
Shivesh Pathak

Cover Letter, 2021

Dear Dr. Chen, Dr. Sachdev, Dr. Vishwanath, and all others in the Simons Collaboration,

I am writing to apply for the The Simons Collaboration on Ultra-Quantum Matter Postdoctoral Fellow position. I am a graduate student at the University of Illinois at Urbana-Champaign and plan to graduate in August of 2021 working with my advisor Lucas K. Wagner. My PhD thesis is entitled "Accurate low-energy states and interacting effective models using ab initio quantum Monte Carlo."

I am interested in the Simons Collaboration position because I have the skills required for this kind of large scale collaboration, and my research goals align well with the collaboration. As mentioned in my research statement and CV, I have a very strong background in computational and theoretical condensed matter physics, in particular for simulation and model development for strongly interacting quantum systems. I have experience in building models and excited states for graphene-based systems, and in particular the ultra-quantum twisted bilayer graphene system. I also have experience in large, multi-research-group collaborations, with the QMC-HAMM collaboration with works to understand the effective interactions in the twisted bilayer graphene system. However, my research interests extend beyond these graphene systems as outlined in my future plans, and I can integrate well with the broader goal of the Simons Collaboration on furthering our understanding of ultra-quantum systems.

I believe that the Simons collaboration postdoctoral fellow position is an excellent opportunity for me to pursue my research goals, and I know that my research goals and expertise will help the collaboration accomplish their goals. I look forward to speaking with all of you in the future, and I appreciate your consideration of my application.

Shivesh Pathak