

Title of the special track: “Electromagnetic-Body Area NanoNETworks (E-BANNET)”

Organizing Chairs:

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- Anna Maria Vegni, *University of Roma Tre, Italy*
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Abstract:

Recently, nanotechnology has emerged as a novel evolution in technology enabling the design of miniaturized devices at nanoscale level (*i.e.*, nanorobots and nanoparticles). At this scale, the behaviors and characteristics of nanodevices require a deep understanding and a revision of well-known features of devices at the macroscale level.

A set of nanodevices, sharing the same medium (*e.g.*, the biological tissue or the bloody flow) and collaborating for the same task, forms a nanonetwork. Nanonetworks are expected to expand the capabilities of single nanodevices and enable new nanotechnology applications in biomedical, environmental, military, industrial, and consumer fields.

Electromagnetic Body Area NanoNETworks (E-BANNET) represent a novel field of research that will allow the interconnection of various components to support health monitoring, medical diagnoses and treatment, telemedicine, sensing, and assistance to people with disabilities.

E-BANNET is intended to have a twofold aim of both telecommunications and electromagnetic issues in body area nanonetworks. The main goal of this special track is to involve researchers and academics from various and inter-disciplinary fields of study, such as electrical and electronic engineering, computer science, biology, medicine, chemistry, physics, materials science, bio-engineering, bio-technology, and nanotechnology.

Topics of interest:

We invite submissions to E-BANNET special track with original (unpublished and not currently under review) and novel contributions on electromagnetic body area nanonetworks, in areas including (but not limited to), the following:

- **Communications Techniques for E-BANNET**
 - Terahertz Band Communication:
 - Intra-body Channel Modeling & Capacity Analysis
 - Modulation and Channel Coding
 - Near Field Communication:
 - Intra-body Propagation Modeling
 - Modulation and Channel Coding
- **Protocols and architectures for E-BANNET**
 - Medium Access Control
 - Synchronization and Flow Control
 - Error Control
 - Addressing
 - Routing and Neighbor Discovery
 - Network Infrastructure
 - Security and Privacy

- **Nano-Device Design for E-BANNET**
 - Nano-antennas:
 - Nanomaterial- and Metamaterial-based Nano-antennas
 - On-body/wearable Nano-antennas
 - In-body/implanted/tattoo-like Nano-antennas
 - Nano-antenna Arrays
 - Nano-transceivers:
 - Signal Generators & Detectors
 - Modulators & Demodulators
 - Filters & Amplifiers
 - Nano-processors
 - Nano-memories
 - Nano-batteries and Energy Harvesting
 - Nanosensors
 - Electromagnetic Nanoparticles
- **Applications of E-BANNET**
 - Nanosensing for Health Monitoring
 - Intra-body Drug Delivery
 - Human Life Enhancement
- **Electromagnetic Interference (EMI) Analysis for E-BANNET**

TPC:

- Tadashi Nakano, *Osaka University, Japan*
- Jun Suzuki, *University of Massachusetts, USA*
- Andrew Eckford, *York University, Canada*
- Ozgur B. Akan, *Koc University, Turkey*
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