

NANO 703/703L – Fall 2017 (4 cr.)

Instrumentation for Characterization of Nanomaterials

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Starting Date: Mon., Aug. 21, 2017

NANO 703: Discussion/Recitation

Time: M,W,F 10:00-10:50 AM

Location: EP 251A

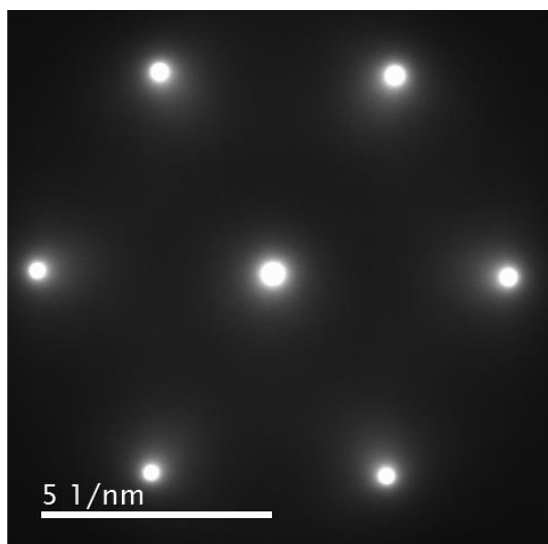
NANO 703L: Laboratory (Times and locations TBD)

Text: Transmission Electron Microscopy

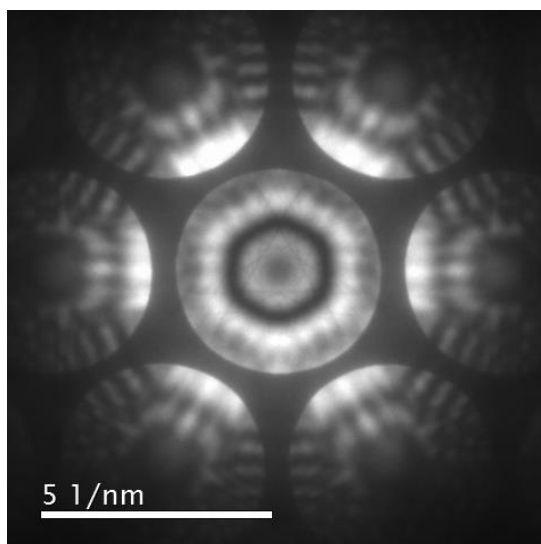
D. B. Williams & C. B. Carter, 2nd Ed. (Springer, 2009)

Description: Experimental nanoscience requires the use of instruments and techniques that can reveal quantum-mechanical phenomena in materials and resolve structural features as small as 1 nm (10^{-9} m). This course will be a hands-on exploration of some of the most important, state-of-the-art tools for nanocharacterization, including electron microscopy, X-ray diffraction, atomic-force microscopy, and optical spectroscopy. Experience with these methods is an asset to any aspiring nanoscientist. Students will be trained in sample preparation, instrument operation, and data acquisition and interpretation. Topics will include electron optics and image formation, beam-specimen interactions, diffraction and crystallography, 3-D reconstruction, and optical signatures of nanomaterials.

selected area



convergent beam



Transmission electron-diffraction patterns from silicon.

Prerequisites: Graduate standing. Interested undergraduate students should contact the instructor.