

NANO HIGHLIGHT

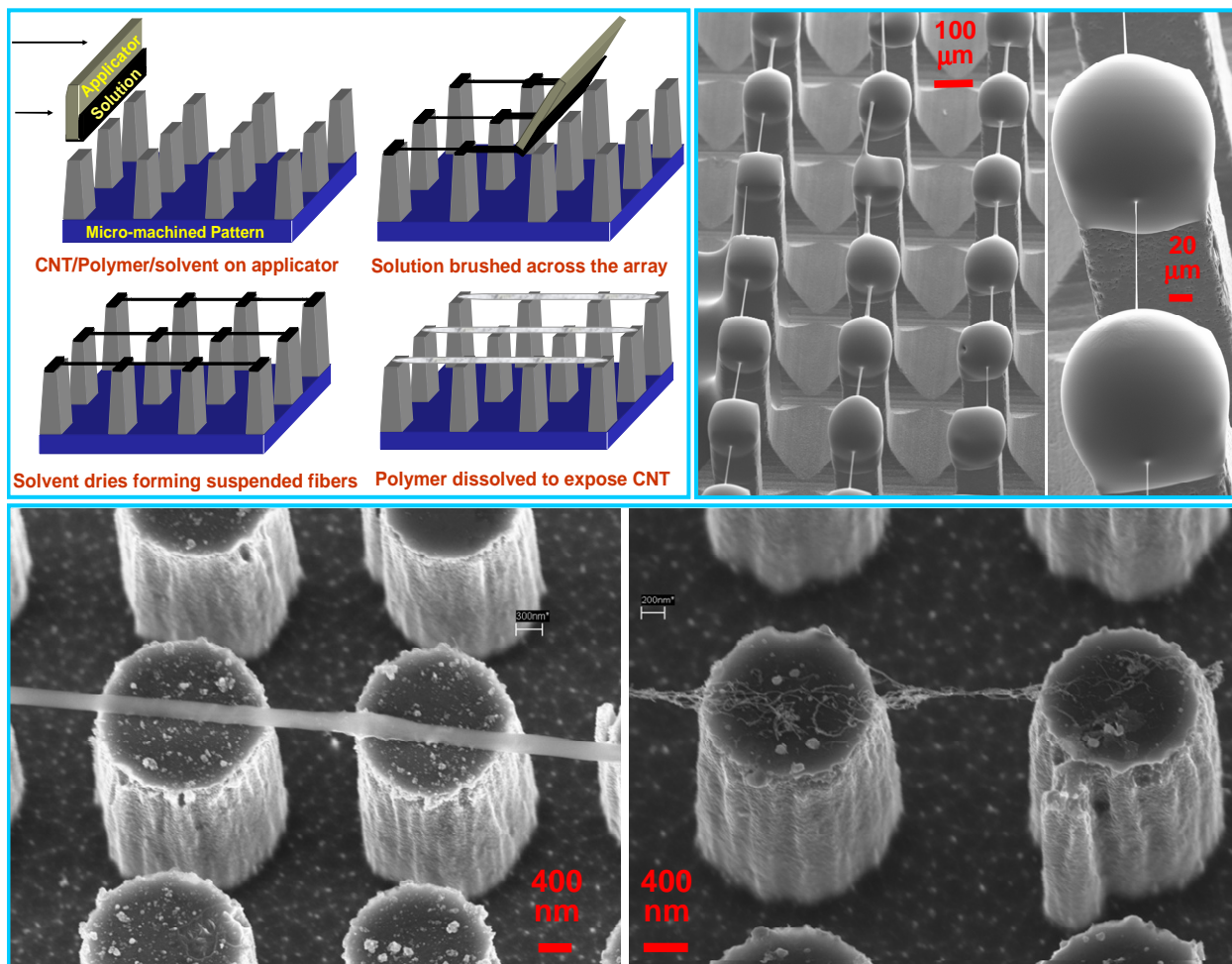
Directed self-assembly of polymers and nanotubes into air-suspended bridges

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Polymers dissolved in volatile solvents can be directed to self-assemble into suspended nanofiber bridges through surface tension driven capillary thinning. This points towards a single step approach to forming suspended 3D structures in a considerably more simple way than by standard microfabrication processes. Fibers form when the polymer liquid is brushed by hand over a corrugated surface, as shown in the cartoon. To the right of the cartoon is a portion of an array and a closeup of polymer microfibers. The large mounds of polymer, compared to the fiber diameter, show how dramatically the fibers have thinned through the capillary forces. Carbon nanotubes can also be suspended, by dispersing them in the liquid polymer, forming fibers, and then thermally decomposing the polymer. The bottom images show the one bridge before and after decomposition of the polymer.[2] Bridges under 10 nm wide have been observed to form.



[1] For further information about this project link to <<http://www.ee.uofl.edu/~eri>> or email <rwcohn@uofl.edu>

[2] S. Pabba, S. M. Berry, M. M. Yazdanpanaah, R. S. Keynton and R. W. Cohn, "Nanotube suspension bridges directly fabricated from nanotube-polymer suspensions by manual brushing," 2006 6th IEEE Conference on Nanotechnology (18 July 2006, Cincinnati, OH).