

Geun-Hee Lee

Curriculum Vitae

Affiliation : Ultrafast Spin Dynamics Laboratory, Department of physics, Korea Advanced Institute of Science and Technology, Daejeon, 34141, Republic of Korea

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• Research interests

- Motion of magnetic solitons (Domain wall, Skyrmion, vortex, etc)
- Domain wall logic device
- Transport of magnon in ferro/ferri/antiferromagnetic materials
- Spin transport and its optical detection

• Abilities

- Setting the laser scanning system with magneto-optic Kerr effect. Optical experiments in sub-micro scale patterns using focused laser.
- Building low voltage electrical measurement system in vacuum environment with rotating stage.
- Homemade micromagnetic simulation
- Programming with C, Python, MATLAB, LabVIEW.

• Education

- Bachelor of science, Korea Advanced Institute of Science and Technology (Dual major in physics and mathematical science) (GPA : 3.91/4.3, credits : 191/130) (2014.03 – 2018.02)
- Integrated master's & doctoral program in physics, Korea Advanced Institute of Science and Technology (Advisor : Prof. Kab-Jin Kim) (2018.03 – present)

• Scholarship

- National Scholarship for science and engineering students (total tuition) (2016.03 – 2018.02)
- Outstanding Grade Scholarship (~250\$/month) (2016.03 – 2016.06)
- Outstanding Grade Scholarship (~200\$/month) (2017.09 – 2017.12)
- Hye-seul Scholarship funded by KAIST president S. C. Shin (~2000\$) (2019.09)

• Awards

- The grand prize (1st) at Busan physics contest for high school students (2013.06)

- Dean's List of physics students (2016.03 – 2018.02)
- Dean's List of natural science students, in physics department (2017.03 – 2018.02)
- Magna Cum Laude (semi-top grade among graduating students) (2018.02)
- Outstanding poster presentation prize in 2019 Korean Physical Society Spring Meeting (2019.04)

• Teaching Experience

- Assistant teacher for leadership class (Title : World of Hand Drip Coffee) (2015.09 – 2015.12)
- Mentor for Freshman Programming course (2015.09 – 2015.12)
- Mentor for General Physics 1 course (2016.03 – 2016.06)
- Mentor for Calculus 2 course (2017.09 – 2017.12, 2018.09 – 2018.12)
- Teaching Assistant for Classical Mechanics 1 class (2018.03 – 2018.08)
- Teaching Assistant for General Physics class (2018.09 – 2020.02)
- Teaching Assistant for Physics Lab. class (2020.03 – present)

• Research Experience

- Undergraduate research : Study on the electrostatic precipitation in low temperature plasma laboratory (Advisor : Prof. Hong Young Chang) (2016.06 – 2016.08)
- Undergraduate research : Analytic calculation of dispersion relation of cylindrical dielectric waveguide with center hole (Advisor : Prof. Myeong Soo Kang) (2017.01 – 2017.02)
- Undergraduate research : Construction of laser scanning system mounted with magneto-optic Kerr effect (Advisor : Prof. Kab-Jin Kim) (2017.06 – 2018.02)
- Chair of organizing committee in 12th Brain Korea plus (BK+) Young Physicists Workshop (held in KAIST, 2020.02.03 ~ 2020.02.04)
- Research on the magneto-optic detection of unconventional Hall effect, proposal on domain wall logic device by own-programmed micromagnetic simulation, and research on magnon migration in magnetic insulator by nonlocal electric measurement.

• Publications

Seung-heon C. Baek, Vivek P. Amin, Young-Wan Oh, Gyungchoon Go, Seung-Jae Lee, Geun-Hee Lee, Kab-Jin Kim, M.D. Stiles, Byong-Guk Park and Kyung-Jin Lee “Spin currents and spin-orbit torques in ferromagnetic trilayers”, *Nature Materials* **17**, 509 (2018) - Contributed to electrical measurement.

Geun-Hee Lee and Kab-Jin Kim “Optimizing the Geometry of Chiral Magnetic Logic Devices”, *Journal of Magnetism* **25**, 150 (2020), Selected by *Editor's Choice, Cover article*. – Contributed to building micro-magnetic simulation, conducting and design simulations, analyzing all results and writing main article.

• Patents

Kab-Jin Kim and Geun-Hee Lee “Magnetic domain wall logic element and manufacturing method thereof”, Korea Patent, 10-2016-0136282 (applying date : 2020.01.31), PCT application, PCT/KR2020/006967 (applying data : 2020.05.29)

Byeong-Guk Park, Kab-Jin Kim and Geun-Hee Lee “Magnetic Logic Device”, Korea Patent, 10-2020-0054160 (applying date : 2020.05.07)

• Presentations

Geun-Hee Lee and Kab-Jin Kim “Stochastic Domain Wall motion and Thermal field characterization”, 2019 Korean Physical Society Spring Meeting & 2019 Korean Magnetism Society Summer Conference (2019) – Contributed to experimental design, mathematical modelling, optical measurement, data analysis and poster presentation.

Geun-Hee Lee and Kab-Jin Kim “Logic Devices based on Domain Wall Motion in Chiral-Coupled Nanomagnets”, 2019 Korean Magnetism Society Winter Conference (2019) – Contributed to building micro-magnetic simulation, conducting and design simulations, analyzing all results.