

XXXV Finnish URSI Convention on Radio Science

Tampere University, Hervanta Campus, 18 October, 2019

Call for papers

The Finnish National Committee of the International Union of Radio Science (URSI) and the Faculty of Information Technology and Communication Sciences of Tampere University will organize “Radiotieteen päivät” next Fall. This XXXV National Convention on Radio Science will be held at Hervanta Campus on Friday, **18 October 2019**. The convention provides a forum for discussion of advances in the broad field of radio science and radio communications. The program will include both invited and contributed presentations. The proceedings will be published on Finnish URSI web pages. The event is free for all participants.

The list of topics of the solicited presentations contain all the fields of radio science. Submitted summaries should be in English and 1–4 pages in length in one-column format, see writing instructions.

In addition to the invited and contributed presentations and poster sessions, the program will contain plenary talks by Finnish experts in selected fields of radio science and engineering.

Topics

Presentations on all URSI research areas are welcome. The following areas are highlighted:

- C: Radiocommunication systems and signal processing
- G: Electromagnetics in biology and medicine

Special sessions including both invited and contributed papers:

- Wireless localization and location-aware communications
- Wireless sensing systems in biology and medicine
- Hybrid photovoltaics
- Nanoscale communications and networking
- Radios in defense and security

Young Scientist award

Following the tradition, a trophy will be awarded to a promising scientist under 35 years.

Important dates

Deadline for the submissions	6 Sept 2019
Notification of acceptance	30 Sept 2019

Links for further info:

- Writing instructions and paper submission: https://www.lyyti.in/ursi2019_cfp
- URSI scientific commissions: <https://www.ursi.org/commissions.php>
- Finnish National Committee of URSI: <http://www.ursi.fi/english/>
- Previous occasions of Radiotieteen päivät: <http://www.ursi.fi/paivat/>
- **Contact:** Markku Renfors, email: first-name.last-name@tuni.fi, phone 040 8490752

Special session on Wireless Localization and Location-Aware Communications

Organizers: Assoc. Prof. Elena-Simona Lohan, Prof. Jari Nurmi*, Faculty of Information Technology and Communication Sciences, Tampere University*

Location information is becoming a crucial aspect in modern wireless communication systems. Time-stamped information about the device location supports not only the functionalities of a variety of autonomous systems, such as industrial robots or vehicular applications, but it can also improve the communication metrics, by a smart design of the location-based and location-aware communications. The improvement of the precision of estimation of the 3D position and speed of devices, robots, and vehicles can also enable better safety, connectivity, sustainability, and accessibility in future wireless communications. This special session invites contributions related to various aspects in wireless localization and location-aware communications, from signal processing and physical layer solutions to medium access control and heterogeneous networking solutions. Location Based Services are also included in the topic call. We encourage the paper submissions of original or survey work addressing the following topics (but not limited to):

- Wireless localization, tracking, and sensing algorithms
- Location-based and location-aware communications
- Novel Location Based Services
- Positioning for smartphones, drones, robots, and unmanned vehicles
- Industrial internet applications relying on time-stamped positioning information
- Tracking algorithms for wearables and eHealth
- Interference detection and mitigation in GNSS bands
- Positioning Hardware and Software

Special session on Wireless Sensing Systems in Biology and Medicine

Organizers: Prof. Leena Ukkonen and Prof. Lauri Sydänheimo*, Faculty of Medicine and Health Technology, Tampere University*

In the future, wireless health technologies will provide solutions for proactive healthcare and diagnosis and treatment of diseases. In these systems, efficient wireless power transfer, antenna technologies and sensors play a key role. This area is also very multidisciplinary, and application and system specific features have to be taken into account. This special session presents recent research topics and advances on wearable and implantable systems, antennas, sensor technologies, wireless power transfer and wireless communication in applications related to biology, biomedicine and medicine.

Special session on Hybrid Photovoltaics

Organizer: Dr. Paola Vivo, Faculty of Engineering and Natural Sciences, Tampere University*

Hybrid solar cells, belonging to the so-called third generation of photovoltaics, (PVs) rely on both organic and inorganic materials as their building blocks. They are low-cost, flexible, lightweight, and solution processable, hence opening up new favorable scenarios for their applications as compared to the traditional PVs based on silicon. Currently, the most attractive and promising hybrid PV technologies are organic and organo-metal halide perovskite solar cells. In the last decade, excited breakthroughs worldwide have led to hybrid solar cells with skyrocketing power conversion efficiencies, though several critical challenges need still to be addressed in order to boost their commercialization.

We encourage the paper submissions of original or survey work addressing the following topics (but not limited to):

- New synthesis approaches of photoactive materials and hole/electron transport layers
- Enhancement of device stability
- Lead-free perovskites
- Understanding of fundamental optoelectronic processes in hybrid solar cells
- Up-scalable fabrication
- Printable hybrid solar cells

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Special session on Nanoscale Communications and Networking

Organizer: Prof. Evgeny Kucheryavy, Faculty of Information Technology and Communication Sciences, Tampere University*

In recent years, the advanced development of nanotechnologies have led to a number of promising applications. These applications have been considered for various fields including healthcare, industrial monitoring and automation, as well as the military. Due to the miniature scale of nanomachines, a fundamental requirement is to enable them to collaborate collectively to achieve a common objective. This collaboration could be realized through communication and networking at the nanoscale. Through the communication and networking process, nanonetworks could be formed between these nanomachines. The interconnection of nanonetworks to the wider Internet is also envisioned in the future, leading to new paradigms known as the Internet of Nano Things or Internet of Bio-NanoThings. However, unlike traditional communication systems, where devices have sufficient processing capabilities, this will be a major challenge at the nanoscale. Therefore, this brings along a new set of challenges, as well as new molecular and nanoscale communication paradigm.

- Nano-Electromagnetic (EM) communications: Graphene-based antennas; EM channel modeling; Terahertz band communication
- Infrastructures for nano/molecular communication
- Network theory
- Natural Computing in nano/molecular communication
- Tools to support nano/molecular network design
- Applications of nano/molecular networks
- Internet of Nano Things (IoNT)

Special session on Radios in Defense and Security

Organizer: Assist. Prof. Taneli Riihonen, Faculty of Information Technology and Communication Sciences, Tampere University*

This special session aims at bringing together the broad scope of radio concepts and technologies in military defense and civilian security, where the radios of interest are understood as any object to transmit/emit or receive electromagnetic radiation in any way that is related to protecting, monitoring or threatening safety, security, or privacy. Presentations on all URSI research areas are welcome focusing on military, professional, commercial/enterprise, law enforcement and civilian applications. Thus, we encourage the submissions of original research or surveys/tutorials addressing the following topics, to name but a few (but not limited to):

- Counter UAV/drone radio technologies
- Digital forensics of radio devices and systems
- Electromagnetic compatibility
- Jamming and its countermeasures
- Physical layer security
- Professional mobile radios
- Radar, radio remote sensing and imaging
- Radio fingerprinting and emitter localization
- Radio signals/communication intelligence
- Radios in law enforcement and alarm systems
- Simultaneous transmit and receive (STAR)
- Software-defined radios and cognitive radios
- Spectrum monitoring, surveillance and management
- Tactical communications; command and control systems
- Ultra-reliable and/or low-latency communications

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