

Letter of Recommendation

Prof. Park

- Courses taken : Classical Mechanics I, II, Mathematical Physics II, Advanced Mechanics;
 - Presentation on string theory in Adv. Mech.
- Research; overcoming adversities, project management skills, passion in studying new topics and skills, ability in communicating research progress
 - Weekly presentations on field theory, gravity
 - * March 23'~ : presentations based on content in Schwartz and Carroll
 - * April 24' : online presentations while on exchange student about paper on BRST formalism
 - * May 24' : talk on inflationary cosmology given to freshmen and juniors
 - Analytic and numerical calculations with Mathematica
 - * May 23'~ : Analytic calculations
 - * Jan 24'~ : Numerical calculations
 - Writing academic papers

Through teaching him and working closely with him as his research advisor for a year and a half, I can advocate that he is one of the most brilliant students I have encountered. He has consistently displayed a great passion in both studying textbook physics and keeping up with current research, and a tenacious ability to overcome adversities.

Ever since I taught him in his sophomore courses, he proved to be one of the brightest students I have taught in terms of his curiosity for deeper structures in physics. In his presentation on string theory during my Advanced Mechanics course, he showed a far greater understanding and appreciation of theoretical physics, exceeding the expectations I typically hold for undergraduate students. This was complemented by his commitment to self studying field theory and gravity, where he would give weekly presentations alongside his research. Two examples that stood out were one on a paper on the BRST formalism and a talk he gave on inflation cosmology to freshmen students, both of which were delivered with remarkable clarity and enthusiasm.

During our research on holography, he collaborated with other students to perform analytic and numerical calculations for correlation functions in a holographic setting. In this period he showed me a great passion to learn the relevant tools and skills for conducting research in physics, and made leading contributions to each problem he was assigned. He often made remarks connecting his work to the material he was self studying, passionately discussing on how he had internalised the methodology. Through this he demonstrated his outstanding enthusiasm for learning physics, and also assisted his juniors' research in the process.

Prof. Hwang

- Research
 - Numerical methods
 - * Parallel computation, GPU acceleration via pytorch and cuda
 - * Various random sampling methods; MCMC; Metropolis-Hastings
 - Presentations
 - * Theory from Kai Lai Chung's book

As his research advisor for Fall 2023, I was continuously impressed by his immense passion in studying both physical and mathematical theory, and how quickly he could understand research problems and engage with them.

Advising his research in numerically confirming a conjecture between diffusion first-last passage and electric potential problems, his rapid understanding of the problem and implementation using advanced numerical tools without external guidance gave me the impression he was one of the brightest undergraduate students I had encountered. When we discovered our results were indeterminate about the conjecture, he approached the problem in an analytical and well structured manner. He was very adaptive and responsive to any feedback I had, and did not hesitate to reach out with clear and insightful questions.

What also stood out was his efforts to understand the underlying sophisticated theory, and his ability to communicate it. I was particularly impressed by his investigation and presentation on the Feynman-Kac formula, which demonstrated not only a firm grasp on the subject but also a great amount of attention to the details of the problem. His deep mathematical appreciation for the topics he was covering and clear passion in communicating his findings made his work thorough and insightful.

Prof. Kim

- Courses taken
 - General Relativity
- Research
 - Summer internship
 - * Reproducing of papers; learning AdS DL method
 - * Independent research project : learning the interpolating function in MOND with neural ODEs
 - KPS Undergraduate Research Competition
 - * Using reinforcement learning to find optimal quantum circuit configuration
 - * Independent research project
 - Tensor network seminar
 - Inverse spectral problem in Schrodingers equation
 - * Using deep neural network methods

He was one of the top students in my General Relativity course, and within the time he has participated in my research group he has shown an outstanding talent in conducting research in theoretical physics. His care to detail and keen eye for nuance pairs with his resilience towards obstacles in research, making him a brilliant candidate for your graduate program.

Over the course of half a year of involvement with my group, he participated in two significant research programs and a seminar, all three which I gave him a leading role based on his foremost performance in an internship this summer. The research I directly advised him on was on applying deep learning to recover potentials from energy spectra, a highly interdisciplinary area of research requiring a wide scope of skills and knowledge. Throughout research his conduct was diligent and meticulous; his survey of numerical methods appropriate for the project was particularly memorable, as it was clearly communicated and was followed by a thorough plan for further investigation.

In addition to his technical skills, he exhibited a resilience against research challenges with his tenacity and creativity. Throughout our work together, he actively participated in discussion with his advisors and colleagues in his attempts to understand any underlying issues, adapting his research methods and proposing new strategies.