Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Charged nanoparticle dynamics in water induced by scanning transmission electron microscopy[1] E.R. WHITE, MATTHEW MECKLENBURG, BRIAN SHEVITSKI, S.B. SINGER, B.C. REGAN, UCLA Department of Physics and Astronomy & CNSI — Using scanning transmission electron microscopy we image ~ 4 nm platinum nanoparticles deposited on an insulating membrane, where the membrane is one of two electron-transparent windows separating an aqueous environment from the microscope's high vacuum. Upon receiving a relatively moderate dose of $\sim 10^4\, e^-/\mathrm{nm}^2$, initially immobile nanoparticles begin to move along trajectories that are directed radially outward from the center of the field of view. As the dose rate is increased the particle motion becomes increasingly dramatic. These observations demonstrate that even under mild imaging conditions, the *in situ* electron microscopy of aqueous environments can produce charging effects that dominate the dynamics of nanoparticles under observation. Such effects provide a new tool for modifying *in vitro* environments such as those used for TEM studies of wet biological systems.

[1]Supported by the ACS Petroleum Research Fund, NSF CAREER Award 0748880, and the EICN at UCLA.

B.C. Regan
UCLA Department of Physics and Astronomy & CNSI

Date submitted: 23 Nov 2011 Electronic form version 1.4