evening events, hobby education travel memoirs were shared along with lots of photos. Kalev Kukk shared interesting experiences from ski marathons: "The story of one physico-geographical hobby, or the geography of skiing and its surroundings, demonstrated at the example of Worldloppet marathons". Tiit Vaasma spoke about what he saw and heard in Beijing. In addition to travel stories, he also talked about the 33rd International Geography Congress that took place there. A more detailed account is included in the Yearbook of the Estonian Geographical Society, Vol. 42. Juta Kuik and Jüri Loide shared memories of their enchanting trip to Karelia, and Mall Kaare and Kalev Kukk spoke of an exciting geologists' trip to Great Britain: "The geology and geography of England, Wales and Scotland, or trip around Great Britain".

The school geographers of the EGS participated in the organisation of geography olympiads. The EGS was involved in preparing and evaluating exam assignments. Teachers went on monthly subject events.

SOCIETY OF ESTONIAN AREAL STUDIES

Associated with the Estonian Academy of Sciences since 27 January 1998

Founded in 1939.

Membership: 195 members

Address: Kohtu 6, 10130 Tallinn, ESTONIA

ekus@ekus.ee, www.ekus.ee

Chairman: Andrus Ristkok, Tel.: +372 644 0475

The year 2018 was opened with a gathering of Pärnumaa areal researchers in Pärnu on 6 January.

The Estonian Geographical Society organised a memorial meeting in celebration of the 100th anniversary of the birth of Vello Tarmisto who was a Founding Member of the EGS and a leader of the re-establishment of the Society of Estonian Areal Studies. Andrus Ristkok gave a presentation on Vello Tarmisto's activities in reviving Estonian areal studies in the 1950s, and his activities on the Committee on Areal Studies at the Estonian Academy of Sciences¹.

For the sixth time, a contest was held for the best publication by a Member of the Society. Among the research works published in 2017, *Kullamaa collection*, 3 (compiled by Kalju Kurepalu, publisher: Kullamaa Parish Museum, 336 pp.), *Contemplations on Old Pärnu* (Olaf Esna, Tartu, publisher: Otto Wilhelm, 375 pp.) and *Haljala Parish in the flow of time* (compiled and many subsections authored by Lemmi Karmin, publisher: Haljala Rural Municipality Government, 503 pp.) received recognition. The latter was also named the best publication.

The regular yearbook was published in March. The section of the Society of Estonian Areal Studies of the 2018 Yearbook published jointly by three societies included several summaries of studies by different authors and, retrospectively, two outstanding pieces of student research from previous years. The two pieces of writing are dedicated to Eva Maaring, long-term Academic Secretary of the Committee on Areal Studies at the Estonian Academy of Sciences and at the Society of Estonian Areal Studies, who celebrated her 90th birthday in 2018. Thanks to her decades-long experience in the field of areal studies and her good memory, she can advise areal researchers on their work even today.

The General Assembly meeting of the Society took place in the Academy Hall on 4 May. The standard

¹ Related publication: *Eesti Geograafia Seltsi aastaraamat 42*. (Yearbook of the Estonian Geographical Society, Vol. 42). Tln, 2018, pp. 54–59.

reporting was followed by a presentation on Estonian Haljala Parish by Lemmi Karmin. Vahur Puik from the Estonian Photographic Heritage Society spoke about legal provisions in the era of digital photography and about the online environment Ajapaik (Estonian Photographic Heritage Society). Mai Härm from Harjumaa provided a longer overview of the areal work currently under way in Ohtu. Aside from the exhibition of last year's publications of areal studies, a rather diverse collection of areal calendars was also exhibited at the General Assembly.

County students' areal studies conferences were held in Türi (at the Estonian Broadcasting Museum on 17 May), in Pärnumaa (in Pärnu Museum on 30 May) and in Tapa (in the Public Library from 10–11 October).

On 30 June 2018, the Society organised a study trip to South Pärnumaa in order to examine the cultural history of Häädemeeste Parish.

Collective photo action was organised from 9–10 July in order to critically go through the Society's entire photo collection – the result of nearly 60 years of activity starting from the days of the Committee on Areal Studies at the Estonian Academy of Sciences. Veterans of the Tallinn City Museum's areal studies group assisted in the work. After careful consideration, duplicates and photos not directly linked to the themes of the Society of Areal Studies were identified and sent to more relevant photo collections.

The Union of Pärnumaa Researchers in Areal Studies was again the one organising the highest number of events for its members. In May, there was a memorial pilgrimage in honour of the renowned and productive researcher Sergei Seeland, who passed away on 1 April 2018. Focused on the Velise area, the journey led through sites that were significant in Seeland's life and research. There was also a series of visits to Harjumaa manor houses at the end of summer, and to Tartu's museums in December.

In 2018, as before, areal researchers participated in the organisation of local celebrations. They helped with preparations for J. Ph. von Roth's memorial day in Kanepi, Põlvamaa (on 13 June), the installation and opening of the memorial rock for the 500th anniversary of Metsla Village and of the memorial plaque with a list of participants of the Estonian War of Independence in Järvamaa (on 11 August) and the memorial day for the 140th anniversary of the birth of Jaan Lattik's in Lüllemäe, Valgamaa (on 17 October). Thematic presentations were given during village and areal events. Members of the Society provided information about various other events initiated by them in Raplamaa, Järvamaa, Lääne-Virumaa, South Tartumaa and other areas, often covered by local media.

A selection of data about the activities of the Society in 2018 is available on the web page of the Society (www.ekus.ee).

ESTONIAN MOTHER TONGUE SOCIETY

Associated with the Estonian Academy of Sciences since
4 February 1998

Founded in 1920

Membership: 371 active members and 15 honorary members

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Librarian: Annika Oherde, Tel.: +372 644 9311

In 2018, the Society organised and co-organised four conferences, three symposia, a youth language camp, two Language Day events at schools, and four Estonian Language Day events abroad, with a total of 90 presentations throughout the year.

47 presentations were given at the four conferences held by the Estonian Mother Tongue Society.

The international conference *Emakeelne Eesti, emakeelne Euroopa III* (Mother Tongue in Estonia, Mother Tongue in Europe, 3), dedicated to F.J. Wiedemann, took place in Väike-Maarja and Rakvere from 22–24 April. A monument to Georg Lurich was opened in Väike-Maarja on the first day of the conference, and laureate of the Wiedemann Language Award, Associate Professor Emeritus of the University of Tartu Reet Kasik planted an oak tree in the oak park dedicated to the Estonian language. Presentations were given by Paavo Kivine, Raul Rebane, laureate of the Wiedemann Language Award Reet Kasik, and Indrek Lillemägi. Reet Kasik's presentation "On the value of mother tongue" addressed the latest trends of change in modern Estonian language, as well as dangers resulting from globalisation that affect our attitude towards our mother tongue.

Six plenary presentations divided into three topical sessions were given in Rakvere: "Reserves of the Estonian language", "Learning and teaching languages", "Young people on the Estonian language", "Language and literature", "Interpreter and translator" and "Language in use". Discussions were held on the role of the Estonian language today and in the future, and on shaping the reputation of the Estonian language. There was also a premiere of the play *Kas siis selle maa keel?* (Cannot the tongue of this land?)² (author Jüri Valge, producers Anu Lamp and Christopher Rajaveer). The conference

was organised in partnership with the Estonian Ministry of Education and Research, the Institute of the Estonian Language, Väike-Maarja Rural Municipality Government, Rakvere City Government and the Alliance of Liberals and Democrats for Europe (ALDE) group of the European Parliament.

On 10 August, the Institute of the Estonian Language, the St Lawrence Society, the Kuusalu Congregation of the Estonian Evangelical Lutheran Church, the Veljo Tormis Cultural Society and Kuusalu Rural Municipality Government jointly organised a conference dedicated to Eduard Ahrens, held in Kuusalu and featuring four presentations. Sulev Valdmaa said the opening words and spoke about recording the memory of Ahrens. Ene Vainik continued with a presentation entitled "Holy and unholy feelings", followed by Enn Ernits who talked about proper names in Kreutzwald's *Old Estonian Fairy Tales*. Mart Rannut and Jaan Bärenson discussed up to date and relevant language and challenges related to the new Bible translation. Mariina Viia concluded the conference day by introducing the "Principles of compiling a religion dictionary".

On 27 June, the traditional J.V. Veski language conference took place in Tartu. The title of the 51st conference in the series was "How are you, Estonian language?" and it included six presentations. Kadri Vider opened the conference day with her presentation "Estonian language technology: why and for whom", followed by Tiina Soon's presentation "Health status of terminology", Mart Rannut's "Narva language and mind", Birute Klaas-Lang and Helle Metslang's "Internationalisation of higher education and mother tongue: the reflection of Estonia in a European mirror" and Ilmar Tomusk's "Estonian language in the bottom left corner". The conference day was concluded by Tõnu Tender's presentation "A matter of reputation. Reputation of the Estonian language and how to shape it".

The university students' conference organised annually by the Mother Tongue Society to celebrate the European Day of Languages was held at the University of Tartu on 28 September. Bachelor's and master's students of the University of Tartu and Tallinn University gave five presentations about their research in linguistics during two topical sessions.

Abroad, four Language Day events (in Bologna, St Petersburg, Helsinki and Munich) were organised in collaboration with the Estonian Ministry of Education and Research, local Estonian associations and Estonian language teaching centres. A total of 11 presentations were given on topics such as the areas of use and the vitality of the Estonian language, language events, dictionaries, reading skills, text types, points of contact with other

² First line of the well-known poem by Estonian literary figure Kristjan Jaak Peterson (translator's note)

languages, language advice sources, children's interest in reading, teaching of the Estonian language, studies and research, and changes in written language. New computer vocabulary was introduced as well.

In collaboration with the Ministry of Education and Research, the Society organised the 2017 Best Language Deed competition. The winner was Enn Ernits' collection of articles *One word at a time. From mother tongue to artificial languages*, published as the 75th volume in the series of publications by the Society. The Society also participated in the organisation of the closing event of the Best Language Deed competition held at Türi Co-educational Gymnasium on 16 March.

At the general meeting of the Society held in Tartu on 23 March, Maire Raadik gave an academic presentation entitled "25 years of operation of the Language Working Group of the Estonian Mother Tongue Society". The Annual Report of the Society's 97th year of activity (2017) was presented by the Academic Secretary Killu Mei.

The three symposia (one in Tallinn and two in Tartu) featured a total of nine presentations.

On 22 February, a celebratory symposium Estonia and Finland 100 was held. The symposium *Valge tee kutse* (Invitation of the white road) took place in Tartu on 26 October in celebration of the 70th birthday of Vice-Chairman of the Society Jüri Valge. On 27 November, Asta Õim's 70th birthday was celebrated in Tallinn with a phraseology-themed symposium One Language, One Hundred Layers, followed by a presentation of Asta Õim's phraseology collection.

In 2018, two Language Day events were organised by the Society of Mother Tongue (at Pühajärve Elementary School on 19 October and at Viljandi Gymnasium on 13 November) with a total of four presentations.

From 22–24 October, a language camp called "To know specialised language" was organised in Väike-Maarja. 19 secondary school students from all around Estonia got together with representatives of the Mother Tongue Society, Tallinn University, the University of Tartu, terminology committees and the Ministry of Education and Research. Eight lectures and seminars took place, as well as one workshop. Linguists talked about preparing concept trees, food vocabulary, legal language and principles of clear language, the mother tongue olympiad, etc. Participants practiced creative writing and tried their hand at compiling a Wikipedia article.

Members of the Society also presented at other language events. The *Riigikogu* (the Parliament of Estonia) held a discussion on 15 March on a crucial national issue "Estonian language as national infrastructure". Martin Ehala spoke about the situation of the Estonian language in basic and general education and Birute Klaas-Lang focused on Estonian in higher education.

At the anniversary conference of the Learned Estonian Society held in Tartu on 23 November, Valve-Liivi Kingisepp gave a presentation "On the correspondence of Julius Mägiste and Andrus Saareste in exile". Helle Metslang participated in the conference Estonian Republic. 100 Years of Innovation held at the Károli Gáspár University of the Reformed Church in Hungary, Budapest, with the presentation "Century of Estonian Linguistic Activities: Mother Tongue Society".

Since 1 April 2016, Maire Raadik has been the elder of the Language Working Group of the Society. In addition to exchanges of e-mails, the Working Group held two meetings. Discussions touched upon the chapter on compound and separate writing in the upcoming handbook of standard Estonian, the question of classifying the word *lemmik* (favourite) and the question of capitalising figures of speech (the decision can be found on the website of the Language Working Group). A Foreign Names Working Group was established.

The use of financial support provided by the Ministry of Education and Research continued for the completion of a comprehensive academic analysis of the Estonian language (reviewing the written language history and the spoken language section; editing the written language history and the grammar of Estonian dialects).

For the third time, the company name image building campaign featuring the slogan "Genuine Estonia: an Estonian name to an Estonian company" was held. Four awards were distributed in four categories (industrial enterprise, service provider, NGO, newcomer of the year). The awards were presented during the Tartu Entrepreneurship Week. Birute Klaas-Lang gave an overview of the competition and Kristel Ress spoke about company names.

The Society continued to hold its youth group language evenings at Tallinn University and the University of Tartu, with the three meetings focusing on scientific language, multilingualism and literary language.

Language-related initiatives that had previously become traditional were continued in 2018: the dictation contest on the Mother Tongue Day in collaboration with the University of Tartu and Estonian National Broadcasting; the summary writing competition Tuum in collaboration with the University of Tartu and the Mother Tongue Teachers' Society; educational exchange of students between the University of Tartu and Tallinn University, and language tweets on Vikerraadio.

The Society participated in the organisation of the 51st annual conference of the Linguistics Society of Europe (*Societas Linguistica Europaea*) which was held at Tallinn University.

In collaboration with the Ministry of Education and Research, six one-off grants of €400 were awarded for

the fourth time to master's students studying under the curriculum "Teacher of the Estonian Language and Literature".

Publications of the year 2018:

Yearbook of the Mother Tongue Society 63 (2017). Editor-in-chief Mati Erelt, editor Sirje Mäearu. The Mother Tongue Society of the Estonian Academy of Sciences. Tallinn, 2018. 360 pp;

Pajusalu, K., Hennoste, T., Niit, E., Päll, P., Viikberg, J. Estonian dialects and place names. 3., edited and revised edition. Edited by Tiit Hennoste. Tartu, 2018, 334 pp;

Asta Õim's phraseology collection. "Peigmees kaseladvas". "Mees metsast". "Nõgesed püksis". "Vesi või mesi". "Kartulipudru ingel". Tallinn, EKSA, 2018; 137 pp in total;

language journal *Oma Keel*, issue 1, 86 pp;

language journal *Oma Keel*, issue 2, 88 pp.

In 2018, the Society's library received 81 publications that were obtained through exchange, donation or purchase. The library has 6,668 recorded publications. The digitalisation of earlier publications (Yearbooks of the Mother Tongue Society 30–34) continues and they are now available on the DIGAR digital archive of the Estonian National Library.

ESTONIAN ASSOCIATION OF THE HISTORY AND PHILOSOPHY OF SCIENCE

Associated with the Estonian Academy of Sciences since
4 February 1998

Founded in 1967

Membership: 65 active members, 7 honorary members,
6 member organisations

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The Estonian Association of the History and Philosophy of Science (EAHPS) is active in Tallinn and Tartu. It is a member of the Baltic Association of the History and Philosophy of Science and a member of both autonomous divisions of the International Union of the History and Philosophy of Science and Technology, of which the first embraces the history of science, and the other the logic, methodology and philosophy of science and technology.

The General Assembly was held in Tartu, at the Institute of Philosophy and Semiotics of the University of Tartu (Jakobi 2) on 25 May 2017. The General Assembly approved the activities and financial report of the EAHPS for 2017 and the working plan for 2018. Member of the Board Erki Tammiksaar presented the book *100 Years of Science in Estonia*, compiled by himself and Member of the Academy Jüri Engelbrecht.

The effects of the previous year's main event, the 28th Baltic Conference on the History of Science organised by the EAHPS in cooperation with the University of Tartu Museum, continued into 2018. The conference was nominated for the Annual Award of Estonian Museums in the Best Scientific Event category. At the awards ceremony held at the Kumu Art Museum on 19 January 2018, the Museum Rat award in this category was indeed presented to the organising committee of the conference, consisting entirely of members of the EAHPS.

The Association continued to publish *Acta Baltica Historiae et Philosophiae Scientiarum*, a journal included in the SCOPUS database. Both editions of the sixth volume of the semi-annual journal were published as planned. The second edition featured articles written on the basis of the best topical presentations given at the 2017 Baltic Conference. The author of the concept of the conference Epi Tohvri steered the publication of the journal.

Epi Tohvri also finished a voluminous monograph on Georges Frederic Parrot. The presentation of the book is due to take place in the first half of 2019.

Member of the Board of the EAHPS Erki Tammiksaar gave a keynote presentation about the history of science during the anniversary celebration of the Estonian Academy of Sciences in the Parliament of Estonia Conference Hall on 31 January.

With funding from the non-profit organisation Universities Estonia, member of the EAHPS Raul Veede was able to continue the digitalisation of the bibliographic lexicon of Estonian science.

Correspondent members of the International Academy of the History of Science Peeter Mürsepp and Erki Tammiksaar represented Estonia at the 8th *European Society for the History of Science (ESHS)* conference.

At the initiation of Member of the Board of the EAHPS Lea Leppik, the annual history conference took place at the University of Tartu Museum on 6 December.

Members of the EAHPS Endla Lõhkivi and Ave Mets along with the other members of the Chair of Philosophy of Science organised an international workshop for postgraduate students entitled "Why History Matters: The Rational Grounding of Historiography" from 19–22 March 2018. The invited speaker was Professor Jouni-Matti Kuukkanen from the University of Oulu.

At the 7th conference of the Society for the Philosophy of Science in Practice (SPSP) held at Ghent University (Belgium) on 1 July 2018, members of the EAHPS Endla Lõhkivi ja Jaana Eigi were in charge of a symposium entitled Evaluation, Quality and Success in Interdisciplinary Research.

Endla Lõhkivi organised an international workshop “How to evaluate interdisciplinary research? Conceptual, methodological and empirical challenges” which took place in Tartu from 28–30 September.

An international seminar on the philosophy of chemistry, dedicated to the 80th anniversary of the birth of Rein Vihalemm and organised by the Chair of Philosophy of Science, was held on 10 December.

The personal research group grant application submitted by Endla Lõhkivi and other science philosophers who are members of the EAHPS was successful. The implementation of the grant began in January 2019.

The EAHPS was sad to lose two dedicated members in 2018 – prominent researcher of the history of science Tullio Ilomets and Member of the Academy Mihkel Veiderma who passed away.

ESTONIAN LEARNED SOCIETY IN SWEDEN

Associated with the Estonian Academy of Sciences since
19 March 1999

Founded in 1945

Membership: 88 active members, including three
honorary members

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Chairman: Evelin Tamm, tammevelin@gmail.com

Co-chair and Secretary: Helena Faust

By the end of the year of operation, the Estonian Learned Society in Sweden (ELSS) had 88 members and three honorary members: Professor Jüri Engelbrecht, Professor Raimo Raag and Professor Tarmo Soomere. Ülla Karin Nurm and Toomas Tuulse joined the Society in 2018 as new members. The Board was made up of Evelin Tamm (Chairman), Helena Faust (Co-chair and Secretary), Sirle Sööt (Co-chair), Anu Mai Kõll (Treasurer), Piret Vilho (Secretary), Ants Anderson, Ruth Rajamaa, Ivar Paljak and Tiit Pädam. Members of the Audit Committee were Ülo Kool and Koidu Norén, while members of the Electoral Committee were Ants Lepp and Thomas Niit.

Eight Board meetings were held in 2018. Most of the communication with members took place via e-mail. Several announcements and articles have been published, mainly via Facebook and the website of the Association of *Estonians in Sweden* (sverigeesterna.se).

The website of the ELSS (<http://etsr.se/>) has been continuously updated. Since last year, all ELSS Yearbooks are available electronically. We updated information about the Society on Estonian Wikipedia and also published a detailed article on Swedish Wikipedia. For the first time, we used technical innovations in the form of video lectures and video conferences this year in order to economise on time and travel expenses.

In 2018, the Society held seven symposia, two book presentations, one film screening, one poetry evening, a symposium dedicated to the centenary of the Republic of Estonia featuring six presentations, and a festive meeting in celebration of the anniversary of university education in the Estonian language. The Society organised various events in partnership with other organisations of Estonians in Sweden. A number of seminars and events presenting Estonia took place across Sweden, with active participation by Board members and other representatives of the ELSS. To give but one example, Chairman of the of the ELSS Evelin Tamm gave a presentation at the Estonia in Swedish Media: Reality and Ideals media seminar of the Embassy of Estonia (the article was published in the June issue of the *Diplomaatia* journal).

Guests of honour at the celebration marking the 99th anniversary of the University of Tartu were Professor Tõnu Lehtsaar of the University of Tartu with his wife, and the Estonian Ambassador to Sweden Merle Pajula. All the events organised by the ELSS took place at the Estonian House Stockholm, with the exception of the poetry evening dedicated to the 135th anniversary of the birth of Marie Under, which was held at Den Gyldene Freden Restaurant in the Old Town of Stockholm.

Chronology of events:

February 13 – Symposium dedicated to the centenary of the Republic of Estonia in partnership with ESTIVAL Evelin Tamm, “On the cooperation between Estonian researchers in Sweden”

Ago Pajur, “The founding of the Republic of Estonia” (video lecture)

Raimo Raag, “Three local languages in the Parliament of Estonia”

Imbi Paju, “Occupation-originated forms of thought in new discourses and forms of thought”

Mai Raud-Pähn, “On Tallinn’s two luxurious silver bowls located in Stockholm museums” (video lecture)

Pille Pruulmann-Vengerfeldt, “e-Estonia’s Tiger Leap – what could be behind Estonia’s e-success? (video lecture)

March 8 – Ruth Rajama gave a presentation on “Pirita Convent 1407–1607”.

March 27 – Translator and writer Enel Melberg gave a presentation on “Marie Under’s 135 years in cooperation with the Association of Estonians in Sweden”.

April 5 – Kersti Kriisk, Phd Student at the School of Governance, Law and Society at Tallinn University and exchange PhD student at Stockholm University presented on “Local welfare regimes: universal social rights or good local governance”.

May 3 – Katrin Pütsep, Associate Professor at the Karolinska Institute presented on “Developing a method of diagnosis for bone marrow disease: from basic research to clinical use”.

May 30 – Presentation of Professor Li Bennich Björkman’s (Uppsala University) book *Sörja ett liv, leva ett annat: om flyktingens mörker och ljus* (2017) in collaboration with the Association of Estonians in Sweden

September 28 – Presentation of Ruth Rajamaa’s book *A broken song: Pirita Convent* in partnership with the Estonian Culture Society in Sweden.

October 4 – There was a screening of Helga Merits’ films *The Story of the Baltic University* and *Coming Home Soon: The Refugee Children of Geislingen*, followed by the opportunity to meet the director. The event was organised in collaboration with the Association of Estonians in Sweden.

November 15 – Helena Faust and Evelin Tamm gave a presentation entitled “Forestry scientist Aino Käärik 100: Life and work”.

September 27 – Media seminar entitled “Estonia in Swedish Media: Reality and Ideals” was held by the Embassy of Estonia and Evelin Tamm gave a presentation entitled “Invisible paper”.

December 1 – Professor Tõnu Lehtsaar of the University of Tartu gave a presentation entitled “On the psychology of ritual”.

ESTONIAN LITERARY SOCIETY

Associated with the Estonian Academy of Sciences since 23 January 2001

Founded in 1907

Membership: 267 members (including 35 lifetime members, 6 honorary members and 21 trusted members)

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In 2018, the Estonian Literary Society (ELS) continued with long-term projects, for example the project popularising literature called Bus Poetry, an annual symposium mapping and analysing Estonian literature published during the previous calendar year, and a literature students’ Spring School (in addition to this over 10-year-old tradition, the first Autumn School was organised last year). The ELS continued the interdisciplinary “Description of Nature” series of seminars. For the first time, World Poetry Day was celebrated on 21 March with readings at different places all over Tartu. There is every likelihood that it will become another tradition of the ELS. The Society continues to be one of the main organisers of Tartu International Literary Festival Prima Vista. In 2018, the festival took place from 7–12 May and bore a title “Music of the Future”. The programme comprised meetings with writers, book presentations and poetry evenings, as well as seminars and lectures. In collaboration with the University of Tartu, the science conference Literature and Technology: Representations and Conceptions was held as part of Prima Vista.

The ELS continued to organise the interdisciplinary international festival Crazy Tartu and the Tartu Children’s and Youth Literature Festival. As part of the latter, the Society also held a symposium on literary education in 2018, bringing together teachers, lecturers, organisers of cultural events and other people active in the world of literature. Together, they discussed activities supporting school education, as well as future opportunities. The Society also coordinates the Tartu City of Literature International Residency Programme. In 2018, Tartu was home for two writers-in-residence, Darran Anderson from Ireland and Gabi Csutak from Hungary, with whom several talks were organised. The Residency Programme is co-organised with the Karl Ristikivi Society that offers writers-in-residence accommodation at the Home Museum

of Karl Ristikivi. Through that, international awareness has also been increased on the heritage of Ristikivi.

As coordinator for Tartu as a UNESCO City of Literature, the Society enhanced international cooperation as well as information exchange and joint activities with several local authorities and organisations. The Society also participated in joint projects between the Cities of Literature and in several international meetings. Among others, Estonia's literary events and projects were introduced at the Baltic States' joint seminar at the London Book Fair.

LEARNED ESTONIAN SOCIETY

Associated with the Estonian Academy of Sciences since 23 January 2001

Founded in 1838

Membership: 107 active members and 17 honorary members

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Chairman: Marju Luts-Sootak, Tel.: +372 737 5396, marju.luts-sootak@ut.ee

At the beginning of 2018, the Society had 115 members and 16 honorary members. Sten-Erik Tammemäe was accepted as member at the General Assembly and Erki Tammiksaar decided to renounce his membership. The Society was also sad to lose its members Mihkel Veiderma, Heino Noor, Nikolai Repän and honorary member Torkel Jansson who passed away.

Marju Luts-Sootak was the Chairman of the Society and the Board was made up of Vice-Chairmen Tiit Rosenberg and Heiki Valk and members Tõnu Tannberg, Kersti Taal, Andres Andresen, Piret Õunapuu, Taavi Pae and Brita Melts. The Board held two meetings (on 17 January and 26 September). Several topical issues were settled by e-mail. Discussions touched upon the General Assembly, the conference, the compilation of a publication on the history of the Society, the Yearbook of the Society and its inclusion in databases.

13 symposia were organised in 2018, dealing with a wide range of topics: the history of the Learned Estonian Society and its periodisation, Estonian literary and cultural history, Baltic German drama and board games, archaeological research of industrial history, religious buildings, etc.

The Learned Estonian Society's 180th Anniversary Conference took place on 23 November, including the presentation of Kersti Taal's monograph *A History of the*

Learned Estonian Society (Tallinn: Argo, 2018) – the most detailed overview of the Society's activities and membership. The Estonian Learned Society is highly grateful to the Academy for the support which allows them to present the monograph on the history of the Society to all of its members.

The Society is going to publish the materials of both the symposia and the conference in the Society's Yearbook 2018.

The Yearbook 2017 of the Learned Estonian Society was compiled and edited in 2018, Taavi Pae being the editor-in-chief and Freydis Ehrlich the operation manager for the compilation. The Yearbook 2018 is currently under preparation.

The Society participated in publishing the 2018 issue of the Estonian archeology journal *Tutulus*.

The Society carried out archaeological excavations in the ruins of the medieval Helme castle with funding received from the Mulgimaa Culture Programme.

ESTONIAN MUSICOLOGICAL SOCIETY

Associated with the Estonian Academy of Sciences since 21 May 2004

Founded in 1992

Membership: 91 active members of whom 4 outside Estonia, 1 honorary member (Professor Emeritus of Lund University Folke Bohlin)

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Chairman: Kerri Kotta, Tel.: +372 528 8781

Estonian Musicological Society brings together researchers in music and people entertaining the interest in scholarly study of music and supports research in all fields of musicology in Estonia.

The achievement of 2018 was release of the tenth issue of the musicological yearbook *Res Musica* in cooperation with the Department of Musicology at the Estonian Academy of Music and Theatre. It is the first journal in Estonia to publish research articles on the identity of pop music that also touch upon the aspect of gender. *Res Musica* is a periodical issue with international editorial board, publishing peer-reviewed scientific articles of all areas of musicology. The yearbook is open to international cooperation. The issue is prevalently in Estonian; however, it includes extended abstracts of articles in English or German. The tenth issue of the yearbook was published

in English. Since 2017, *Res Musica* has its own website: <https://resmusica.ee/en/>.

The Society organises two symposia per year regularly, a spring meeting in Tartu and an autumn meeting in Tallinn. The Society's Day of Tartu was held in the National Archives of Estonia on 14 April and was dedicated to the 60th birthday of Professor Toomas Siitan. The agenda included ten presentations delivered by Heidi Heinmaa, Toomas Siitan, Andreas Waczkat, Anu Schaper, Katre Kaju, Mart Humal, Kristel Pappel, Friedhelm Brusniak, Kevin C. Karnes and Christopher J. May.

Leichter Day in Tallinn was held on 26 November 2018. Stephen Amico gave a talk on pop music in post-Soviet cultural space. In addition, the tenth issue of the musicological yearbook *Res Musica* published in cooperation between the Estonian Musicological Society and the Department of Musicology at the Estonian Academy of Music and Theatre was presented.

It has been a long tradition of the Society to organise a culture-lore trip at the beginning of September. In 2018, the Society visited cultural sights of East Harjumaa.

ESTONIAN PHYSICAL SOCIETY

Associated with the Estonian Academy of Sciences since 14 June 2005

Founded in 1989

Membership: 193 active members

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Chairman: Kaido Reivelt, Tel.: 7374623,

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The goal of activities of the Estonian Physical Society (EPS) is to introduce physics and the related fields to the general public, to connect the community of physicists, and to improve and support the teaching of physics in the Estonian educational system by coordinating, among other things, the network of physics teachers.

The Estonian Physical Society has two divisions: the Division of Teachers of Physics (Chairman of the Board is Siim Oks) and the Division of Physics Students (Society of Physics Students, Chairman of the Board is Hans Hubert Sams). In addition, the Society also operates the Science Bus (managed by Kenneth Tuul). In 2017, Kaido Reivelt, Andi Hektor and Silver Lätt belonged to the Board of the EPS.

The most important activities in 2018:

The 48th Estonian Physics Days took place at the Physicum of the University of Tartu on 16 May.

We organised the Science Camp of the University of Tartu at Värskä Gymnasium from 22–27 July for the 11th time. A total of 100 pupils of 6th to 10th forms took part.

The development of physics e-textbooks continued.

The Science Bus continued its former momentum – another group of young science popularisers were trained and launched.

We have provided practical and moral support to a number of undertakings of partner organisations.

Activities of the Division of Teachers of Physics:

Trainings of physics teachers were continued at CERN (managed by Riina Murulaid).

In cooperation with the school physics centre of the University of Tartu the Division organised the physics teachers' summer school and the 40th Days of Education in Physics at Lapanina Hotel.

As an organisation representing physics teachers, the Division of Teachers of Physics prepared reviews and study materials, participated in the development of national curricula and carried out different INNOVE projects.

Activities of the Society of Physics Students:

On 26–29 October, the EPS Autumn School in Natural and Exact Sciences was held.

The project “The student to the physics class!” continued, wherein students of physics and materials science give physics lessons in Estonian schools.

SPS organised numerous events in 2018: evenings with guests of honour, a chess tournament, a table tennis tournament, scientific seminars and trips.

On 26 May, a spring party of the Society of Physics Students was held.

The Society of Physics Students also participated in organising a Christmas party of the Institute of Physics of the University of Tartu on 20 December.

ESTONIAN ASSOCIATION OF ENGINEERS

Associated with the Estonian Academy of Sciences since 23 September 2008

Founded in 1921 as the Estonian Society of Engineers
Re-established on 10 December 1998 under the name of the Estonian Association of Engineers

Membership: 18 legal entities

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President: Arvi Hamburg, Tel.: +372 516 2026,
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The Estonian Association of Engineers (EAE) is a non-profit association operating in the public interest and bringing together sector-specific organisations of engineers, trainers of engineers and innovative employers who are interested in the advancement of engineering and technology. The mission of the EAE is to promote Estonian engineering sciences and development activities, innovation and related education policy. The vision of the EAE is a knowledge- and innovation-based society.

In 2018, the EAE focused on collaboration between educators and employers in the field of engineering and on the popularisation of engineering.

The activities of the EAE were mainly focused on:

1. Developing marketing activities in line with the common principles of the engineering field;
2. Developing a vision of a science and technology pact; harmonising the possibilities and capacity of partners of the pact to reach the goals.

One General Assembly and five Board meetings were held in 2018.

The main activities of the EAE in 2018:

With the support of the Ministry of Social Affairs, the EAE initiated the Restart project to help guide adults back to working in the field they have studied.

Target group – people with technical (higher) education who do not work in their specialisation field for any reason.

Purpose – to alleviate the lack of engineers and technicians in companies operating in the fields of engineering and technology; to bring graduates who have studied engineering under former curricula and who are not working in their area of specialisation back to the field they studied.

Content – to renew and update theoretical knowledge acquired at university or technical college on the basis of modern curricula and acquire practical experience using modern technology.

The Association participated in the round table of

organisations associated with the Estonian Academy of Sciences in Tartu on 23 May. The decision was made to establish a common information exchange platform.

Engineering Summer School “Why?” took place.

The Association participated in the Summer School “Engineer’s creativity” held in Nelijärve from 23–24 August. The event was aimed at science teachers, instructors at after-school clubs, leaders of hobby groups, lecturers and museum workers, and focused on the popularisation of science. The broader goal was to demonstrate that nearly everything in our life is related to engineering – an idea to which anyone wanting to popularise science could link their activities.

Collaboration agreement with the Collegium Educationis Revaliae (Old Town Educational College) – in the context of introducing technological studies, the school entered into an agreement with the Estonian Association of Engineers and the Development Centre of St. Michael’s Society. The collaboration agreement was signed with the aim of popularising academic education in engineering and technology and to introduce engineering-related professions to schoolchildren. The agreement provides that the EAE familiarises pupils with the daily work of engineers, develops a technology curriculum and is in charge of the teaching. Secondary school students have the opportunity to get to know different professions through lectures and practical classes and are given a basic overview of what engineering studies involve. Lectures and practical classes are imparted as a three-year modular cycle.

Harmonisation of engineer accreditation – the aim is to use harmonised and uniform criteria when accrediting engineers. Professional standards shall be established in line with the amount of in-service training and independent work currently required.

Results of the contest for EAE honorary titles:

2018 Engineer of the Year – Andres Piirsalu, authorised water supply and sewerage engineer, level 8, Chairman of the Board of OÜ ENTEC Eesti, Project Manager

2018 Technology Student of the Year – Konrad Ilustrumm, 4th year student of Mechanical Engineering at the Institute of Technology of Tallinn University of Applied Sciences

The EAE participated in the FEAN general assembly held in Malta from 7–9 October, with key themes being the qualification of engineers and the role of engineers in society.

The 30th anniversary of the re-establishment of the EAE was celebrated in the Academy Hall, and the brochure *EAE 30* was issued to mark the occasion. Dean of the School of Engineering Arvo Oorn gave a presentation and a collaboration agreement was signed with the Collegium Educationis Revaliae.

ESTONIAN BIOCHEMICAL SOCIETY

Associated with the Estonian Academy of Sciences since 13 November 2009

Founded in 1959

Membership: 69 active members, 21 student members

Address: Akadeemia 15, 12618 Tallinn, ESTONIA
katrina.laks@gmail.com, www.biokeemiaselts.ee

President: Olga Mazina, Tel.: +372 56 985 281,
olga.mazina@ut.ee

Academic Secretary: Katrina Laks, Tel.: +372 52 96 923, katrina.laks@gmail.com

The goal of the Estonian Biochemical Society is to support and promote research and teaching in biochemistry and in the related theoretical and applied research areas, to raise public interest in those areas of science, and to support and protect the professional interests of the members of the Society.

Estonian biochemists have a long tradition of organising spring schools for members of the Society and guests interested in the field. In 2018 the spring school was titled “Poison and medicine” and held in Paunküla on 10–11 May (coordinator: Professor Peep Palumaa, Tallinn University of Technology), followed by the annual meeting of the Society. Agenda items included the approval of the annual report, the auditor’s report and Elections of the new Board.

The annual congress of the Federation of European Biochemical Societies (FEBS) was held in Prague from 7–12 July. At the end of the congress, the FEBS Council meeting was held where a board member of the Society Tiit Lukk participated as a representative of Estonia.

With the aim to popularise the research activities among students and encourage the best students who have published their results in well-known journals, the Society has awarded student science prizes since 2007. This year, the first prize was granted to Tõnis Laasfeld, a master’s student of the Chair of Bioorganic Chemistry at the University of Tartu.

ESTONIAN SEMIOTICS ASSOCIATION

Associated with the Estonian Academy of Sciences since 15 December 2009

Founded in 1998

Membership: 72

Address: Jakobi 2, 51005 Tartu, ESTONIA
www.semiootika.ee

President: Katre Pärn, Tel.: +372 566 19 492,
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Vice-President: Eva Lepik, Tel.: +372 737 5413,
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In 2018 the Estonian Semiotics Association (ESA) celebrated its 20th year of activity with a variety of scientific and popular science events and promoted social activities.

In spring the Semiosalong Spring Sessions began a series of lounge meetings aimed at popularising semiotics. The three sessions, united under the theme “Order in/from Chaos” (19 March, 2 April, 16 April) featured presentations by Mihhail Lotman and Andres Kursimaa, among others. Further information can be found at: www.facebook.com/Semiosalong/.

On 13 June, the general assembly of the ESA under the title “Quo vadis, semiotics?” was held. Apart from routine and organisational questions, there was also a discussion about the Association’s development plans. Timo Maran, Silvi Salupere and Peeter Torop gave a presentation about the future trends of semiotics. The traditional prize “Semiootiline Jälg” was awarded to Tyler Bennett for popularising semiotics through the lounge sessions and to Merit Rickberg for her outstanding research.

The beginning of autumn was all about theatre. As proposed by its members, the ESA made a donation to the Tartu New Theatre to support the theatre’s goal to purchase the house in which it operates. On 15 September, the Association went on a trip to the Estonian Drama Theatre in Tallinn to see the play *Metsa forte*, followed by a discussion with the director, semiotician Mehis Pihla.

The Semiosalong Autumn Sessions again consisted of three lounge meetings (31 October, 14 November, 29 November) with a total of six presenters. This season entitled “Excavations in the Esoteric” aimed to contemplate different forms of esoteric, hidden, forbidden or thus far unknown knowledge.

The ESA supported the University of Tartu in organising the traditional 19th Autumn School of Semiotics under the title “Medium is the message. A digital turn in humanities”. 11 speakers from different fields presented to

approximately 70 participants on 3–4 November. Further information can be found at: semiootikasygiskool.blogspot.com.

The ESA was also a partner in organising the international conference *Semiotics of Hybrid Natures: Anthropogenic Ecosystems, Multimodalities, Transformed Umwelts*, which took place from 8–10 November. The conference focused on anthropogenic changes in interactions between different species and ecosystems and new hybrid environments. Further information can be found at: www.ffi.ut.ee/en/semiotics-of-hybrid-natures.

The ESA supported the development of www.mison-semiootika.ee, a website that introduces semiotics and was launched in autumn. It offers different definitions of semiotics that semioticians have used in their work. The Association also helped semiotics students to publish the art- and poetry-oriented journal *Semioculus* on paper for the first time. The journal seeks to provide a platform for students' creativity. Further information can be found at: <https://semioculus.tumblr.com>.

At the end of the year the new 15th volume of the ESA's journal *Acta Semiotica Estica* appeared. It included five papers, nine other pieces of writing in the "Perceptions" column, interviews with Peet Lepik and Jaan Kaplinski, and a translation of Susanne K. Langer's article "Why philosophy?". The journal is available at <http://www.semiootika.ee/acta/>.

The end of the year saw the new website of the Association finished, providing a more comprehensive overview of the Association's activities. A "Perceptions" section was added to the website as an expansion of the column of the same name in the *Acta*, granting semioticians a space for expressing their ideas and opinions in writing.

The Christmas Seminar and Party, held on 15 December in celebration of the 20th anniversary of the ESA, concluded the year. The topic of the seminar was bringing world-changing ideas to life, and presentations were given by Lemmit Kaplinski, who spoke about the founding and development of the Estonian Print and Paper Museum, and Faisal Sadegh, who shared his experience of leading the international Let's Do It event.

ESTONIAN SOCIETY OF HUMAN GENETICS

Associated with the Estonian Academy of Sciences since 5 April 2011

Founded in 2000

Membership: 161 active members and one legal entity (Asper Biogene)

Address: Eesti Inimesegeneetika Ühing, Riia 23, 51010 Tartu, ESTONIA

estshg@ebc.ee, www.estshg.ebc.ee

President: Maris Laan, Tel.: +372 737 5008, maris.laan@ut.ee

Secretary: Maarja Kõiv, Tel.: +372 522 9126, maarjakoiv@gmail.com

The Management Board of the Estonian Society of Human Genetics (EstSHG) includes the following people: President Maris Laan, Vice-President Mari Palgi and Members of the Board Neeme Tõnisson, Olev Kahre, Kai Muru, Lili Milani and Tõnis Org.

The annual EstSHG conference is the most important science forum of the field in Estonia and is held solely in the Estonian language. The long-standing success of the conference can be attributed to its broad and engaging programme, Estonian format, and affordable participation fee. The 20th anniversary conference of the EstSHG was held in the rooms of the Ugala Theatre, Viljandi from 22–23 November with a record number of attendees – nearly 300 people – making it the most popular conference in the history of the EstSHG. The programme was drawn up aiming for the highest level of research excellence. Speakers were chosen from among Estonian researchers who had issued top-level publications in recent years, PhD graduates whose research had stood out at the National Contest for University Students, and scientists leading outstanding applied research and development projects. The composition of the program and the choice of speakers were again based upon the principle that the selected speakers had not presented their results for a minimum of two years.

The first day of the conference programme was dedicated to human genetics and related molecular and clinical studies. The second day focused on studies of model organisms and drug development. The Board of the EstSHG introduced a number of innovations to the programme this year, thus making the conference even more representative and multifaceted. In the selection of speakers, focus was on researchers of Estonian origin living abroad. The Society wanted to invite them to present to home audience and introduce their research in order

to either form or renew networks of collaboration. This year's presenters included Terje Raudsepp (Texas A&M College of Veterinary Medicine & Biomedical Sciences, USA), Professor Toomas Kivisild (Cambridge University, United Kingdom) and Dr Priit Pruunsild (Heidelberg University, Germany). The expenses of inviting the latter two researchers were covered by targeted support from the Estonian Academy of Sciences.

The other speakers were: Professor Pärt Peterson (Institute of Biological and Translational Medicine, University of Tartu), Dr Lili Milani (Estonian Genome Centre, University of Tartu), Dr Kaur Alasoo (Institute of Computer Science, University of Tartu; PhD 2017 from the University of Cambridge), Professor Allen Kaasik (Institute of Biological and Translational Medicine, University of Tartu), Professor Pille Taba (Department of Neurology and Neurosurgery, Tartu University Hospital), Dr Mari Moora (Institute of Ecology and Earth Sciences, University of Tartu), Dr Margus Punab (Centre of Andrology, Tartu University Hospital), Dr Anti Vasemägi (Estonian University of Life Sciences), Dr Hanna Hõrak (Institute of Technology, University of Tartu), dr Mirja Palo (PhD 2017, Åbo Akademi University, Finland), Professor Uko Maran (Institute of Chemistry, University of Tartu), Member of the Academy Mart Ustav (Institute of Technology, University of Tartu; Icosagen Grupp). Four young researchers (Maris Alver, Andreas Christian Hade, Hindrek Teder and Ene Reiman) chosen on the basis of their submitted abstracts also presented at the conference.

During the conference, the society's award for Lifetime Achievement in Genetics 2018 was bestowed upon Member of the Academy Andres Metspalu, Professor of Biotechnology at the University of Tartu and founder of the Estonian Genome Centre.

In addition to our attempt to bring more Estonian researchers working abroad to present in Estonia, we also seek to promote the Estonian-speaking research environment. The annual conference of the Society can be considered one of the largest-scale high level research forums in Estonia, which is held solely in Estonian. What is more, in 2018 we joined the initiative proposed by the Ministry of Education and Research to systematically develop terminologies in science and other fields. With the support of the Ministry, the Society is in the process of setting up a Genetics, Genomics and Genetic Engineering Terminology Committee.

The Society is an active participant in the activities of the European Society of Human Genetics (ESHG) and a member of the association of National Human Genetic Societies (<https://www.eshg.org/index.php?id=nhgs>). Dozens of members of the Society participated in the annual conference of the ESHG held in Milan, Italy, in June 2018. President of the Society Maris Laan also represented

the EstSHG in the 14th Meeting of the European Human Genetics Societies in Milan on 17 June.

President of the EstSHG Maris Laan is also part of the programme committee of the ESHG annual conference from 2018–2021.

ESTONIAN CHEMICAL SOCIETY

Associated with the Estonian Academy of Sciences since 5 April 2011

Legal successor to the Estonian Chemical Society founded in 1919

Membership: 59 active members

Address: Akadeemia tee 15, 12618 Tallinn, ESTONIA

President: Margus Lopp, Tel.: +372 620 2808,

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The Estonian Chemical Society (ECS) unites chemists with the aim of promoting collaboration in the interest of developing the Estonian economy, chemistry research, chemical industry, environmental chemistry, chemistry education, scientific language of chemistry, sharing of information and other professional activities in the field of chemistry.

In the year 2018, the ECS had an active role in organising and carrying out the *Balticum Organicum Syntheticum* (BOS2018, www.boschem.eu). BOS2018 was the 10th conference in the series and was dedicated to the latest achievements in chemical synthesis and engineering from around the world. Over 300 researchers participated, representing every continent except for Antarctica, and including academic researchers from universities as well as creators of industrial technologies from private companies. The event that took place at the National Library in Tallinn from 1–4 July featured 18 plenary presentations. Presenters were exclusively the most renowned researchers in the field, including two Nobel Prize laureates – Robert H. Grubbs (California Institute of Technology, USA, Winner of the Nobel Prize in 2005) and Jean Marie Lehn via video (University of Strasbourg, France, Winner of the Nobel Prize in 1987). In addition, 127 poster presentations were given. The conference was officially opened by President of the Republic of Estonia Kersti Kaljulaid and President of the Estonian Academy of Sciences Tarmo Soomere.

The conference was preceded by a traditional brainstorming session Pre-BOS Round Table on the topic "Chemistry hand in hand with biology". The event took place from 28–30 June in Tartu and was organised in collaboration with the Centre of Excellence In Molecular

Cell Engineering, led by Professor Tanel Tenson. The Round Table provided plenary speakers (from the USA, Canada, United Kingdom, Sweden, Finland, etc.) and gave scientists from the University of Tartu and the Centre of Excellence (over 50 researchers in total) the opportunity to further deliberate issues related to chemistry and biology. New viewpoints emerged and discussions were held on topics such as sugar molecules as carriers of biological information in organisms, common ground between synthetic chemistry and synthetic biology, and the challenges that molecular biology poses to chemists.

The ECS plays an active role in the European Chemical Society (EuChemS), represented by Professor Rincken from the University of Tartu.

ESTONIAN SOCIETY FOR THE STUDY OF RELIGIONS

Associated with the Estonian Academy of Sciences since 16 June 2011

Founded in 2006

Membership: 65 active members, one honorary member, one correspondent member

Address: Ülikooli 16, 50090 Tartu, ESTONIA

www.eaus.ee

President: Madis Arukask, Tel.: +372 737 5227, madis.arukask@ut.ee

Academic Secretary: Piret Koosa, Tel.: +372 735 0414, piret.koosa@erm.ee

By uniting scholars who specialise in the study of religions in various fields of research, the Estonian Society for the Study of Religions (ESSR) is a member of leading umbrella organisations within the sphere: the International Association for the History of Religions (IAHR) and the European Association for the Study of Religions (EASR). The ESSR primarily operates in the form of conducting symposia and conferences. The society's activity mainly takes place at the University of Tartu. In 2018, all the symposia and meetings were held in Tartu.

The symposium "From St Petersburg to Pechory: On the content of orthodox pilgrimages" was held on 8 January. Georg Allik gave a presentation entitled "From the idea of pilgrimage to reality: Orthodox symbolism", followed by Anne Kukermann and Ingrid Mäsak's presentation "Pilgrims' impressions with photos". An open discussion followed.

At a symposium held on 6 February, Naatan Haamer gave a presentation on "How to nurture a soul whose owner does not believe in its existence?".

On 15 March, Anil Boro (Gauhati University, India) gave a lecture entitled "Indigenous Religion of the Bodos of Assam".

On 23 March, the Estonian Academic Ingrian Society, the ESSR and the Estonian Society of Church History jointly held a symposium where Varpu Myllyniemi (University of Helsinki, Finland) spoke on "Cooperation between Kindred Peoples in Ingria: Lutheran Estonians and Ingrian Finns in Late-19th Century and Early Soviet Decades".

On 27 March, Karénina Kollmar-Paulenz (University of Bern, Switzerland) gave a presentation on "How to use belief to overcome belief: Demons in the Tibetan Buddhist god-ritual".

On 8 June the symposium "Meaning fields of religion" was held. Jenna Supp-Montgomerie presented on "Resonances of Religion in Digital Secularism", Lea Altnurme on "Religion factory: How do you make a religion?", Amar Annus "On the formation of religious ideas through dreams", Ain Riistan on "Jesus' looks in the intersection of art, religion and science", Art Leete on "I believe, I do not believe: Komi bricolage in the backdrop of orthodox, atheism and animism", Marko Uibu on "Health, nature and religion in the practices of new spirituality and alternative medicine", Alar Kilp on "Medium is the message: Technological development, human resource management, religion becoming mundane" and Märt Läänemets on "By improving the quality of humans, we turn the world into a clean land: On the activities of Buddhist associations in modern-day Taiwan".

The symposium was followed by the General Assembly where the Board reported on the activities of the previous year and the financial report and the report on activities were approved.

On 14 December the Society held the Esotericism and the Society Conference. The plenary presentation was given by Marco Pasi (University of Amsterdam) on "Social and cultural aspects of esoteric sex". He was followed by Lea Altnurme who presented on "Modernist self-awareness in an overflow of esotericism", Indrek Linnuste on "Religious and spiritual crises in light of mental health", Liina Eek on "How orthodox is the Estonian-language Orthodox?", Helle Kaasik on "...I am alive thanks to Aya's help: The psychology of Estonian ayahuasca users", Age Kristel Kartau on "The import of Buddhist manual medicine to Estonia in the years 2001–2008", Elo Süld on "The esoterical religion of the Yazidis" and Helen Haas on "The saintly story of Hacı Bektaş

Veli”. Siim Lill concluded the conference with his presentation on “Esotericism meets politics: The example of Julius Evola”.

On 14 December the annual meeting of the Society was held, with the Board providing a review of activities of the Society in 2017. In connection with the termination of the election period of the Board, the new Board was elected. Madis Arukask was re-elected President and Piret Koosa, Katre Koppel, Indrek Peedu and Atko Remmel were elected members of the Board.

The Estonian Society for the Study of Religions and the University of Tartu are jointly organising the annual conference of the European Association for the Study of Religions which is to take place in Tartu in June 2019. The second half of 2018 was mostly dedicated to preparatory meetings for the large-scale conference, to creating the online platform, etc. Further information can be found at: <https://easr2019.org>.

ESTONIAN ECONOMIC ASSOCIATION

Associated with the Estonian Academy of Sciences since 16 June 2011

Founded in 1930

Re-established in 2002

Membership: 121 private persons and four legal entities

Address: Estonian Business School, Lauteri 3, 10114 Tallinn, ESTONIA

www.emselts.ee

<https://www.facebook.com/EMS-219560925131732/>

President: Meelis Kitsing, Tel.: +372 665 1348, meelis.kitsing@ebs.ee

Board members: Kaire Pöder, Tel.: +372 665 1348, kaire.poder@ebs.ee, Karmo Kroos, Tel.: +372 665 1349, karmo.kroos@ebs.ee

Honorary member: Professor Jüri Sepp, University of Tartu

The Estonian Economic Association (EEA), re-established in 2002, is a non-profit scientific society that brings together Estonian economists with the aim to promote the spread of modern economics and discussion on contemporary economic topics. The association contributes to improving the quality of education in economics and supports cooperation between institutions working in economic research and teaching. EEA supports the enhancement of the quality of doctoral dissertations and

their supervising and it promotes the seminars of Doctoral School in Economics and Innovation.

In 2018, the EEA continued its tradition of annual conferences, giving them a specific focus and involving more researchers outside of Estonia and specialists from different areas. The 13th annual conference of the Estonian Economic Association was held on 25–26 January in Tallinn and Toila and focused on institutional and educational economics.

The first keynote speech was given by Bengt Holmström, Professor at the Massachusetts Institute of Technology and laureate of the Nobel Prize for Economics. He spoke about performance-based remuneration from the perspective of contract theory. Finnish educational economist and Senior Researcher at the VATT Institute for Economic Research Mika Kortelainen gave the second keynote speech on the productivity of education systems.

The conference had renowned top-level researchers as presenters this year, which also resulted in heightened media interest in the EEA annual conference. The topics explored at the conference were later discussed in Äripäev, Eesti Päevaleht and other media outlets.

In the context of the General Assembly of the Association that took place with the conference, representatives of member organisations provided overviews of the previous year’s activities. Different workshops were also offered at the conference on topics such as the labour market, innovation and macroeconomics, among others. In addition to researchers from the USA and Finland, presentations were also given by researchers from the leading Estonian universities and research institutions.

An important part of the Association’s activities in 2018 were preparations for the Association’s 14th annual conference, which will take place in Pühajärve from 31 January to 1 February 2019. The opening presentation of the first conference day will be given by the Governor of the Bank of Estonia Ardo Hansson, and the keynote speaker is going to be Professor Gilles Saint-Paul (Paris School of Economics and New York University). The General Assembly of the Association will take place with the annual conference, where the new Board is also going to be elected. The leading role is assigned by rotation and will pass over to Tallinn University of Technology from the Estonian Business School, which has held it for three years.

The EMS research prize named after Professor Vello Vensel was once again awarded in 2018. The prize is meant for doctoral students who present their research at the international summer school organised as part of the Doctoral School in Economics and Innovation, and whose research work merits this particular award. The

Vello Vensel Doctoral Research Prize was awarded for the 6th time in 2018. The committee, comprising representatives of the University of Tartu, Tallinn University of Technology, Bank of Estonia and Estonian Business School, awarded the prize to Orsolya Soosaar, a doctoral student at the Department of Economics and Finance at Tallinn University of Technology.

ESTONIAN SOCIETY OF TOXICOLOGY

Associated with the Estonian Academy of Sciences since 31 May 2017

Founded in 1997

Membership: 64 active members

Address: Akadeemia 23, 12618 Tallinn, ESTONIA
www.kbfi.ee/ets

Chairman: Villem Aruoja, Tel.: +372 639 8368,
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Secretary: Angela Ivask, Tel.: +372 639 8361,
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The Board of the Estonian Society of Toxicology (ETS) includes Villem Aruoja (Chairman), Angela Ivask, Reet Pruul, Arvo Tuvikene, Anne Kahru and Mailis Laht. The Members of the Society are researchers and students from the University of Tartu, Tallinn University of Technology and the National Institute of Chemical Physics and Biophysics (NICPB), as well as occupational health physicians, employees of the ministries and their divisions or authorities dealing with environmental monitoring.

The goal of the ETS is to advance and promote toxicological research, training and general knowledge in toxicology. This involves cooperating with the toxicology societies of other countries, exchanging information among members, and organising scientific conferences, courses and trainings. ETS is committed to the sustainable management of Estonian natural resources and solving environmental protection related issues.

ETS has been a member of the Federation of European Toxicologists and European Societies of Toxicology (EUROTOX) since 1998 and of the International Union of Toxicology (IUTOX) since 2004.

In 2018, the main activities of the Society involved introducing toxicology research and training opportunities at the Congress of Toxicology in Developing Countries (CTDC10), as well as in Estonia by organising an Information Day on environmental toxicology.

The CTDC10 was held in Belgrade in April 2018, with the ETS being represented at the symposium on

antimicrobial coatings (the main organisers included Anne Kahru and Angela Ivask from the ETS), as well as at the Round Tables about the situation of women in toxicology research and about toxicology-related training and career opportunities for young people.

The Information Day held in Nelijärve was titled “Estonia’s competence in environmental toxicology: From scientists to the Estonian society” and took place on 1 June 2018 along with the General Assembly. In addition to members of the Society, participants included employees of the Ministry of the Environment, the Centre for Environmental Investments and the Health Board, but also some doctoral students from outside of the Society. Presentations were given by members of the Society and guest lecturers. Arvo Tuvikene (Estonian University of Life Sciences) talked about the assessment of water contamination on the basis of the damage to fish, Kaja Orupõld introduced waste studies, Villem Aruoja gave an overview of the competence of the NICPB environmental toxicology laboratory, Merrit Shanskiy’s (Estonian University of Life Sciences) presentation was on the stability of composts, Erik Teinmaa from the Estonian Environmental Research Centre spoke about research on outdoor air particle pollution, Kai Künnis (Tallinn University of Technology) addressed pharmaceutical pollution in the Baltic Sea and Ilona Oja Acik (Tallinn University of Technology) focused on new materials and their photocatalytic properties.

The ETS has regularly communicated information from the EUROTOX, IUTOX and other organisations to keep its members informed about the opportunities of professional development and events aimed at students. For instance, members of the Society Mariliis Sihtmäe and Uku Rooni joined the course organised by the Slovenian Society of Toxicology entitled “EUROTOX specialised toxicology course in regulatory toxicology” which took place from 5–9 November.

Members of the ETS Katre Juganson and Sandra Käosaar defended their doctoral theses. Both of them are researching environmental toxicology, namely the impact of nanoparticles on Protozoa and yeast cells. Katre Juganson’s doctoral thesis “Ecotoxicological Impacts of Industrially Relevant Engineered Nanomaterials: Effects on *Tetrahymena thermophila*” was awarded the First Prize at the National Contest for University Students. The question of environmental toxicology was brought to public attention not only through the successful doctoral theses, but also through radio and television interviews on microplast with members of the ETS. In addition, Member of the Board and long-term Chairman of the Society Anne Kahru was elected Member of the Academy in Ecotoxicology.

ESTONIAN ACADEMIC AGRICULTURAL SOCIETY

Associated with the Estonian Academy of Sciences since
6 March 2018

Founded in 1920

Membership: 224 active members, 29 honorary
members

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Secretary: Heli Kiiman, Tel.: +372 731 3454,
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Membership of the Estonian Academic Agricultural Society (AAS) primarily includes agricultural researchers with an academic degree (from veterinary to technical scientists). The main goal of the activities of the Society is to promote Estonian rural life and agriculture, especially agricultural sciences. The Society organises scientific conferences, symposia and study trips, develops international research links and participates in international projects when possible. Publishing activities are also important, as the AAS publishes a journal and other works. The work of the AAS is coordinated by a Board consisting of 13 members.

Five symposia featuring a total of nine presentations were held in 2018, touching upon topics such as breeding a meristem culture of potato, the impact of climate change on livestock farming, the impact of heavy machinery on soil compaction, etc.

A festive meeting dedicated to the centenary of the Republic of Estonia was held in the K.E. von Baer House on 19 February. Member of the Academy Jaak Järv was an invited guest and gave a celebratory speech.

The General Assembly of the Society took place on 6 April within the scientific conference Plant Pathology Today and Tomorrow. Upon the proposal by the Board, Senior Researcher at the Estonian Crop Research Institute Ants Bender was elected as Honorary Member of the AAS. From 5–6 May, the President of the Society participated in the 90 Years of Estonian Life Conference dedicated to the 90th birthday of President Arnold Rüütel, who is an honorary member of the AAS.

The Latvian association of agronomists invited a two-member delegation of the Board of the AAS to participate in a four-sided meeting of agricultural associations in Riga, which took place on 8 September. Representatives of four organisations talked about their activities and recent developments. Invitations to visit were exchanged.

The President of the AAS took part in the General Assembly of The Union of European Academies for Sciences applied to Agriculture, Food and Nature, held in Firenze, Italy, from 22–23 October 2018.

On 30 September, three presidents of the Society planted a Lembitu variety apple tree in the orchard in the middle of the Estonian University of Life Sciences campus.

On 26 November, a delegation of the Board of the AAS participated in a festive gathering dedicated to the 80th birthday of Honorary President Professor Emeritus Olev Saveli.

Three Board meetings were held during the year, with e-mail exchanges in between to discuss urgent matters (association agreement with the Estonian Academy of Sciences, membership application; organisation of the NJF Conference on Horticulture in 2019). The Board decided to set up two work groups to organise the centenary celebration of the AAS in 2020. The first is tasked with organising a visionary conference and the second with compiling a photo album. As per the decision of the Board, the two work groups will be led by the President and the editor-in-chief of the Journal, respectively.

The 29th volume of the official journal of the AAS *Agraarteadus* (Journal of Agricultural Sciences) was published in 2018 in two issues. In recent years, the Society has been focusing on ensuring the quality of articles published in the journal and changing the editing process to meet international standards. Since the journal accepts papers written in Estonian in addition to English articles, the Editorial Board also includes Estonians working in foreign research institutions in order to ensure the high quality of the articles. All published articles are assigned a DOI (Digital Object Identifier) index. As the most important achievement of the year 2018, it was officially confirmed that research articles published in *Agraarteadus* fulfilled the Elsevier requirements. On 16 November, a contract was signed to index the articles published in the journal in the SCOPUS® database.

A livestock farming terminology work group that operates at the AAS joined the Million+ Programme in support of the idea of compiling one million Estonian Wikipedia articles by 2020.

Since 2018, the AAS has also been using social media to communicate news and important information.

ESTONIAN ACADEMIC ORIENTAL SOCIETY

Associated with the Estonian Academy of Sciences since
12 June 2018

Founded in 1935 (re-established in 1988)

Membership: 68 active members, 6 honorary members,
29 corresponding members

Address: Ülikooli 18-226, 50090 Tartu, ESTONIA

www.eao.ee

President: Märt Läänemets, Tel.: +372 551 8847,
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Academic Secretary: Mart Tšernjuk, Tel.: +372 513
2660, mtsernjuk@gmail.com

The Estonian Academic Oriental Society (AOS) is an academic network connecting specialists on the Middle-East and Asia. The aim of the organisation is to provide relevant information on Middle-Eastern and Asian cultures in Estonia through research, translation, teaching and creative work done by the members. The Society publishes a regular yearbook *Idakiri* (Eastern Journal).

The highlight of 2018 was the organisation of the 30th Orientalism Days in Tartu on 17–18 March. This year's event was dedicated to the 30th anniversary of the re-establishment of the AOS and to the 80th anniversary of the birth of Linnart Mäll, leader of the re-establishment, long-term President and Honorary President of the Society. The two-day conference included 14 presentations and Sven Grünberg's memorial programme "Memories of Linnart Mäll in words and images". The agenda of the 30th Orientalism Days can be found here: <https://www.eao.ee/xxx-orientalistikapaevad/>. Orientalism Days have been celebrated since 1988, preceded by a tradition of the oriental club of the University of Tartu Students' Research Society to organise annual graduate colloquia, a tradition which lasted over ten years.

The beginning of summer saw the publication of the AOS yearbook *Idakiri 2017* that was presented in Tartu on 15 June. The yearbook has been published since 2006,

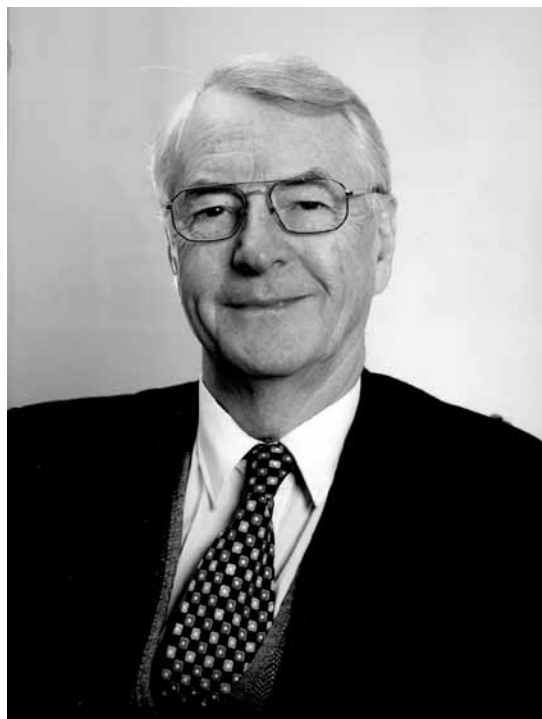
making this year's yearbook the tenth in line (the 2009/2010 and 2011/2012 were published as dual issues). *Idakiri 2017* contains ten voluminous papers by Estonian orientalists (Alari Allik, Alver Aria, Peeter Espak, Margit Juurikas, Viktor Korrovits, Tarmo Kulmar, Märt Läänemets, Üllar Peterson, and Vladimir Sazonov), including some very interesting materials from the perspective of cultural history – Uku Masing and Linnart Mäll's commented correspondence from the years 1963–1965, offering an insight into the communication and exchange of ideas between these two great men, teacher and student. The correspondence between Masing and Mäll was edited for print by Märt Läänemets. In line with tradition, the yearbook also offers an overview of Oriental-themed books published in Estonian in the past year. English summaries are supplied with all the papers. The editor-in-chief of *Idakiri* is the Honorary President of the AOS Tarmo Kulmar, and the Managing Editor is Indrek Ude.

The book *The Origins of Estonia-China Relations* was published by the AOS in November (authors Priit Rohtmets, Urmas Pappel and Tiit Kuuskmäe, edited by Märt Läänemets). The book is rich in historical photos and rare archive documents and is released in three languages (Estonian, Chinese, English). It gives an overview of the prelude to the relations between the two nations and the difficult process of forming diplomatic relations in the early 20th century. It talks about the birth of both republics in the 1920s, and special attention is paid on the life of the Estonian community in China before 1949. The foreword is written by former ambassador (2012–2016) to the Peoples' Republic of China Toomas Lukk who was one of the initiators of the idea of compiling this book. The book was officially presented at University of Tartu Art Museum on 13 December and in the Academy Hall in Tallinn on 14 December.

IN MEMORIAM

FOREIGN MEMBER OF THE ACADEMY CARL-OLOF JACOBSON

24/04/1929–4/06/2018



Carl-Olof Jacobson was born on 24 April 1929 in Ör, South West Sweden. In 1948 he graduated from the Secondary School in Vänersborg and proceeded to study at Uppsala University, which he graduated in 1952 obtaining the master's degree in Zoology. The following academic degrees too (1958 – Licentiate, 1964 – Doctor) were defended by Carl-Olof Jacobson at Uppsala University.

After obtaining the Doctor's degree Carl-Olof Jacobson continued his research career at Uppsala University, where he was on faculty for more than forty years (incl. in 1970–1989 as Professor in Zoo morphology), holding in 1977–1989 also the posts of Dean of the Department of Engineering and Natural Sciences and Member of the University Board. Carl-Olof Jacobson worked as Visiting Fellow with Wistar Biological Institute in Philadelphia (1967/1968) and, as Visiting Professor with Texas University in Austin in 1979. Since 1994 Carl-Olof Jacobson's academic activities continued as Professor Emeritus in the Department of Development and Genetics.

Carl-Olof Jacobson's main research areas were applied neurobiology and ecology of clean water. His activities in the area of science organisation, communication of science and promotion of scientific cooperation have been in the least of equal significance. He is also a highly appreciated lecturer at the Swedish Folk High School.

Carl-Olof Jacobson was a Member of the Royal Swedish Academy of Sciences since 1979. In 1989–1997

he was Secretary-General of the Royal Swedish Academy of Sciences, sitting also on the Board of Directors of the Nobel Foundation. During these years, he made a significant contribution to the development of scientific relations between the Baltics and Sweden (and the other Scandinavian countries), even before the restoration of Estonia's independence. It is also important to highlight his role in coordinating the international assessment of science in the Baltic States, and in particular the little-known fact that he was the direct initiator of the entire process.

Carl-Olof Jacobson was elected Foreign Member of the Estonian Academy of Sciences in Zoomorphology in 1995. He was also a member of the Royal Swedish Academy of Engineering Sciences, the Royal Society of Sciences (Uppsala), the Royal Society of Physiography (Lund), and the European Academy of Sciences, Arts and Letters (Academia Europaea). For many years, he was the Chairman of the Swedish Linné Society. He belonged to the American Association for Promotion of Science several professional associations like the International Society of Applied Biologists, etc.

In 2001 his long work in promotion of cooperation between Baltic and Nordic academies was acknowledged with the Medal of the Academies of the Baltic States.



MEMBER OF THE ACADEMY ENN MELLIKOV

1/04/1945–23/07/2018

Enn Mellikov was born on 1 April 1945 in Pärnu – a Southern Estonian town where his family had long established roots. It was also the town of his childhood and high school years. In 1963 Enn Mellikov graduated from Pärnu Secondary School No. 4 and proceeded to Tallinn University of Technology. He undertook a newly opened programme in technology of specialised materials for electronics, completing it in 1968.

After graduation Enn Mellikov proceeded to work at the university, where his first employment was with the Chair of Physical Chemistry. His research themes were involved in the chemistry and technology of radiation-sensitive materials. He defended his Candidate of Chemical Sciences (PhD) thesis at Sverdlovsk State University in 1977 and his Doctor of Sciences thesis at the Institute of Inorganic Chemistry, Ural Branch, USSR Academy of Sciences in 1988. He became one of the youngest Doctors of Sciences in Estonia of that time. Enn Mellikov continued his career path at Tallinn University of Technology through several positions: Head of the Laboratory of Optoelectronic Materials (1987–1992), Acting Professor and Head of the Chair of Semiconductor Materials Engineering (1992–1997), Head of the Centre of Competence in Materials Science (2001–2003), Director of the Department of Materials Science (2003–2014).

The Estonian Academy of Sciences elected Enn Mellikov to its membership in 2003.

The research themes addressed by Professor Mellikov are invariably associated with materials science. His studies targeting the design and development of novel materials for solar energy transformation into electrical energy have had a pioneering and boosting role across the entire globally influential sphere of renewable energy

and have laid the foundations to a corresponding school in Estonia. Enn Mellikov's state-of-the-art laboratory is the only one of its kind in the world that studies powdered materials as components of solar panels.

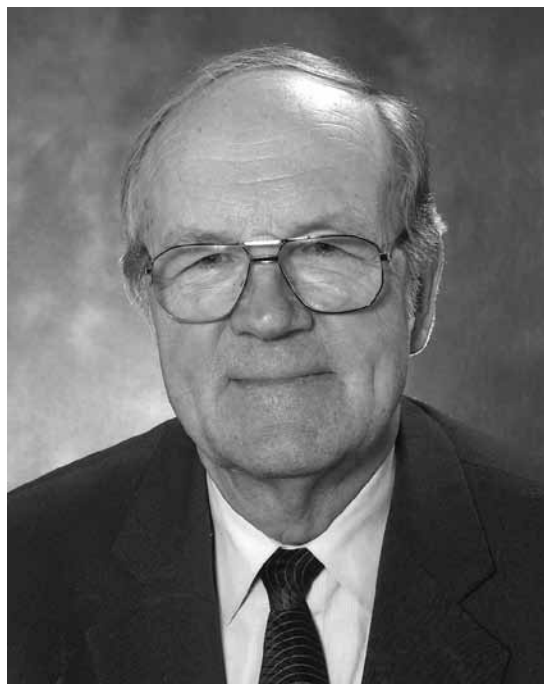
The original methods worked out by his team and their possible further application for manufacturing devices has led to major enhancements in comparison to the inefficient and expensive technologies that had been used up to that time. Their innovative solutions are covered by more than 60 patents. In 2007, Enn Mellikov initiated the opening of the Centre of Excellence in Solar Energy for Nordic Countries.

Enn Mellikov was renowned among colleagues both in Estonia and abroad for his valuable research, excellent organization skills, and his role in educating the next generations of young scientists. He took part in the work of several decision making bodies and programme committees of international conferences, represented Estonia in international organisations, worked as Principal Investigator and Steering Committee Member on multiple international and national R&D projects. He was a long-term member of the Board of the Estonian Academy of Sciences, member of the Council of the Estonian Science Foundation, member of the Evaluation Committee of the Estonian Research Council and of the National Science Prize Committee. Various MSc and Phd dissertations were defended under the supervision of Enn Mellikov.

He was acknowledged with the National Science Prize four times: Annual Award in Chemistry as a member of research team (1985), Annual Award in Natural Sciences and Engineering as Head of research team (1997), Annual Award in Engineering as Head of research team (2006), and Outstanding Lifetime Achievement Award in Research and Development (2013). In 2006 he was presented with the 4th class Order of the White Star.

MEMBER OF THE ACADEMY
MIHKEL VEIDERMA

27/12/1929–25/10/2018



Mihkel Veiderma was born on 27 December 1929 in Tallinn as the fifth child to the family of Aleksander Veiderma, a renowned figure in Estonian education and politics. He therefore spent his childhood in a school environment – in a girls' commerce gymnasium where the family's official residence was located. Veiderma started his education at J. Westholm Gymnasium but graduated from Tallinn Secondary Science School in 1948. He considered humanities at the University of Tartu as one of his further study options but opted for chemistry in the end and graduated from Tallinn University of Technology, Department of Chemistry in 1953. In 1972 he defended his doctoral thesis at the Research Institute of Fertilizers and Insectofungicides in Moscow on the topic "Research into processing obolus phosphorites into phosphor fertilisers and fodder phosphates". He was awarded Professorship in 1973. In 1975 he was elected Member of the Estonian Academy of Sciences in inorganic chemistry.

After graduation from the University, he worked for seven years at Maardu Chemical Combine (incl. 1956–1960 as Chief Engineer). Thereafter he proceeded to work at Tallinn University of Technology, first as Associate Professor at the Department of Chemical Technology, 1972–1997 as Professor and Head of the Department of Inorganic and Analytical Chemistry, 1978–1983 also as Dean of the Department of Chemistry and 1965–1992 as Scientific Supervisor of the Laboratory of Mineral Fertilisers. Since 1997 Mihkel Veiderma was Professor Emeritus. In 1988–1999 he was Vice-President of the Estonian Academy of Sciences, in 1999–2004 Secretary-General, and from 2004–2009 Member of the Board. In the period 1992–1994 Mihkel Veiderma was Director of the Office of the President of Estonia.

Mihkel Veiderma's scientific research was primarily related to the chemistry and technology of inorganic phosphor compositions. He has studied the composition of natural apatites, their properties and reactions, phase

transfers and thermal processes in phosphate containing systems. Meriting his attention were new technologies and areas of use, safe disposal and use of industrial waste. As long-term Chairman of the Academy's Energy Council, he was concerned with key problems relating to the use of Estonian mineral resources (phosphorite, oil shale) and energetics.

Mihkel Veiderma is the author or co-author of nearly 250 scientific articles, author, compiler or editor of 11 books and collections of articles, and co-author of 12 author certificates. He has been supervisor of 14 doctoral theses and Diploma papers. Among his many academic and professional acknowledgement, he valued most highly his Karl Ernst von Baer and Paul Kogerman memorial medals, having been named Honorary Member of the Estonian Chemical Society and the Estonian Naturalists' Society, Foreign Member of the Finnish Academies of Technology, Corresponding Member of the Finnish Chemical Society and Honorary Doctor of the Latvian Academy of Sciences. He was also member of the Academic Council of the President of the Republic, the Estonian Science Foundation, the Commission for Sustainable Development, and the Estonian-Finnish Energy Co-operation Commission.

In 1998 he was decorated with the 3rd class Order of the White Star. In 2001 for his long lasting work for promotion of co-operation between academies he was awarded the Medal of Academies of the Baltic States and in 2006 the National Science Prize and Outstanding Lifetime Achievement Award in Research and Development.

Beside his main work Mihkel Veiderma was keen on the history of Estonian science and education, politics, theatre and music of the 20th century.



MEMBER OF THE ACADEMY EVE OJA

10/10/1948–27/01/2019

Eve Oja was born on 10 October 1948 in Tallinn. She graduated from Tallinn Secondary School No. 1 (now Gustav Adolf Grammar School) with a silver medal and began her studies at the University of Tartu Faculty of Mathematics. After graduating with a diploma in applied mathematics in 1972, she enrolled in a doctoral programme and defended her physics and mathematics thesis entitled “Unconditional Schauder decompositions in locally convex spaces”.

1975 marked the beginning of Eve Oja’s career as an assistant in the Faculty of Mathematics and Computer Science, where she later became Senior Lecturer and Assistant Professor. In 1992 she became a full-time Professor of Functional Analysis. From 1977–1978 she was a lecturer at the National School of Engineers in Bamako, the Republic of Mali, and from 1980–1981 she carried out postdoctoral research at Aix-Marseilles University, France, funded by a scholarship from the Republic of France (she had completed intensive French studies at St. Petersburg State University (then Leningrad State University)).

Eve Oja was elected member of the Estonian Academy of Sciences in 2010.

Oja carried out varied, intensive and fruitful research at an international level. She was the founder of the school of Banach space theory in Estonia, with her main research fields being functional analysis and operator theory. She worked on basic research in relation to Banach space theory, developing innovative methods that lay on the frontiers of the field. Various renowned mathematicians have complemented their results on the basis of Oja’s research.

Member of the Academy Eve Oja conducted research in Belgium, Spain, England, Yugoslavia, Latvia, Norway, Poland, France, Sweden, Romania, Germany, Finland, the Czech Republic, Ukraine, Hungary, the USA, and Russia. She also coordinated presentations and consultations of renowned researchers from these countries at the University of Tartu. She was invited to present the results of her research at various international science forums in Europe and the USA.

The pedagogical activities of Eve Oja were equally successful. She taught all the core subjects of mathematical analysis, integral and measure theory and functional analysis, organised a number of special courses and seminars, and published a comprehensive textbook on functional analysis along with collections of tasks. She supervised 11 doctoral and 15 master’s theses, as well as a considerable number of bachelor’s dissertations.

Several roles of responsibility were held by Eve Oja in the administrative sphere as well. She had been editor-in-chief of the mathematics journal *Acta et Commentationes Universitatis Tartuensis de Mathematica* since 1998 and was Head of the Estonian Doctoral School in Mathematics and Statistics from 2009–2015. She was Head of the Institute of Pure Mathematics at the University of Tartu and Member of the Estonian National Science Prize Committee, as well as being a member of numerous organising committees of science conferences.

Work done by Eve Oja was recognised with the Soros Prize of the International Science Foundation (1993), and she received the Estonian National Science Prize twice (in 2001 and in 2014).

FINANCIAL ACTIVITIES

The budget of the Estonian Academy of Sciences for 2018 and its execution (EUR)

INCOME	BUDGET	EXECUTION
ALLOCATIONS TO THE ACADEMY FROM THE STATE BUDGET	1 460 000	1 460 000
For basic activities of the Academy, incl.	1 038 948	1 038 948
For publication of books	225 000	225 000
For Remuneration to Members of the Academy	293 090	293 090
For Grants of Academy Research Professors	100 662	100 662
For bestowing science awards	27 300	27 300
OTHER REVENUE	118 100	118 861
Targeted allocations from the Ministry of Education and Research, incl.	42 800	42 800
For membership fees to international science organisations	42 800	42 800
Receipts from letting the premises	26 000	26 868
Receipts for publishing scientific journals	23 300	23 334
From sale of printed matter (Academy Publishers)	26 000	25 859
ALLOCATIONS TO UNDER AND TUGLAS LITERATURE CENTRE	442 387	441 406
Through the Ministry of Education and Research, incl.	337 386	337 387
Targeted funding of research	148 200	148 200
For infrastructure expenses	41 111	41 111
Basic funding	103 830	103 830
For fulfilment of the state programme	44 170	44 170
For repayment of study loan	76	76
Targeted allocations	103 000	101 902
From sale of publications	2 000	2 117
TOTAL INCOME	2 020 487	2 020 267

EXPENDITURES	BUDGET	EXECUTION
GENERAL BREAKDOWN		
Main activities of the Academy (through Academy Office)	781 548	765 524
Estonian Academy Publishers	251 000	246 399
Remuneration to Members of the Academy	293 090	293 090
Grants of Academy Research Professors	100 662	100 662
Research paper prizes for university students	6 000	5 498
Allocations to the scientific and learned societies	52 200	51 850
Estonian Academy of Sciences 80 / Republic of Estonia 100	23 500	22 404
Membership fees to international science organisations	42 800	32 839
Activities of the National Science Prize Committee	27 300	27 300
Under and Tuglas Literature Centre	442 387	441 406
TOTAL EXPENDITURES	2 020 487	1 986 972
DETAILED BREAKDOWN OF EXPENDITURES MAIN ACTIVITIES OF THE ACADEMY (THROUGH ACADEMY OFFICE)		
Wages (incl. social tax and unemployment insurance premium)	366 600	362 433
Office expenses	33 500	32 741
Maintenance expenses of registered immovable (incl. routine repairs)	222 098	220 535
Acquisitions	19 000	18 212
Transport expenses	5 500	4 910
Travel and subsistence	21 500	19 276
Expenditures of organising events	33 500	32 692
Popularisation of science expenditures	7 500	6 676
Estonian Young Academy expenditures	5 500	4 363
Training expenses	500	445
Expenses of commissions and divisions	6 350	6 060
Scientific exchange programme expenditures	20 000	19 976
Legal, accounting and auditing services	3 000	2 982
Science Advisory System's expenditures	11 000	9 428
Printing and other expenses	26 000	24 796
TOTAL EXPENDITURES OF MAIN ACTIVITIES	781 548	765 524

ESTONIAN ACADEMY PUBLISHERS		
Wages (incl. social tax and unemployment insurance premium)	209 500	208 585
Administration expenses	23 500	22 350
Printing expenses	12 500	10 423
Acquisitions	5 500	5 041
TOTAL EXPENDITURES OF THE PUBLISHERS	251 000	246 399
UNDER AND TUGLAS LITERATURE CENTRE		
Wages (incl. social tax and unemployment insurance premium)	332 400	332 173
Research and administration expenses	109 911	109 157
Repayment of study loan	76	76
TOTAL EXPENDITURES OF LITERATURE CENTRE	442 387	441 406

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