



## The “mem-computer” explained



### A new computational approach in the next SISSA *colloquia*

27 July 2016, 2:00pm  
SISSA, Main Lecture Hall  
Via Bonomea 265, Trieste

Massimiliano Di Ventra, Physicist at the University of California San Diego, will explain the basics of memcomputing, a new computational approach that uses memory for information processing and storage using the human brain as an analogy. The talk will be held in English and is open to the public.



The analogy between brain and computer is even closer when it comes to memcomputing, a new computational paradigm where memory plays a major role. At the next colloquium, Massimiliano Di Ventra will explain the new approach, which he developed. The human brain is a powerful processor and very efficient from an energy point of view. Is it possible, he asks, to duplicate this capacity in a solid state, with a device based on the physical properties of the material? How? A crucial aspect for Di Ventra is to create a machine that uses memory to both store and process information much in the way our brain does. The approach itself was named mem-computing to emphasize this central role of memory.

In his talk, the scientist will explain the characteristics of this new paradigm in detail, focusing on mathematical aspects that describe how these computers operate. The colloquium is open to the public and will be of a technical and scientific nature. The talk will be held in English. No prior reservation is necessary.

### ***The Speaker***

Massimiliano Di Ventra is an accomplished Physicist who obtained his undergraduate degree in Physics from the University of Trieste and did his PhD studies at the Ecole Polytechnique Federale de Lausanne. He was a Visiting Scientist at IBM (Thomas Watson Research Center) and Assistant Professor at Vanderbilt University. Later, he worked as a Professor in the Physics Department at Virginia Tech. He was promoted to Associate Professor in 2003 and moved to the Physics Department of the University of California, San Diego, in 2004 where he was promoted to Full Professor in 2006. He has been a visiting professor at many international universities including SISSA.

Author of nearly 200 scientific papers, including some of the most cited internationally in recent years, Di Ventra's research interests are in the theory of electronic and transport properties of nanoscale systems, non-equilibrium statistical mechanics, DNA sequencing/polymer dynamics in nanopores, and memory effects in nanostructures for applications in unconventional computing and biophysics, including the paradigm of memcomputing.

### **IMAGE:**

- **Massimiliano Di Ventra - Credits: UCSD, San Diego**

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