

CURRICULUM VITAE

• PERSONAL INFORMATION

Name: **Kun-Rok Jeon**

Nationality: Republic of Korea

Current Affiliation: Department of Physics, Chung-Ang University, Seoul 06974, Republic of Korea

E-mail: jeonkunrok@gmail.com

ORCID ID: [0000-0003-0237-990X](https://orcid.org/0000-0003-0237-990X)

Lab Website: <https://jeonkunrok.wixsite.com/sqs-lab>



• EDUCATION

03/2009 - 02/2013	Doctorate of Philosophy (Ph.D.)	Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea Advisor: Prof. Sung-Chul Shin (retired)
02/2007 - 02/2009	Master of Science (M.S.)	
03/2000 - 02/2007	Bachelor of Science (B.S.)	Kyung-Hee University (KHU), Seoul, Korea (03/2002 - 02/2005: Military Service)

• PROFESSIONAL APPOINTMENTS

03/2022 - Present	University Lecturer (Assistant Professor)	Department of Physics, Chung-Ang University, Seoul 06974, Republic of Korea
09/2019 - 02/2022	Humboldt experienced researcher (W1)	Department of Nano-Systems from Ions, Spins and Electrons (NISE), Max Planck Institute (MPI) of Microstructure Physics, Weinberg 2, 06120 Halle/Saale, Germany Director: Prof. Dr. Stuart S.P. Parkin
06/2016 - 08/2019	Post-doctoral research associate of EPSRC Program	Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge CB3 0FS, UK & Cavendish Laboratory, University of Cambridge, Cambridge CB3 0HE, UK Advisor: Prof. Mark G. Blamire (retired) & Prof. Jason W. A. Robinson
09/2015 - 05/2016	Post-doctoral research associate	Korea Institute of Science and Technology (KIST), Seoul 136-791, Korea Advisor: Dr. Byoung-Chul Min
03/2013 - 03/2015	Post-doctoral researcher with JSPS fellowship	National Institute of Advanced Industrial Science and Technology (AIST), Spintronics Research Center, Tsukuba, Ibaraki, Japan Advisor: Dr. Hidekazu Saito & Dr. Ron Jansen

• RESEARCH INTERESTS

Topological superconductivity: Spin-texture-protected triplet spin supercurrents

Superconducting spintronics: Dynamic characterization of superconducting pure spin currents

Spin transport in 2D material: Spin transport phenomena in two-dimensional (2D) quantum materials

Spin-orbitronics: Spin-orbit effects in (impurities-embedded) non-magnetic systems

Spin-caloritronics: Thermal injection, control, and detection of spin polarization in Si and Ge

Si/Ge-based spintronics: Electrical injection, control, and detection of spin polarization in Si and Ge

- **EXPERIMENTAL EXPERIENCES**

Sample preparation: Especially, skilled in the epitaxy of bcc ferromagnet/MgO tunnel structures on semiconductors (e.g. Ge, Si) and the deposition of superconductor/ferromagnet multilayers, ultrahigh vacuum (UHV) molecular beam epitaxy (MBE), UHV/HV sputtering, annealing, photolithography, electron-beam lithography, wet/dry etching, wire bonding, wafer dicing, dry transfer of 2D materials

Sample characterization: Surface magneto-optical Kerr effect (SMOKE), reflective high-energy electron diffraction (RHEED), scanning tunnelling microscope (STM), atomic force microscopy (AFM), magnetic force microscope (MFM), scanning electron microscope (SEM), transmission electron microscope (TEM), vibrating sample magnetometer (VSM), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), physical property measurement system (PPMS), low-temperature field-driven/current-driven ferromagnetic resonance (FMR)

Data analysis: Mathematica, Origin, Matlab

- **PUBLICATIONS**

*: Corresponding Author

- **5 selected key publications**

<p>[1] Kun-Rok Jeon*, Binoy Krishna Hazra, Jae-Keun Kim, Jae-Chun Jeon, Hyeon Han, Holger L Meyerheim, Takis Kontos, Audrey Cottet*, Stuart SP Parkin*, “Chiral antiferromagnetic Josephson junctions as spin-triplet supercurrent spin valves and dc SQUIDs,” <i>Nature Nanotech.</i> 18, 747 (2023).</p> <p>Significance: First realization of spin-triplet spin-valves in a single chiral antiferromagnet</p>
<p>[2] Kun-Rok Jeon*, Jae-Keun Kim, Jiho Yoon, Jae-Chun Jeon, Hyeon Han, Audrey Cottet, Takis Kontos, Stuart SP Parkin*, “Zero-field polarity-reversible Josephson supercurrent diodes enabled by a proximity-magnetized Pt barrier,” <i>Nature Mater.</i> 21, 1008 (2022).</p> <p>Significance: First demonstration of zero-field polarity-switchable Josephson supercurrent diodes</p>
<p>[3] Kun-Rok Jeon*†, Binoy Krishna Hazra†, Kyungjune Cho, Anirban Chakraborty, Jae-Chun Jeon, Hyeon Han, Holger L Meyerheim, Takis Kontos, Stuart SP Parkin*, “Long-range supercurrents through chiral non-collinear antiferromagnet in lateral Josephson junctions,” <i>Nature Mater.</i> 20, 1358 (2021).</p> <p>Significance: First realization of chiral antiferromagnetic spin-triplet Josephson junctions</p>
<p>[4] Kun-Rok Jeon, Chiara Ciccarelli*, Andrew J. Ferguson, Hidekazu Kurebayashi, Lesley F. Cohen, Xavier Montiel, Matthias Eschrig, Jason W. A. Robinson, and Mark G. Blamire*, “Enhanced spin pumping into superconductors provides evidence for superconducting pure spin currents,” <i>Nature Mater.</i> 17, 499 (2018).</p> <p>Significance: First observation of superconducting pure spin currents in the dynamic regime</p>
<p>[5] Kun-Rok Jeon, Byoung-Chul Min, Aurelie Spiesser, Hidekazu Saito, Sung-Chul Shin, Shinji Yuasa, and Ron Jansen*, “Voltage tuning of thermal spin current in ferromagnetic tunnel contacts to semiconductors,” <i>Nature Mater.</i> 13, 360 (2014).</p> <p>Significance: First demonstration of voltage-tunable spin-dependent Seebeck tunneling</p>

- **AWARDS AND HONORS**

2024 POSCO Science Fellowship for the next two years

2023 Max Planck Partner Group for the next five years

2020 Humboldt Research Fellowship for Experienced Researchers

2013 Post-Doctoral Fellowship of Japan Society for the Promotion of Science (JSPS)

2012 Dong-Wha Fellowship for graduate students