



HAJIM SCHOOL OF ENGINEERING & APPLIED SCIENCES  
UNIVERSITY of ROCHESTER

Department of Chemical Engineering  
Professor Amit Bandyopadhyay



School of Mechanical and Materials Engineering  
Washington State University

**Novel hard materials and manufacturing processes towards  
repair and reconstruction of bone disorders**

**Wednesday, April 3, 2013**  
**2:15 p.m.**  
**101 Goergen Hall**

Musculoskeletal disorders, bone deficiencies or osteoporosis are among the most important human health conditions that exist today. Currently, repairing such bone defects involves surgical techniques, including the use of autogenous grafts, allogeneous grafts, internal and external fixation devices, electrical stimulation, and replacement implants. Although effective in many cases, these existing technologies still need improvement to overcome many difficulties. Our research is focused on novel hard biomaterials and their manufacturing at different length-scales towards repair and reconstruction of bone disorders. The presentation will focus on our recent work on load-bearing implants such as hip and knee joints to reduce stress shielding and minimize wear induced osteolysis and to enhance bone-tissue engineering via surface modification such as electrical polarization. Application of 3D printing towards novel implants designs will also be discussed.

**Amit Bandyopadhyay** received his Ph.D. in Materials Science and Engineering from the University of Texas at Arlington in 1995. He joined the Center for Ceramics Research at Rutgers University for his post-doctoral training in 1995. In 1997, he joined the School of Mechanical and Materials Engineering (MME) at WSU as an Assistant Professor and promoted to an Associate level in 2001 and to the full professor level in 2006. Prof. Bandyopadhyay supervised/supervising 12 Ph.D. and 22 MS graduate students. He has published over 225 technical papers including over 160 journal papers. He holds 8 US patents. His research papers have been cited over 3500 times by various research groups ("h" index 33). Prof. Bandyopadhyay is a Fellow of the American Ceramic Society (ACerS), American Society for Materials (ASM International), American Institute for Medical and Biological Engineering (AIMBE) and American Association for the Advancement of Science (AAAS).