Dr. JUNE-SEO, KIM

Birth: 02. Sep. 1975
Place: Seoul, Republic of Korea

EDUCATION

Ph.D – Department of Physics, University of Konstanz**,** Konstanz, Germany (advisor: Prof. **Mathias Kläui**)	Nov. 2011
M.S. – Department of Physics, Sungkyunkwan University**,** Suwon, South Korea (advisor: Prof. **Jung Hoon Han**)	Aug. 2006
B.S. – Department of Physics, Inha University – Incheon, South Korea	Aug. 2003

EXPERIENCES

02.2015-05.2016	**Senior Engineer, *SK Hynix* (**New Memory Process Development Group) ▪ Electrical and Magnetic Characterization of STT-MRAM devices (Evaluation) ▪ Material and Process Developments for STT-MRAM ▪ New MTJ Stack Designs and New Etch Schemes Developments (Simulation and Modeling)
01.2013-10.2014	**Postdoctoral Research Fellow,** *University of Eindhoven*, Netherlands (advisor: Prof. **Henk . J. M. Swagten**)
11.2011-12.2012	**Postdoctoral Research Fellow**, *University of Mainz*, Germany (advisor: Prof. Dr. **Mathias Kläui**)
09.2009-10.2009	**Visiting Research Assistant**, *University of Salamanca*, Spain (supervisor: Prof. **Luis Lopez–Diaz**)
05.2008-09.2010	**Membership,** European Commission–**EU Marie Curie Research Training Network** "Spin Current Induced Ultrafast Switching" – SPINSWITCH (MRTN–CT–2006–035327)
05.2008-11.2011	**Graduate Research Assistant**, Dept. of Physics, Univ. of Konstanz, Germany Thesis title: "**Magnetization Dynamics in Permalloy Nanostructures**"
08.2006-01.2008	**Visiting Research Assistant**, SPINTRONICS Lab, Inha University, South Korea (supervisor: Prof. **Chun–Yeol You**)
03.2004-08.2006	**Graduate Research Assistant**, Dept. of Physics, Sungkyunkwan University, South Korea Theoretical Condensed Matter Physics (Numerical Modeling and **Monte Carlo Simulations**)

RESEARCH INTERESTS

- **Skyrmionics – Skyrmion Generation and Manipulation by Spin-Orbit Torques (SOTs)**
- **Magnonics – Magnon–Optics and Voltage Controlled Magnon**
- **Antiferromagnetic Spintronics**
- **Spin-Torque Memristor**

DEVELOPMENT INTERESTS

- **Selector Based Spin-Transfer Torque MRAM (STT-MRAM)**
- **Material Developments for STT-MRAM**
- **Multilayer Based Permanent Magnet**

EXPERIMENT & SIMULATION SKILLS

- **Sample Fabrication**
  - e–beam and Focused Ion–beam Lithography (RAITH 150-TWO and FEI Dual Beam System)
  - Optical lithography and Ion milling system
  - magnetron sputtering chamber, e-beam evaporator, and thermal evaporator
- **Measurement Techniques**
  - Oxford Super Conducting Magnet Systems (8 T and 15 T, temperature: down to 2.2 K)
  - ^{4}He High Frequency (< 20 GHz) Magneto–transport Setup with Vector Coil System (0.5 T and 1.5 K–300 K)
  - X-Ray Diffraction (XRD) and X-Ray Reflectivity (XRR)
  - Magneto-Optical Kerr Microscope (Zeiss Microscope + Evico Magneto-Optical Kerr Microscope)
  - Brillouin Light Scattering (BLS) (Spintronics lab at Inha Univ.)
- **Numerical Simulations**
  - Object Oriented MicroMagnetic Framework (OOMMF)
  - GPMagnet (http://www.goparallel.net/index.php/gp-software)
  - LLG Micromagnetic Simulator
  - COMSOL Multiphysics (formerly FEMLAB)

ACTIVITIES and LANGUAGES

Korean Mandatory Military Service (08.1996–10.1998)
Languages: **Korean** (Native), **English** (Fluent), **German** (Intermediate), and **Dutch** (Basic)

REFERENCES

① **Prof. Dr. Mathias Klaeui (Ph.D. advisor)** – Johanes-Gutenberg Universität im Maniz, Germany
Address: 01–631, Institut für Physik, Staudinger Weg 7, 55128 Mianz, Germany
Tel: +49–6131–39–23633 Email: Klaeui@uni-mainz.de
② **Prof. Chun–Yeol You (advisor)** – Daegu Gyeongbuk Institute of Science & Technology (DGIST)
Address: Department of Emerging Materials Science, DGIST (Daegu Gyeongbuk Institute of Science & Technology) 333 Techno Jungang-Daero, Hyeonpung-myeon, Dalseong-Gun, Daegu, 42988, Rep. of Korea
Tel: +82-53-785-6522 Email: cyyou@dgist.ac.kr
③ **Prof. Henk J. M. Swagten (advisor)** – (Professor in Eindhoven University of Technology, Netherlands)
Address: Department of Applied Physics, Center for NanoMaterials, Eindhoven University of Technology, PO Box 513, 5600 MB Eindhoven, The Netherlands
Tel: +31–40–2474279 Email: H.J.M.Swagten@tue.nl
④ **Dr. Soo-Man Seo** – Senior Engineer at SK Hynix
Tel: +82-10-9489-6075 Email: sooman.seo@gmail.com
⑤ **Dr. Seung-Young Park** – Senior Researcher at Korea Basic Science Institute
Tel: +82-10-4033-0960 Email: parksy@kbsi.re.kr

PUBLICATION LIST [C]=Corresponding Author

- **[C] N.-H. Kim, J. Jung, J. Cho, D.-S. Han, Y. Yin, J.-S. Kim, H. J. M. Swagten and C.-Y. You, *Interfacial Dzyaloshinskii-Moriya interaction, surface anisotropy energy, and spin pumping at spin orbit coupled Ir/Co interface*, Appl. Phys. Lett. 108, 142406 (2016).**
- **[C] N.-H. Kim, D.-S. Han, J. Jung, J. Cho, J.-S. Kim, H. J. M. Swagten, and C.-Y. You, *Improvement of the interfacial Dzyaloshinskii-Moriya interaction by introducing a Ta buffer layer*, Appl. Phys. Lett. 107, 142408 (2015).**
- **[C] J. Cho, N.-H. Kim, S. Lee, J.-S. Kim, R. Lavrijsen, A. Solignac, Y. Yin, D.-S. Han, N. J. J. van Hoof, H. J. M. Swagten, B. Koopmans, and C.-Y. You, *Thickness dependence of the interfacial Dzyaloshinskii–Moriya interaction in inversion symmetry broken systems*, Nature Communications 6, 7635 (2015).**
- **F. Ummelen, D.-S. Han, J.-S. Kim, H. J. M. Swagten, and B. Koopmans, *Asymmetric Domain-Wall Depinning Induced by Dzyaloshinskii–Moriya Interaction*, IEEE Transaction on Magnetics 51, 6000703 (2015).**
- **J.-S. Kim, *et. al.*, *Synchronous precessional motion of multiple domain walls in a ferromagnetic nanowire by perpendicular magnetic field pulses*, Nature Communications 5, 3429 (2014).**
- **J.-S. Kim, *et. al., Double resonance response in nonlinear magnetic vortex dynamics*, Phys. Rev. B 88, 064402 (2013).**
- **J.–S. Kim, M. Stärk, J. Yoon, C.–Y. You, M. Eduardo, L. Lopez–Diaz, and M. Kläui, *Interactions between Propagating Spin–Waves and Domain Walls on a Ferromagnetic Nanowire,* Phys. Rev. B 85, 174428 (2012).**
- **J.–S. Kim, *et. al., Current-Induced Vortex Dynamics and Pinning Potentials Probed by Homodyne Detection*, Phys. Rev. B 82, 104427 (2010).**
- **O. Boulle, J.–S. Kim, K. Bouzenhouane, R. Mattheis, G. Faini, and M. Kläui, *Detection of Vortex Core Polarities by a Homodyne Detection Scheme*, ICEAA: 2009 International Conference on Electromagnetics in Advanced Applications, pp. 898–900 (2009).**
- **M. Kläui, D. Ilgaz, L. Heyne, J. S. Kim, O. Boulle, C. Schieback, F. Zinser, *et. al.*, *Concepts for Domain Wall Motion in Nanoscale Ferromagnetic Elements due to Spin Torque and Particular Oersted Fields*, Journal of Magnetics 14, pp. 53-61 (2009).**
- **J. S. Kim, K. Kwak, and C.-Y. You, *Signal Modulation of Super Read Only Memory with Thermally Activated Aperture Model*, Japanese Journal of Applied Physics 47, pp. 5845–5847 (2007).**
- **C. Jia, J. H. Nam, J. S. Kim, and J. H. Han, *Lattice–coupled Antiferromagnet on Frustrated Lattices*, Phys. Rev. B 71, 212406 (2005).**
- **J. H. Han, J. S. Kim, M. J. Kim, and P. Ao, *Effective Vortex Mass from Microscopic Theory*, Phys. Rev. B 71, 125108 (2005).**