Junyeop Kim

Curriculum Vitae

Personal Informations

Citizenship : Republic of Korea

Born : November 21st, 2001 in Seoul, Republic of Korea

Address : 132, Magokseo 1-ro, Gangseo-gu, Seoul, Republic of Korea (postal : 07598)

Email : f4june777@konkuk.ac.kr

Website : `https://juneyeop.github.io/`

Languages : native in Korean, fluent in English

Education

BSc in Physics and Mathematics (*Mar. 2020 ∼ Feb. 2025*)
Konkuk University, Seoul

GPA : 4.29 / 4.50 (major : physics 4.39, mathematics 4.25) (1st best out of 130 students)

Thesis : Path-integral approach to Bose-Einstein condensation (ongoing project)
Advised by *Junhyun Yeo*

Research Interests

- Mathematical generalisations of quantum field theory : topological and algebraic QFT
- Categorical approaches to topological spaces
- Applications of quantum field theory to condensed matters, especially quantum phase transitions

Awards and Honors

- **Merit-based scholarship** (*2020 ∼ 2023*)
  Konkuk University, 7 times
- **Dean's List** (*2020 ∼ 2023*)
  Konkuk University, 5 times
- **Bronze Medal, 40th University Students Contests of Mathematics** (*Jan. 2022*)
  Korean Mathematical Society

Outreach

- **Mentorship**
  - Mentorship programs of department of physics (*2022 ∼ 2023*)
    : As a mentor student, gave lectures on selected topics of mathematical physics.
    (Fourier series and transform, ordinary and partial differential equations, complex analysis)
- **Essays** posted on my personal website (*2023 ∼ 2024*)
  - The method of steepest descent and asymptotic forms of Airy function
  - ~~Weierstrass factorization theorem~~
  - ~~Monte-Carlo simulation and its application to 2-dim Ising model~~
  - ~~Tight-binding approximation~~
  - Hypergeometric differential equation
  - Integral representation of Bessel function
  - ~~Path-integral Monte-Carlo and its application to the harmonic oscillator~~
  - ~~Grassmann variable~~
  - ~~Why are second-countable Hausdorff spaces important?~~

- **Presentation**
  - Solid state physics I (*May. 2023*)
    : 20 minutes presentation about tight binding approximation
- **Volunteer Activities**
  - ~~N hours at OO institute (*Nov. 2024*)~~
    ~~: teach OO for OO~~
  - ~~M hours at PP institute (*Oct. 2024*)~~
    ~~: teach PP for PP~~

Undergraduate Internship Program

- **Computational Many-Body Physics Group** (*Jan. 2024*)
  (GIST, Gwangju Institute of Science and Technology)

  Advised by *Donghee Kim*
  - Learnt Variational and Path Integral Monte-Carlo techniques.
  - Wrote a Fortran program for which calculates diagonal elements of a density operator of harmonic oscillators applying PIMC technique.
  - Reviewed papers which adumbrate the way to get the excitation spectrum of liquid ^{4}He, so called phonon-maxon-roton spectrum, applying VMC and shadow wave function method.

Skills

- Fortran, Python, LaTeX, Matlab