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Title: Unconventional micro-/nanofabrication for semiconductor materials towards via high temperature annealing

Abstract: In integrated circuits (IC) and micro-/nanoelectromechanical systems (MEMS/NEMS), annealing is commonly employed to relieve stress, relocate or activate dopants and heal implant damage for semiconductor materials and to activate the interfacial reaction of metal contacts. It's interesting to note that annealing can cause shape evolution (or morphological change) of pre-structured semiconductor materials towards the minimization of surface energy. Consequently, standard etching and post-annealing procedures can be used to create unique semiconductor micro-/nanostructures. In this talk, I would like to introduce membrane-cavity and pedestal sphere structures, which are primary results of annealing semiconductor materials at high temperature, and discusses the technical uses of them.

Biography: Dr. Jungchul Lee is an Associate Professor in the Department of Mechanical Engineering at Korea Advanced Institute of Science and Technology. His research interests include large-scale batch fabrication of functional nanostructures based on silicon self-assembly, hydrogel based micro-/nanoelectromechanical systems, and materials and processing for flexible, stretchable, and wearable devices. He is currently focusing on nanoscale 3D printing, multifunctional atomic force microscopy, and single molecule force/mass spectroscopy. He serves as a convenor of International Electrotechnical Commission (IEC) SC47E/WG1 (Semiconductor sensors) and an assistant secretary of IEC TC124 (Wearable electronic devices and technologies). He is the recipient of the Academic Award from the Society of Micro Nano Systems in 2016, the IEC 1906 award in 2016 and the Academic Award from the Korean Society of Mechanical Engineers Micro/Nano division in 2019. He organized the 15th International Workshop on Nanomechanical Sensing in 2018. Since 2021, he is serving as the editor-in-chief in the Micro and Nano Systems Letters.