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SCUOLA SUPERIORE DI CATANIA

CAN WE USE LIGHT TO IMPROVE MEMORY DEVICES?

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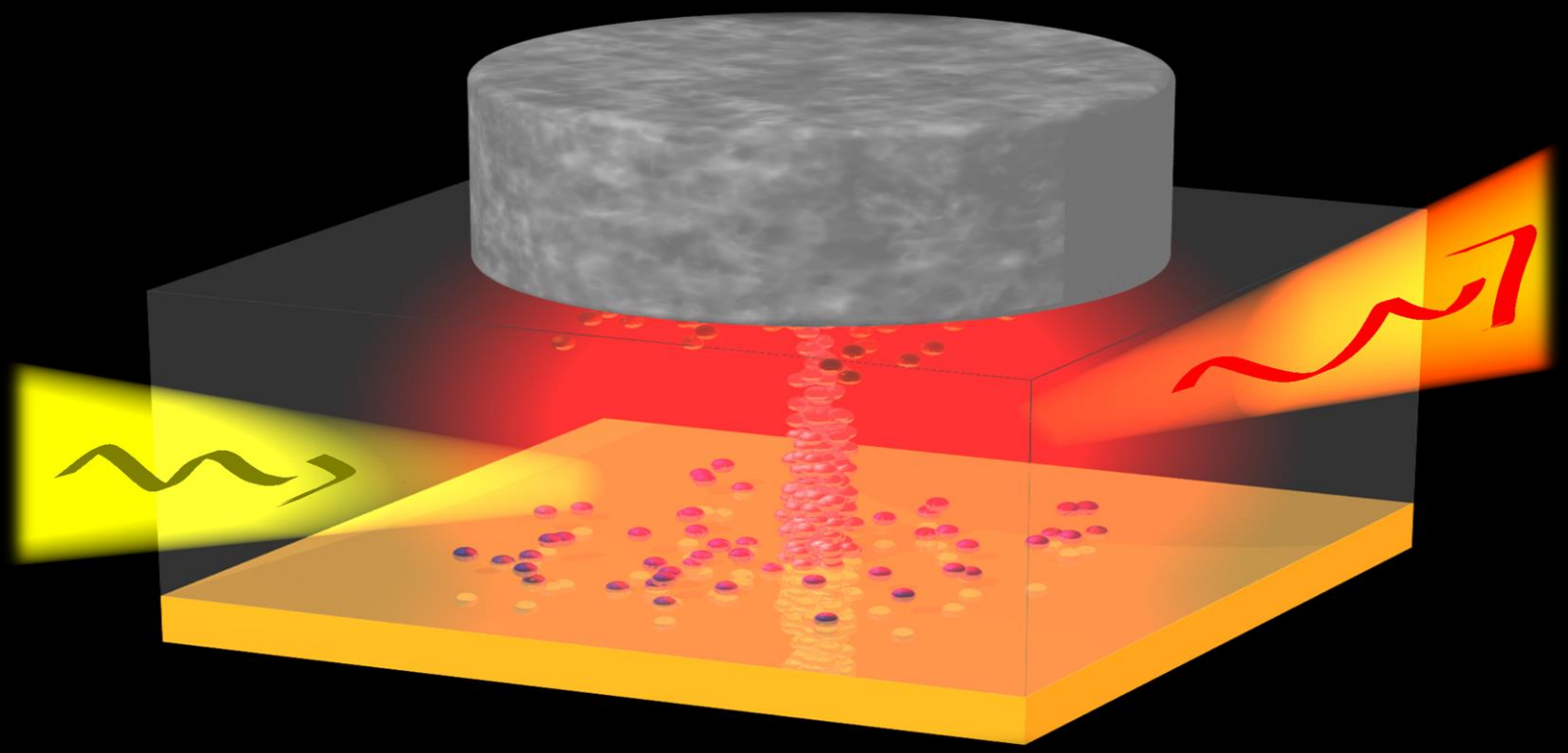
28 Marzo 2018, ore 21.00



Abstract – We are currently approaching the limit for miniaturising transistors and memory devices using current architectures, with more and more components packed together to grow computing power. Virtually all power in microelectronics is converted into heat and up to 80% of the computing energy is consumed in the data-transfer bottleneck between logic and memory on interconnects.

One of the most promising contenders for ultralow-energy electronic devices is resistive switching memory (RRAM), potentially capable of reducing energy consumption in IT by >50%. Understanding the nanoscale kinetics of the switching mechanisms is needed to enable high-endurance devices – only this can unlock their integration into fast and low-energy architectures. RRAMs are currently studied by so is not sufficient for developing true understandings. During this talk I will explore how to use the ultra-concentration of light for innovative fast ways to study real-time movement of individual atoms that underpins this new generation of ultra-low energy memory nano-devices.

Short Bio – Giuliana's research career started in Catania under the supervision of Prof Priolo. She then worked with Prof Dal Negro in the department of Electrical and Computer Engineering at Boston University and completed her PhD in Physics in 2014 in the group of Prof Maier, Imperial College London. She then joined Prof Baumberg in Cambridge. She recently became an independent group leader at the University of Cambridge.