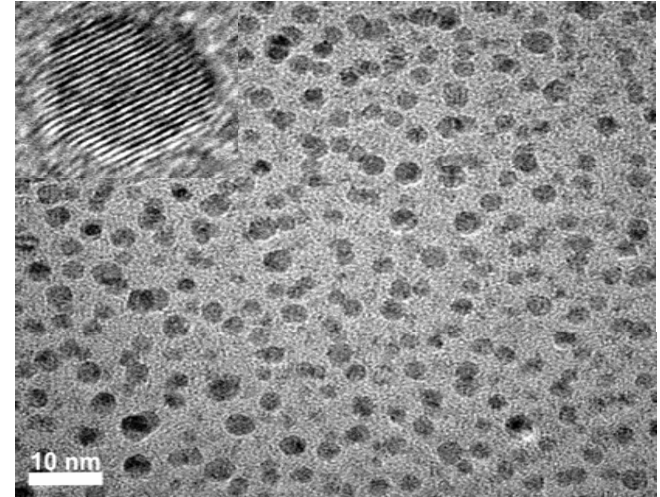


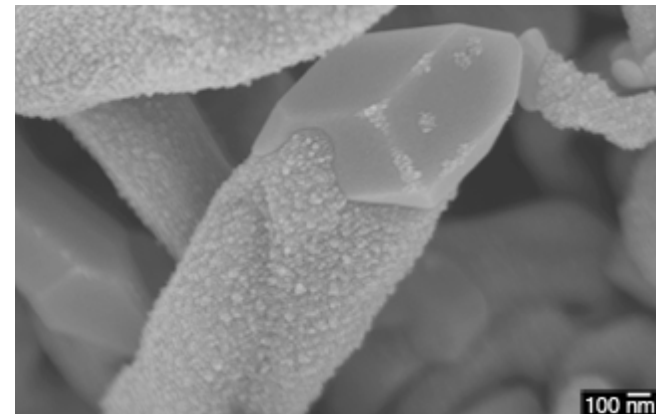
Plasma Synthesis of Nanoparticles

Steven Girshick (PI), Postdocs: J. Hafiz and Yuanqing He; Graduate Students: A. Beaber, A. Boies, S. Eickhoff, Srivathsan G, V. Kodimala, Lejun Qi, L. Ravi, M. VanOtterloo, S. Warthesen & Bin Zhang
Mechanical Engineering, University of Minnesota

- Plasma synthesis of metal, ceramic & semiconductor nanoparticles
- Manufacturing with nanoparticle sprays & beams
- Coating nanoparticles by photo-assisted chemical vapor deposition
- Applications: superhard coatings, optical materials, nanoenergetics
- Numerical modeling of “nanodusty” plasmas
- Publications
 - ◆ *Nanoparticles and Plasmas*, S. L. Girshick and S. J. Warthesen, *Pure Appl. Chem.* **78**, 1109 (2006).
 - ◆ *Analysis of Nanostructured Coatings Synthesized through Ballistic Impaction of Nanoparticles*, J. Hafiz et al., *Thin Solid Films* **515**, 1147 (2006).
 - ◆ *Nanoparticle-Coated Silicon Nanowires*, J. Hafiz et al., *J. Nanopart. Res.* **8**, 995 (2006).
 - ◆ *Hypersonic Plasma Particle Deposition—a hybrid between plasma spraying and vapor deposition of nanophase materials*, J. Hafiz et al., *J. Therm. Spray Technol.* **15**, 822 (2006).
 - ◆ *An Energy Balance Criterion for Nanoindentation-Induced Single and Multiple Dislocation Events*, W. W. Gerberich et al., *J. Appl. Mech.* **73**, 327 (2006).



Plasma-synthesized cubic-phase silicon carbide nanoparticles



Silicon nanowire coated with silicon nanoparticles, with TiSi₂ catalyst particle at tip.