Postdoctoral Position Available in Fluctuating Hydrodynamics
Beginning Fall of 2012 or Spring of 2013

Dear Colleagues,

A postdoctoral position is open in Aleksandar Donev’s group in the Department of Mathematics at New York University, part of the Courant Institute of Mathematical Sciences. We offer a competitive salary and an initial appointment of one or two years, and a flexible starting date. Extension of the postdoctoral position for up to 3 years is possible.

Prof. Donev’s research focuses on fluid mechanics in regimes where thermal fluctuations are important. Notable examples include flows at micro and nano scales typical of new microfluidic, nanofluidic and microelectromechanical devices and novel nano-materials, as well as processes where the effect of fluctuations is amplified by strong non-equilibrium effects. Thermal fluctuations can be included in the classical Navier-Stokes equations through stochastic forcing terms, as first proposed by Landau and Lifshitz. The presence of non-trivial dynamics at all spatio-temporal scales, as well as the necessity to maintain fluctuation-dissipation balance in spatio-temporal discretizations, makes the continuum stochastic partial differential equations of fluctuating hydrodynamics difficult to solve using existing approaches.

The postdoctoral candidate will participate in several aspects of this broad research agenda. One ongoing project (funded by the NSF) will develop algorithms and codes for modeling thermal fluctuations in miscible fluid mixtures, and use the developed tools to study giant fluctuations that appear in strongly non-equilibrium settings. This work will also involve extensions to phase-separating mixtures, modeled via a coupled fluctuating Navier-Stokes / Cahn-Hilliard model (funded by DOE). Another project (funded by AFOSR) will couple a fluctuating Navier-Stokes solver to immersed particles using a stochastic extension of the immersed boundary method, and use this to study complex fluids such as nanocolloids.

The Courant Institute is one of the leading centers for pure and applied mathematics in the world; and in the heart of one of the most vibrant cities in the world. New York University is an equal opportunity/affirmative action employer.

A successful candidate will have a Ph.D. in Applied or Computational Mathematics or related areas (e.g., Engineering, Physics), a strong publication record in computational physics journals (e.g., Physical Review Letters/E, J. Comp. Phys.), ability to work independently and ambition to pursue cutting-edge research with real impact. Previous experience with hands-on computing (including programming in a compiled language), PDEs, and Langevin equations is valuable. Some experience with multiscale modeling, stochastic analysis, fluid dynamics, and/or immersed boundary methods is preferred but not required.

Please submit your application via email, and include a statement of interest and a Curriculum Vitae.
with complete list of publications and computational skills and contact details for 2 to 3 references.

Thank you for your interest

Aleksandar Donev

Professor Aleksandar Donev