Dipartimento di Fisica e Astronomia Galileo Galilei

Università degli Studi di Padova

COLLOQUIUM DI FISICA

Giovedì 22 marzo 2018, ore 15.00
aula "A. Rostagni"

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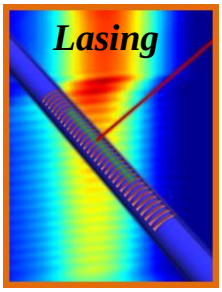
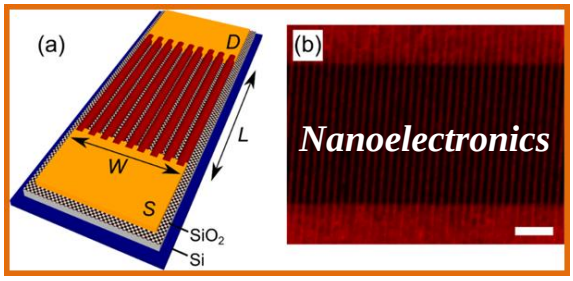
Electrospinning of active organic materials, functional polymers, and nanocomposites for photonics and energy harvesting

Active materials and building blocks involving organics or nanoparticles [1-3] as well as electrospun polymer nanofibers [4,5] are appealing for a variety of scientific fields, including photonics, nanoelectronics, and microelectromechanical systems. Electrospinning technologies are especially interesting in this respect, since potentially up-scaled to industrial level. Demonstrated devices and applications comprise various sub-wavelength optical components and nanofiber lasers [6,7], chemical sensors [8], and accelerometers and wearables made of piezoelectric polymer nanofibers [9,10]. Next-generation electrospun nanosystems are being designed and developed, which couple opto-mechanical properties through properly interlocked molecular components [11].





Here the electrospinning methods developed in our group will be presented as well as recent results on active polymer nanofibers. Investigated properties include light-confinement, optical losses and anisotropy, stimulated emission [12-14], and random lasing from complex materials obtained by biomimetic routes [15]. The research leading to these results has received funding from the European Research Council under the European Union's Seventh Framework Programme (FP/2007-2013)/ERC Grant Agreement n. 306357 (ERC Starting Grant "NANO-JETS", www.nanojets.eu).

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