



Press release – Aalborg (DK) Aug. 16th 2016

Aren't we tired enough of continuously recharging the battery of mobile phones?

Starts tomorrow in Aalborg (DK) the International conference **ICT-Energy 2016** on “energy efficiency and sustainability in ICT”. The conference is organized by prof. K. Larsen, at the University of Aalborg, in the framework of the project “ICT-Energy” funded by European Commission.

The goal of the conference is to bring together scientists from the vast international community interested in the way ICT (Information and Communication Technology) devices consume energy during functioning.

In fact, reducing energy consumption in ICT devices has nowadays become a strategic task to further improve performances and diffusion of such technology. Both the future of supercomputing and the dawn of the Internet-of-Things scenario are at risk if the power consumption problem is not solved: too much electric energy is required by present systems. On the other hand: aren't we tired enough of continuously recharging the battery of mobile phones?

The European project ICT-Energy, coordinated by Luca Gammaitoni at the university of Perugia (IT), targets energy consumption in computing and communication, with the aim of raising awareness and promoting actions for the sustainable development of the future of the entire ICT sector.

During the conference there will be oral presentations on a number of innovative solutions, at the edge of present research, for the future of computing. Particularly, two of the most revolutionary solutions in this field (single electron transistors and micro mechanical switches) will be presented by the people who designed them (F. Gonzales-Zalba from Hitachi Cambridge and M. Lopez-Suarez from NiPS Laboratory). Proceedings of the conference are published in a special number of ICT-Energy Letters, freely available here: www.ict-energyletters.eu.

The Science Conference is supported by European Commission under the FET Proactive Coordination Action ICT-Energy (www.ict-energy.eu).



www.ict-energy.eu

Additional information:

- Conference Program (attached)
- Video presentation of the ICT-Energy initiative (www.ict-energy.eu)
- Proceedings of the conference (www.ict-energyletters.eu)

Conference Program

Aug 16 Tue

Arrival

17:00 registration

18:00 welcome cocktail

Aug 17 Wed

9:00- 9:30 Introduction, L. Gammaitoni

9:30-10:00 Research at Aalborg, K. Larsen

Session I: Fundamental limits in energy consumption of computing

10:00-10:30 *Sub- $k_B T$ micro-electromechanical irreversible logic gate*
M. Lopez-Suarez

10:30 coffee break

11:00-11:30 *Fundamental Heat Dissipation Limits in Logic Circuits*
I. Ercan

11:30-12:00 *Fundamental thermal machines for the thermodynamics of computation*, D. Chiucchiù

12:00 *ICT-Energy Board Meeting*

12:30 Lunch

Session II: Novel architectures and devices for energy efficient computing

14:00-14:30 *Single-electron devices and circuits: An alternative route to conventional computing*, F. Gonzales-Zalba

14:30-15:00 *Comparing CMOS and NEMS adiabatic circuits: A system overview*, S. Hourì

15:00-15:30 *Fundamental energy limits in the physics of nanomagnetic binary switches*, M. Madami

15:30 coffee break

16:00-16:30 *Impact of Delay Propagation on NTV PCMOs Design*,
G. Gillani

16:30-17:00 *An Ultra-low-power NVM-based Multi-core Architecture for Embedded Bio-signal Processing*, R. Braojos

17:00-17:30 *Silicon Nanowires Transistors for Quantum Information Architectures*, D. Paul

21:00 **Poster session** (with drinks and snacks)



Aug 18 Thu

Session III: Efficient Energy harvesting for autonomous devices

- 9:00-9:30 *MEMS-based energy harvester*, C. Rusu
- 9:30-10:00 *Kinetic energy harvesting at microscale: current progress and perspectives*, D. Galyco
- 10:00-10:30 *Kinetic Energy Harvesting based on electrostatic transduction*, P. Basset
- 10:30 coffee break
- 11:00-11:30 *Underwater piezoelectric energy harvester*, F. Orfei
- 11:30-12:00 *Optimized Photovoltaic Solar Cells combined with High Thermal Efficiency*, L. Ferre Llin
- 12:00-12:30 *Highly Doped Silicon-Germanium Thermoelectric Module: Design and Microfabrication*, F. Miranda
- 12:30 Lunch
- 14:00-14:30 *Developing PiezoMEMS Vibration Energy Harvesters for IoT*, N. Jackson

Session IV: Energy aware software

- 14:30-15:00 *Energy-optimization for Dataflow Applications using Timed Automata*, J.C. van de Pol
- 15:00-15:30 *Programming energy aware systems in Safety Critical Java*, B. Thomsen
- 15:30 coffee break
- 16:00-16:30 *Energy Centric Quantitative Model Checking I*, A. Legay
- 16:30-17:00 *Energy Centric Quantitative Model Checking II*, K.G. Larsen
- 17:00-17:30 *An Energy-Aware Programming Approach for Mobile Application Development Guided by a Fine-Grained Energy Model*, J. Gallagher
- 17:30-18:00 *Navigating the PET Triangle: An industrial perspective on Power-Energy-Time tradeoffs in IoT devices and beyond*, Z. Chamski
- 20:00 Gala dinner

Aug 19 Fri

Session V: HPC energy constraints towards exascale computers

- 9:30-10:00 *Efficient Cooling Methods of large HPC Systems*, R. Lohner
- 10:00-10:30 *CAM Cell Design Based on Nano-Electro-Mechanical Switch and CMOS for Highly Efficient Processors* A. Seyedi
- 10:30 coffee break
- 11:00-12:00 Discussion: the future of ICT-Energy
- 12:00 Lunch

End of conference

