

Workshop on Unconventional Computing – Erice, 6 – 12 July 2024

Program

Day	Time	Title	Speaker
Saturday 6	21:30-24:00	Welcome and get together (Marsala Room)	
Sunday 7 Introduction to UC (<i>M. Fanciulli</i>)	8:45-9:00	Introduction to the Workshop	M. Fanciulli/G. Benedek
	9:00-10:00	The need for unconventional computing paradigms - motivation, challenges and prospects	B. Offrein
	10:00-10:30	Coffee break	
	10:30-11:30	What a mathematical foundation for unconventional computing should deliver and how it might look like	H. Jaeger (remote)
	11:30-12:30	Designing and Evaluating Physical Unconventional Computers.	S. Stepney
	12:30-14:30	Lunch	
NANOELECTRONICS I	15:00-16:00	On Chip photonic computing using in multidimensional and without coherent light	H. Bhaskaran
<i>(S. Stepney)</i>	16:00-17:00	Unconventional computing approaches with CMOS friendly devices	V. Bragaglia
	17:00-17:30	Tea Break	
	17:30-18:30	Scaling up Reservoir Computing with Heterogeneous ESNs	C. Wringe
	18:30-19:30	Go hard(ware network) or go (smart) home: What's next for nanomagnetic reservoir computers?	T. Hayward
	19:30	Dinner	
	21:00-23:00	Poster Session	
Monday 8 NANOELECTRONICS II (<i>V. Bragaglia</i>) (<i>W.v.d. Wiel</i>)	9:00-10:00	Dopant Network Processing Units in Silicon	W.v d. Wiel
	10:00-11:00	The physics of donors in SOI for unconventional computing	M. Fanciulli
	11:00-11:30	Coffee Break	
	11:30-12:30	Phosphorus doping of silicon by means of block copolymer lithography and Ion Implantation: a versatile platform for new computing paradigms	M. Perego
	12:30-14:30	Lunch	
	14:30-15:30	Machine learning and optimization utilizing non-linear dynamics in electron devices and their networks	S. Kasai (remote)
	15:30-16:30	Brain-like Computation with Percolating Networks of Nanoparticles	S. Brown
	16:30-17:30	Self-organizing nanowire networks: from device physics to reservoir computing	C. Ricciardi
	17:30-18:00	Tea Break	

	17:30-18:00		POSTER
	18:00-18:30		POSTER
	18:30-19:00		POSTER
	19:00-19:30		POSTER
	19:30	Dinner	
	21:00-23:00		POSTER
Tuesday 9 SPINTRONICS, PHOTONICS, NEUROELECTRONICS <i>(H. Bhaskaran)</i>	9:00-10:00	Neuromorphic Computing with Spintronics	J. Grollier
	10:00-10:30	Coffee Break	
	10:30-11:30	Computing with Physics: the Bayesian Approach	D. Querlioz
	11:30-12:30	Photonic neuromorphic computing with integrated phase change material assisted with graphene microheaters	A. Ovvyvan
	12:30-14:30	Lunch	
	14:30-15:30	Neuroelectronics 2.0: signal transduction and neuromorphic processing in biohybrid neural networks	S. Vassanelli
	15:30-16:30	Photonic Image Convolution & Machine Vision via Random Network Lasers	J. C. Gartside
	16:30-17:00	Tea Break	
	17:00-17:30	Phosphorus incorporation and ionization in ultra-thin silicon nanofilms	A. Pulici
	17:30-18:00	SOI-based DNPUs	F. Taglietti
	18:00-18:30	Gradient descent in materia	L. Cassola
	19:30	Dinner	
	21:00-23:00	Poster Session	
Wednesday 10 CHEMICAL <i>(C. Bartolozzi)</i>	9:00-10:00	Networks of microscale chemical oscillators – towards chemical computing	H. Wolf
	10:00-10:30	Programmable Chemical Computers	L. Cronin (remote)
	11:00-11:30	Growing Echo State Networks with Developmental Graph Cellular Automata	R. Waldegrave
	11:30-13:15	Lunch	
	13:15-20:00	Excursion - Selinunte	
	20:00	Dinner	
	21:00-23:00	Poster Session	
Thursday 11 QUANTUM <i>(M. Perego)</i> APPLICATIONS <i>(H. Wolf)</i>	9:00-10:00	Quantum reservoir computing for quantum information processing	S. Ghosh (remote)
	10:00-10:30	Coffee Break	
	10:30-11:30	Unconventional Computing with Photonic Substrates	M. Soriano
	11:30-12:00	Neuromorphic Computing Enhanced by Nonvolatile Ion Implantation Tuning of Photonic Structures	Shabnam Taheriniya
	12:00-12:30	III-V Semiconductor Bioinspired Nanopillar Arrays for Neuromorphic Computing Applications	João Azevedo
	12:30-14:30	Lunch	

	14:30-15:30	Applications of neuromorphic technologies to robotics: from vision to touch	C. Bartolozzi
	15:30-16:30	Generative property in physical reservoir computing	K. Nakajima (remote)
	16:30-17:00	Tea Break	
	17:00-17:30	Open discussion on the outlook for UC	S. Stepney Moderator
	17:30-18:00	Open discussion on the outlook for UC	
	18:00-18:30	Closing	M. Fanciulli
	18:30-19:00		
	19:00-19:30		
	19:30	Social Dinner - sponsored by HYBRAIN	
Friday 12	9:00-9:50	Departure	
	9:50-10:20	Departure	
	10:20-14:00	Lunch/Departure	
	12:00-14:00		

The workshop is partly supported by



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