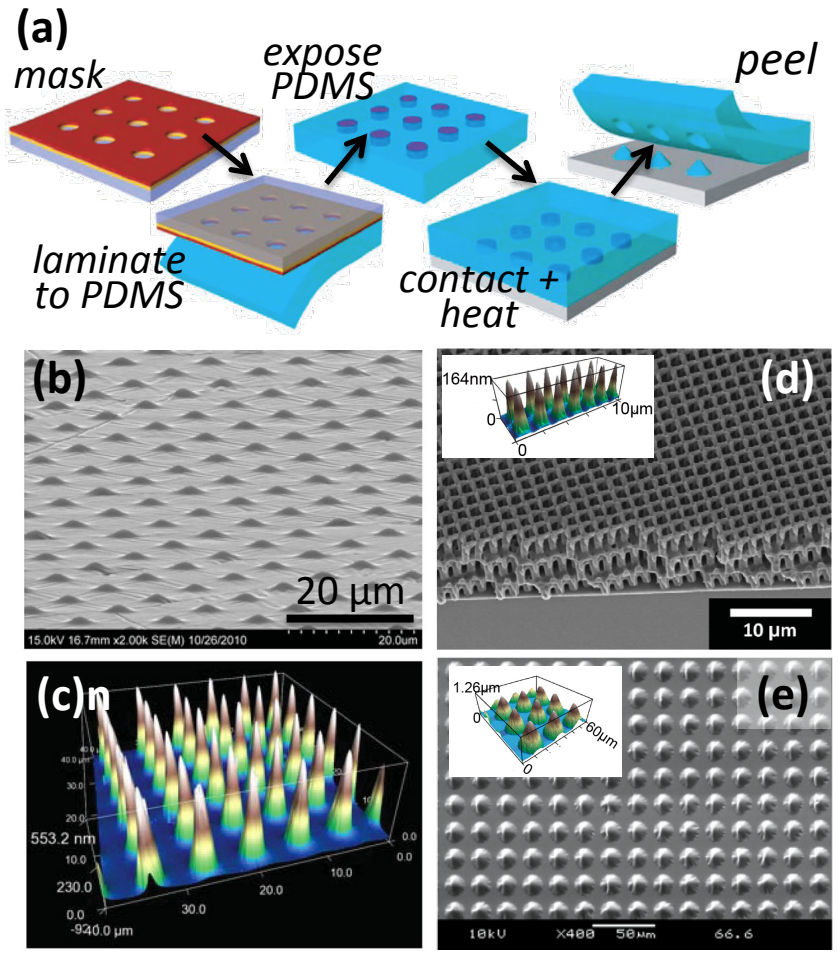
Slap, Stick, & Peel: Soft Triangular Stamps for Nanotexturing



SEM and AFM images of textured surfaces fabricated using soft PDMS stamps

Scientific Achievement

Soft, reusable stamps are fabricated and used to pattern nanoscale triangular prisms and cones for optical applications including Raman sensing, antireflective coatings for solar cells, and photolithography.

Significance and Impact

We offer a quicker and easier approach with a more diverse range of achievable patterns and substrates than other techniques, applied to applications requiring precise control of light-matter interactions.

Research Details

- We fabricate polymer-based soft lithography masters with decal transfer lithography and replicate elastomeric stamps.
- Nanoscale patterns by near-field phase shift lithography can be achieved using a microscale mask.

Work was performed at Univ. of Illinois at Urbana-Champaign & Lawrence Berkeley National Lab

A.M. Bowen, M.J. Motala, J.M. Lucas, S. Gupta, A.J. Baca, A. Mihi, A.P. Alivisatos, P.V. Braun, and R.G. Nuzzo, Adv. Func. Mater. (2012)

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LIGHT-MATERIAL INTERACTIONS IN ENERGY CONVERSION