**New Advances in 3D Nanoprinting**

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3D printing has been a very active area of research and development (R&D) in the context of additive manufacture, due to its capability to produce 3D objects by design. Current 3D nanoprinting technology pushes the spatial limit to micrometer scale. Further miniaturization represents a major challenge in current R&D effort in 3D printing. This work reports new advances in miniaturizing 3D printing to nanometer scale using scanning probe microscopy in conjunction with local material delivery such as nanofluidics.[1] Using various materials, the concept of layer-by-layer nanoprinting by design have been demonstrated.[1-2] Nanometer precision is achieved in all three dimensions, as well as in inter-layer registry, as shown in Figure 1. The approach and results provide a new and general platform for conducting scientific research in designed 3D nano-environments, as well as enabling production of new nanomaterials and scaffolds for photonics, devices, biomedicine and tissue engineering.[3-4]

**Figure 1.** An atomic force microscopy based 3D nanoprinting using a nanofluidic probe (A). The dendrimers self-assembled into nanoline arrays with carters (B), while star-polymers form arrays of bamboos. The former represents weak inter-molecular interaction, while the later represents strong interaction.

**References**

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**Biography**



Gang-yu Liu received her Ph.D. from Princeton University in 1992. Following a two-year postdoctoral research at University of California, Berkeley, under a Miller Research Fellowship, she became an assistant professor at Wayne State University, where she received a tenure in 1999. In 2001, she joined the Chemistry Department, University of California, Davis. She has received several prestigious awards, including an ACS Fellow in 2010, AAAS Fellow in 2007, Sloan Faculty Recognition Award in 2007, NSF-CAREER Award (1997), Arnold and Mable Beckman Young Investigator Award (1996-1998), and the Camille and Henry Dreyfus New Faculty Award (1994-1999). She has been a senior editor for the J. Phys. Chem. since 2005. She serves on editorial advisory boards for ACS Nano, (2007-Present) and ACS Applied Nanomaterials. (2017-present). Her research focuses on advanced technology development for 3D nanoprinting, bioimaging, and applications in biomedical research.