Brandeis University MRSEC Research Computing Fellow and MRSEC Active Matter Postdoctoral Fellow

The Brandeis [Brandeis BioInspired Soft Materials Research Center](#) (a National Science Foundation MRSEC) has two openings. The first, **MRSEC Research Computing Fellow,** is designed for a researcher who is looking to stay connected to scientific research while preparing for a career in scientific computation or information technology. The second, **MRSEC Active Matter Postdoctoral Fellow,** is a more traditional postdoctoral position except that the candidate will work with a number of different computational, theoretical, machine learning, and experimental groups to model and apply control protocols to active matter systems currently under development.

To apply: Please email MRSECpostdoc@brandeis.edu a CV, a list of 3 references, a brief description of your previous research, experience with computational research, and (if any) systems administration experience. Please include 'Research Computing Fellow' or 'Active Matter Postdoctoral Fellow' in the email subject line depending on which position you are interested in.

(1) MRSEC Research Computing Fellow. This position is designed for a researcher who is looking to stay connected to scientific research while preparing for a career in scientific computation or information technology. The primary goal of the Research Computing Fellow will be to work with students and postdocs in computational, theoretical, and experimental research labs in the Brandeis MRSEC to enable, advance, and support scientific computing efforts. Activities will include working to develop novel computing solutions, developing machine learning strategies and other automated data analysis procedures, and helping to optimize code for use on modern CPU and GPU architectures on the Brandeis HPC and national supercomputing resources. The Fellow will also help to train researchers and best computational practices, through one-on-one meetings and group training sessions. The Fellow will thus gain significant experience in mentorship. If desired, the Fellow will also be encouraged to develop her/his independent research project as part of the MRSEC. In addition, she/he will take a lead role in directing the Brandeis MRSEC computational facility high performance computing cluster; the Brandeis Technology Services group will provide on-the-job training in systems administration to support this role.

The ideal candidate would have experience in performing large-scale simulations, programming for highly parallelized and/or GPU architectures, proficiency in C++ and the Unix shell environment, an interest in non-equilibrium statistical mechanics, and a PhD in condensed matter physics, biophysics, theoretical or computational chemistry, computer science (but with background in the physical sciences), or a related field.

(2) MRSEC Active Matter Postdoctoral Fellow. This position is a more traditional postdoctoral position except that the candidate will work with a number of different computational, theoretical, machine learning, and experimental groups, as part of the Brandeis MRSEC and a new [DOE grant](#). The candidate will work with the computational physics groups of [Michael Hagan](#) and [Aparna Baskaran](#), the machine learning group of [Pengyu Hong](#), and in close collaboration with the experimental groups of [Seth Fraden,](#) [Guillaume Duclos,](#) and [Zvonimir Dogic](#) to understand the striking phenomena and dramatic new physical behaviors observed in far-from-equilibrium materials such as mixtures of microtubules, motor proteins, and ATP. There will also be ample opportunities to interact with other experimental and theoretical soft matter and biophysics labs at Brandeis. In addition to developing physics-based models for newly developed active matter systems, one objective of the position will be to guide experimental

development of closed-loop control systems that drive active matter into particular emergent behaviors. The ideal candidate would also have experience in performing large-scale simulations on either particle-based models, continuum models or hybrid models, an interest in non-equilibrium statistical mechanics, and a PhD in condensed matter physics, engineering, biophysics, theoretical or computational chemistry, or a related field. The position will also require willingness to learn optimal control theory and data-driven control approaches.

Brandeis MRSEC: The Brandeis MRSEC seeks to create new materials that capture the remarkable functionalities found in living organisms. The center includes two Interdisciplinary Research Groups (IRGs). IRG1, Self-Limiting Assembly (SLA), seeks to elucidate the physical principles for engineering components that self-assemble into large, but finite-size, superstructures. The adaptive functions of biological materials, including viral shells, cytoskeletal filaments, and photonic nanostructures of bird feathers arise from the regulated finite size of self-assembled architectures. In contrast, most inorganic materials form unlimited structures like crystals. IRG2, Biological Active Materials, will establish rational design principles for building 3D adaptive active matter, leading to robust active materials endowed with capabilities currently found only in living organisms, such as crawling, reconfiguring, regenerating, and reproducing.

Start Date: As soon as April 2022. **Location:** Brandeis University MRSEC, Waltham, MA, USA

Brandeis University is an Affirmative Action/Equal Opportunity employer M/W/D/V. Brandeis is committed to building a culturally diverse intellectual community, and strongly encourages applications from women and minorities.