Conformal Micropatterning of Curved and Soft Surfaces

Gary Zabow

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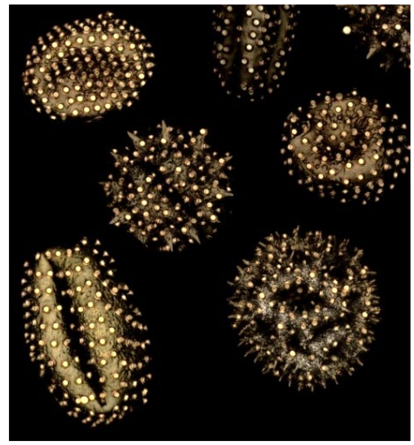
Online [link here](#) via MS Teams


Gold microdisks conformally patterned on grains of pollen

Lithographic patterning and patterned additions of nanomaterials to substrates are usually only compatible with planar, or in some cases, gently curving surfaces. This talk will show how to extend such patterning to highly curved surfaces, edges, and recesses, as well as to soft materials. Arbitrary micropatterns can be transferred from hard, planar surfaces to soft or highly curved surfaces (such as the pollen shown in the figure) via a newly developed transfer microprinting process that uses reflowable soft transfer carrier materials. One example of this is regular table sugar, a material that can spontaneously conform to curved surfaces when it is heated and reflowed. Successful transfers have been made to rigid surfaces, elastomers, and hydrogels. Decorating surfaces with nanomaterials can add or modify numerous functionalities including wettability, chemical reactivities, and optical and meta-optical properties. When applied to microparticles, such patterning may prove useful for active matter research, microrobotics, self-assembly, and colloidal science in general. As time permits, I will discuss related work on designing and fabricating custom shaped microparticles and dynamic shape-changing microstructures.

Gary Zabow, is Head of the Magnetic Imaging Group, National Institute of Standards and Technology (NIST). He holds the Ph.D. in Physics from Harvard. He was previously a Senior Research Fellow at the National Institutes of Health (NIH). His current research focuses on biological cell tracking, NMR/MRI contrast agents and microprobes, magnetism and magnetic micro- and nanoparticles, soft-materials-based sensors, and the development and application of novel micro- and nanofabrication processes.

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