



JONGWON LEE

Associate Professor

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Education

2012.01-2014.12, University of Texas at Austin, Austin, TX, U.S.A.

Ph.D. in Electrical and Computer Engineering (GPA: 4.0/4.0)

Dissertation title: “Nonlinear and wavelength-tunable plasmonic metasurfaces and devices”

Research advisor: Mikhail A. Belkin

2009.08-2011.12, University of Texas at Austin, Austin, TX, U.S.A.

M.S. in Electrical and Computer Engineering (GPA: 4.0/4.0)

Thesis title: “Broadly wavelength-tunable bandpass filters based on long-range surface plasmon-polaritons”

Research advisor: Mikhail A. Belkin

2001.03-2009.02, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

B.S. in Electrical Engineering (minor in Physics, GPA: 3.84/4.3)

Thesis title: “Geometric effect of nanocrystals in nonvolatile memory using block copolymer nanotemplate”

Research advisor: Yang-Kyu Choi

Professional Appointments

2019.09-Present, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea

Department of Electrical Engineering

Associate Professor

2015.09-2019.08, Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea

School of Electrical and Computer Engineering

Assistant Professor

2010.01-2014.12, University of Texas at Austin, Austin, TX, U.S.A.

Department of Electrical and Computer Engineering

Graduate Research Assistant (Prof. Mikhail Belkin group)

Research Interests

- Nonlinear optical phenomena from metamaterials and metasurfaces
- Actively tunable metamaterials and metasurfaces
- III-V semiconductor heterostructures and intersubband transitions in Multi-Quantum-Well structures
- Surface Enhanced Infrared Absorption Spectroscopy
- Remote chemical detection using Mid-IR quantum cascade lasers
- Infrared plasmonic filters for polarimetric and multi-spectral imaging
- Orbital Angular Momentum generation metasurfaces for high data capacity communications
- Nonlinear and actively tunable THz metasurfaces

Teaching Experience

2015.09-2019.08, Assistant Professor, UNIST, School of Electrical and Computer Engineering, Ulsan, Korea

2019.09-present, Associate Professor, UNIST, Department of Electrical Engineering, Ulsan, Korea

Detailed teaching courses:

- *Engineering Programming II* for 1st year undergraduate (2nd semester in 2015)
- *Electromagnetism II* for 2nd year undergraduate (2nd semester in 2016, 2017, 2018)
- *Intro. to Electron Devices* for 3rd year undergraduate (1st semester in 2016, 2017)
- *Nanophotonics* for Ph.D. candidates (1st semester in 2016, 2017, 2018)
- *Optoelectronic Devices* for senior undergraduate (1st semester in 2018, 2019)
- *Digital System Lab.* for 3rd year undergraduate (1st semester in 2019)
- *Compound Semiconductor Devices* for Ph.D. candidates (2nd semester in 2019, 2020)

Research Projects

- 2020.07-2023.02, *Research on photon-electron hybrid nonlinear systems for high power harmonic generation in Terahertz gap region*, NRF, Basic Research Laboratory Program, Korea. (PI)
- 2019.06-2022.02, *Research of Mid-Infrared Broadband Nonlinear Meta Light Source*, NRF, Basic Science Research Program, Korea. (PI)
- 2018.10-2021.10, *Development of standoff chemical warfare agent detector based on Mid-IR semiconductor laser*, ADD-ICMTC, Civil-Military Technology Development Program, Korea. (PI)
- 2018.09-2021.08, *Study on infinite capacity possibility through OAM-based communication system development*, Samsung ICT, Korea.
- 2018.08-2023.07, *Development of plasmonic nanostructured infrared filter design technology*, NRF, Nano-Material Technology Development Program, Korea. (PI)
- 2016.06-2019.05, *Mid-Infrared second-harmonic and third-harmonic generation nonlinear metasurfaces*, NRF, Basic Science Research Program, Korea. (PI)
- 2015.11-2017.04, *Mid-Infrared third-harmonic generation nonlinear metasurfaces*, UNIST, Korea. (PI)

Peer-reviewed Journal Publications

(+ co-first authors, * corresponding author, ** Jongwon Lee is corresponding author and his student is a first author)

Google Scholar link: <https://scholar.google.co.kr/citations?user=zgaHDE0AAAAJ&hl=ko>

- J1.** Hyeongju Chung, Daeik Kim, Eunmi Choi, and Jongwon Lee**, “E-band metasurface-based orbital angular momentum multiplexing and demultiplexing” (submitted) (2021).
- J2.** Jaeyeon Yu, Seongjin Park, Inyong Hwang, Daeik Kim, Frederic Demmerle, Gerhard Boehm, Markus-Cristian Amann, Mikhail A. Belkin, and **Jongwon Lee****, “Electrically tunable nonlinear polaritonic metasurfaces” (submitted) (2021).
- J3.** Yun-Tae Kim, Daeik Kim, Sanghwan Park, Anar Zhexembekova, Mirang Byeon, Tae Eun Hong, **Jongwon Lee**, and Chang Young Lee, “Aqueous microlenses for localized collection and enhanced raman spectroscopy of gaseous molecules” *Advanced Optical Materials*, adom.202101209 (2021).
- J4.** Inyong Hwang, Mingyun Kim, Jaeyeon Yu, Jihye Lee, Jun-Hyuk Choi, Su A Park, Won Seok Chang, **Jongwon Lee****, and Joo-Yun Jung, “Ultrasensitive molecule detection based on infrared metamaterial absorber with vertical nanogap” *Small Methods*, smtd.202100277 (2021). IF: 14.188
[This paper was highlighted on the general press, e.g. 연합뉴스, 전자신문, 울산신문, 경상일보, 아시아경제, 뉴스웍스, Newsis, 디지털타임스, 이데일리, 머니투데이]
- J5.** Daeik Kim, Jaeyeon Yu, Inyong Hwang, Seongjin Park, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Mikhail A. Belkin, and **Jongwon Lee****, “Giant nonlinear circular dichroism from intersubband polaritonic metasurfaces” *Nano Letters*, 20, 8032-8039 (2020). IF: 12.344
[This paper was highlighted on the general press, e.g. 연합뉴스, News1, Newsis, 머니투데이, 매일경제, 헤럴드경제, 아시아경제, 뉴스웍스, 특허뉴스, 대학지성]
- J6.** Hyeongju Chung, Daeik Kim, Ashiwini Sawant, Ingeun Lee, Eunmi Choi, and **Jongwon Lee****, “Generation of E-

band metasurface-based vortex beam with reduced divergence angle” *Scientific Reports*, 10, 8289 (2020). IF: 4.011

- J7.** Daeik Kim, Hyeongju Chung, Jaeyeon Yu, Inyong Hwang, Seongjin Park, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Mikhail A. Belkin, Joo-Yun Jung, and **Jongwon Lee****, “Spin-controlled nonlinear harmonic generations from plasmonic metasurfaces coupled to intersubband transitions” *Advanced Optical Materials*, 8, 2000004 (2020). IF: 7.125
- J8.** Yongseok Jung, Inyong Hwang, Jaeyeon Yu, Jihye Lee, Jun-Hyuk Choi, Jun-Ho Jeong, Joo-Yun Jung, and **Jongwon Lee****, “Fano metamaterials on nanopledstals for plasmon-enhanced infrared spectroscopy” *Scientific Reports*, 9, 7834 (2019). IF: 4.011
- J9.** Jaeyeon Yu⁺, Seongjin Park⁺, Inyong Hwang, Daeik Kim, Joo-Yun Jung, and **Jongwon Lee****, “Third-harmonic generation from plasmonic metasurfaces coupled to intersubband transitions” *Advanced Optical Materials*, 1801510, (2019). IF: 7.125
- J10.** Inyong Hwang, Jaeyeon Yu, Jihye Lee, Jun-Hyuk Choi, Dae-Geun Choi, Sohee Jeon, **Jongwon Lee****, and Joo-Yun Jung*, “Plasmon-enhanced infrared spectroscopy based on metamaterial absorbers with dielectric nanopledstals” *ACS Photonics*, 5, 3492-3498, (2018). IF: 7.143
- J11.** Yingnan Liu, **Jongwon Lee**, Stephen March, Nishant Nookala, Daniele Palaferri, John F. Klem, Seth R. Bank, Igal Brener, and Mikhail A. Belkin*, “Difference-frequency generation in polaritonic intersubband nonlinear metasurfaces” *Advanced Optical Materials*, 6, 1800681, (2018). IF: 7.125
- J12.** Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, **Jongwon Lee**, Mikhail A. Belkin, and Andrea Alu*, “Highly-efficient THz generation using nonlinear plasmonic metasurfaces” *Journal of Optics*, 19, 104001, (2017). IF: 2.753
- J13.** Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, **Jongwon Lee**, Nishant Nookala, Mikhail A. Belkin, and Andrea Alu*, “Advanced control of nonlinear beams with Pancharatnam-Berry metasurfaces” *Physical Review B*, 94, 214303, (2016). IF: 3.736
- J14.** Feng Lu, **Jongwon Lee**, Aiting Jiang, Seungyong Jung, and Mikhail A. Belkin*, “Thermopile detector of light ellipticity” *Nature Communications*, 7, 12994, (2016). IF:11.878
- J15.** Alexander B. Khanikaev, Nihal Arju, Zhiyuan Fan, David Purcheladze, Feng Lu, **Jongwon Lee**, Paulo Sarriugarte, Martin Schnell, Rainer Hillenbrand, Mikhail A. Belkin, and Gennady Shvets*, “Experimental demonstration of the microscopic origin of circular dichroism in two-dimensional metamaterials” *Nature Communications*, 7, 12045, (2016). IF:11.878
- J16.** Nima Dabidian, Shourya Dutta-Gupta, Iskandar Kholmanov, Kueifu Lai, Feng Lu, **Jongwon Lee**, Mingzhou Jin, Simeon Trendafilov, Alexander Khanikaev, Babak Fallahazad, Emanuel Tutuc, Mikhail A. Belkin, and Gennady Shvets*, “Experimental demonstration of phase modulation and motion sensing using graphene-integrated metasurfaces” *Nano Letters*, 16, 3607-3615 (2016). IF: 12.279
- J17.** Nishant Nookala, **Jongwon Lee**, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Kueifu Lai, Gennady Shvets, Markus-Christian Amann, Andrea Alu, and Mikhail Belkin*, “Ultrathin gradient nonlinear metasurface with a giant nonlinear response” *Optica*, 3, 283-288, (2016). IF:9.263
- J18.** **Jongwon Lee**, Nishant Nookala, J. Sebastian Gomez-Diaz, Mykhailo Tymchenko, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Ultrathin second-harmonic metasurfaces with record-high nonlinear optical response” *Advanced Optical Materials*, 4, 664, (2016). IF: 7.125
- J19.** Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, **Jongwon Lee**, Nishant Nookala, Mikhail A. Belkin, and Andrea Alu*, “Gradient nonlinear Pancharatnam-Berry metasurfaces” *Physical Review Letters*, 115, 207403, (2015). IF:9.227
- J20.** J. Sebastian Gomez-Diaz, Mykhailo Tymchenko, **Jongwon Lee**, Mikhail A. Belkin, and Andrea Alu*, “Nonlinear processes in multi-quantum-well plasmonic metasurfaces: Electromagnetic response, saturation effects, limits, and potentials” *Physical Review B*, 92, 125429, (2015). IF: 3.736
- J21.** **Jongwon Lee**, Seungyong Jung, Pai-Yen Chen, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Ultrafast electrically-tunable polaritonic metasurfaces” *Advanced*

Optical Materials, 2, 1057-1063, (2014).

[This paper was featured on the inside cover and selected for the Best of Adv. Opt. Mater. 2014 edition]

- J22.** **Jongwon Lee**, Mykhailo Tymchenko, Christos Argyropoulos, Pai-Yen Chen, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu*, and Mikhail A. Belkin*, “Giant nonlinear response from plasmonic metasurfaces coupled to intersubband transitions” *Nature*, 511, 65-69, (2014).
[This paper was highlighted on the general press, e.g. [UT Austin press release](#), [Nanowerk](#), [Phys.org](#)]
- J23.** **Jongwon Lee** and Mikhail A. Belkin*, “Widely tunable thermo-optic plasmonic bandpass filter” *Applied Physics Letters*, 103, 181115, (2013).
- J24.** **Jongwon Lee**, Feng Lu, and Mikhail A. Belkin*, “Broadly wavelength-tunable bandpass filters based on long-range surface plasmon polaritons” *Optics Letters*, 36, 3744-3746, (2011).
- J25.** **Jong-Won Lee**, Seong-Wan Ryu, Dong Ok Shin, Bong Hoon Kim, and Sang Ouk Kim, Yang-Kyu Choi*, “Geometric Effects of Nanocrystals in Nonvolatile Memory Using Block Copolymer Nanotemplate”, *Solid State Electronics*, 53, 640-643, (2009).
- J26.** Seong-Wan Ryu, **Jong-Won Lee**, Jin-Woo Han, Sungho Kim, and Yang-Kyu Choi*, "Designed Workfunction Engineering of Double-Stacked Metal Nanocrystals for Nonvolatile Memory Application", *IEEE Transactions on Electron Devices*, 56, 377-382, (2009).
- J27.** Xing-Jiu Huang, Joo-Hyung Lee, **Jong-Won Lee**, Jun-Bo Yoon, Yang-Kyu Choi*, “A One-Step Route to a Perfectly Ordered Wafer-Scale Microbowl Array for Size-Dependent Superhydrophobicity”, *Small*, 4, 211-216, (2008).

Non-peer-reviewed Journal Publications

- NJ1.** Inyong Hwang, **Jongwon Lee**, and Joo-Yun Jung*, “Plasmon-enhanced infrared spectroscopy based on metasurface absorber with vertical nanogap” *Journal of Sensor Science and Technology*, 27, 275-279 (2018).
- NJ2.** Nishant Nookala, **Jongwon Lee**, Yingnan Liu, Wells Bishop, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Omri Wolf, Igal Brener, Andrea Alu, and Mikhail A. Belkin*, “Flat nonlinear optics: metasurfaces for efficient frequency mixing” *Proc. SPIE*, 10113, 1011300 (2017). (**Invited paper**)
- NJ3.** **Jongwon Lee**, Nishant Nookala, J. Sebastian Gomez-Diaz, Mykhailo Tymchenko, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Highly-nonlinear quantum-engineered polaritonic metasurfaces” *Proc. SPIE*, 9546, 95460K (2015). (**Invited paper**)
- NJ4.** **Jongwon Lee**, Nishant Nookala, Mykhailo Tymchenko, Seungyong Jung, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Nonlinear optics with quantum-engineered intersubband transitions” *Proc. SPIE*, 9382, 938216 (2015). (**Invited paper**)
- NJ5.** **Jongwon Lee**, Feng Lu and Mikhail A. Belkin*, “Widely-tunable optical bandpass filter based on long-range surface plasmon polaritons” *Proc. SPIE*, 8457, 84572G (2012).

International Conference Talks

- C1.** Daeik Kim, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin, and **Jongwon Lee****, “Efficient third harmonic generation from Mie resonance coupled to intersubband transitions” Nano Korea 2021, Ilsan, Korea, July 7-9, (2021).
- C2.** Seongjin Park, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin, and **Jongwon Lee****, “Electrically tunable third-harmonic-generation from plasmonic metasurfaces coupled to intersubband transitions” Nano Korea 2021, Ilsan, Korea, July 7-9, (2021).
- C3.** Jeongwoo Son, Jaeyeon Yu, Seongjin Park, Inyong Hwang, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin, and **Jongwon Lee****, “Electrically-tunable difference-frequency-generation from nonlinear polaritonic metasurface” Nano Korea 2021, Ilsan, Korea, July 7-9, (2021).
- C4.** Jaeyeon Yu, Seongjin Park, Inyong Hwang, Daeik Kim, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin, and **Jongwon Lee****, “Electrical control of second-harmonic generation from nonlinear polaritonic metasurface”

Nano Korea 2021, Ilsan, Korea, July 7-9, (2021).

- C5. Hyeongju Chung, Inyong Hwang, Jaeyeon Yu, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin, and **Jongwon Lee****, “Electrically tunable quarter waveplate based on intersubband polaritonic metasurfaces” Nano Korea 2021, Ilsan, Korea, July 7-9, (2021).
- C6. Inyong Hwang, Mingyun Kim, Jaeyeon Yu, Joo-Yun Jung, and **Jongwon Lee****, “Ultrasensitive surface-enhanced infrared absorption spectroscopy based on metamaterial absorber with vertical nanogap” Nano Korea 2021, Ilsan, Korea, July 7-9, (2021).
- C7. Hyeongju Chung, Inyong Hwang, Jaeyeon Yu, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin, and **Jongwon Lee****, “Electrically tunable quarter waveplate based on intersubband polaritonic metasurfaces” CLEO Conference 2021, Virtual conference, May 9-14, (2021).
- C8. Jaeyeon Yu, Inyong Hwang, Daeik Kim, Frederic Demmerle, Gerhard Boehm, Markus-Cristian Amann, Mikhail A. Belkin and **Jongwon Lee****, “Broadband second-harmonic generation from electrically tunable nonlinear polaritonic metasurfaces” CLEO Conference 2020, Virtual conference, May 10-15, (2020).
- C9. Daeik Kim, Jaeyeon Yu, Frederic Demmerle, Gerhard Boehm, Markus-Cristian Amann, Mikhail A. Belkin and **Jongwon Lee****, “Giant nonlinear circular dichroism from nonlinear chiral polaritonic metasurfaces” CLEO Conference 2020, Virtual conference, May 10-15, (2020).
- C10. Yingnan Liu, **Jongwon Lee**, Nishant Nookala, Daniele Palaferri, Omri Wolf, Igal Brener, Seth R. Bank, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Andrea Alu, and Mikhail A. Belkin*, “Difference-frequency generation and frequency up-conversion with polaritonic nonlinear metasurfaces” CLEO Conference 2018, San Jose, CA, May 13-18, (2018).
- C11. Jaeyeon Yu and **Jongwon Lee****, “Broadband second-harmonic generation based on active nonlinear metasurfaces” META 2017, Song-do, Incheon, July 25-28, (2017). (**Invited talk**)
- C12. Jaeyeon Yu and **Jongwon Lee****, “Active Nonlinear Metasurfaces for Broadband Second-Harmonic-Generation” Nano Korea 2017, Ilsan, Korea, July 12-14, (2017).
- C13. Nishant Nookala, **Jongwon Lee**, Yingnan Liu, Wells Bishop, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Omri Wolf, Igal Brener, Adrea Alu, and Mikhail A. Belkin*, “Flat nonlinear optics: metasurfaces for efficient frequency mixing” SPIE Photonics West 2017, San Francisco, CA, Jan. 28- Feb.2, (2017).
- C14. Nishant Nookala, **Jongwon Lee**, J. Sebastian Gomez-Diaz, Mykhailo Tymchenko, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail Belkin*, “Ultrathin gradient nonlinear metasurfaces with giant nonlinear response” SPIE Optics and Photonics 2016, San Diego, CA, Aug. 28- Sep.1, (2016). (**Invited talk**)
- C15. Nishant Nookala, **Jongwon Lee**, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Kueifu Lai, Gennady Shvets, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Flat nonlinear optics with ultrathin highly-nonlinear metasurfaces” Advanced Electromagnetic Materials in Microwaves and Optics, Chania, Greece, Sept. 19-22, (2016).
- C16. **Jongwon Lee***, Nishant Nookala, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Kueifu Lai, Gennady Shvets, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin, “Gradient nonlinear metasurfaces for continuous phase control” PIERS 2016, Shanghai, China, Aug. 8-11, (2016). (**Invited talk**)
- C17. Feng Lu, **Jongwon Lee**, Aiting Jiang, Seungyong Jung, and Mikhail A. Belkin*, “Monolithic bipolar thermopile detector sensitive to light ellipticity” CLEO Conference 2016, San Jose, CA, June 5-10, (2016).
- C18. **Jongwon Lee**, Nishant Nookala, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Flat nonlinear optics: efficient frequency conversion in ultrathin nonlinear metasurfaces” Frontiers in Optics/Laser Science 2015, San Jose, CA, Oct. 18-22, (2015). (**Invited talk**)
- C19. **Jongwon Lee**, Nishant Nookala, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Andrea Alu, Mikhail A. Belkin*, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, “Flat nonlinear optics: efficient frequency conversion in ultrathin nonlinear metasurfaces” Photonics Conference 2015, Reston, VA, Oct. 4-8, (2015). (**Invited talk**)

- C20.** **Jongwon Lee**, Nishant Nookala, J. Sebastian Gomez-Diaz, Mykhailo Tymchenko, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Highly-nonlinear quantum-engineered polaritonic metasurfaces” SPIE Optics and Photonics conference 2015, San Diego, CA, Aug. 10-14, (2015). **(Invited talk)**
- C21.** **Jongwon Lee**, Nishant Nookala, Mykhailo Tymchenko, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Nonlinear optics with quantum engineered intersubband metasurfaces” META 2015 conference, New York City, NY, Aug. 4-7, (2015). **(Invited talk)**
- C22.** J. Sebastian Gomez-Diaz, **Jongwon Lee**, Mykhailo Tymchenko, Mikhail A. Belkin, and Andrea Alu*, “Giant nonlinear processes in plasmonic metasurfaces” 2015 IEEE International Symposium on Antennas and Propagation and North American Radio Science Meeting, Vancouver, BC, July 19-25, (2015).
- C23.** J. Sebastian Gomez-Diaz, Mykhailo Tymchenko, **Jongwon Lee**, Mikhail A. Belkin, and Andrea Alu*, “Giant nonlinearities and Topological Transitions in Engineered Metasurfaces” 11th International Conference on Optics of Surfaces and Interfaces, Austin, TX, USA, June 28- July 3, (2015).
- C24.** **Jongwon Lee**, Nishant Nookala, Mykhailo Tymchenko, J. Sebastian Gomez-Diaz, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Giant nonlinear response of polaritonic metasurfaces coupled to intersubband transitions” CLEO Conference 2015, San Jose, CA, May. 10-15, (2015).
- C25.** Nihal Arju, Tzuhsuan Ma, Simeon Trendafilov, **Jongwon Lee**, Mikhail A. Belkin, and Gennady Shvets*, “Active epsilon-near-zero infrared metamaterials” CLEO Conference 2015, San Jose, CA, May. 10-15, (2015).
- C26.** Nihal Arju, Feng Lu, **Jongwon Lee**, Martin Schnell, Alexander Khanikaev, Rainer Hillenbrand, Mikhail A. Belkin, and Gennady Shvets*, “Ohmic loss produces chiral dichroism in plasmonic metasurfaces: First experimental demonstration” CLEO Conference 2015, San Jose, CA, May. 10-15, (2015).
- C27.** **Jongwon Lee**, Nishant Nookala, Mykhailo Tymchenko, Seungyong Jung, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Nonlinear optics with quantum-engineered intersubband metamaterials” SPIE Photonics West 2015, San Francisco, CA, Feb. 7-12, (2015). **(Invited talk)**
- C28.** **Jongwon Lee**, Yifan Jiang, Karun Vijayraghavan, Aiting Jiang, Mykhailo Tymchenko, Christos Argyropoulos, Pai-Yen Chen, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Nonlinear optics with quantumengineered intersubband metamaterials,” International Quantum Cascade Lasers School and Workshop, Policoro, Italy, September 10, 2014. **(Invited talk)**
- C29.** **Jongwon Lee**, Mykhailo Tymchenko, Christos Argyropoulos, Pai-Yen Chen, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Giant nonlinear response from plasmonic metasurfaces coupled to intersubband transitions” SPIE Optics and Photonics conference 2014, San Diego, CA, Aug. 6-11, (2014). **(Invited talk)**
- C30.** **Jongwon Lee**, Seungyong Jung, Mykhailo Tymchenko, Christos Argyropoulos, Pai-Yen Chen, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Giant nonlinear response from plasmonic metasurfaces coupled to intersubband transitions,” The 23rd Annual International Laser Physics Workshop, Sofia, Bulgaria, July 15, 2014. **(Invited talk)**
- C31.** **Jongwon Lee**, Seungyong Jung, Pai-Yen Chen, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Ultrafast voltage-tunable plasmonic metamaterials based on intersubband polaritons” CLEO Conference 2014, San Jose, CA, June 8-13, (2014).
- C32.** **Jongwon Lee**, Christos Argyropoulos, Pai-Yen Chen, Mykahilo Tymchenko, Feng Lu, Frederic Demmerle, Gerhard Boehm, Markus-Christian Amann, Andrea Alu, and Mikhail A. Belkin*, “Giant nonlinear response from plasmonic metasurfaces coupled to intersubband transitions” CLEO Conference 2014, San Jose, CA, June 8-13, (2014).
- C33.** **Jongwon Lee**, Pai-Yen Chen, Christos Argyropoulos, Andrea Alu, and Mikhail A. Belkin*, “Metamaterials based on intersubband polaritons,” The 7th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics, Bordeaux, France, September 2013. **(Invited talk)**
- C34.** **Jongwon Lee** and Mikhail A. Belkin*, “Widely wavelength tunable thermo-optic bandpass filters based on long-range surface plasmon polaritons” CLEO Conference 2013, San Jose, CA, June 9-14, (2013).

- C35.** **Jongwon Lee**, Feng Lu, and Mikhail A. Belkin*, “Widely-tunable optical bandpass filter based on long-range surface plasmon polaritons” SPIE Optics and Photonics conference 2012, San Diego, CA, Aug. 6-11, (2012).
- C36.** **Jongwon Lee**, Feng Lu, and Mikhail A. Belkin*, “Widely wavelength tunable optical filters using characteristics of long-range surface plasmon polaritons” CLEO Conference 2012, San Jose, CA, May 6-11, (2012).
- C37.** **Jongwon Lee**, Feng Lu, and Mikhail A. Belkin*, “Broadly wavelength-tunable bandpass filters based on long-range surface plasmon polaritons” IEEE Photonics Conference 2011, Arlington, Virginia, Oct. 10-13, (2011).

Domestic Conference Talks

- D1.** Inyong Hwang, Joo-Yun Jung and **Jongwon Lee****, “Surface-enhanced infrared absorption spectroscopy based on metamaterial absorber with vertical nanogap” Optics and Photonics Congress 2021, Virtual conference, Feb. 17-19, (2021).
- D2.** Hyeongju Chung, Inyong Hwang, Jaeyeon Yu, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin and **Jongwon Lee****, “Electrically tunable quarter waveplate based on intersubband polaritonic metasurfaces” Optics and Photonics Congress 2021, Virtual conference, Feb. 17-19, (2021).
- D3.** Jaeyeon Yu, Daeik Kim, Inyong Hwang, Seongjin Park and **Jongwon Lee****, “Flat nonlinear optics with intersubband polaritonic metasurfaces” Optics and Photonics Congress 2020, Busan, Korea, July 13-15, (2020).
- D4.** Jaeyeon Yu, Inyong Hwang, Daeik Kim, Frederic Demmerle, Gerhard Boehm, Mikhail A. Belkin and **Jongwon Lee****, “Broadband second-harmonic generation from electrically tunable nonlinear polaritonic metasurfaces” Optics and Photonics Congress 2020, Busan, Korea, July 13-15, (2020).
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- D11.** Inyong Hwang and **Jongwon Lee****, “Highly sensitive infrared spectroscopy based on plasmonic metamaterial absorbers with vertical nanogap” 2018 Photonics Conference, Pyeongchang, Korea, Nov. 28-30, (2018).
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- D13.** Jaeyeon Yu, Seongjin Park and **Jongwon Lee****, “Second and Third Harmonic Generation from Intersubband Metasurfaces” ALTA2018, Jeju, Korea, May 10-12, (2018). (Invited talk)
- D14.** Jaeyeon Yu and **Jongwon Lee****, “Broadband Second-Harmonic-Generation metasurfaces based on Stark-tunable intersubband nonlinearities” 2018 KPS Spring Meeting, Daejeon, Korea, April 25-27, (2018). (Invited talk)
- D15.** Jaeyeon Yu, Inyong Hwang, Seongjin Park and **Jongwon Lee****, “Active and Nonlinear Intersubband Metasurfaces” OSK Winter Annual Meeting 2018, Gwangju, Korea, Feb. 7-9, (2018). (Invited talk)
- D16.** Seongjin Park, Jaeyeon Yu and **Jongwon Lee****, “Third-Harmonic Generation Metasurfaces” OSK Winter Annual Meeting 2018, Gwangju, Korea, Feb. 7-9, (2018).
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Patents

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- P2.** **Jongwon Lee**, Jaeyeon Yu and Seongjin Park, “광대역 비선형 광학 응답을 갖는 광 변조 소자” KR 10-2040881, Ulsan National Institute of Science and Technology, Oct. 30, (2019).
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Public and Professional Services

• Reviewer service

- Regular reviewer for Nature Light Science & Applications, Advanced Materials, Advanced Optical Materials, Applied Physics Letters, ACS Applied Materials & Interfaces, Optics Letters, Optics Express, and other journals.
- Reviewer for the Korea Evaluation Institute of Industrial Technology (KEIT), Agency for Defense Development (ADD) and Institute of Civil Military Technology Cooperation (ICMTC).

• Membership

- Optical Society of Korea (OSK), Optical Society of America (OSA), The Korean Physical Society (KPS), The Korean Sensors Society (KSS).