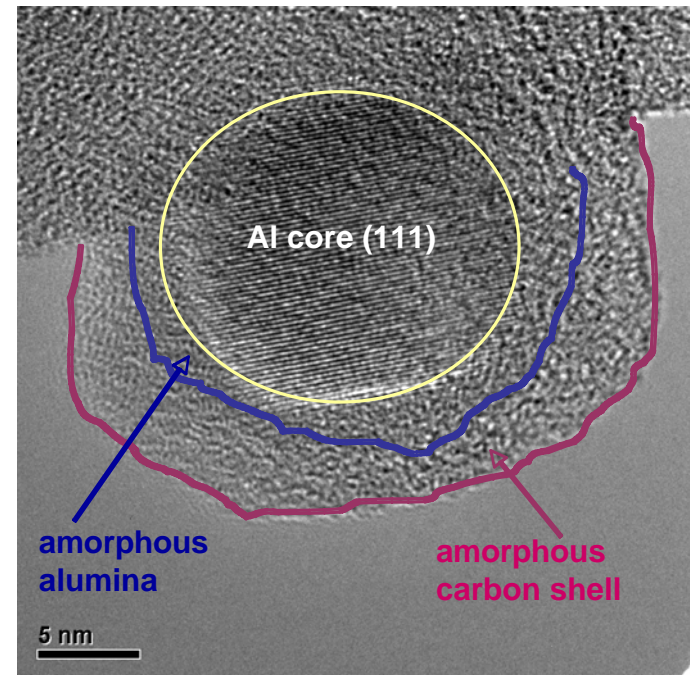


# Plasma Synthesis of Nanoparticles

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NNIN Facility utilized: Characterization Facility

- Plasma synthesis of nanoparticles & nanostructured films
- Coating nanoparticles by photo-assisted CVD
- Focused beam deposition of nanoparticle micropatterns
- Applications: superhard coatings, photonics, biomedical theranostics, nanoenergetics
- Numerical modeling of “nanodusty” plasmas
- Publications
  - ◆ *Thermal Plasma Synthesis of Nanostructured Silicon Carbide Films*, S. L. Girshick and J. Hafiz, *Journal of Physics D* **40**, 2354-2360 (2007).
  - ◆ *Numerical Simulation of the Spatiotemporal Evolution of a Nanoparticle-Plasma System*, S. J. Warthesen and S. L. Girshick, *Plasma Chemistry and Plasma Processing* **27**, 292-310 (2007).
  - ◆ *Compressive Stress Effects on Nanoparticle Modulus and Fracture*, W. M. Mook, J. D. Nowak, C. R. Perrey, C. B. Carter, R. Mukherjee, S. L. Girshick, P. H. McMurry and W. W. Gerberich, *Physical Review B* **75**, 214112 (2007).
  - ◆ *Group Additivity Values for Enthalpies of Formation (298 K), Entropies (298 K), and Molar Heat Capacities (300 < T < 1500 K) of Gaseous Fluorocarbons*, M. K. Van Otterloo, S. L. Girshick and J. T. Roberts, *Journal of Chemical Thermodynamics* **39**, 1418–1422 (2007).
  - ◆ *Nanostructured SiC by Chemical Vapor Deposition and Nanoparticle Impaction*, A. Beaber, L. Qi, J. Hafiz, W. W. Gerberich, S. L. Girshick, J. V. R. Heberlein and P. H. McMurry, *Surface and Coatings Technology* **202**, 871-875 (2007).



High-resolution TEM image of aluminum nanoparticle coated with amorphous carbon shell. Particles are synthesized in plasma reactor and then coated using photo-assisted CVD.