



## TECHNOLOGY

# Method and Device for Nanoscale Plasma Processing of Materials

## OVERVIEW

Nanoscale processing of thin-films and substrates by exposure to electrically charged plasmas is a desirable technology for surface modifications. The process requires controlling the interaction time of the plasma with the substrate. Currently, surface modifications are generated using lithography, a technique which is cumbersome and expensive. Researchers in the Department of Materials Science and Engineering have constructed a moving shutter to control the interaction of a substrate with a plasma for carefully controlled exposure of the substrate. The shutter contains openings with lateral dimensions less than the Debye screening length.

The broad potential of this device is shown:

- in its ability to provide a controlled removal/addition of a nanoscale layer to a substrate;
- in its use in association with an etching plasma to form micrometer scale diffraction gratings in SiO<sub>2</sub> and polymeric materials without the use of lithography; and
- in its use to generate micro-scale plasma induced surface modifications of a substrate and patterned deposition of materials, again without the use of lithography.

See U.S. published patent application No. 20050051517. Additional patent applications are pending.

For more information please contact the Office of Technology Commercialization, 301-405-3947, or by e-mail at [otc@umd.edu](mailto:otc@umd.edu)

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## Additional Information

### INSTITUTION

University of Maryland, College Park

### PATENT STATUS

Patent(s) pending

### LICENSE STATUS

Contact OTC for licensing information

## **CATEGORIES**

- Nanotechnology + Nanoparticles + Nanomaterials

## **EXTERNAL RESOURCES**

- [US Patent 7,470,329](#)

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