

PROCEEDINGS OF SPIE

# ***Nano-Opto-Mechanical Systems (NOMS)***

**Jaume Esteve  
Eugene M. Terentjev  
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*Editors*

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## Introduction

The first scientific meeting on the topic Nano-Opto-Mechanical-Systems (NOMS) took place in San Diego on September 21st 2011, kindly hosted by SPIE NanoScience+Engineering. This is the first forum gathering scholars to purposefully discuss photoactuation in the realm of smart materials, and has assembled participants from Asia, Europe and the United States.

The SPIE NOMS 2011 edition was honored to host invited speakers Antonio Sanchez-Ferrer (ETH Zürich) and Yanlei Yu (Fudan University). Sanchez-Ferrer overviewed chemical processes conducive to photoactuation of liquid-crystal elastomers and Yu reviewed photoisomerization of cross-linked liquid-crystal polymers, providing abundant examples of photoactuators. Demonstrations were staged by Deane B. Blazie and Noel H. Runyan (National Braille Press) and by Balaji Pachapakesan (University of Louisville), who provided a comprehensive review of efforts to incorporate photoactuators into common microtechnologies manufacturing practices.

Additional covered topics included thermo mechanical modeling and microstamping of photoactuators for microtechnologies (Camargo), optical properties (Torras and Zinoviev), all-optical shape memory in azo-LCN materials (Lee), liquid crystalline polymeric nanoparticles immobilized on solid substrates (Tsoi), photoactuation elasticity models (Negron-Marrero), in situ TEM characterization (McGilvray), photo-active double-layer polymer cantilevers (Martin-Olmos), synthesis and characterization of poly lactic acid and multiwall carbon nano-tubes (Kumar and Berrios), and novel photoactuators in polymeric elastomers and carbon nanotubes (Krupa and Omastova). An overview of the impact of photoactuation in the Nano-Bio-Info-Cogni (NBIC) quartet was provided by Campo, as well as a description of societal impacts by way of education to the general public; critical to influence consumer behavior. Education was emphasized at the NOMS session by including undergraduate research presentations, where Electrospinning was suggested as a possible manufacturing method of photoactuators (Rosa and Crespo).

Scientific discussion was prompted by the reviewed topics with a distinctive multidisciplinary tone. Indeed, participants assembled experts in materials, microtechnology, chemistry, and applications. We are delighted with the success of this first edition of SPIE NOMS; we are in the planning stages of the second edition. In closing, the NOMS community is indebted to the SPIE staff and symposium chairs for kindly hosting this meeting. In particular, we are especially grateful to Professor Maria Yzuel, SPIE 2009 President, whose combined leadership, mentorship, and vision has been crucial to make this event possible. We would

also like to thank all conference participants and session chairs, as well as the funding bodies that have facilitated this gathering.

**Eva M. Campo**  
**Jaume Esteve**  
**Eugene M. Terentjev**