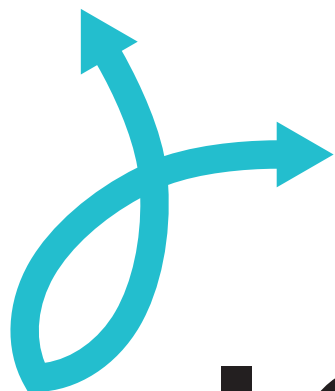


Annual Report 2014



**ICE-TCS**

Icelandic Centre of Excellence  
in Theoretical Computer Science

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## 1 Introduction

The Icelandic Centre of Excellence in Theoretical Computer Science (ICE-TCS) celebrated its ninth birthday on 29 April 2014. This ninth annual report is meant to give the (Theoretical) Computer Science community in Iceland and elsewhere, our sponsors and funding agencies, and our scientific advisory board an overview of the activities of the centre in 2014. It will also allow us to evaluate our achievements vis-a-vis our original aims in setting up this centre, and to set ourselves goals for the future.

For the sake of completeness, we remind our readers that the aim of the centre is to establish in Iceland important areas of basic research in the mathematical foundations of Computer Science, notably Algorithmic Program Verification, Mathematical Logic in Computer Science, Models and Logics for Reactive Systems, Semantics of Computation and Systems Biology, alongside existing activities in Algorithmics, Bioinformatics, Applied and Discrete Mathematics and Machine Learning.

ICE-TCS aims at exploiting the available scientific strength in order to

- focus the research efforts, and establish synergies amongst the active researchers in Iceland,
- attract outstanding researchers in Theoretical Computer Science to Iceland for short- or long-term visits leading to collaborations with local researchers and to improvements in the Icelandic research environment,
- organize international conferences and workshops in Theoretical Computer Science in Iceland to put the country firmly on the map as a recognized conference location for high quality events in the field, and
- attract young, outstanding students from Iceland to this research area.

The research centre initially started as a collaboration between the Department of Computer Science, Faculty of Engineering, University of Iceland, and the School of Computer Science, Reykjavik University. From 2011 to 2013, the centre was based solely at Reykjavik University. In November 2013, Páll Melsted (University of Iceland and Decode Genetics) joined the centre, thereby restoring some of the original links with the University of Iceland. Moreover, ICE-TCS still has some affiliated members from the University of Iceland. However, it is fair to say that all the activities of the centre take place at Reykjavik University.

Further information is available from the centre's web page at:

<http://www.icetcs.ru.is>.

## 2 Executive Summary and Highlights for the Reporting Period

The calendar year 2014 has been an active one for ICE-TCS, both nationally and internationally. The following subsections survey briefly what the centre has achieved in the reporting period.

### Research Highlights

At the time of writing, according to our records that are available at

<http://www.icetcs.ru.is/publications.pdf>,

ICE-TCS members have a total of 435 publications since the establishment of the centre: two books, 28 edited volumes, six book chapters, 210 journal

papers, 182 conference and workshop papers and seven abstracts in peer-reviewed ISI-indexed journals. By way of comparison, the overall number of publications was 297 at the time of writing our annual report for 2010, 339 for 2011, 360 for 2012 and 403 for 2013.

The centre still has substantially more journal publications than conference publications. However, the difference between the two figures has been slowly decreasing in the last few years: it is now 28, and was 39 in our report for 2013, 43 in our report for 2012 and 45 in 2011. We expect that this trend will continue in the coming years, but we will strive to continue publishing in journals a substantial percentage of our scientific work.

ICE-TCS still contributes four out of the five Icelandic entries to the list of [DBLP most prolific authors](#).

Below, we limit ourselves to pointing out a few highlights of the research work carried out within the centre in the reporting period.

- The algorithmics group continued its work on algorithms for wireless networks and on their theoretical and experimental analysis.
- The bioinformatics group spent the year on developing algorithms for finding genetic variants.
- The concurrency group worked on an expressiveness classification for Halpern-Shoham Logic and on rule formats for structural operational semantics.
- The discrete mathematics group worked on the study of permutation patterns and on algorithms for discovering structure in sets of permutations.
- The formal methods for software engineering group worked on the development of a probabilistic extension of the (Timed) Rebeca language and on its application to case studies.

## Events

During 2014, ICE-TCS members organized a large number of scientific events, both in Iceland and abroad.

ICE-TCS continued the Pearls of Computation seminar series that was started in January 2013. The talks in the Pearls of Computation series focus on presenting the life and work of some of the recipients of the ACM Turing Award or some other major award related to computer science in an accessible way. The Pearls of Computation talks at Reykjavik University are

organized in collaboration with the School of Computer Science at Reykjavik University, CADIA (Center for Analysis and Design of Intelligent Agents), CRESS (Center on Research in Engineering Software Systems), the Icelandic Mathematical Society, IIIM (Icelandic Institute for Intelligent Machines) and the Mathematics Group at Reykjavik University.

On Friday, 22 August 2014, ICE-TCS held the tenth edition of its annual Theory day, which featured as a special guest Erik Demaine (MIT), who delivered a public talk as well as a more technical talk during the Theory Day, as well as talks by Marjan Sirjani and ICE-TCS postdoctoral researcher Christian Konrad.

ICE-TCS members organized two international workshops, the Theory Day 2014 and one public talk. Of special note is the special half-year on *Graphs, Hypergraphs, and Computing* that Magnus Halldorsson, Carsten Thomassen, Andrzej Rucinski and Klas Markstroem organized at Institut Mittag-Leffler in Stockholm.

In addition, members of ICE-TCS have been invited speakers at international conferences and workshops, and have been honoured with recognitions related to their research work and service to the research community. Here we limit ourselves to mentioning the following recognitions to ICE-TCS members.

- Anna Ingolfsdottir was an invited speaker at the 26th Nordic Workshop on Programming Theory, NWPT '14, Halmstad University, Sweden.
- Dario Della Monica delivered a tutorial at ECAI 2014 entitled *Temporal Representation and Reasoning in Interval Temporal Logics*. The tutorial was given jointly with Angelo Montanari and Pietro Sala.
- Magnus M. Halldorsson received an ACM Recognition of Service Award at PODC 2014.
- Luca Aceto was elected as a member of the Informatics section of the Academia Europaea, the Academy of Europe.
- Luca Aceto was re-elected president of the European Association for Theoretical Computer Science for a second two-year term.

Below we list the other main events in reverse chronological order. See

<http://www.icetcs.ru.is/events.html>

for more details.

- 23-24 October 2014: Anna Ingolfsdottir was in the evaluation panel for the degree programmes in Computer Science at the University of Aarhus and the University of Copenhagen.
- 15-16 October 2014: Together with Ilaria Castellani and Rocco De Nicola, Luca Aceto and Anna Ingolfsdottir organized a two-day workshop in honour of Matthew Hennessy's 65th birthday. The workshop was held at IMT Lucca, Italy.
- Monday, 22 September 2014: Alvaro Garcia Perez joined the concurrency group within ICE-TCS as a post-doctoral researcher for two years.
- Wednesday, 27 August 2014: Vignir rñ Gumundsson defended his MSc thesis, which was co-supervised by Luca Aceto and Mikael Lindvall (Fraunhofer Center for Experimental Software Engineering, USA).
- 25-29 August 2014: Mikael Lindvall (Fraunhofer Center for Experimental Software Engineering, USA) visited ICE-TCS at Reykjavik University. The hosts for his visit were Luca Aceto and Ingolfsdottir.
- Friday, 22 August 2014: The 10th ICE-TCS Theory Day was held on this day from 2pm till 4pm in room M1.04. As a special guest, we had Erik Demaine (MIT), who delivered a public talk as well as a more technical talk during the Theory Day.
- Thursday, 21 August 2014: ICE-TCS, the School of Computer Science at Reykjavik University and the Icelandic Academy of Sciences jointly organized a workshop on Art and Science at Reykjavik University. The event featured a public talk by Erik Demaine (MIT) as well as presentations by Kjartan Emilsson (CCP) and Anna Hrund Msdttir.
- 20-27 August 2014: Erik Demaine (MIT) visited ICE-TCS at Reykjavik University. The hosts for is stay were Luca Aceto, Magnus M. Halldorsson and Anna Ingolfsdottir.
- Friday, 11 July 2014: Tigran Tonoyan joined ICE-TCS as a postdoctoral researcher, working with Magnus M. Halldorsson.
- 15 July 2014: Magnus M. Halldorsson organized the [Fifth Workshop on Realistic models for Algorithms in Wireless Networks \(WRAWN\)](#) in Paris, France. The workshop was co-located with PODC 2014.

- Wednesday, 2 July 2014: Luca Aceto was a member of the Executive Committee and of the Awards Committee of the ACM Special Interest Group on Logic and Computation (SIGLOG).
- 25-29 May 2014: The paper *First Steps towards Automated Synthesis of Tableau Systems for Interval Temporal Logics* by Dario Della Monica, Angelo Montanari, Guido Sciavicco and Dmitry Tishkovsky received the best paper award at The Fifth International Conference on Computational Logics, Algebras, Programming, Tools, and Benchmarking (COMPUTATION TOOLS 2014).
- Wednesday, 14 May 2014: Sigrur Lna Viarsdttir defended her MSc thesis entitled *Isomorphisms between consecutive pattern classes*. Lina's thesis was supervised by Henning Arnar lfarsson (ICE-TCS). The members of the evaluation Committee were Anders Claesson (Senior Lecturer at Strathclyde University) and Mike Atkinson (Professor Emiritus, University of Otago.)
- Monday, 17 February 2014: Magnus M. Halldorsson accepted to become Associate Editor for the journal Discrete Optimization.
- 17-19 March 2014: Adrian Francalanza (University of Malta) delivered a five-hour mini-course on Fundamentals of Monitors and Runtime Verification.
- Monday, 10 February 2014: The project *Formal Methods for the Development and Evaluation of Sustainable Systems* has been approved for funding under the Programme NILS Science and Sustainability (Abel - Coordinated Mobility for Researchers) as part of the research within Priority Sectors Programme of the EEA Grants Framework. The project is a collaboration between Reykjavik University and Universidad Complutense de Madrid, and is led by Luca Aceto and Anna Ingolfssdottir (ICE-TCS) and David de Frutos Escrig (UCM). The total funding is 100,050 for 2014-2015.
- 27-31 January 2014: Guy Even, Magnus M. Halldorsson, Yvonne-Ann Pignolet and Christian Scheider are organizers of a Dagstuhl workshop on "Algorithms for Wireless Communication".
- Thursday, 16 January 2014: ICE-TCS researchers have been awarded two of the nine project grants in Engineering, Technical Science and Physical Sciences for 2014 of the Icelandic Research Fund. The funded projects are:

- Finding structure in sets of permutations (Henning A. Ulfarsson PI; Michael H. Albert, Anders Karl Claesson co-proposers) and
  - Nominal Structural Operational Semantics (Luca Aceto, PI; Anna Ingolfsdottir, MohammadReza Mousavi and Davide Sangiorgi co-proposers).
- 14 January-14 May 2014: Magns Halldrsson, Carsten Thomassen, Andrzej Rucinski and Klas Markstroem organized a special half-year on Graphs, Hypergraphs, and Computing at Institut Mittag-Leffler in Stockholm.

The ICE-TCS Pearls of Computation Events, in chronological order, are listed below.

- Friday, 31 January 2014: Ymir Vigfusson delivers a Pearls of Computation on Jon Kleinberg’s work, entitled *It’s a small world: why you are connected to anyone on the planet through only a handful of people.*
- Friday, 21 February 2014: Marjan Sirjani delivered a Pearls of Computation talk, focused on Edmund Clarke’s work. The talk, which was entitled *Edmund Clarke: Sharing a Turing Award for Model Checking.*
- Friday, 14 March 2014: Hannes Hgni Vilhjmsson delivered a Pearls of Computation talk. The talk, which was entitled *The Ultimate Display: Imagining and Inventing Computer Graphics Polygon by Polygon*, focused on Ivan Sutherland’s work.
- Friday, 4 April 2014: Bjrn . Jonsson delivered a Pearls of Computation talk on Jim Gray’s work, entitled *Lost at sea: From Jim Grays first transaction to his final.*
- Friday, 12 September 2014: Magnus M. Halldorsson delivered a Pearls of Computation talk, entitled *This Year’s Turing Award*, focusing on the work of Leslie Lamport.
- Friday, 3 October 2014: David Thue delivered a Pearls of Computation talk, entitled *A Turing Machine in Conway’s Game of Life*, was devoted to John H. Conway and his Game of Life.
- Friday, 7 November 2014: Luca Aceto delivered a Pearls of Computation talk, entitled *Tony Hoare: From Quicksort to a billion-dollar mistake*, was devoted to the work of Tony Hoare.



The posters for the talks and further information, as well as links to audio and slides for most of the talks, are available here

<http://www.icetcs.ru.is/poco.html>

As in previous years, ‘regular’ events, such as talks in our seminar series, have been advertised locally and on our mailing lists. Events that are appealing to a general audience have also been advertised in the local newspapers, and on the mailing lists of Reykjavik University as a whole, of the mathematics society and of the computer science society. In all cases, ICE-TCS events have been a large fraction (if not the majority) of advertised events. In fact, it is fair to say that the ICE-TCS Research Seminar series continues to be the only regular seminar series in Computer Science in Iceland, and one of the very few seminar series in the country that have more than a handful of talks each year. At the time of writing, ICE-TCS has organized and hosted over 250 seminars. During the reporting period, the **ICE-TCS Research Seminar series** hosted 20 seminars, not counting the talks delivered as part of the above-mentioned events.

## Networking

During the reporting period, a prime opportunity for networking with our research community was the semester-long programme on *Graphs, Hypergraphs, and Computing* that Magnús M. Halldórsson co-organized at Institut Mittag-Leffler in Stockholm. Moreover, ICE-TCS has strengthened its ties with international PhD schools such as IMT Lucca, Italy, and the newly established Gran Sasso Science Institute in L’Aquila, Italy, where Luca Aceto serves as a member of committee for the PhD programme in Computer Science.

Moreover, Luca Aceto and Anna Ingólfssdóttir successfully obtained EEA grants to fund research cooperation with Universidad Complutense de Madrid, Spain, and the University of Szeged, Hungary. That funding will support visits by Spanish and Hungarian researchers to ICE-TCS and stays abroad by ICE-TCS members.

ICE-TCS researchers continue to maintain strong ties with the international research community and co-author a substantial number of papers with foreign colleagues.

Cooperation with industrial research centres continues in the field of bioinformatics, with Bjarni V. Halldórsson spending most of his time at DeCode Genetics.

## Outreach

One of the goals of the centre is to foster an appreciation of discrete mathematics and theoretical computer science within a general scientifically-minded public and to attract students to these fields.

Some educational initiatives during the reporting period were aimed at BSc. and MSc. students. In particular, ICE-TCS members continue to play a major role in the Bachelor program in Discrete Mathematics and Computer Science at Reykjavik University. The prime movers behind this new study program are Anna Ingólfssdóttir and Henning Úlfarsson. The program continues to attract a small number of students, but many of those are talented and motivated. To wit, the vast majority of the students in the HERE

As an alternative way of attracting more theoretically-minded students to discrete mathematics and theoretical computer science, we have also designed an ‘emphasis line’ in theoretical computer science as part of the BSc. degree in computer science at Reykjavik University.

Moreover, ICE-TCS members continue to play a leading role in the design and running of novel courses such as *Problem Solving* for first-year students in Computer Science, *Effective Programming and Problem Solving* for BSc. students, *Graph Theory Theory* for BSc. students, *Modelling Real-time Systems* for BSc. students and *Logic in Computer Science* for third-year BSc. students and MSc. students, amongst others.

ICE-TCS events have managed to attract a sizable attendance. Beyond members of the centre, nearly every meeting is attended by some researcher from fields with areas of contact with theoretical computer science. We also continue to host a small number of talks by researchers from sister fields like mathematics, physics and engineering, with the aim to explore possible synergies between their work and the research carried out within the centre. As mentioned above, ICE-TCS has strengthened its connections with the Icelandic Mathematical Society. In particular, two members of ICE-TCS are on the board of the Icelandic Mathematical Society.

ICE-TCS research continues to involve students and other young researchers. The number of students affiliated with the centre is still small, but will grow further in 2014. During the reporting period, members of ICE-TCS have supervised four MSc. students and five PhD. students (four in computer science and one in bioinformatics).

### 3 Current Members and Their Research Areas

ICE-TCS has now nine permanent members (nine at Reykjavik University and one at the University of Iceland) and two affiliated members at the University of Iceland. The present members of the centre are: Luca Aceto (Scientific Co-director), Eyjólfur Ingi Ásgeirsson, Yngvi Björnsson, Bjarni V. Halldórsson, Magnús M. Halldórsson (Scientific Director), Anna Ingólfssdóttir (Scientific Co-director), Páll Melsted, Marjan Sirjani and Henning Úlfarsson. During the reporting period, we lost Ýmir Vigfússon, who took up a tenure-track assistant professorship at Emory University, USA.

In addition, at the time of writing, the centre hosts five postdoctoral researchers: Dario Della Monica (temporal logics, mentored by Luca Aceto and Anna Ingólfssdóttir), Ignacio Fabregas (concurrency theory, mentored by Luca Aceto and Anna Ingólfssdóttir), Alvaro Garcia-Perez (semantics of programming languages, mentored by Luca Aceto and Anna Ingólfssdóttir), Christian Konrad (design and the analysis of algorithms, mentored by Magnús M. Halldórsson) and Tigran Tonoyan (design and the analysis of algorithms, mentored by Magnús M. Halldórsson).

During 2014, the centre had four PhD. students (three in Computer Science and one in Bioinformatics). All those students are from outside Iceland. Moreover, ICE-TCS hosted three PhD students from foreign universities in 2014 for stays lasting from four weeks to two months.

At present, the members of ICE-TCS carry out research in the following main areas of Theoretical Computer Science and Discrete Mathematics: Algorithms and Complexity, Bioinformatics, Combinatorics, Computer-aided Verification, Concurrency Theory, Formal Methods in Software Engineering, Machine Learning, Search Methods in Artificial Intelligence and Structural Operational Semantics. With the recent addition of Páll Melsted, ICE-TCS has further strengthened its research profile in algorithmics and bioinformatics.

**Algorithms group** The majority of recent efforts of the algorithms group has been within a subgroup on wireless networking. That subgroup has included Magnús M. Halldórsson, Eyjólfur I. Ásgeirsson, Henning Úlfarsson, Christian Konrad, Tigran Tonoyan and Marijke Bodlaender. Additionally, Sverrir Ólafsson (from RU School of Science and Engineering and Business) has collaborated with the group. The main research effort has been on giving efficient and effective algorithms for link scheduling and capacity in generic wireless networks. More recently, studies have included connectivity and aggregation capacity, as well as connections with game theory and stability

of networks.

Other efforts on algorithms included streaming algorithms and online algorithms motivated by distributed computing.

**Bioinformatics group** The bioinformatics group developed discrete optimization algorithms, algorithms for DNA sequence variant detection and classification algorithms for clinical decision support systems for osteoporosis and autoimmune diseases. The group further contributed to the analysis of human and zebrafish genetics datasets.

**Concurrency theory group** The research efforts within the concurrency theory group have mainly focused on negative and positive results in the equational logic of process algebras, on the meta-theory of structural operational semantics, with emphasis on rule formats for guaranteeing the validity of certain algebraic properties of processes, and on modal characterizations of process semantics. Moreover, the group has joined an ongoing research effort aimed at obtaining a complete classification of the expressiveness of fragments of Halpern-Shoham logic over various classes of linear orders.

**General game playing group** The focal point of this research group continues to be on general game playing, that is, in building intelligent game-playing agents capable of autonomously learning to play a wide variety of games at an expert level. The work over the past year focussed mostly on developing efficient algorithms for online learning of search-control for simulation-based search.

**Software engineering group** The software engineering group has focused on the further development of the theory and applications of the actor-based language Timed Rebeca, and of its associated tool suite. In particular, the group worked on a variety of case studies related to the modelling and analysis of timed asynchronous systems using Timed Rebeca and its probabilistic extension.

## 4 Funding

Despite the increasingly hard competition and the decrease in the available funding, ICE-TCS researchers continue to be fairly successful in obtaining grants from the Icelandic Research Fund. In the rounds of applications for

projects starting in 2014, ICE-TCS researchers received funding from several sources.

- Henning Úlfarsson obtained a three-year project grant from the Icelandic Research Fund for the project *Finding structure in sets of permutations*.
- Luca Aceto and Anna Ingólfssdóttir obtained a three-year project grant from the Icelandic Research Fund for the project *Nominal Structural Operational Semantics*.
- Luca Aceto and Anna Ingólfssdóttir obtained funding for the project *Formal Methods for the Development and Evaluation of Sustainable Systems* from the Programme NILS Science and Sustainability (Abel—Coordinated Mobility for Researchers) as part of the Priority Sectors Programme of the EEA Grants Framework. The project is a collaboration between Reykjavik University and Universidad Complutense de Madrid. The total funding is 100,050 euros for the period 2014–2015.
- Luca Aceto was co-proposer for the project *Effective Model-Based Testing of Concurrent System (EFFEMBAC)*, funded by the Swedish Science Foundation (VR) for the period 2014–2019. The total funding is 6,629K SEK (roughly 719,000 euros) for the period 2014–2019.

We remark that these grants, however, can only be used to support project specific activities, and *not* for activities related to the centre as such. Whatever success ICE-TCS might have had so far has therefore been achieved with minimal financial support for centre-building.

We believe that the quantity and quality of the centre’s activities, and its impact on research and education in computer science in Iceland, could be increased substantially if ICE-TCS had more funding.

## 5 Activities in 2014

### 5.1 Guests

During the reporting period, we received 14 guests from foreign institutions for short stays. These are listed in Table 1 in reverse chronological order. All the guests delivered seminars and/or contributed (mini-)courses organized by the centre.

Georgiana Caltais (ETH Zurich, CH). Period: 21–25 November 2014.  
Matthew Macaulay (Clemson University, USA). Period: 20–24 November 2014.  
Mikael Lindvall (Fraunhofer Center for Experimental Software Engineering, USA).  
Period: 25–29 August 2014.  
Erik Demaine (MIT). Period: 20–27 August 2014.  
Alexander Guterman (Moscow State University, Russia). Period: 7–11 July 2014.  
Marc Renault (LIAFA, Universite Paris Diderot - Paris 7, France). Period: 11–13  
June 2014.  
Maria Martos-Salgado (Universidad Complutense Madrid, Spain). Period: 9 May–  
19 June and 15 September–3 November 2014.  
Fernando Rosa Velardo (Universidad Complutense Madrid, Spain). Period: 9–24  
May 2014.  
Ignacio Fabregas Alfaro (Universidad Complutense Madrid, Spain). Period: 4 April  
2014–31 March 2016.  
Alvaro Garcia Perez (IMDEA Software Institute and Universidad Politecnica de  
Madrid, Spain). Period: 24–27 April 2014.  
David Romero Hernandez (Universidad Complutense Madrid, Spain). Period: 4–30  
April 2014.  
Adrian Francalanza (University of Malta). Period: 17–21 March 2014.  
Matteo Cimini (LIX, Ecole Polytechnique, Paris, France). Period: 17–21 February  
2014.  
Yusuke Aoki (Tohoku University, Japan). Period: December 2013–January 2014.

Table 1: ICE-TCS Guests in 2014

## 5.2 Organization of Conferences, Symposia and Workshops

Members of the centre have served as organizers and PC members for a large number of international events. Here we limit ourselves to mentioning some of the highlights in 2014 in reverse chronological order.

- 15–16 October 2014: Together with Ilaria Castellani and Rocco De Nicola, Luca Aceto and Anna Ingolfssdottir organized a **two-day workshop in honour of Matthew Hennessy’s 65th birthday**. The workshop was held at IMT Lucca, Italy.
- 15 July 2014: Magnús M. Halldórsson organized the **Fifth Workshop on Realistic models for Algorithms in Wireless Networks (WRAWN)** in Paris, France. The workshop was co-located with PODC 2014.
- 27–31 January 2014: Guy Even, Magnús M. Halldórsson, Yvonne-Ann Pignolet and Christian Scheider organized a Dagstuhl workshop on “Algorithms for Wireless Communication”.
- 14 January–14 May 2014: Magnús M. Halldórsson, Carsten Thomassen, Andrzej Rucinski and Klas Markstroem organized a special half-year on “Graphs, Hypergraphs, and Computing” at Institut Mittag-Leffler in Stockholm.

## 5.3 Service and Honours

The reporting year has been rich of recognitions for ICE-TCS members. Amongst other things, we limit ourselves to mentioning the following highlights.

- Magnús M. Halldórsson has received an ACM Recognition of Service Award at PODC 2014.
- Magnús M. Halldórsson has become Associate Editor for the journal **Discrete Optimization**, Elsevier.
- Anna Ingolfssdottir has served on the evaluation panel for the degree programmes in Computer Science at the University of Aarhus and the University of Copenhagen.
- Anna Ingolfssdottir was an invited speaker at the **26th Nordic Workshop on Programming Theory, NWPT ’14**, Halmstad University, Sweden.

- The paper *First Steps towards Automated Synthesis of Tableau Systems for Interval Temporal Logics* by Dario Della Monica, Angelo Montanari, Guido Sciavicco and Dmitry Tishkovsky has received the best paper award at the Fifth International Conference on Computational Logics, Algebras, Programming, Tools, and Benchmarking (COMPUTATION TOOLS 2014).
- Luca Aceto has been re-elected president of the [European Association for Theoretical Computer Science](#) for a second two-year term.
- Luca Aceto has been elected as a member of the Informatics section of the [Academia Europaea](#), the Academy of Europe.
- Luca Aceto has become a member of the Executive Committee and of the Awards Committee of the [ACM Special Interest Group on Logic and Computation \(SIGLOG\)](#).

Members of ICE-TCS participate in the life of the international research community in Theoretical Computer Science at large. For instance, they hold positions in the steering committee of conferences and professional organizations, and act as (guest) editors of volumes and international journals. A sample of service activities contributed by members of the centre can be found in Tables 2 and 3.

#### 5.4 ICE-TCS Seminar Series

One of the main aims of ICE-TCS is to foster a broad appreciation of the field of Theoretical Computer Science in Iceland, and to help improve the Icelandic research environment in Computer Science at large. To this end, during 2014, the centre has organized the following seminar series:

- Research Seminar Series, and
- Reading groups.

These two seminar series are supposed to cater for different types of audiences and of presentations. As its name suggests, the *Research Seminars Series* is used for technical presentations reporting on research that has reached a fairly complete stage of development. Overall, there have been 20 seminars in this series during the reporting period. (See <http://www.icetcs.ru.is/rsem.html> for details on these talks.)

**CHECK/EDIT** *Reading groups* are used by ICE-TCS to learn about topics that have the potential of creating synergies amongst the members



## Membership and Steering of Learned Bodies CHECK/EDIT

- Luca Aceto is the president of the EATCS (July 2012–July 2016).
- Luca Aceto is a member of the advisory board of *Electronic Proceedings in Theoretic Computer Science (EPTCS)*.
- Luca Aceto is a member of the Organizing Committee for the *ACM/IEEE Symposium on Logic in Computer Science* (2012–2014).
- Luca Aceto is a member of the Board of the *European Association for Computer Science Logic (EACSL)*.
- Luca Aceto is a member of the Board of the journal *Logical Methods in Computer Science*.
- Yngvi Björnsson is a member of the Education Committee of the Icelandic Association of Computer Scientists.
- Yngvi Björnsson is a member of the evaluation committee for the Research Infrastructure Fund of the Icelandic Research Fund.
- Bjarni V. Halldórsson is a committee member of the IFIP working group on computational biology.
- Bjarni V. Halldórsson is event organizer for the EURO working group on computational biology.
- Magnús M. Halldórsson is a member of the steering committee for the Scandinavian Workshop on Algorithm Theory series. He is chair of that committee since March 2007.
- Magnús M. Halldórsson is a member of the steering committee for the European Symposium on Algorithms.
- Anna Ingólfssdóttir is a member of the steering committee for the *Workshop on Fixed Points in Computer Science (FICS)*.
- Marjan Sirjani is a member of the steering committee for DisCoTec (International Federated Conference on Distributed Computing Techniques).

Table 2: Service and Honours by Members of ICE-TCS

## Membership of Editorial Boards

- Journal of Logic and Algebraic Programming, Elsevier. (Luca Aceto editor and Anna Ingólfssdóttir guest editor)
- Acta Cybernetica (a scientific journal published by the Department of Informatics of the University of Szeged, Szeged, Hungary). (Luca Aceto editor)
- **Electronic Proceedings in Theoretic Computer Science (EPTCS)**. (Luca Aceto editor)
- Frontiers in Statistical Genetics and Methodology. (Bjarni V. Halldórsson editor)
- Discrete Mathematics and Theoretical Computer Science. (Magnús M. Halldórsson managing editor)
- Soft Computing Journal (to be published by University of Kashan). (Marjan Sirjani Editor-in-Chief)

Table 3: Editorial Activities of Members of ICE-TCS

of the centre, or as fora for the discussion of research in one of the core areas of the centre. An example of the former use of a reading group is provided by the weekly concurrency lunch meetings. The weekly meeting of the wireless networking subgroup has included a reading group on game theory and auctions. Moreover, Marjan Sirjani holds weekly lunches with students working on formal methods in software engineering on Fridays.

## 6 Publications by Members of the Centre

We already mentioned some of the research highlights earlier in this report. Here we limit ourselves to mentioning that the work carried out by the members of our research groups in algorithmics and combinatorics has been presented at some of the premiere conferences in those areas such as DISC and PODC and in some of the top journals, such as the Theoretical Computer Science and IEEE/ACM Transactions on Networking. Yngvi Björnsson’s work on search-methods in artificial intelligence and on general game playing continues to have high visibility both nationally and internationally. Apart from being published in the top publication outlets in the area, some of that work has achieved wide recognition. Finally, ICE-TCS researchers published journal papers in outlets such as Science of Computer Programming, Theoretical Computer Science and the Journal on Logic and Algebraic Programming.

Full details on the publications by members of the centre since its inception may be found at

<http://www.icetcs.ru.is/publications.pdf>.

## 7 Forthcoming Activities

During 2015, ICE-TCS will celebrate its tenth anniversary. To mark this milestone, we plan to continue our work with the aim of achieving the objectives stated in Section 1. Despite the available funding and staffing, the levels of ambition and activity remain high within ICE-TCS, and we hope that 2015 will be as successful as 2014 was.

In spite of the lack of funding, we intend to maintain a vibrant visitor program, taking full advantage of the attractiveness that Iceland has as a travel destination.

The calendar year 2015 will be rich of events that see major involvement from ICE-TCS members. The following events are confirmed at the time of writing.

- From January 2015, ICE-TCS will continue organizing the Pearls of Computation seminar series—see <http://www.icetcs.ru.is/poco.html> for details. The first four talks in the spring 2015 will be devoted to presentations of the work by Philippe Flajolet, J. C. R. Licklider, Grace Murray Hopper and John C. Reynolds.
- Due to unforeseen circumstances, the celebration of the centenary of George Dantzig’s birth that was originally scheduled for November 2014 was delayed, but will be held in early 2015 with a public seminar delivered by Eyjólfur I. Ásgeirsson.
- We will hold the 11th ICE-TCS Theory Day on Friday August 21, 2015. As a special guest, we will have Gérard Berry, who will deliver a public talk as well as a more technical talk during the Theory Day. Berry’s public talk entitled *The Algorithmic Revolution in the Sciences* will be held in cooperation with the Icelandic Academy of Sciences.
- Magnús M. Halldórsson will be the PC chair for the Track C of **ICALP 2015** and will co-organize the **Sixth Workshop on Realistic models for Algorithms in Wireless Networks (WRAWN)** in Kyoto, Japan.
- Luca Aceto will be PC co-chair for the 26th International Conference on Concurrency Theory (CONCUR 2015), Madrid, Spain.

- In the period 21–23 October 2015, Luca Aceto and Anna Ingólfssdóttir will be PC co-chairs and organizers for the Nordic Workshop on Programming Theory 2015 at Reykjavik University. The invited speakers for the workshop will be Rocco De Nicola, Marta Kwiatkowska and Jiri Srba.

These events will complement our standard activities, such as the the ICE-TCS seminar series.

## 8 Summary and Self-Evaluation

The reporting period has seen ICE-TCS continue to achieve a fair amount of visibility in the research community. The centre has been very active in organizing high-quality scientific events at Reykjavik University and some of its members have received recognitions from our research community and play leadership roles in steering committees and boards for conferences, journals and learned societies. These are all signs of recognition for the research work that has been carried out within the centre, and for the role that the centre as a whole has played in the theoretical-computer-science community since its inception.

Scientifically, the centre has continued to play an important role in the computer-science and discrete mathematics communities in Iceland. As in previous years, the vast majority of the scientific events in those fields taking place in Iceland have been associated with the centre and, to the best of our knowledge, the ICE-TCS seminar series and guest program are pretty much unique in the country. Internationally, the centre has continued to contribute to the TCS community via its research output and its service activities.

Overall, we feel that we can be proud of what has been achieved in 2014. However, given the available resources and the very large increase in the number of students in computer science at Reykjavik University, it is unclear for how much longer the centre can continue this level of activity.