

KI-Net: Kinetic description of emerging challenges in multiscale problems of natural sciences



An NSF Research Network in Mathematical Sciences

## **Conference Announcement**

# Mathematical and Numerical Methods for Complex Quantum Systems

March 26-30, 2014

Department of Mathematics, Statistics and Computer Science University of Illinois at Chicago

#### Organizers

Victor Batista	Yale University
Shi Jin	University of Wisconsin-Madison
Christian Ringhofer	Arizona State University
Christof Sparber	University of Illinois at Chicago
Eitan Tadmor	University of Maryland

#### **Confirmed Participants**

Weizhu Bao Yongyong Cai **Eric Cances Tucker Carrington Jingrun Chen Carlos García-Cervera** George Hagedorn **Clemes Heitzinger Kay Kirkpatrick Alex Kiselev Caroline Lasser Mathieu Lewin Jianfeng Lu Dionisios Margetis Peter Markowich Florian Mehats Olivier Pinaud Stefan Teufel Haobin Wang** Michael I. Weinstein

National University of Singapore Purdue University **INRIA Rocquencourt** Queen's University University of California, Santa Barbara University of California, Santa Barbara Virginia Tech University of Vienna University of Illinois at Urbana-Champaign University of Wisconsin, Madison Technische Universität München Paris-Cergy **Duke University** University of Maryland University of Cambridge University of Rennes Colorado State University University Tuebingen New Mexico State University Columbia University

### **Scientific Background**

Complex quantum systems arise in the description of matter at microscopic and nanoscopic scales. The mathematical formulation and the efficient numerical simulation of such systems is a notoriously difficult problem. An interplay between mathematical analysis and numerical simulations is usually needed in order to obtain a detailed understanding.

#### Goals

To bring together a group of experts in Applied Mathematics, Mathematical Physics and Theoretical Chemistry to discuss recent developments and challenges in the analysis and numerical simulation of complex quantum systems. Emphasis will be placed on multi-scale problems, band-mixing, mean-field equations, and the reduction of high-dimensional systems to effective lower dimensional models. Relativistic equations for graphene will also be featured.

#### A limited number of openings are available.

To apply, complete the online application before **December 31, 2013**.

For more information and to apply: www.ki-net.umd.edu



Weitao Yang Xu Yang Harry Yserentant Paul Zimmerman Duke University University of California, Santa Barbara Technische Universität Berlin University of Michigan

