Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Using the Binary Phase-Field Crystal Model to Describe Non-Classical Nucleation Pathways in Gold Nanoparticles[1] NATHAN SMITH, NIKOLAS PROVATAS, McGill University - Department of Physics — Recent experimental work [Loh et al, Nature Chemistry, Vol 9, 2017] has shown that gold nanoparticles can precipitate from an aqueous solution through a non-classical, multi-step nucleation process. This multi-step process begins with spinodal decomposition into solute-rich and solute-poor liquid domains followed by nucleation from within the solute-rich domains. We present a binary phase-field crystal theory that shows the same phenomology and examine various cross-over regimes in the growth and coarsening of liquid and solid domains.

[1]We'd like to the thank Canada Research Chairs (CRC) program for funding this work

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Date submitted: 05 Jan 2017 Electronic form version 1.4