



INTERSECT WORKSHOP

International Workshop on Advanced Materials-to-Device Solutions for Synaptic Electronics

Barcelona - November 10-12, 2021

AGENDA

| CET | Wednesday 10 |
|----------------|--|
| 1:30 - 2:00 pm | Welcome and opening |
| | Session 1 - Ferroelectrics device and materials |
| | <i>Session Chair: Arrigo Calzolari (CNR Nanoscience Institute)</i> |
| 2:00 - 2:40 pm | Sven Beyer (Global Foundries) |
| | “The FeFET – learning to handle this new powerful device available in 2x CMOS platforms” |
| 2:40 - 3:20 pm | Stefan Slesazek (NaMLab gGmbH) |
| | “Ferroelectric tunneling junctions for beyond vonNeumann computing” |
| 3:20 - 4:00 pm | Josep Fontcuberta (Institut de Ciència de Materials de Barcelona) |
| | “Electroresistance in epitaxial HZO films” |
| 4:00 - 4:20 pm | Coffee break* |
| 4:20 - 5:00 pm | Johannes Ocker (Ferroelectric Memory GmbH) |
| | “Interplay between polarization switching and charge trapping in ferroelectric field-effect transistors” |
| 5:00 – 5:40 pm | Sergiu Clima (Imec) |
| | “Atomistic mechanisms for polarization switching and wakeup in HFO _x -based Ferroelectrics” |
| | “OTS material electrical parameter mapping from theoretical electronic structure” |



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| CET | Thursday 11 |
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| | Session 2 - Interoperability, Ontology & Workflow in Materials Modelling |
| | <i>Session Chair: Pablo Ordejón (Catalan Institute of Nanoscience and Nanotechnology)</i> |
| 09:00 - 09:40 am | Jesper Friis (SINTEF) |
| | “Using EMMO to represent properties ontologically” |
| 09:40 - 10:20 am | Marnik Bercx and Flaviano José dos Santos (École Polytechnique Fédérale de Lausanne) |
| | “Generating a fair crystal-structure database with the AiiDA informatics platform” |
| 10:20 - 11:00 am | Matthias Büschelberger (Fraunhofer Institute for Mechanics of Materials IWM) |
| | “SimPhoNy for ontology-based material exploration” |
| 11:00 - 11:20 am | Coffee break* |
| 11:20 - 12:00 am | Emanuele Ghedini (University of Bologna) |
| | “Ontologies as a multidisciplinary approach towards data and software interoperability in applied sciences” |
| 12:00 - 12:40 pm | INTERSECT team |
| | “IM2D demonstrator” |
| 12:40 - 2:00 pm | Lunch* |

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| CET | Thursday 11 |
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| | Session 3 - Alternative solutions for neuromorphic computing |
| | <i>Session Chair: Andrea Padovani (Applied Materials Italia)</i> |
| 2:00 - 2:40 pm | Daniele Ielmini (Politecnico Milano) |
| | “Recent progresses of in-memory computing: materials, devices and architectures” |
| 2:40 - 3:20 pm | Elisa Vianello (CEA-Leti) |
| | “Linking Hardware and Software for frugal AI solutions” |
| 3:20 - 4:00 pm | Mathieu Luisier (Integrated Systems Laboratory, ETH Zurich) |
| | “Ab initio Simulations of ReRAMS: from Atoms to Current vs. Voltage Characteristics” |
| 4:00 - 4:20 pm | Coffee break* |
| 4:20 - 5:00 pm | Derek Stewart (Western Digital) |
| | “Combining First Principles Simulations, Topological Constraint Theory, and Experiments to Optimize OTS Chalcogenide Alloys” |
| 5:00 - 5:40 pm | Stefano Brivio (CNR Institute for Microelectronics and Microsystems) |
| | “Memristive device optimization towards spiking neuromorphic systems” |
| 5:40 - 6:30 pm | Poster Session |
| | Social Dinner |



The H2020 **INTERSECT** project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 814487

Organized by:



Institut Català de Nanociència i Nanotecnologia

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| CET | Friday 12 |
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| | Session 4 - PCM device and materials |
| | <i>Session Chair: Sergiu Clima (Imec)</i> |
| 09:00 - 09:40 am | Marco Bernasconi (Department of Materials Science, University of Milano-Bicocca) |
| | "Atomistic simulation of phase change materials for non-volatile memories" |
| 09:40 - 10:20 am | Andrea Padovani (Applied Materials Italia) |
| | "A Multiscale Approach to Identify Traps Responsible for Subthreshold Conduction and Threshold Switching in OTS Materials" |
| 10:20 - 11:00 am | Francesco Tavanti (CNR Nanoscience Institute) |
| | "Going deeper on the structural and electronical properties of amorphous Ge _x Se _{1-x} : a microscopic investigation" |
| 11:00 - 11:20 am | Coffee break* |
| 11:20 - 12:00 am | David Gao (Nanolayers Research Computing LTD) |
| | "Multiscale Materials Modelling of Nanotube-based Devices" |
| 12:00 - 12:40 pm | Pablo Ordejón (Catalan Institute of Nanoscience and Nanotechnology) |
| | "A-GeSe for selector materials: model preparation from first-principles" |
| 12:40 - 1:30 pm | Closing |

*Room rental, coffee breaks and lunch are paid by ICN2 as co-organizer of the workshop.

CONTACTS

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