Robert J Colby
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Education

2007-present: Ph.D. Materials Engineering, Purdue University, GPA 4.0
2005-2007: M.S. Materials Engineering, Purdue University, GPA 4.0 (February, 2007)
2001-2005: Bachelor's of Engineering Physics, University of Illinois at Urbana-Champaign, GPA 3.5

Experience

Research Assistant, Purdue University, School of Materials Engineering – 2007-present
Advisor: Professor Eric Stach
Electron microscopy-based characterization of template-grown GaN/InGaN nanopyramids, with potential LED application. Characterizing the defect structures associated with these pyramids in TEM, including HRTEM work on the FEI Titan at Birck Nanotechnology Center. Using STEM to help map InN concentration, and working on tomography to extend concentration mapping to three dimensions. Work has included extensive TEM sample preparation using FIB-liftout approach. Work funded by the Department of Energy.

Research Assistant, Purdue University, School of Materials Engineering – 2005-2007
Advisor: Professor Lia Stanciu
Metalized alpha-synuclein protein fibrils using electroless chemical deposition of palladium, copper, gold, and cobalt. Characterized synthesis over a wide range of conditions using SEM and TEM, confirming results with diffraction, EDS, and EELS. Performed electrical characterization of metalized nanowires by making direct contacts with ion beam deposited platinum using an FIB. Presented work in poster sessions at Materials Research Society 2006 meeting and awarded for best student poster at 2007 Argonne User Week, Electron Microscopy Center.

Research Assistant, University of Illinois, Engineering Physics – 2003-2005
Advisor: Professor Alexey Bezryadin
Created sub-100-nm diameter freestanding superconducting loops. Worked with fluorinated carbon nanotubes as initial template, and later electron beam induced deposition of carbon using an SEM. Contacts made using photolithography, including clean room experience. Developed technique to the level that fabrication of loops with an inner radius smaller than the Cooper pair coherence length in the cooled superconductor was routine. Measured in ^{3}He cryostat in a magnetic field. Work supported by the National Science Foundation. Includes participation in Research Experience for Undergraduates (REU) 2004 program.

Training/Skills

Experience with Hitach-S4700/S4800 SEM, JEOL 35CF SEM, JEOL 2000FX/EX TEM, FEI Titan 80/300 S/TEM, FEI Nova Dual Beam FIB, Klocke Nanotechnik nanomanipulator, Gatan PIPS, AJA Int. ATC 2000 Co-Sputter System, Uniaxis/ Plasma-Therm 790 series Reactive Ion etching system, Suss Microtech inc. MJB3 Mask Aligner, and clean room use. Generally experienced with software, including Photoshop, CAD (AutoCAD, Inventor), IMOD (tomography software), and MacTempas.