

# Peter Alexander Greaney

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- EDUCATION
- ◇ **University of California at Berkeley**, Berkeley, CA.  
Ph.D. in Materials Science and Mineral Engineering, 2003,  
Thesis Title: *Theoretical Studies of Nano Self-Assembly*, Adviser: D. C. Chrzan.
  - ◇ **St Edmund Hall, Oxford University**, Oxford, OXON, UK.  
M.Eng (2:1) in Metallurgy, Materials Science and Engineering, June 1998,  
Part II (masters) Project Title: *Diffusion in Ternary Alloys*, Adviser: J. D. Hunt  
Exhibitioner of: *The Worshipful Company of Armourers and Braziers*
- RESEARCH INTERESTS
- Theory and modelling of structure and morphology of materials. In particular understanding order in complex systems such as: nano self-assembly, spinodal decomposition, nucleation and growth of islands during epitaxy, and formation of dislocation cell structure during deformation.
- CURRENT RESEARCH
- January 2004-Present: Postdoctoral Researcher for D. C. Chrzan at U. C. Berkeley.
- ◇ Understanding morphology and patterning of Ge islands grown on Au patterned Si substrates.
  - ◇ Developing stochastic coarse grained models of dislocation dynamics toward a continuum picture of plasticity.
- PREVIOUS RESEARCH
- ◇ 2000-2003, Ph.D. dissertation work: Theoretical study of spinodal decomposition of a film on a strain patterned substrate, and theoretical studies of diffusion and island growth on strained substrates during epitaxial growth.
  - ◇ 1998-2000, GSRA work at U. C. Berkeley: Continuum dislocation dynamics simulation of amplitude dependent internal friction.
  - ◇ 1997-1998, Part II (masters) thesis in the Department of Materials, Oxford University: Computer modelling of diffusion in multi-component systems.
  - ◇ Summer 1997, Research conducted for Alcan International Ltd. Banbury Laboratory, UK: Effects of cold work on the Thermo Electric Power of Al alloys.
  - ◇ Summer 1996, Industrial project in the Department of Materials, Oxford University (this is a required part of the degree programme performed at the end of the second year): Measurement of the chemical diffusion coefficient of Mn in Al (undertaken at Alcan International's Banbury Laboratory, UK).
- PUBLICATIONS
- J. T. Robinson, J. A. Liddle, A. Minor, V. Radmilovic D. O. Yi, P. Alex Greaney, K. N. Long, D. C. Chrzan, O. D. Dubon, "Metal-induced assembly of a semiconductor-island lattice: Ge truncated pyramids on Au-patterned Si", in review.
- P. Alex Greaney and D. C. Chrzan, "Island growth in the presence of anisotropic diffusion with long atomic jumps", *Materials Research Society Proceedings*, Modelling of Morphological Evolution at Surfaces and Interfaces Symposium, Boston, MA, USA, 2004, in press.
- P. Alex Greaney and D. C. Chrzan, "Irreversible island growth in the presence of anisotropic surface diffusion with long jumps", in review.

E. Ertekin, P. Alex Greaney, T. D. Sands, and D. C. Chrzan, "Equilibrium limits of coherency in strained nanowire heterostructures", *Journal of Applied Physics*, vol.97, no.11, 1 June 2005, 4325.

Wei Xiao, P. Alex Greaney, and D. C. Chrzan, "Pt adatom diffusion on strained Pt(001)", *Physical Review B*, vol.70, no.3, 15 July 2004, 33402.

P. Alex Greaney, "Theoretical studies of nano self-assembly", Ph. D. Thesis, U. C. Berkeley, 2003.

E. Ertekin, P. Alex Greaney, T. D. Sands, and D. C. Chrzan, "Equilibrium analysis of lattice-mismatched nanowire heterostructures", *Materials Research Society Proceedings*, Vol.737, Quantum Confined Semiconductor Nanostructures Symposium, Boston, MA, USA, 2002, 769-74.

P. Alex Greaney, D. C. Chrzan, B. M. Clemens, and W. D. Nix, "Self-assembled nanostructures through wavelength-controlled spinodal decomposition": *Applied Physics Letters*, Vol. 83, 7, (2003), 1364-6.

Wei Xiao, P. Alex Greaney, and D. C. Chrzan, "Adatom Transport on Strained Cu(001): Surface Crowdions", *Physical Review Letters*, Vol. 90, (2003), 156102.

P. Alex Greaney, Lawrence H. Friedman, and D. C. Chrzan, "Continuum simulation of dislocation dynamics: predictions for internal friction response", *Computational Materials Science*, Vol. 25, (2002), 387-403.

P. Alex Greaney and D. C. Chrzan, "Amplitude dependent internal friction within a continuum simulation", *Materials Research Society Proceedings*, Vol.578, Multi-scale Phenomena in Materials - Experiments and Modelling Symposium, Boston, MA, USA, (30 Nov.-2 Dec. 1999), 161-6.

TALKS

"Island growth in the presence of anisotropic diffusion with long atomic jumps", Materials Research Society Meeting, Boston, MA, Fall 2004.

"Spinodal decomposition of a film on a strain patterned substrate", Materials Research Society Meeting, Boston, MA, Fall 2002.

"Strain-driven, thin-film spinodal decomposition", Materials Research Society Meeting, San Francisco, CA, Spring 2002.

"Amplitude dependent internal friction within a continuum simulation", 12th International Conference on the Strength of Metals, Asilomar, CA, September 2000.

TEACHING

Advising an undergraduate student researcher, January 2004-Present.

Graduate Student Teaching Assistant for: "MSE200: Survey of Materials Science", Fall 2002.

Graduate Student Teaching Assistant for: "MSE201A: Thermodynamics and Phase Transformations", Fall 2002.

OTHER SKILLS

◇ C, FORTRAN, HTML, perl, csh, Mathematica, Matlab, L<sup>A</sup>T<sub>E</sub>X

◇ Have experience with the embedded atom method, molecular dynamics, Monte Carlo methods, the finite element method, the finite volume method, the nudged elastic band method and phase field simulations.

REFEREES

Prof. D. C. Chrzan, Department of Materials Science and Engineering, U. C. Berkeley, Berkeley, CA. 94720, dcchrzan@berkeley.edu, (510) 643-1624.

Prof. O. Dubon, Department of Materials Science and Engineering, U. C. Berkeley, Berkeley, CA. 94720, oddubon@berkeley.edu, (510) 643-3851.

Prof. J. D. Hunt, Department of Materials Science, Oxford University, Oxford, OXON, UK, john.hunt@materials.ox.ac.uk, (+44) 1865 273700.

Prof. E. E. Haller, Department of Materials Science and Engineering, U. C. Berkeley, Berkeley, CA. 94720, eehaller@lbl.gov, (510) 486-5294.