

Jin-Kyu Yang

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- EDUCATION**
- Yale University** New Haven, CT, USA
Post-Doctoral Associate in Hui Cao's Group, May 2008 – present
- Korea Advanced Institute of Science and Technology; KAIST** Daejeon, Korea
Postdoctoral fellow in College of Natural Science, Sep. 2007 – Nov. 2007
- Korea Advanced Institute of Science and Technology; KAIST** Daejeon, Korea
Ph. D. in Physics, Aug. 2007
Thesis title: Control of the light using photonic crystal slab structure
Advisor: Professor Yong-Hee Lee
- Korea Advanced Institute of Science and Technology; KAIST** Daejeon, Korea
M. S. in Physics, Feb. 2003 (GPA 3.76/4.3)
Thesis title: Lasing from slab edge mode of free-standing two dimensional photonic crystals
Advisor: Professor Yong-Hee Lee
- YONSEI University** Seoul, Korea
B. S. in Physics, Feb. 2001 (GPA 3.55/4.0)
- WORK EXPERIENCES**
- Advanced Photonic Research Institute; APRI** Gwangju, Korea
Senior Research Scientist in Nano-photonics Lab., Nov. 2007 – Apr. 2008
- Study of THz devices and meta-materials by numerical methods.
 - Study of the surface plasmon resonance in metal nano-cavity structures.
- RESEARCH EXPERIENCES**
- Postgraduate researcher and graduate student at KAIST** (Jan. 2002 – Oct. 2007)
- Detection of photons in photonic crystal slab structures.
 - Simulations using plane-wave expansion method and finite-difference time-domain method for designing the high efficient photonic crystal photodetector.
 - Fabrication of a photodiode device composed of InGaAsP/InP QWs.
 - Study of the surface plasmon phenomena and anomalies at metallic stripe arrays
 - Investigation of surface plasmon resonance and the Fano-resonance in conventional metallic stripe arrays on ITO guided layer.
 - Demonstration of plasmon-suppressed vertically-standing stripe arrays.
 - Optimization of metal polarizer for OLED by numerical methods (with Samsung SDI)
 - Development of the FDTD code for the hetero OLED structure design
 - Design of metal grating polarizer for blocking the external light of the OLED
 - Characterization of the gradually-changed metal-dielectric grating polarizer
 - Study of the photonic crystal surface mode
 - Classification of the photonic crystal slab-edge mode at a different terminal shape of slab.
 - Demonstration of the photonic crystal slab-edge laser based on surface cavity mode
- Visiting Researcher in DFG-CFN at Univ. of Karlsruhe in Germany** (Jan. – Feb. 2007)
- Study of meta-materials in IR region
 - Characterization of Split-Ring Resonator array structures for negative index materials
 - Analytic investigation of the negative beam shift in the negative index material layer

TEACHING EXPERIENCES **Teaching Assistant** in Dept. of Physics at KAIST (spring 2002 – fall 2005)
 - Fundamental Physics I for undergraduate students (spring 2002)
 - General Physics II for undergraduate students (fall 2002)
 - Optics II for undergraduate students (spring 2003)
 - Quantum Mechanics II for undergraduate students (fall 2003)
 - Applied physics Laboratory II for graduate students (fall 2003 – fall 2005)

TECHNICAL EXPERTISE **Semiconductor processing of GaAs, InP, and Si:** electron-beam lithography, photolithography, two-beam interference patterning, reactive ion etching, inductively coupled plasma etching, chemically assisted ion-beam etching, selective wet etching, electron-beam evaporation, thermal evaporation, plasma enhanced chemical vapor deposition, lift-off technique, mechanical polishing, scanning electron microscopy
Characterization: photoluminescence, photocurrent spectrum measurement, free-space transmission-reflection measurement with tunable laser source or white light source, microscope FT/IR transmission-reflection measurement.
Numerical calculation and programming: finite-difference time domain (FDTD) program, CST microwave studio™, and MIT photonic bandgap (MPB) package. C, Matlab et. al.

ACTIVITIES Reviewer for Journal of the Optical Society of Korea,
 Member, Optical Society of Korea

PATENTS (*Domestic*) Kyu Hwan Hwang, Young-Woo Song, Jong Hyuk Lee, Sang-Hwan Cho, **Jin-Kyu Yang**, and Yong-Hee Lee, "Polarizer and organic light emitting display apparatus comprising the same," KoreaPO applicant number 2007-0038324 (April 2007).

HONORS Research scholarship of graduated student in Science and Engineering from KOSEF
 Best honors of Yonsei Univ. (spring 2000 and fall 1998)
 Honors of Yonsei Univ. (spring 1999)

PUBLICATIONS **Jin-Kyu Yang**, In-Kag Hwang, Min-Kyo Seo, Se-Heon Kim, and Yong-Hee Lee, "Plasmon-suppressed vertically-standing nanometal structures," *Opt. Express*, **16**, 1951-1957 (2008).

Min-Kyo Seo, Kwang-Yong Jeong, **Jin-Kyu Yang**, Yong-Hee Lee, Hong-Gyu Park, and Sung-Bock Kim, "Low threshold current single-cell hexapole mode photonic crystal laser," *Appl. Phys. Lett.*, **90**, 171122 (2007).

Myung-Ki Kim, **Jin-Kyu Yang**, Yong-Hee Lee and In-Kag Hwang, "Influence of Etching Slope on Two-Dimensional Photonic Crystal Slab Resonators," *J. Korean Phys. Soc.*, **50**, 1027-1031 (2007).

In-Kag Hwang, Sun-Kyung Kim, **Jin-Kyu Yang**, Se-Heon Kim, Sang Hoon Lee, and Yong-Hee Lee "Curved-microfiber photon coupling for photonic crystal light emitter," *Appl. Phys. Lett.*, **87**, 131107 (2005).

Hong-Gyu Park, Se-Heon Kim, Soon-Hong Kwon, Young-Gu Ju, **Jin-Kyu Yang**, Jong-Hwa Baek, Sung-Bok Kim, and Yon-Hee Lee, "Electrically Driven Single-Cell Photonic Crystal Laser", *Science*, **305**, 1444 (2004).

Jin-Kyu Yang, Se-Heon Kim, Guk-Hyun Kim, Hong-Gyu Park, Yong-Hee Lee, and Sung-Bock Kim, "Slab-edge modes in two-dimensional photonic crystals," *Appl. Phys. Lett.* **84**, 3016 (2004).

PRESENTATIONS (Poster) **Jin-Kyu Yang**, Min-Kyo Seo, Se-Heon Kim, Ju-Young Kim, and Yong-Hee Lee, (International) "Plasmon-free vertically-standing nanometal structure," *13th MOC '2007*, Takamatsu Kagawa Japan, #H81 (2007)

(Talk) Min-Kyo Seo, Kwang-Yong Jeong, **Jin-Kyu Yang**, Se-Heon Kim, Sung-Bock Kim, and Yong-Hee Lee, "Electrically-driven single hexapole mode photonic crystal laser using parity-selective mirrors," *LEOS 2007*, Florida USA, TuL1 (2007)

(Poster) **Jin-Kyu Yang**, and Yong-Hee Lee, "Surface plasmon excitation in standing metal-nano-stripe structure," *PECS-VII '2007*, Monterey CA USA, #BII-32 Poster Session D (Tuesday) (2007)

(Poster) Min-kyo Seo, Kwang-Yong Jeong, **Jin-Kyu Yang**, and Yong-Hee Lee, "Electrically driven photonic crystal single cell cavity structure for low threshold lasing action," *PECS-VII '2007*, Monterey CA USA, #BII-5 Poster Session D (Tuesday) (2007)

(Talk) Myung-Ki Kim, In-Kag Hwang, **Jin-Kyu Yang**, and Yong-Hee Lee, "Influence of etching slope on two-dimensional photonic crystal slab resonators", *Proc. SPIE*, **6352**, 63520P (APOC, Gwangju, 2006)

(Talk) **Jin-Kyu Yang**, In-Kag Hwang, Soon-Hong Kwon, Hyun-Ju Chang and Yong-Hee Lee, "Standing Metallic Nano-Stripe Array Structure," *Proc. SPIE*, **6353**, 635334 (APOC, Gwangju, 2006)

(Talk) **Jin-Kyu Yang**, In-Kag Hwang, Soon-Hong Kwon, and Yong-Hee Lee, "Vertical coupling enhanced Fano-resonance in photonic crystal coupled cavity array," *OECC'2005*, Seoul, 6E4-1 (2005)

(Poster) **Jin-Kyu Yang**, Soon-Hong Kwon, In-Kag Hwang and Yong-Hee Lee, "Vertically-coupled Fano resonance in photonic crystal coupled cavity array," *PECS-VI '2005*, Crete, #52 Poster Session D (Thursday) (2005)

(Talk) Yong-Seok Choi, Se-Heon Kim, **Jin-Kyu Yang**, and Yong-Hee Lee, "Modified photonic-crystal stick resonators with self-organized InGaAs quantum dots emitting at 1.2 μ m," *31-st International Symposium on Compound Semiconductors (ISCS2004)* (2004)

(Talk) **Jin-Kyu Yang**, Se-Heon Kim, Guk-Hyun Kim, Hong-Gyu Park, and Yong-Hee Lee, "Lasing from slab edge mode of free-standing two-dimensional photonic crystal," *CLEO/QELS '2003*, Baltimore, CThP4 (2003)

(Domestic)
- Selected -

(Invited) **J. K. Yang**, M. K. Seo, M. K. Kim, I. K. Hwang and Y. H. Lee, "Photonic crystal photodetector," *OSK Annual Meeting '2008*, Hongik Univ., Korea, T2A-I1(2008)

(Talk) **J. K. Yang**, S. H. Kwon, M. K. Seo, Y. H. Lee and I. K. Hwang, "Photonic crystal cavity arrays for photon detection," *OSK Summer Meeting '2006*, Cheju Nat. Univ., Korea, T2A-V1(2006)

(Poster) **J. K. Yang**, I.K. Hwang, and Y. H. Lee, "Polarization property of one-dimensional Ag grating structure," *OSK Annual Meeting '2006*, Ajou Univ., Korea, TP-V3 (2006)

(Talk) **J. K. Yang**, S. H. Kim, S. K. Kim, S. H. Kwon, I. K. Hwang, Y. H. Lee, "Fano-Resonance of triangular lattice photonic crystal slabs," *OSK Annual Meeting '2004*, Muju resort, Korea, TF-V20 (2004)

(Talk) **J. K. Yang**, K. H. Kim, S. H. Kim, and Y. H. Lee, "Lasing from slab edge mode of free-standing two-dimensional photonic crystals," *OSK Annual Meeting '2003*, Inha Univ., Korea, TG-V23 (2003)