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Dear Mike Chies,

I am writing this letter to express my strong support for Dr. Edward Feng. I believe Dr. Feng to be an excellent candidate.

Dr. Feng has been a Miller fellow here at Berkeley for the last several years, and I discovered that we share many research interests. We have been working closely together for the last year, and I feel that I can give you a reliable opinion based on this collaboration, and an overview of Dr. Feng's recent research in the field of non-equilibrium statistical mechanics.

The initial puzzle that we have studied is what is the most accurate method for extracting a potential of mean force from non-equilibrium experiments? For instance, if we unfold an RNA molecule using molecular tweezers, can we reconstruct the free energy as a function of end-to-end length? The correct answer for extracting changes in free energy is known: one applies a variant of Bennett's acceptance ratio method to the distribution of measured work values. But extracting a full potential of mean force along a reaction coordinate from a single non-equilibrium experiment is much harder. Many partial solutions have been offered in the literature. Dr. Feng has been able to apply his considerable insights to this problem, and has found an optimal solution. Happily, this solution exhibits deep connections to other areas of non-equilibrium thermodynamics, in particular to a quantity known as the thermodynamic length. Our article is currently under review; a preprint can be found on the ArXiv.

In addition, in one of those surprises that favor the prepared mind, during the exploration of the previous problem Dr. Feng also discovered a novel measure of time-asymmetry in driven systems. This work will appear shortly in Physical Review Letters.

Looking back, I am extremely pleased with our collaboration. Dr. Feng has demonstrated his ability to rapidly assimilate a new field and make immediate progress on problems at the cutting edge of research in non-equilibrium thermodynamics. With this, Dr. Feng has my strong recommendation.

Sincerely yours,

Gavin Crooks

Divisional Fellow, Physical Biosciences, Lawrence Berkeley Natl. Lab.