

Dai-Sik Kim

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Personal Information

Born on January 8th, 1963

Married with three children

Higher education and professional experience

1985	B. A. in Physics, Seoul National University, Seoul, Korea
1985-1986	M. A. in Biophysics, U. C. Berkeley, CA, USA
1987-1990	Ph. D. in Physics, U. C. Berkeley, CA, US
1986-1990	Graduate Student Research Assistant, Lawrence Berkeley Laboratories
1990-1991	Postdoctoral Researcher, Oklahoma State University
1991-1993	Postdoctoral Researcher, AT&T Bell Labs., Holmdel
1993-1994	Center for Laser Research, Oklahoma State University, Senior Scientist
1994-1998	Assistant Professor, Department of Physics, Seoul National University
1998-2004	Associate Professor, Department of Physics, Seoul National University
2004-2019	Professor, Department of Physics and Astronomy, Seoul National University
2019-2021	Director, Quantum Photonics Institute, UNIST
2019- present	Distinguished Professor, UNIST

Professional Activities

- General Chair, **Surface Plasmon Photonics 5 (SPP5)**, Busan, 2011 (attendees of over 600)
- Director, **Center for subwavelength optics**, 2008-2015, funded by National Research Foundation, Science Research Center
- Director, **Center for Angstrom Scale Electromagnetism**, 2015-, funded by National Research Foundation, Creative Research Initiative
- **Reviewer** for the National Research Foundation (Korea)
- **Outstanding referee**, APS, 2011
- **Regular Referee** for Physical Review Letters, Optics Express, Science, Nature, Nature Materials, Nature Photonics, Nature Physics, Physical Review, Optics Letters, Optics Communications, Semiconductor Science and Technology, Applied Physics Letters, Journal of the Optical Society of America, Applied Physics B, New Journal of Physics, Journal of Microscopy, Journal of Applied Physics, Applied Optics, Journal of Physics D, ...
- Service on **conference committees**, including **CLEO/QELS-IQEC** 2000, 2001, 2004, 2007, 2012-2015; **LEOS** 2005; **NFO** 2008, 2012, 2014, 2016, 2018; **Photonics West** 2003-2005, 2007-2019;

SPIE Optics and Photonics 2009-2018, **SPP** steering committee 2011-2019

- **Member** of the Korean Academy of Science and Technology, Korean Physical Society, Optical Society of Korea, Optical Society of America, American Physical Society

Editorship, Awards and Honours

2017	VAJRA (Visiting Advanced Joint Research Award) Faculty (IIT Bombay) by Department of Science & Technology of India
2016	KAST, Korean Academy of Science and Technology
2016	Topical Editor for Optics Letters
2015	Editorial Board Member of Scientific Reports
2013	Korean Science Award
2012	Seoul National University Research Award
2011	Seoul National University College of Natural Sciences Research Award American Physical Society Fellow <i>"For important contributions to ultrafast optical processes in semiconductors and near-field studies of plasmonics"</i>
2009	Optical Society of America Fellow <i>"For contributions to ultrafast studies of semiconductors, plasmonics and near-field optics"</i> Sung-Do Optics Scientist Award by Optical Society of Korea
2005	Selected as one of ten 'Star Faculties' by Korea Ministry of Education
2002	Korea Young Scientist Award
1997	Lotte Fellow

Research Interests

Terahertz nanotechnology, Ultrafast phenomena in semiconductors, Nano-optics and surface plasmon photonics, optical vector field mapping, Terahertz near-field phenomena, Optical magnetism

Major Recent Achievements

Development of zerogap; closable gap technologies (ref. [1, 2]).

Fabrication of Angstrom- and nano gap of millimeter to centimeter length for linear and nonlinear optical purposes (ref. [3-5] of *Selected publications*).

Nano manipulation of terahertz molecular cross sections and phase transition temperatures (ref. [6-8]).

Nano field mapping of electric and magnetic fields of light (ref. [9] and ref. [10]).

Research Vision

With diverse experiences in spectroscopy and materials, combined with wafer-length tunable nano and Angstrom gap technologies, I aim to make something out of the wafer-length *gaptronics* that I founded.

Supervision of Ph. D. students

I produced over 30 Ph. D. students, out of whom 15 became university professors.

Publications

Over 240 research articles in international journals; google scholar h index=60

Selected publications of recent years

1. **Topology-Changing Broadband Metamaterials Enabled by Closable Nanotrenches**, D. Kim, H. S. Yun, B. Das, J. Rhie, P. Vasa, Y. I. Kim, S. H. Choa, N. K. Park, D. H. Lee, Y. M. Bahk, and D. S. Kim, Nano Letters, 21 4202-4208 (2021).
2. **A Transformative Metasurface Based on Zerogap Embedded Template**, B. Das, H. S. Yun, N. K. Park, J. Y. Jeong and D. S. Kim, Adv. Opt. Mater 9, 2002164 (2021).
3. **Electromagnetic Saturation of Angstrom-Sized Quantum Barriers at Terahertz Frequencies**, Y. M. Bahk, B. J. Kang, Y. S. Kim, J. Y. Kim, W. T. Kim, T. Y. Kim, T. H. Kang, J. Y. Rhie, S. H. Han, C. H. Park, F. Rotermund, and D. S. Kim, Physical Review Letters 115, 125501 (2015). **cover article*
4. **Atomic layer lithography of wafer-scale nanogap arrays for extreme confinement of electromagnetic waves**, X. Chen, H. R. Park, M. Pelton, X. Piao, N. C. Lindquist, H. S. Im, Y. J. Kim, J. S. Ahn, K. J. Ahn, N. K. Park, D. S. Kim and S. H. Oh, Nature Communications 4, 2361 (2013). **featured article*
5. **Terahertz field enhancement by a metallic nano slit operating beyond the skin-depth limit**, M. A. Seo, H. R. Park, S. M. Koo, D. J. Park, J. H. Kang, O. K. Suwal, S. S. Choi, P. C. M. Planken, G. S. Park, N. K. Park, Q. H. Park, and D. S. Kim, Nature Photonics 3, 152 (2009).
6. **A Vanadium Dioxide Metamaterial Disengaged from Insulator-to-Metal Transition**, Y. G. Jeong, S. H. Han, J. Y. Rhie, J. S. Kyoung, J. W. Choi, N. K. Park, S. H. Hong, B. J. Kim, H. T. Kim, and D. S. Kim, Nano Letters 15 (10), 6318-6323 (2015).
7. **Active Terahertz Nanoantennas Based on VO₂ Phase Transition**, M. A. Seo, J. S. Kyoung, H. R. Park, S. M. Koo, H. S. Kim, H. Bernien, B. J. Kim, J. H. Choe, Y. H. Ahn, H. T. Kim, N. K. Park, Q. H. Park, K. J. Ahn and D. S. Kim, Nano Letters 10 (6), 2064 (2010).
8. **Colossal absorption of molecules inside single terahertz nanoantennas**, H. R. Park, K. J. Ahn, S. H. Han, Y. M. Bahk, N. K. Park, and D. S. Kim, Nano Letters 13(4), 1782 (2013).
9. **Bethe-hole polarization analyser for the magnetic vector of light**, H.W. Kihm, S. M. Koo, Q.H. Kim, K. Bao, J.E. Kihm, W.S. Bak, S. H. Eah, C. Lienau, H. Kim, P. Nordlander, N.J. Halas, N. K. Park & D. S. Kim, Nature Communications 2, 1 (2011).
10. **Vector field microscopic imaging of light**, K. G. Lee, H. W. Kihm, J. E. Kihm, W. J. Choi, H. Kim, C. Ropers, D. J. Park, Y. C. Yoon, S. B. Choi, D. H. Woo, J. Kim, B. Lee, Q. H. Park, C. Lienau and D. S. Kim, Nature Photonics 1, 53 (2007).