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 *(M. Fanciulli)*	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**
(S. Stepney)	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 *(V. Bragaglia)*	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	
(W.v.d. Wiel)	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** *(H. Bhaskaran)*	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. Ovvyan**
	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** **(***C. Bartolozzi)*	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** *(M. Perego)*	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
APPLICATIONS *(H. Wolf)*	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		

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STMicroelectronics – www.st.com

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