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Graduate Admission Committee
Computer Science Department
University of Waterloo
Waterloo, Ontario Canada

Dear Admission Committee,

As an independent expert in the field of computational condensed matter physics and material science, I express my unconditional support for Dr. Xinfu Lu for his application to the M.S. program in the Computer Science Department at University of Waterloo. As a successful graduate student, Xinfu has exhibited extraordinary talent and diligence on scientific research. He has amassed an impressive streak of research success in the highly challenging research field of computational condensed matter physics at the very beginning of his research career.

I am a Postdoctoral Researcher of the Physical Science Division at IBM Thomas J Watson Research Center. My research focuses on ab-initio calculations and multi-length and time scale modeling of high-performance energy storage materials, novel low-dimensional materials, scintillator radiation detectors, and material screening from high-throughput calculations. I have published over 30 peer-reviewed papers in top scientific journals including Nano Energy, Nanoscale, and Physical Review B.

Prior to working at IBM, I was a member of Prof. Williams' group of the Physics Department at Wake Forest University. I have known Xinfu Lu since he joined the team in 2013. We collaborated on several projects on scintillator radiation detectors, which have played a crucial role in many fields, including the recent discovery of Higgs bosons and homeland security. As his colleague and advisor on these projects, I have firsthand knowledge regarding his performance and capabilities in conducting scientific research. One of the projects led by Xinfu Lu was to use a multi-scale simulation to determine the performance of scintillators, which solved a long-puzzling problem in this field. Based on a large set of rate equations describing the fundamental physical mechanisms in scintillating systems, Xinfu wrote independently a program to perform the simulations. He also performed Monte-Carlo simulations tracking the excitations in the materials and atomic-level first-principles calculations based on density functional theory to extract necessary parameters for his continuum scale simulations. During this process, he showed great passion for coding and high mathematical analysis ability. I enjoyed the time I spent to discuss with him about issues such as the proper use of mathematical models and data structures, and the optimization of algorithms. As a project leader, he showed excellent leadership. His intelligence helped us find the way to achieve the goals, and his persistence helped us overcome many obstacles along the way.

As a result, a paper “Coupled rate and transport equations modeling proportionality of light yield in high-energy electron tracks: CsI at 295 K and 100 K; CsI:Tl at 295 K” with Xinfu as the first author was published in one the leading journals in our field – Physical Review B.

Xinfu is a highly motivated researcher. He is always able to deliver high-quality and well-presented results when new tasks are assigned to him. During our group meetings, he can consistently bring up intriguing questions and creative ideas that are helpful to the team. It seems that he never stops thinking how to combine the cutting-edge scientific research in condensed matter physics and highly efficient and adaptive computer programs for researchers in the solid state physics community to use.

Xinfu is also a fast learner. Before he joined our group, he had limited knowledge on scintillators and excitation transport. After he had realized the problem, he started literature studying and constantly asked Prof. Williams and me questions. Thanks to his strong knowledge basis and dedicated learning, he mastered the most important concepts and methods in scintillator research in a very short amount of time. He also built up a strong Computer Science background by taking relevant Computer Science classes, which allowed him to turn physical concepts into high-quality computer programs efficiently.

I appreciate your kind consideration of my independent expert evaluation of Dr. Xinfu Lu. Xinfu has shown many shining aspects as a researcher at his age. I think he can continue his great success in Computer Science study and research. Please do not hesitate to contact me for any further information.

Sincerely yours,

Qi Li

Postdoctoral Researcher
IBM Thomas J Research Center
