



Interfaces and Nanoparticles

Wednesday March 28, 2012, Babbio 122, 11am

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The present talk will consider some examples of TEM studies of nanoparticles, paying particular attention to how recent improvements in the instrumentation are improving the quality of the data that the TEM produces. Transmission Electron Microscopy is the essential tool for understanding nanoparticles. It can tell you about the structure and chemistry of specific nanoparticles and the local variations due to segregation or defects. Features such as interfaces within a nanoparticle, small facets on the surface, and local changes in chemistry, which may or may not involve local changes in structure, can each be examined with near atomic resolution. TEM can also bridge the length scale to more macroscopic features such as the distribution of nanoparticles: their clustering and alignment being particularly important. We can examine the surface coating of nanoparticles and other local changes in chemistry which we intentionally or accidentally induce. We can even examine how nanoparticles change in response to applied stimuli (in particular stress, heat, the electron beam or an applied voltage). Throughout the talk the emphasis will be on Ceramic Materials.

C. Barry CARTER is a Professor & Head of the Department of Chemical, Materials, and Biomolecular Engineering at the University of Connecticut. He holds a B.A., M.A. and Sc.D. from Cambridge, an M.Sc. from Imperial College, and a D. Phil. from Oxford. After 6 years in Oxford (3 as a postdoc) he spent 14 years at Cornell and then 16 years as Professor and the 3M Endowed Multidisciplinary Chair in the Department of Chemical Engineering and Materials Science at the University of Minnesota before moving to his current position at UConn. He has been a long-term visitor at Sandia National Labs, and held visiting positions at Los Alamos National Labs, Chalmers University in Sweden, NIMS in Tsukuba, Bristol University, Max Planck Institute in Stuttgart, the Institute for Physical Chemistry in Hannover and the Ernst Ruska Center in Julich. He has been awarded a Guggenheim Fellowship and the Alexander von Humboldt Senior Award. His group has won the Roland B Snow Award of the American Ceramic Society 6 times including 3 consecutive years 2000-2002. He is a Fellow of AAAS, MRS, MSA, ACerS and RMS. He served as the 1997 President of the Microscopy Society of America and as the 2003-2010 General Secretary of the International Federation of Societies for Microscopy; he is the current (2011-2014) President of IFSM. He has published more than 700 articles with 290+ in archival journals but is better known as the co-author of two textbooks Transmission Electron Microscopy: A Textbook for Materials Science, with Dave Williams and Ceramic Materials; Science and Engineering with Grant Norton. He is the Editor-in-Chief of the Journal of Materials Science, which was cited more than 26,000 times in 2010.

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