

# 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
	<b>Session 1 - Ferroelectrics device and materials</b>
	<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 <sub>x</sub> -based Ferroelectrics"
	"OTS material electrical parameter mapping from theoretical electronic structure"



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

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Institut Català de Nanociència i Nanotecnologia

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CET	Thursday 11
	<b>Session 2 - Interoperability, Ontology &amp; Workflow in Materials Modelling</b>
	<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
	<b>Session 3 - Alternative solutions for neuromorphic computing</b>
	<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



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CET	Friday 12
	<b>Session 4 - PCM device and materials</b>
	<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 <sub>x</sub> Se <sub>1-x</sub> : 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

Website:	<a href="https://intersect-workshop.icn2.cat/">https://intersect-workshop.icn2.cat/</a>
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