

REU-Site: Undergraduate Research Project in Ultra-Smooth Nanostructured Diamond Films on Metals

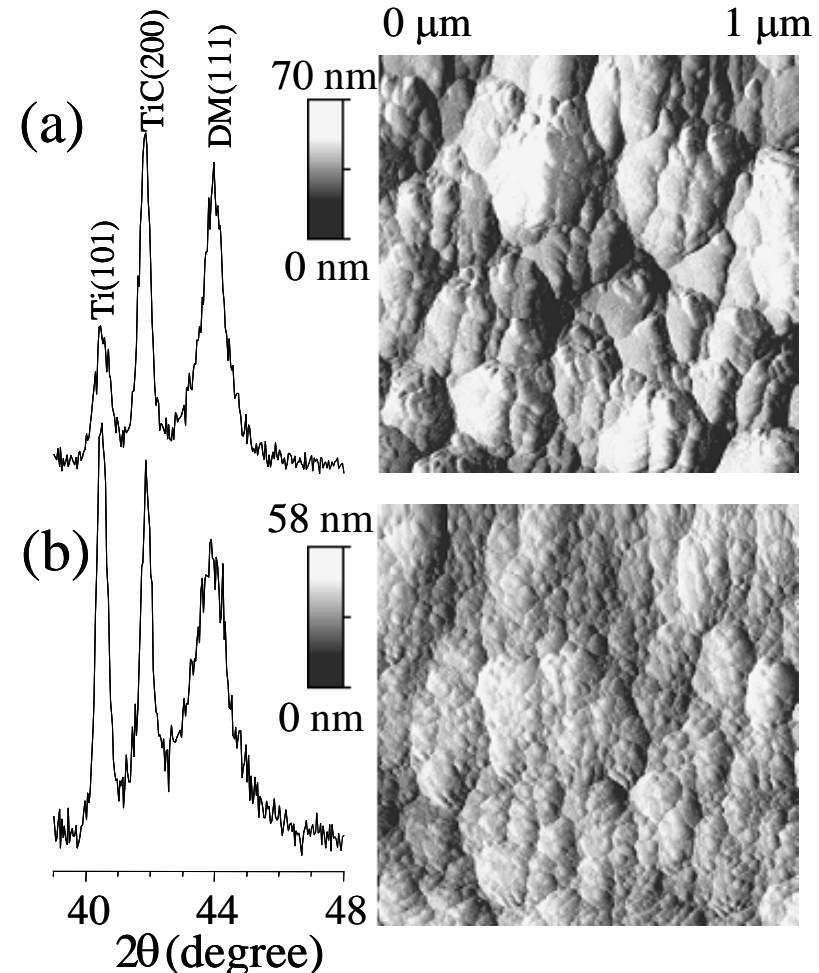
Yogesh Vohra, University of Alabama at Birmingham, **DMR-0243640**

Intellectual Merit: The gas phase chemistry in a microwave plasma chemical vapor deposition process can be altered with controlled addition of helium to a $\text{CH}_4/\text{H}_2/\text{N}_2$ plasma.

This research is notable because nanostructured ultra-hard coatings on metals are ideal for articulating surfaces where low friction and high wear resistance is desirable.

REU-Site Publication:

J. Nanosci. Nanotechnol. **6**, 258-261 (2006).



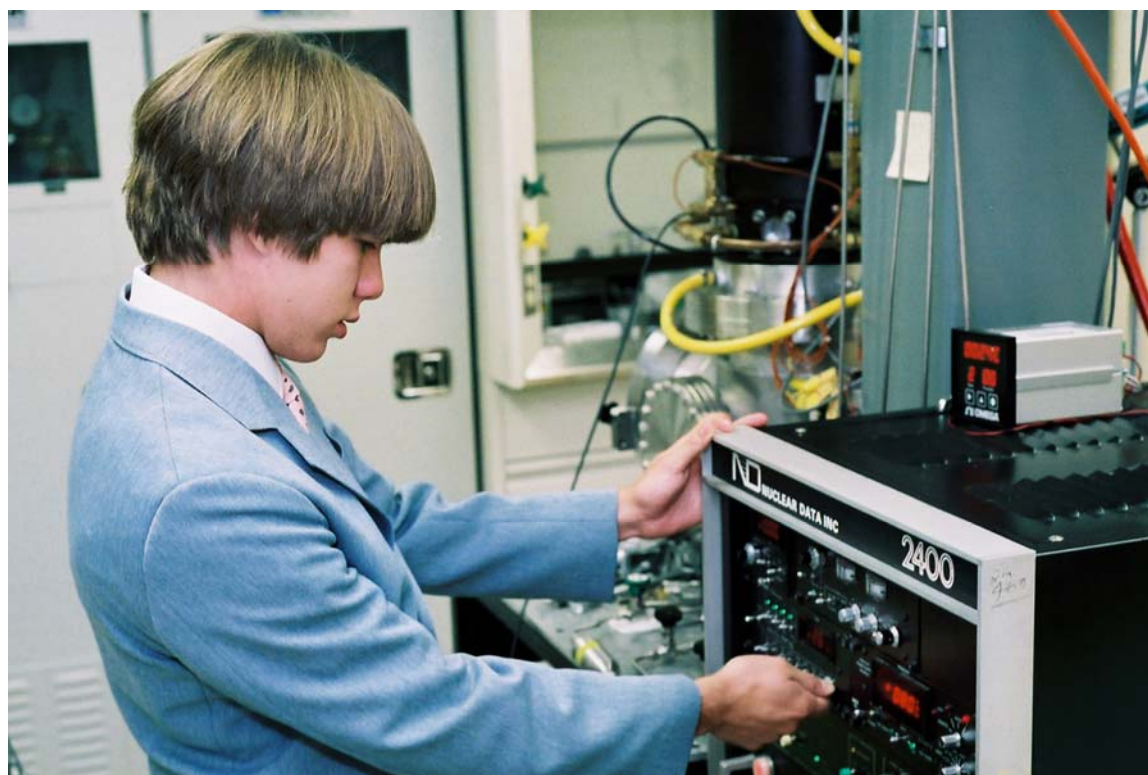
1×1 μm AFM images and XRD 2θ-angular dependencies of two diamond films grown in He/H₂/CH₄/N₂ plasma with (a) 0 and (b) 71 vol% He.

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Broader Impacts:

The University of Alabama at Birmingham (UAB) in collaboration with Samford University and University of Montevallo in Alabama offer interdisciplinary materials research experiences to undergraduate students with diverse backgrounds in physics, chemistry, applied mathematics, and engineering.



Andrew Melo is an undergraduate physics major from The University of the South, Sewanee, Tennessee and was an REU-site participant on UAB campus. Andrew Melo is working on the controls at the 6 kilowatt Microwave Plasma Chemical Vapor Deposition system