**ELENA G. STREKALOVA, Ph.D.** Citizenship: United States

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## SUMMARY

Physicist with over 7 years of expertise in the areas of statistical physics, computational modeling, computer simulations, and analytic theories. Recognized team leader with strong quantitative and data analysis skills, outstanding presentation skills and ability to work under pressure both independently and in teams. Knowledge in computational finance with an emphasis on financial econometrics, construction of optimized portfolios, probability models for asset returns, statistical analysis, linear regression, Monte Carlo simulation and bootstrapping techniques.

## SKILLS

- R, C, Excel, Unix shell scripting, HTML, VPython, Gnuplot, Mathematica, LaTeX, UNIX/Linux, Mac OSX, Windows NT/XP.
- Monte Carlo, Molecular Dynamics and All-atom simulations.
- Data analysis and applied statistics.
- Supercomputers: Carried out massive simulations on IBM BladeCenter Linux Cluster and multi-core SGI computer clusters.

## PROFESSIONAL EXPERIENCE

### MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA

*Postdoctoral Associate* (MIT Department of Civil and Environmental Engineering) 2012–present

- Wrote a C code that implements the mean-field theory to study a lattice-gas model of disordered mesoporous media.
- Wrote a tessellation algorithm in C to characterize the porosity of the disordered materials.
- Use simulations and analytical theories to understand water adsorption isotherms in gel pores of cement.
- Collaborate with Schlumberger Doll Research team to gain insights into physical properties of cement microstructure.

### UNIVERSITY OF MASSACHUSETTS BOSTON, BOSTON, MA

*Lecturer* (UMB Honors Program) Fall 2012

- Developed and implemented the Honors Program 200-level course: “Science: in the Universe, Nature, Art and Daily Life”.
- Taught honors students the important concepts in current science and technology with the objectives:
  - to teach students to read and understand scientific literature.
  - to help students to develop presentation skills and to communicate scientific ideas to the general public.

### BOSTON UNIVERSITY, BOSTON, MA

*Research Assistant* (BU Physics Department) 2007–2012

- Wrote an efficient C code for Monte Carlo simulations with Wolff cluster algorithm of the 2D coarse-grained model of water confined in a fixed matrix of particles to study liquid polyamorphism. The program allows the simulation of more than 160,000 water molecules within 24 hours.
- Demonstrated the crucial effects of confinement structure on liquid-liquid phase transition by using Discrete Molecular Dynamics simulations of the 3D spherically symmetric ramp potential.
- Improved the knowledge of the nature of phase transitions in confined water by statistical analysis, finite size scaling of thermodynamic response functions and 4th-order cumulants.

### MUSEUM OF SCIENCE, BOSTON, MA

*Science Interpreter* 2003–present

- My mission: to transform America's relationship with science and technology by engaging visitors in subjects of biological optical effects of thin-films via answering questions about butterflies.
- Trained 20+ volunteers and interns to work in the Butterfly Garden exhibit.
- Developed educational materials for the exhibit that attracted over 1,000,000 visitors since its grand opening in 2006.
- Improved exhibit functionality by solving technical problems.
- Taught and engaged the elementary school children to rediscover physics by observing live butterflies.

## EDUCATION

**BOSTON UNIVERSITY, BOSTON, MA**

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|---|---|
| Doctor of Philosophy, Physics (*cum laude*, GPA: 3.62) | 2012 |
| Master of Arts, Physics (*cum laude*, GPA: 3.62) | 2011 |

**UNIVERSITY OF MASSACHUSETTS BOSTON, BOSTON, MA**

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|---|---|
| Master of Science, Chemistry (*summa cum laude*, GPA: 4.00) | 2006 |
| Bachelor of Science, Chemistry and Physics, Biology Minor (*summa cum laude*, GPA: 4.00) | 2006 |

## HONORS, AWARDS and FELLOWSHIPS

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|---|---|---|
| Provost Award, Science and Engineering poster competition | l Boston University, Boston, MA | 2011 |
| University Honors | l University of Massachusetts Boston, Boston, MA | 2006 |
| Ethel and Herman Rosansky Chemistry Scholarship | l University of Massachusetts Boston, Boston, MA | 2005 |
| ACS award in Analytical Chemistry | l University of Massachusetts Boston, Boston, MA | 2004 |
| Undergraduate Summer Research Fellowship | l Princeton University, Princeton, NJ | 2004 |
| Litton Industries Merit Scholarship | l University of Massachusetts Boston, Boston, MA | 2003 |
| Women Merit Scholarship | l University of Massachusetts Boston, Boston, MA | 2003 |
| Director's List for consistent *summa cum laude* performance | l University of Massachusetts Boston, Boston, MA | 2002–2006 |
| Dean's list | l University of Massachusetts Boston, Boston, MA | 2001–2006 |

## PUBLICATIONS

Dario Corradini , **Elena G. Strekalova**, H. Eugene Stanley, and Paola Gallo, *Microscopic mechanism of protein cryopreservation in an aqueous solution with trehalose*, Scientific Reports **3**, 1218 (2013).

**E. G. Strekalova**, J. Luo, H. E. Stanley, G. Franzese, S. V. Buldyrev, *Nanoparticle confinement in anomalous liquids,* Physical Review Letters **109**, 105701 (2012).

**E. G. Strekalova**, M. G. Mazza, H. E. Stanley, and G. Franzese, *Hydrophobic nanoconfinement suppresses fluctuations in supercooled water*, Journal of Physics: Condensed Matter, **24**, 064111 (2012).

**E. G. Strekalova**, D. Corradini, M. G. Mazza, S. V. Buldyrev, P. Gallo, G. Franzese, and H. E. Stanley, *Effect of Hydrophobic Environments on the Hypothesized Liquid-Liquid Critical Point of Water*, Journal of Biological Physics, **38**(1), 97-111 (2011).

**E. G. Strekalova**, M. G. Mazza, H. E. Stanley, and G. Franzese, *Large Decrease of Fluctuations for Supercooled Water in Hydrophobic Nanoconfinement*, Physical Review Letters **106**, 145701 (2011).

G. Franzese, A. Hernando-Martinez, P. Kumar, M. G. Mazza, K. Stokely, **E. G. Strekalova**, F. de los Santos, H. E. Stanley, *Phase Transitions and Dynamics in Bulk and Interfacial Water*, Journal of Physics: Condensed Matter **22**, 284103 (2010).

M. G. Mazza, K. Stokely, **E. G. Strekalova**, H. E. Stanley, and G. Franzese, *Cluster Monte Carlo and numerical mean field analysis for the water liquid-liquid phase transition*, Computer Physics Communications **180**, 497–502 (2009).

**LANGUAGES** Russian, French

**INTERESTS** Skiing • Argentine Tango • Scuba diving • Piano • Travel • Photography