

Summer School in Computational Materials Science July 9-13, 2012, McGill University, Montreal, Quebec



Course Description

The summer school will cover theoretical and numerical methods for modeling microstructure formation in materials using phase field methods. The format will involve interactive lectures and hands-on work using high performance computing.

Syllabus:

- Ginzburg-Landau theory and phase field models of phase transformations
- Phase field crystal (PFC) models for elastic and plastic effects in phase transformations
- Molecular dynamics connections with PFC and classical density functional theory
- Basics of code development and parallel computing

Experience-based learning

Students will engage in preparatory reading prior to attending the summer school. The course will comprise in-class sessions where students will be encouraged to critically examine theoretical concepts through interactive discussions driven by the instructors. Break-out sessions will be held for students to work in teams to practice algorithm/code development for simulating select numerical problems associated with phase field and PFC modeling. CLUMEQ staff will be available to teach students the basics of compilation and execution of codes on a supercomputer. Students already in the field are invited to bring material from their research.

Instructors

- Nikolas Provatas, Department of Physics, McGill University and CLUMEQ/Calcul Quebec
- Ken Elder, Department of Physics, Oakland University
- Jeff Hoyt, Department of Materials Science and Engineering, McMaster University
- Zhi-Feng Huang, Department of Physics and Astronomy, Wayne State University

Registration

Students should register prior to May 30, 2012. Registration is \$175 for graduate students, \$250 for postdocs. Registration includes course materials, breakfast, lunch and residence accommodation for five nights. To register or for more information email Nikolas Provatas (provatas@physics.mcgill.ca)

Sponsors:

Department of Physics & Faculty of Science, McGill University, CLUMEQ High Performance Computing Centre, Calcul Quebec, Compute Canada.