

## MEMRISYS 2015

*International Conference on Memristive Systems*

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## MemoCIS 2nd Workshop and MC Meeting

'Memristors – Devices, Models, Circuits, Systems and Applications', Paphos, Cyprus

### Sunday, 08 Nov

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|---------------|--|
| 14:00 - 14:15 | Welcome Session<br>Room: Athenaeum Ballroom  |
| 14:15 - 15:15 | Keynote Talk 1: "Everything You Want to Know About Memristors But Are Afraid to Ask", Prof. Leon Chua and Dr. Fernando Corinto<br>Chair: Julius Georgiou<br>Room: Athenaeum Ballroom   |
| 15:15 - 15:45 | Invited Talk<br>Chair: Julius Georgiou<br>Room: Athenaeum Ballroom   |
| 15:15         | Memristor: The Enabler of Computation-in-Memory Architecture for Big-Data<br><i>Said Hamdioui</i> , Hoang Anh Du Nguyen, Muhammad Adib Bin Haron, Lei Xie, Mottaqiallah Taouil, Koen Bertels   |
| 15:45 - 16:15 | Break Session<br>Room: Athenaeum foyer   |
| 16:15 - 16:45 | Invited Talk<br>Chair: M. Ogorzalek<br>Room: Athenaeum Ballroom  |
| 16:15         | Radiation hard design of HfO <sub>2</sub> based 1T1R cells and memory arrays<br><i>Alessandro Grossi</i> , Cristiano Calligaro, Eduardo Perez, Florian Teply, Thomas Mausolf, Cristian Zambelli, Piero Olivo, Christian Wenger   |
| 16:45 - 17:15 | Invited Talk<br>Chair: M. Ogorzalek<br>Room: Athenaeum Ballroom  |
| 16:45         | Organic Memristive Devices Based Circuits for Memorizing and Processing of the Information<br><i>Victor Erokhin</i>  |
| 17:15 - 18:15 | Papers Session Sun-1<br>Chair: Stavros Stavrinos<br>Room: Athenaeum Ballroom   |
| 17:15         | Monolayer hybrid redox organic/nanoparticle devices with giant negative differential resistance and memristive behaviors.<br><i>Tianchen Zhang</i> , David Guerin, Fabien Alibart, Kamal Lmimouni, Ali Yassin, Maitena Ocafrain, Jean Roncali, Philippe Blanchard, Stephane Lenfant, Dominique Vuillaume |
| 17:35         | Unfolding Principle gives insight into physics behind threshold switching in a NbO memristor<br><i>Alon Ascoli</i> , Stefan Slesazek, Hannes Mähne, Ronald Tetzlaff, Thomas Mikolajick   |
| 17:55         | Heterogeneous Memristive Crossbar for In-Memory Computing<br>Georgios Papandroulidakis, <i>Ioannis Vourkas</i> , Georgios Sirakoulis, Antonio Rubio  |

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### Monday, 09 Nov

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|---------------|--|
| 8:30 - 9:30   | Keynote Talk 2: "Computing with phase change resistive memory devices", Dr. Abu Sebastian<br>Chair: Fernando Corinto<br>Room: Athenaeum Ballroom   |
| 9:30 - 10:00  | Invited Talk<br>Chair: Fernando Corinto<br>Room: Athenaeum Ballroom  |
| 9:30          | Practical Gradient-Descent for Memristive Crossbars<br>Manu Nair, <i>Piotr Dudek</i>   |
| 10:00 - 10:40 | Papers Session - Mon1<br>Chair: Fernando Corinto<br>Room: Athenaeum Ballroom   |
| 10:00         | Short-Term to Long-Term Plasticity Transition in Filamentary Switching for Memory Applications<br><i>Selina La Barbera, Adrien Vincent, Damien Querlioz, Dominique Vuillaume, Fabien Alibart</i>   |
| 10:20         | Gradual set dynamics in HfO <sub>2</sub> -based memristor driven by sub-threshold voltage pulses<br><i>Stefano Brivio, Erika Covi, Alexantrou Serb, Themistoklis Prodromakis, Marco Fanciulli, Sabina Spiga</i>                                |
| 10:40 - 11:00 | Break Session<br>Room: Athenaeum foyer   |
| 11:00 - 11:30 | Invited Talk<br>Chair: Giacomo Indiveri<br>Room: Athenaeum Ballroom  |
| 11:00         | NANOPORE IONIC MEMRISTIVE EFFECTS<br><i>Mauro Poggio, Fernando Corinto</i>   |
| 11:30 - 12:50 | Papers Session - Mon2<br>Chair: Giacomo Indiveri<br>Room: Athenaeum Ballroom   |
| 11:30         | Modeling of the major and minor I-V loops in La <sub>0.3</sub> Ca <sub>0.7</sub> MnO <sub>3</sub> films using asymmetric logistic hysterons<br><i>Enrique Miranda</i>  |
| 11:50         | Memristor based neuromorphic circuit for visual pattern recognition<br><i>Paolo Lorenzi, Vanessa Sucre, Giulio Romano, Rosario Rao, Fernanda Irrera</i>  |
| 12:10         | GROWING NEURONS CELLS ON MEMRISTIVE SUBSTRATES<br><i>Silvia Battistoni, Victor Erokhin, Nicola Cornella, Tatiana Berzina, Paolo Macchi, Salvatore Iannotta</i>   |
| 12:30         | PANI-based neuromorphic networks – first results and close perspectives<br><i>Andrey Emelyanov, Vyacheslav Demin, Dmitrii Lapkin, Victor Erokhin, Silvia Battistoni, Giacomo Baldi, Salvatore Iannotta, Pavel Kashkarov, Mikhail Kovalchuk</i> |

Monday, 09 Nov



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12:50 - 14:30 Lunch

14:30 - 15:30 Poster Session - Mon1  
Room: Athenaeum foyer

Modular Emulators of Memristors and Other Higher-Order Elements from Chua's Periodical Table  
*Dalibor Biolek, Tomas Teska, Viera Biolkova, Zdenek Kolka*

Layer-by-layer technique for the fabrication of organic memristors and neuromorphic systems  
*Svetlana Erokhina*

Simplified SPICE Model of TiO<sub>2</sub> Memristor  
*Zdenek Kolka, Dalibor Biolek, Viera Biolkova*

Modeling and analysis of memristor circuits and systems  
*R.Tetzlaff, A.Ascoli*

High-Dimensional Computing with Sparse Vectors  
*Mika Laiho, Jussi H. Poikonen, Pentti Kanerva, Eero Lehtonen*

Emulation of a memristor element using a programmable microcontroller device  
*Milutin Nestic, Stefan Ivanovic, Amela Zekovic, Slavica Marinkovic, Branko Tomcik, Bratislav P. Marinkovic, Borislav Hadzibabic*

Hybrid Memristor Devices for Low Cost Non-Volatile Memory Storage  
*E. Verrelli, R. J. Gray, A. Hamdiyah, B. Gardner, M. O'Neill, S. M. Kelly, N. T. Kemp*

Simulation of the major and minor hysteretic I-V loops in bipolar resistive switches using recursive operators  
*J. Blasco, E. Miranda*

Experimental study of the temperature and bias polarity effects on the conduction characteristics of HfO<sub>2</sub>-based resistive switching devices  
*A. Rodriguez-Fernández, M.B. Gonzalez, E. Miranda, F. Campabadal, J. Suñe*

15:30 - 16:45 MemoCIS MC Meeting  
Room: Athenaeum Ballroom

16:45 - 17:00 Break Session  
Room: Athenaeum foyer

17:00 - 18:00 MemoCIS MC Meeting  
Room: Athenaeum Ballroom

19:00 Conference Dinner



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**Tuesday, 10 Nov**

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|---------------|--|
| 8:30 - 9:30   | Keynote Talk 3: "Brain-inspired models of stochastic computation and learning", Prof. Robert Legenstein<br>Chair: Ronald Tezloff<br>Room: Athenaeum Ballroom   |
| 9:30 - 10:50  | Papers Session - Tue1<br>Chair: Sabina Spiga<br>Room: Athenaeum Ballroom   |
| 9:30          | Insights to Memristive Memory Cell from a Reliability Perspective<br><i>Peyman Pouyan, Antonio Rubio, Esteve Amat</i>  |
| 9:50          | Resistance switching in SiOx<br><i>Adnan Mehonic, Mark Buckwell, Luca Montesi, Anthony Kenyon</i>  |
| 10:10         | Exploring ReRAM-based Memristors in the Charge-Flux Domain, a Modeling Approach<br><i>Rodrigo Picos, J. B. Roldán, Mohamed Moner Al Chawa, F. Jimenez-Molinos, M.A. Villena, Eugeni Garcia-Moreno</i>        |
| 10:30         | A non-ideal memristor device<br><i>Stavros Stavrinides, Antonios Theodorakakos, Euripides Hatzikraniotis, Rodrigo Picos</i>  |
| 10:50 - 11:10 | Break Session<br>Room: Athenaeum foyer   |
| 11:10 - 12:10 | Papers Session - Tue2<br>Chair: Rodrigo Picos<br>Room: Athenaeum Ballroom  |
| 11:10         | Approximate Programming of Magnetic Memory Elements for Energy Saving<br><i>Nicolas Locatelli, Adrien F. Vincent, Sylvie Galdin-Retailleau, Jacques-Olivier Klein, Damien Querlioz</i>                       |
| 11:30         | Combined optical/e-beam lithography approach for the development of HfO <sub>2</sub> -based memristors in crossbars<br><i>Yury Matveyev, Roman Kirtaev, Alena Fetisova, Dmitriy Negrov, Andrey Zenkevich</i> |
| 11:50         | Interfacing Physarum polycephalum with organic memristors<br><i>Alice Dimonte, Victor Erokhin</i>  |
| 12:10 - 13:40 | Lunch  |
| 13:40 - 14:55 | WG meetings<br>Room: WG 1: Athenaeum Ballroom, WG 2: Aphrodite Room, WG 3: Ariadne Room, WG 4: Artemis Room  |
| 14:55 - 15:10 | Break Session<br>Room: Athenaeum foyer   |
| 15:10 - 16:10 | WG meetings<br>Room: WG 1: Athenaeum Ballroom, WG 2: Aphrodite Room, WG 3: Ariadne Room, WG 4: Artemis Room  |

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