

Can smart materials and neural cells communicate?

May 16, 2017

Trento-based Fondazione Bruno Kessler is hosting an international meeting on the new frontiers in neuroscience

Thursday, May 18 and Friday, May 19, 2017 over 50 researchers will be discussing the fascinating development of bioelectronics and will be presenting the results of the “MADELENA” scientific project, coordinated by the CNR’s Institute of Materials for Electronics and Magnetism

A conference that will bring together, at Fondazione Bruno Kessler’s Povo premises, experts in a rapidly growing field of research: **neuromorphic adaptive electronics, and materials and devices that mimic the behavior of natural systems, such as neurons, synapses and the brain.**

The works will start on **Thursday, May 18 at 2.00 pm** in the Stringa Hall of FBK’s Scientific Hub, on 18, Sommarive Road, Povo and will wrap up the day after.

The research meeting has been organized as part of the **“MaDEleNA”** (Developing and Studying novel intelligent nanoMaterials and Devices towards Adaptive Electronics and Neuroscience Applications) **scientific project**, financed by the Autonomous Province of Trento under the **“Grandi progetti 2012”** call and started in September 2013.

During the two-day event, the partners and the MaDEleNA project coordinator, **Salvatore Iannotta**, with researcher **Silvia Battistoni**, both from the **IMEM-CNR** Institute will illustrate to the scientific community of reference the main achievements of the four years of experiments (the study will officially end in August).

In addition to Fondazione Bruno Kessler, with its **Center for Materials and Microsystems** (CMM), there are various protagonists involved in this research that come from the Povo “Hill of science”. Among them, the Institute of Materials for Electronics and Magnetism (**IMEM**) of **CNR**, the University of Trento, the Department of Industrial Engineering (**DII**), the Center for Integrative Biology (**CIBIO**) and two other CNR bodies, the Institute of Biophysics (**IBF**) and the Institute of Photonics and Nanotechnologies (IFN). Two companies, **ST Microelectronics Italia** (Lecce

branch) and **Biomat** (Rovereto) are also contributing to the project.

The meeting will also be attended by chief officers of **prestigious international laboratories**. Among them, **Massimiliano Di Ventra** and **Mirko Prezioso**, with the University of California (USA), **George Malliaras**, from the Ecole Nationale Supérieure des Mines (France), **Miguel Romera Rabasa**, with CNRS Thales, **Sabina Spiga** (IMM-CNR) and **Stefano Vassanelli** (University of Padua).

After the presentations, a **roundtable on the topic of new technologies based on adaptive materials, neural networks and bioelectronics** will bring together different ideas and experiences from both the scientific and the industrial worlds, toward the so-called unconventional computing and frontiers of neuroscience.

More about the MaDEleNA project

Scientific experiments conducted in **MaDEleNA** project partner laboratories have given encouraging results and proposed a **strongly innovative approach** to study and point out solutions to relevant questions of modern science and technology in fields that seem to be far apart such as electronics and neuroscience. The **objective is twofold**: implementing new neuro-bio-inspired computing systems and creating hardware models (devices and systems) that mimic the functioning of the human brain. The original idea of the researchers was to create new technologies and new methodological approaches, creating in Trento a center of reference for research in this area.

The scientific results obtained in the **MaDEleNA** project have given way to a tight network of relationships and contacts with international research centers and agencies. The areas of application of these technologies would make it possible to create **interfaces between materials and neural tissues for innovative bioelectronics, setting the stage for new developments in the field of neurodegenerative diseases, related, for example, to cell aging processes.**

Project website: <http://www.imem.cnr.it/Madelena/drupal-7.22/?q=node/28>



MaDEleNA

MaDEleNA international meeting

May 18-19 2017

FBK – Via Sommarive 18, Trento

Thursday, May 18, 2017

2.00 pm -2.30 pm Meeting opening

2:30 pm -3:00 pm S. Iannotta, CNR Inst. of Materials for Electronics and Magnetism, Parma (Italy)

3:00 pm – 3:40 pm M. Di Ventura, Dept. of Physics, Univ. of California, San Diego (USA)

3:40 pm – 4:20 pm M. Romera, Unité Mixte de Physique CNRS/Thales, Paris (France)

4:20 pm -4:40 pm Coffee-break

4:40 pm – 5:20 pm S. Spiga, CNR Inst. for Microelectronics and Microsystems, Agrate Brianza (Italy)

5:20 pm – 6:20 pm Poster session

Friday, May 19, 2017

9:00 am – 9:30 am S. Battistoni, CNR Inst. of Materials for Electronics and Magnetism, Parma (Italy)

9:30 am -10:10 am M. Prezioso, Electrical and Computer Eng. Dept., Univ. of California, Santa Barbara (USA)

10:10 am -10:50 am G. Malliaras, Ecole Nationale Supérieure des Mines, Dept. of Bioelectronics (France)

10:50 am -11:20 am Coffee-break

11:20 am -12:00 pm S. Vassanelli, Dept. of Biomedical Sciences, Univ. of Padova (Italy)

12:00 pm -1:00 pm Round table

13:00 Concluding remarks

Organizing Committee

Salvatore Iannotta – CNR IMEM

Roberto Verucchi – CNR IMEM

Cecilia Pederzoli – FBK LaBSSAH

Lorenzo Lunelli – FBK LaBSSAH

Laura Pasquardini – UNITN DII

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- MaDELeNA project website: <http://www.imem.cnr.it/Madelena/drupal-7.22/?q=node/28>

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