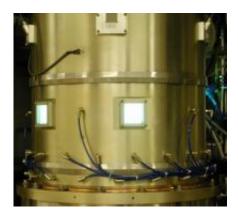


## **New Research on Nanodiamond Materials**

## September 9 2008



Microwave plasma chemical vapor deposition chamber shown in action growing ultrananocrystalline diamond films at Argonne's Center for Nanoscale Materials.

In a recent special issue of *Chemical Vapor Deposition* devoted to nanodiamonds, editors Amanda Barnard and Oliver Williams note that "the diversity of nanocarbon structures and allotropes has led to a plethora of growth techniques and unique properties, and has opened the door to a number of exciting applications."

An invited review article by Anirudha V. Sumant (CNM) and James Butler (Naval Research Laboratory) shows how nanocrystalline diamond is a designer material that can be tailored to specific applications. Materials that grow by using a suppression of renucleation, similar to conventional diamond growth, are distinguished from materials grown by using intentional enhancement of renucleation processes.



These specially designed nanodiamond materials find use in X-ray windows and lithography, micro- and nanomechanical and optical resonators, tribological shaft seals and AFM probes, electron field emitters, platforms for chemical and DNA sensing, to name a few applications.

The CNM offers a Lamda Technologies microwave plasma chemical vapor deposition system in its user program for the growth of ultrananocrystalline diamond films.

Further reading: "The CVD of Nanodiamond Materials," J.E. Butler and A.V. Sumant, Chem. Vap. Deposition, 14, 145–160 (2008) (online).

Provided by Argonne National Lab

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