

**Sixth ITU Kaleidoscope Academic Conference**

**“Living in a converged world -  
impossible without standards?”**

**Saint Petersburg, Russian Federation, 3-5 June 2014**

**Final Report**

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## 1. ITU Kaleidoscope 2014 overview

The [ITU Kaleidoscope conference 2014](#) (K-2014) was held at the kind invitation of the Ministry of Communications and Mass Media, and hosted by the Bonch-Bruевич Saint-Petersburg State University of Telecommunications (SPbSUT), which provided excellent logistics. Evening receptions at the Telecommunications Museum and on a boat, kindly offered by the host, gave the opportunity to enhance cultural exchanges and enrich the knowledge of Russian Federation.

Over 120 delegates from 28 countries participated in the conference. About 10 people used the remote participation facilities. The events have been broadcasted and the archived webcast as well as some photos are available at the Kaleidoscope webpage.

SES (Luxembourg), Platinum supporter, kindly offered the prize money that is awarded to the authors of the best papers.

The Host, with the support of Expo Telecom (Russian Federation), generously offered coffee breaks and lunches to all the participants, and supported the logistics expenses for the events.

The event was technically co-sponsored by the Institute of Electrical and Electronics Engineers (IEEE) and IEEE ComSoc, the Popov Society of the Russian Federation, and the Institute of Electronics, Information and Communication Engineers of Japan (IEICE).

K-2014 partnering organizations supported the promotion of the conference: TTC (Japan), Waseda University (Japan), the Institute of Image Electronics Engineers of Japan (I.I.E.E.J.), the European Academy for Standardization (EURAS), the University of the Basque Country (Spain), and Tampere University of Technology (Finland).

A 14 month, substantial preparatory process was required for this Kaleidoscope edition. This process involved the efforts and collaboration of TSB staff, a [Steering Committee](#) of 4 members (SC), a [Host Committee](#) of 11 members (HC), and a [Technical Programme Committee](#) of 100 members (TPC), all internationally recognized ICT experts from academia, research institutes and the private sector.

Special thanks go to [Sergey Bachevsky](#) (Rector, Bonch-Bruевич Saint-Petersburg State University of Telecommunications, Russian Federation), Kaleidoscope 2014 General Chairman, and to the Technical Programme Committee Chairman, [Kai Jakobs](#) (RWTH Aachen University, Germany), for ensuring transparency through the double-blind peer-review process.

Ms Alessia Magliarditi (Programme Officer, ITU/TSB), ITU Kaleidoscope Coordinator, chaired the meeting of the Award Committee members which selected the winners of the awards for best papers. The Award Committee was composed of five conference attendees: Martin Adolph (ITU/TSB), [Christoph Dosch](#) (ITU-R Study Group 6 Chairman; IRT GmbH, Germany), [Andrey](#)

[Koucheryavy](#) (SPbSUT, Russian Federation), [Dhananjay Kumar](#) (Anna University, India), and [Mitsuji Matsumoto](#) (Waseda University, Japan).

## 2. Conference programme

The **opening ceremony** included welcome remarks from the Host, [Sergey Bachevsky](#) (Rector, Bonch-Bruевич Saint-Petersburg State University of Telecommunications, Russian Federation; Kaleidoscope 2014 General Chairman); **Opening Address** by TSB Director, [Malcolm Johnson](#); and inaugural speeches were given by Oleg Dukhovnitsky, Head of the Federal Agency of Communications, Russian Federation; Rashid Ismailov, Head of Department of International Cooperation, Ministry of Communications and Mass Media, Russian Federation; Ivan Gromov, Chairman of the Committee on IT and Communications, Government of St. Petersburg, Russian Federation; Vyacheslav Ivanyuk, Director General of Russian Broadcasting and Warning Networks, Russian Federation. The announced welcome scientific speech from the Nobel Prize Winner Academician Z. Alferov was not delivered.

**Four keynote speeches** were included in the programme and shared insight into the potential of nanoscale communications and developments in cloud computing and sensor networks.

- Internet of Nanothings - [I.F. Akvildiz](#) (Georgia Institute of Technology, USA)
- Experimental Biology and Molecular Communications - [Y. Koucheryavy](#) (Tampere University of Technology, Finland)
- Data vs Device-centric Cloud services for resource monitoring.  
[Antonio Puliafito](#), Maria Fazio (University of Messina, Italy) [[Presentation](#)]

Ole Hanseth (University of Oslo, Norway) in his keynote summary critiqued the emerging needs of the healthcare industry, a sector with an ICT-rich future, in “ICT architectures, standardization strategies and service innovation in healthcare”. Unfortunately he could not join the event due to personal issues.

In addition to the keynote speeches, the programme included **three invited papers** that presented on the role of software-defined networking and network virtualization in the transition to IPv6, the accessibility of broadcasting and broadband technologies to the elderly and persons with disabilities, and the workings of the world of ICT standardization. “*A Software Defined Approach to Unified IPv6 Transition*” was outlined by [Kevin Hu](#) (Huawei Technologies, China) [[Presentation](#)]. [Christoph Dosch](#) (ITU-R Study Group 6 Chairman; IRT GmbH, Germany) spoke on developments in work to create more inclusive communications in “*Convergence of Broadcasting and Broadband Internet - A benefit for people with disabilities (and for us all)*”

[[Presentation](#)]. In “*Standardization: A primer*”, [Ken Krechmer](#) (University of Colorado, USA) offered an insider’s view into ICT standardization processes geared towards an audience certain to contain a wealth of future standardization experts.

98 papers from 39 countries were submitted for review, 34 of which were accepted for publication and presentation (23 in the lecture sessions, 11 in the poster session).

Two papers were not presented at the conference, one allocated to a Lecture session and one to the Poster session.

The research results submitted are related to various ITU activities, including quality of service (QoS), cybersecurity, digital identity, future networks, cloud computing, RFID technology, optical wireless network, accessibility, sensor networks, multimedia applications, open data, e-Health, emergency communications networks, standards education, etc. As in previous editions of the conference, a number of papers address radio-related issues such as 3G, 4G, 5G and the impact on spectrum. An overview of Kaleidoscope papers and a mapping of papers and ITU activities (i.e. Study Groups, Focus Groups, etc.) is available in the ITU Telecommunication Standardization Advisory Group ([TSAG](#)) TD [[0169](#)], and in the ITU Radiocommunication Advisory Group ([RAG](#)) Information document [[2](#)]; the same document will be also submitted to the next meeting of the ITU Telecommunication Development Advisory Group ([TDAG](#)).

Representatives of **ten ITU academia members** are included in the conference programme. Three ITU-T academia members already expressed interest in submitting contributions to ITU-T SGs based on their paper proposals. In particular, the University of Rome Tor Vergata, Italy, will submit a contribution to the next SG 17 meeting (Maurizio Talamo and [Daniela Merella](#) gave a [Presentation](#) on “*Global Convergence in Digital Identity and Attribute Management: Emerging Needs for Standardization*”, in Session 1 “The future of convergence”); the University of the Basque Country, Spain, would like to contribute to SG11 ([Fidel Liberal](#) delivered a [Presentation](#) on ‘*Global standards, the key enablers for deploying next generation emergency communications networks*’). This paper proposed an IMS-based emergency inter-networking system capable of connecting existing first responder communication systems (TETRA, etc.) and enabling the integration of next-generation mobile networks. The work is result of a EU project (see <http://www.sec-geryon.eu/>).

The authors of the award winning papers shared the prize fund of 10,000 USD.

- **1<sup>st</sup> prize** (5,000 USD): “*Towards Converged 5G Mobile Networks - Challenges and Current Trends*” by Anna Zakrzewska, Sarah Ruepp and Michael S. Berger (Technical University of Denmark, Denmark)”. It analyzes the expectation that the emergence of ‘5G’ mobile wireless systems will result from standards convergence, critiquing technical considerations spanning machine-to-machine communications (M2M), energy efficiency, complete ubiquity and autonomous management.

- **2<sup>nd</sup> prize** (3,000 USD): “*Dynamic Mobile Sensor Network Platform for ID-based Communication*” by Ved P. Kafle, Yusuke Fukushima and Hiroaki Harai (NICT, Japan). This paper details the design of a dynamic mobile-sensor network platform consisting of mobile sensors, mobile sensor gateways and sink servers. A number of the components of the proposed sensor network platform are already the subjects of ITU standardization work, and, in addition, the paper highlights other potential candidates for standardization in the near future. Ved P. Kafle is active in ITU-T Study Group 13 (“Future Networks”), Question 15 “Data-aware networking in future networks” and his position as new co-rapporteur for Q15/13 will be formalized on 7 July. One of the authors of a poster paper (P.2 *Content Distribution in Information Centric Network: Economic Incentive Analysis in Game Theoretic Approach*) Takuro Sato, from an ITU-T academia member, Waseda University, Japan, is very interested in reflecting the outcome of his research projects in the area of information-centric networks (ICN) in international standards, which is within the scope of Q15/13. Prof. Sato will evaluate the options with his colleagues and in the TTC coordination group and maybe contribute to the SG13 upcoming meeting.
- **3<sup>rd</sup> prize** (2,000 USD): “*Combining ICT-Standards Essential-Patents and Medical-managerial Guidelines towards sustainable Assisted-living and home-care*” by Vasileios P. Spyropoulos (Technological Education Institute of Athens, Greece). This paper discusses the potential of combining common ICT standards with medical-managerial guidelines to improve assisted living and home-care worldwide. The paper emphasizes the importance of fair regulation of standard-essential patents (SEPs) in this domain, going on to describe the standards and guidelines most capable of enabling interoperability in contemporary systems for home-care and assisted living.

Alongside the winners of cash prizes, **nine** entrants - Anna Zakrzewska (Technical University of Denmark, Denmark); José Vinícius de Miranda Cardoso (Federal University of Campina Grande - UFCG, Brazil); Veronica Rojas Mendizabal (CICESE Research Center, Mexico; ITU-T academia member); Megi Medzmariashvili (Lund University, Sweden; ITU-T academia member); Beny Nugraha (Mercuru Buana University, Indonesia); Eduardo Saiz (University of the Basque Country, Spain; ITU-T Academia member); Fan Bai (Waseda University, Japan; ITU-T Academia member); Nikolay Suschenko and Alexander Lutokhin (Federal State Unitary Enterprise Radio Research And Development Institute, Russia) - received **Young Author Recognition Certificates**.

For the third time at Kaleidoscope, a short “Fast-forward Poster Preview” session in the conference plenary gave more prominence to poster presenters. Presenters had 2 minutes and not more than 2 Powerpoint slides each to pitch their research and to stir the participants’ interest in the following **poster session**.

All papers presented at the conference are included in the [Conference Proceedings](#), which are freely available for download on the Kaleidoscope 2014 webpage. They will be also listed in the IEEE Xplore digital library.

Programme, presentations, abstracts and biographies are available [online](#).

Relevant recommendations and conclusions from the technical sessions, as drafted and presented by the Session Chairs, are available online in PDF format on the programme webpage, [Wrap up session](#).

The fourth edition of the [Jules Verne's corner](#) "**Heart to heart communication**", drew a parallel with Hans Christian Andersen's story of "The Snow Queen" to imagine a world in which pheromones act as carrier substances in 'nanonetworks' enabling electromagnetic or molecular communications between human beings.

All participants received a CD which included an electronic version of the proceedings. In addition, TSB distributed **promotional material** (flyers, brochures and CDs on ITU-T activities).

### 3. Next Kaleidoscope event

It was announced that the next Kaleidoscope conference will probably take place at the Istanbul Technical University, Istanbul, Turkey.

Additional information will be available soon at <http://itu-kaleidoscope.org/>.

## Annex – Side Events

### **Joint ITU-IEICE-IEEE Workshop on Education about Standardization**

Jointly organized by the ITU-T, the Institute of Electronics, Information and Communication Engineers of Japan ([IEICE](#)) and the Institute of Electrical and Electronics Engineers ([IEEE](#)), this Workshop on Education about Standardization was held at the Bonch-Bruевич Saint-Petersburg State University of Telecommunications ([SPbSUT](#)), Saint-Petersburg, Russian Federation, on 2 June. 33 participants from 11 countries joined the event.

At the Opening Ceremony, Oleg Zolotokrylin, SPbSUT vice-rector, delivered the Host's Welcoming Remarks; [James Irvine](#) and [Mitsuji Matsumoto](#) briefly introduced their Committees, respectively the IEEE Standards Education Committee and the IEICE Standard Education Committee of Japan. TSB Director, [Malcolm Johnson](#), gave his [inaugural speech](#) mentioning the membership category for academia.

The objective of the workshop was to gather representatives of academic and research institutes, ITU Academia Members, standards developing organizations, international organizations, industry associations and governments to foster collaboration in the development of initiatives aimed at increasing the attention devoted to standardization by curricula across all academic disciplines.

Initiatives from IEICE, IEEE, CEN/CENELEC, UNECE and ETSI were presented. The attendees from government, business, standardization and research communities, also heard from academia (members) supporting education on standardization including the ITU-D academia member SPbSUT, Russian Federation; ITU-T academia member Waseda University, Japan; ITU-T academia member Aalborg University's Center for TeleInFrastruktur (CTIF), South East Europe; and the Institute of International Business and Law NRU ITMO, Russian Federation. Mrs. Elena Bogdanova, Director of the Institute of International Business and Law NRU ITMO, Russian Federation, suggested to start consultations about the possibility of developing and implementing supranational standards.

### **3rd meeting of TSB Director's Ad hoc Group on Education about Standardization**

The programme for the Workshop incorporated the third meeting of the [TSB Director's Ad hoc Group on Education about Standardization](#) (AHG-SE).

[Malcolm Johnson](#), Chairman of the Group, stressed the importance of and need for coordination among all relevant stakeholders that would greatly assist in the development of consistent, high-quality curricula for education on standardization.

The [Final Report](#) of this meeting is available online at the Group's webpage: <http://itu.int/go/standardseducation>