

VIII. CURRICULUM VITA

YUN-SHIK LEE

PROFESSOR OF PHYSICS, OREGON STATE UNIVERSITY

A. EDUCATION AND EMPLOYMENT

Education:

1997 **Ph.D.** Physics, University of Texas at Austin

Doctoral Dissertation: *Optical fourth harmonic generation at crystalline surfaces*

1991 **M. S.** Physics, Seoul National University

Master's Thesis: *Study of electronic structure of $Ba_{1-x}K_xBiO_6$ by X-ray photoemission spectroscopy*

1989 **B. S.** Chemistry (Major) and Physics (Second Major), Seoul National University

Employment:

- **Professor** (2012 ~ present)
Department of Physics, Oregon State University
- **Associate Professor** (2006 ~ 2012)
Department of Physics, Oregon State University
- **Assistant Professor** (2001 ~ 2006)
Department of Physics, Oregon State University
- **Research Fellow** (Jan. 1998 ~ Sep. 2001)
Center for Ultrafast Optical Science, EECS Department, University of Michigan
Supervisor: Prof. Theodore B. Norris
Projects:
 - *High-Speed All-Optical Switching in Semiconductor-Oxide Microcavities via Coherent Control of Excitons* Supported by Air Force Office of Scientific Research
 - *Generation of Complex THz Waveforms* Supported by Army Research Office
- **Research Assistant** (Jan. 1993 ~ Dec. 1997)
Department of Physics, University of Texas at Austin
Supervisor: Prof. Michael C. Downer
Projects:
 - *Nonlinear Spectroscopy of Semiconductor Interfaces* Supported by Robert A. Welch Foundation
 - *Properties of Condensed Matter under Planetary Interior Conditions Measured by Femtosecond Spectroscopy* Supported by Department of Defense
- **Research Assistant** (Jul. 1989 ~ Feb. 1991)
Physics Department, Seoul National University
Supervisor: Prof. Se-Jung Oh
Project:
 - *Electronic structure of high T_c superconductors by X-ray photoemission spectroscopy*

B. TEACHING, ADVISING AND OTHER ASSIGNMENTS

1. Instructional Summary

Credit Courses

		Term	Enrollment
PH 651	Graduate Quantum Mechanics I	Fall 2001	5
PH 652	Graduate Quantum Mechanics II	Winter 2002	6
PH 651	Graduate Quantum Mechanics I	Fall 2002	16
PH 652	Graduate Quantum Mechanics II	Winter 2003	15
PH 653	Graduate Quantum Mechanics III	Spring 2003	12
PH 651	Graduate Quantum Mechanics I	Fall 2003	8
PH 652	Graduate Quantum Mechanics II	Winter 2004	8
PH 653	Graduate Quantum Mechanics III	Spring 2004	7
PH 431/531	Electromagnetism	Fall 2004	20
PH 425/525	Quantum Measurements and Spin	Winter 2005	29
PH 485/585	AMO Physics	Spring 2005	7/5
PH 431/531	Electromagnetism	Fall 2005	23
PH 425/525	Quantum Measurements and Spin	Winter 2006	29
PH 682	AMO Physics	Spring 2006	12
PH 431/531	Electromagnetism	Fall 2006	21/2
PH 425/525	Quantum Measurements and Spin	Winter 2007	20
PH 485/585	AMO Physics	Spring 2007	4/2
PH 651	Graduate Quantum Mechanics I	Fall 2008	8
PH 652	Graduate Quantum Mechanics II	Winter 2009	8
PH 653	Graduate Quantum Mechanics III	Spring 2009	7
PH 651	Graduate Quantum Mechanics I	Fall 2009	7/1
PH 652	Graduate Quantum Mechanics II	Winter 2010	4
PH 653	Graduate Quantum Mechanics III	Spring 2010	4
PH 651	Graduate Quantum Mechanics I	Fall 2010	21
PH 652	Graduate Quantum Mechanics II	Winter 2011	19
PH 684	Graduate AMO Physics IV	Winter 2011	9
PH 631	Graduate Electromagnetic Theory I	Fall 2011	9
PH 632	Graduate Electromagnetic Theory II	Winter 2012	9
PH 633	Graduate Electromagnetic Theory III	Spring 2012	10
PH 631	Graduate Electromagnetic Theory I	Fall 2012	9
PH 632	Graduate Electromagnetic Theory II	Winter 2013	8
PH 684	Graduate AMO Physics IV	Winter 2013	8
PH 631	Graduate Electromagnetic Theory I	Fall 2013	17
PH 632	Graduate Electromagnetic Theory II	Winter 2014	15
PH 633	Graduate Electromagnetic Theory III	Spring 2014	10

- Finalist for 2002 Carter Award (OSU graduate teaching award)

PH503/603 Research/Thesis: instruction has continued all terms and has led to the following Ph.D. or M.S. dissertations or M.S. projects:

Grant Eastland Major Professor M.S. 2003

Thesis Title: "Study of carrier dynamics in transparent conducting oxides via optical pump-probe experiments"

Bryan Norton Major Professor M.S. 2005

Thesis Title: "Manipulation of multi-cycle THz waveforms in nonlinear optical crystals via shaped optical pulses"

Naaman Amer Major Professor Ph.D. 2006

Thesis Title: "Generation and manipulation of THz waves"

Walter C. Hurlbut Major Professor Ph.D. 2006

Thesis Title: "The Nonlinear Optical Properties of Gallium Arsenide Pertaining to Terahertz Generation"

Joel D. Wetzel Major Professor M.S. 2006

Thesis Title: "Narrowband THz generation via difference frequency generation in ZnTe"

Jeremy R. Danielson Major Professor Ph.D. 2008

Thesis Title: "Generation of Narrowband THz Pulses and THz Studies of Ultrafast Phenomena in Semiconductor Quantum Wells"

Joseph L. Tomaino Major Professor Ph D. 2011

Thesis Title: "Terahertz Imaging and spectroscopy of Carbon-Based and Semiconductor Nanostructures"

Andrew D. Jameson Major Professor Ph D. 2012

Thesis Title: "Generating and Using Terahertz Radiation to Explore Carrier Dynamics of Semiconductor and Metal Nanostructures"

Louis Maizy Major Professor M.S. 2013

Thesis Title: "Terahertz Spectroscopy of Carbon Nanotubes"

Michael J. Paul Major Professor (Ph D. expected 2014)

Thesis Title: "Nonlinear terahertz spectroscopy of nanostructures"

Zachary Thompson Major Professor (Ph D. expected 2015)

Thesis Title: "Nonlinear terahertz subwavelength microscopy"

Andrew Stickel Major Professor (Ph D. expected 2016)

Thesis Title: "Time-resolved nonlinear terahertz spectroscopy of quantum materials"

Byounghwak Lee Major Professor (Ph D. expected 2016)

Thesis Title: "Nonlinear terahertz spectroscopy"

Ali Mousavian Major Professor (Ph D. expected 2018)

Thesis Title: "Nonlinear terahertz spectroscopy"

PH403 Senior Thesis

Modesto Godinez B.S. 2003

Thesis Title: "Photonic crystals for broadband signal from 0.5 THz to 2.5 THz"

Ae Kim B.S. 2005
Thesis Title: "THz wave propagation in one-dimensional photonic crystals"

Brent Valle B.S. 2006
Thesis Title: "Measurements of autocorrelation for femtosecond pulses"

Matthew Cibula B.S. 2010
Thesis Title: "High-power THz generation in lithium niobate prism"

Andrew Stickel B.S. 2010
Thesis Title: "Nonlinear frequency mixing of terahertz and optical radiation in organic nonlinear crystals"

Mackenzie Lenz B.S. 2014
Thesis Title: "Nonlinear terahertz spectroscopy of vanadium oxide"

PH601 Research

James Keller	2009 Winter, 2009 Fall, 2010 Winter
Liangdong Zhu	2009 Winter, 2011 Winter
Mike Paull	2009 Fall – 2011 Fall
Louis Maizy	2010 Winter – 2012 Spring
Zachary Thompson	2010 Fall – 2013 Spring
Andrew Stickel	2011 Fall – present
Lee Aspitarte	2012 Winter – 2012 Spring
Byounghwak Lee	2011 Fall – present
Garrett Potter	2013 Winter
Ali Mousavian	2013 Fall – present
Jihan Kim	2013 Fall – present

PH405/505/605 Reading and Conference

PH605	2002 Winter, Nonlinear Optics with Naaman Amer
PH605	2002 Fall, Nonlinear Optics with Walter C. Hurlbut
PH605	2003 Fall, Nonlinear Optics with Walter C. Hurlbut
PH505	2003 Fall, Nonlinear Optics with Heungman Park
PH405	2005 Spring, Electromagnetism with English Connor

Non-Credit Courses and Workshops

PH507/607 Solid State Seminar 2001 Fall
Title: "Fourth harmonic generation from crystalline surfaces"

Research Seminar 2002 Winter
Title: "Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy"

Colloquium 2002 Fall
Title: "Terahertz pulse shaping via optical rectification in poled ferroelectric crystals and its application to time-domain molecular spectroscopy"

PH683 Nonlinear Optical Interactions in Materials 2003 Winter
Title: “THz generation via optical rectification in nonlinear crystals”
Lab session: “THz time-domain spectroscopy of gas phase molecules”

Research Seminar 2003 Winter
Title: “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy”

Paradigms Postscript 2003 Spring
Title: “Terahertz pulse shaping via optical rectification in poled ferroelectric crystals and its application to time-domain molecular spectroscopy”

Research Seminar 2004 Winter
Title: “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy”

Paradigms Postscript 2004 Spring
Title: “Terahertz pulse shaping via optical rectification in poled ferroelectric crystals and its application to time-domain molecular spectroscopy”

PH673 Solid State Physics 2004 Spring
Title: “Light emitting diodes and semiconductor lasers”

PH507/607 Solid State Seminar 2004 Fall
Title: “Wave propagation in photonic crystals”

Research Seminar 2005 Winter
Title: “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy”

PH683 Nonlinear Optical Interactions in Materials 2005 Winter
Title: “THz generation via optical rectification in nonlinear crystals”
Lab session: “THz time-domain spectroscopy of gas phase molecules”

PH673 Solid State Physics 2005 Spring
Title: “Light emitting diodes and semiconductor lasers”

Research Seminar 2006 Winter
Title: “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy”

Research Seminar 2007 Winter
Title: “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy”

Research Seminar 2008 Winter
Title: “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy”

Research Seminar 2009 Winter
Title: “New Light and New Science: Optical Terahertz Science and Technology”

Research Seminar 2010 Winter
Title: “New Light and New Science: Optical Terahertz Science and Technology”

Research Seminar	2011 Winter
Title: “New Light and New Science: Optical Terahertz Science and Technology”	
Colloquium	2011 Fall
Title: “Terahertz spectroscopy of two-dimensional systems”	
Research Seminar	2012 Winter
Title: “New Light and New Science: Optical Terahertz Science and Technology”	
Research Seminar	2013 Winter
Title: “New Light and New Science: Optical Terahertz Science and Technology”	
Research Seminar	2014 Winter
Title: “New Light and New Science: Optical Terahertz Science and Technology”	

Curriculum Development

- PH 683 (CH 681, ECE 592) Nonlinear Optical Interactions in Materials
Winter 2003 and 2005
 - I developed a lecture/laboratory section consulting with William Hetherington (Physics), Joseph Nibler (Chemistry) and Thomas Plant (EECS).
- PH 425/525 Quantum Measurements and Spin Winter 2005 and 2006
 - I developed the disseminable lecture note in the form of PowerPoint slides which has been used by other instructors.
- PH 682 Atomic, molecular, and Optical Physics II Winter 2006
 - I prepared and submitted the CAT II proposal for the new graduate specialty course and developed the course material.
- PH 684 Atomic, Molecular, and Optical Physics IV Fall 2009
 - I prepared and submitted the CAT II proposal for the new graduate specialty course and developed the course material.
- PH 681-4 AMO Physics and PH 671-4 Solid State Physics Fall 2009 – Fall 2010
 - I led a departmental task force to modernize the graduate atomic, molecular, optical physics (PH 681-4) and solid state physics (PH 671-4) curriculum. The modular courses reflect the up-to-date topics of optical science and condensed matter physics.
 - I prepared and submitted the CAT II proposal for the two new sequences of the graduate courses.

Graduate and Undergraduate Students and Postdoctoral Trainees

- **Graduate Students**

Grant Eastland	Major Professor	M.S. 2003
Thesis Title: “Study of carrier dynamics in transparent conducting oxides via optical pump-probe experiments”		
Bryan Norton	Major Professor	M.S. 2005
Thesis Title: “Manipulation of multi-cycle THz waveforms in nonlinear optical crystals via shaped optical pulses”		
Naaman Amer	Major Professor	Ph.D. 2006

Thesis Title: “Generation and manipulation of THz waves”

Walter C. Hurlbut Major Professor Ph.D. 2006

Thesis Title: “The Nonlinear Optical Properties of Gallium Arsenide Pertaining to Terahertz Generation”

Joel D. Wetzel Major Professor M.S. 2006

Thesis Title: “Narrowband THz generation via difference frequency generation in ZnTe”

Jeremy R. Danielson Major Professor Ph.D. 2008

Thesis Title: “Generation of Narrowband THz Pulses and THz Studies of Ultrafast Phenomena in Semiconductor Quantum Wells”

Joseph L. Tomaino Major Professor Ph D. 2011

Thesis Title: “Terahertz Imaging and spectroscopy of Carbon-Based and Semiconductor Nanostructures,”

Andrew D. Jameson Major Professor Ph D. 2012

Thesis Title: “Generating and Using Terahertz Radiation to Explore Carrier Dynamics of Semiconductor and Metal Nanostructures”

Louis Maizy Major Professor M.S. 2012

Thesis Title: “Terahertz Transmission & Spectroscopy of Vertically Grown Multi-Walled Carbon Nanotube Forests”

Michael J. Paul Major Professor (Ph D. expected 2014)

Thesis Title: “Nonlinear terahertz spectroscopy of nanostructures”

Zachary Thompson Major Professor (Ph D. expected 2015)

Andrew Stickel Major Professor (Ph D. expected 2016)

Byoungwak Lee Major Professor (Ph D. expected 2016)

Ali Mousavian Major Professor (Ph D. expected 2018)

Jihan Kim Research Advisor (Fall 2013 – Spring 2014)

Lee R. Aspirtarte Research Advisor (Fall 2011 – Fall 2012)

James Keller Research Advisor (2009 Winter, 2009 Fall, 2010 Winter)

Liangdong Zhu Research Advisor (2009 Winter, 2011 Winter)

Hee-Jun Shin Research Advisor (Visiting scholar, Fall 2011 – Fall 2012)

Hyeongmun Kim Research Advisor (Visiting scholar, Fall 2011 – Fall 2012)

Young-Gyun Jeong Research Advisor (Visiting scholar, Fall 2012 – Winter 2013)

• Undergraduate Students

Modesto Godinez Senior Thesis B.S. 2003

Thesis Title: “Photonic crystals for broadband signal from 0.5 THz to 2.5 THz”

Ae Kim Senior Thesis B.S. 2005
 Thesis Title: “THz wave propagation in one-dimensional photonic crystals”

Brent Valle Senior Thesis B.S. 2006
 Thesis Title: “Measurements of autocorrelation for femtosecond pulses”

Matthew Cibula Senior Thesis B.S. 2010
 Thesis Title: “High-power THz generation in lithium niobate prism”

Andrew Stickel Senior Thesis B.S. 2010
 Thesis Title: “Nonlinear frequency mixing of terahertz and optical radiation in organic nonlinear crystals”

Doug Fettig Undergraduate Research Assistant 2006
 Project Title: “Interactive JAVA program for EM wave interaction with a harmonic oscillator”

Howard Hui NSF REU 2007
 Project Title: “Terahertz spectroscopy of myoglobin”

Matt Cibula NSF REU 2009
 Project Title: “Terahertz time-domain spectroscopy of carbon nanotubes”

MacKenzie Lenz Senior Thesis (B.S. expected 2014)
 Project Title: “Nonlinear terahertz spectroscopy of vanadium oxide”

• **Committee member for graduate program**

Michele Winz	Physics	Ph.D. 2004
Zachary Wiren	Physics	Ph.D. 2007
Robyn Wangberg	Physics	Ph.D. 2007
Robert Kykyneshi	Physics	Ph.D. 2007
Katrina Hay	Physics	Ph.D. 2008
Justin Elser	Physics	Ph.D. 2008
Alexander A. Govyadinov	Physics	Ph.D. 2008
Jonathan Day	Physics	Ph.D. 2008
Peter Sprunger	Physics	Ph.D. 2009
Jared Stenson	Physics	Ph.D. 2010
Benjamin Buford	EECS	(Ph.D. expected 2013)
Grant Saltzgaber	Physics	MS. 2012
Matt Cibula	Physics	Ph.D.
Jeff Schulte	Physics	Ph.D.
Longteng Tang	Chemistry	Ph.D.
Liang Wang	Chemistry	Ph.D.
Liangdong Zhu	Chemistry	Ph.D.

• **Graduate Council Representative**

Al Hamrani	ECE	MS 2002
Xia Ying	ECE	MS 2004
Iva Orhanovic	ECE	Ph.D. 2004
Kyle Harbert	ECE	MS 2004
Ozkan Erdem	EECS	Ph.D. 2005
Xiaochun Duan	EECS	Ph.D. 2005

Yolanda Tennico	CH	MS 2005
David Dutton	EECS	MS 2007
Zhang Wei	EECS	Ph.D. 2009
Karthik Jayaraman	ECE	MS 2009
Bahar Ozmen	CH	Ph. D. 2010
Divya Kesharwani	EECS	MS 2010
Arul Dhamodaran	EECS	MS 2011
Santosh Murali	EECS	MS 2011
Syed Feruz	EECS	Ph.D. candidate
Saurabh Saxena	EECS	Ph.D. candidate
Kevin Snyder	CH	Ph.D. candidate
Leslie Loh	CH	Ph.D. candidate

Collaborative Efforts

- Winter 2003 and 2005: PH 683 (CH 681, ECE 592) Nonlinear Optical Interactions in Materials
This is an interdisciplinary lecture/laboratory course designed for graduate students and seniors at OSU and engineers and scientists from industry interested in nonlinear optics and applications. I developed a lecture/laboratory section consulting with William Hetherington (Physics), Joseph Nibler (Chemistry) and Thomas Plant (EECS).
- Winter 2005 and 2006: PH 425/525 Quantum Measurements and Spin
Paradigms in Physics is a collaborative project. I actively participated in the discussions at the program faculty meetings. I often consulted the program director to coordinate topics relevant to other Paradigms courses.
- Spring 2005: PH 485/585 AMO Physics
I taught this course with Prof. David McIntyre.
- Fall 2009 – Fall 2010: PH 681-4 and PH 671-4
I have been leading a departmental task force to modernize the graduate atomic, molecular, optical physics (PH 681-4) and solid state physics (PH 671-4) curriculum. The modular courses reflect the up-to-date topics of optical science and condensed matter physics.

International Teaching

Philipps-Universität Marburg, Germany Fall 2007 – Spring 2008
I instructed a group of graduate students how to generate and manipulate high-power terahertz pulses.

2. Advising

Head Graduate Advisor

I have been serving as the *Head Graduate Advisor* at the OSU physics department since the Fall term of 2009. The advising activities are described below.

Conventional Advising

- One-on-one advising sessions with new graduate students during fall orientation (evaluation of academic background, recommendations of first year courses, Q&A)

- Follow-up course advising of first-year students as necessary (continues until students have major professor and Graduate Committee)
- Review student grades (annually, except quarterly for first year students), identify negative trends early and discuss with student (and faculty as necessary)
- Serve as default major professor for students who need to file a program, but have not yet identified a major professor (should be a rare situation)
- Enforce annual meeting requirement, meet with first-year students in Spring Term (discuss second year courses, comp exam, program meeting, progress in starting research, etc.)
- Prepare suggested program of courses for M.S. students
- Organize fall departmental orientation program for new graduate students
- Troubleshooting (with Department Chair, faculty, and Graduate Dean as needed)
 - Academic deficiency (diagnosis, retention versus dismissal decisions, Appeals to Graduate School to postpone dismissal as appropriate)
 - Lack of progress to degree (investigate cause, seek solutions, recommend and administer department policy on progress to degree)
 - Failure to meet requirements (program meeting, timely oral exam, timely comp exam)
 - Personal problems (health, relationships, etc.)

Student Recognition

- Administer Physics Graduate Research Award (announcement, appoint and chair selection committee, monitor preparation of award plaque with Graduate Secretary)
- Consider eligibility and qualifications for University awards and fellowships (nominate or orchestrate nominations as appropriate)

Recruiting and Admissions

- Serve as primary contact for prospective students (respond to inquiries year-round)
- Monitor activities of Graduate Admissions Committee (do not serve as member)
- Recruit admitted students (telephone/email offers, answer questions, schedule and organize visits, maintain contact to encourage acceptance of offers, etc.)

General Administration

- Chair the Grad Curriculum Group (call meetings, set agenda)
- Maintain records of progress of current students
- Update statements of department policy as necessary, obtain faculty approval and post (Preliminary Oral Exam, Comp Exam, Annual Meetings, etc.)
- Collect data and summarize status of graduate program for faculty (from time to time as deemed necessary)
- Coordinate with Graduate Secretary whose duties include
 - Maintain graduate student files (Physics Office)
 - Payroll (GTA and GRA)

- Maintain records of student committee meetings and exams
- Process grad student applications
- Assist with inquiries about graduate program
- Logistics and materials for Fall orientation program
- Assist with logistics of visits of prospective students, including group visit in Spring
- Liaison with incoming students (housing, travel, visa issues, etc.)

Graduate and Undergraduate Research Advising

- I am advising five Ph.D. students (Michael Paul, Zachary Thompson, Andrew Stickel, Byoungwak Lee, Ali Mousavian) and another graduate students at present (Winter 2014) working on their research projects. I meet all of them once a week at the weekly group meeting. I also have individual meetings with each of them once or twice per week.
- Five students (Naaman Amer, Walter C. Hurlbut, Jeremy Danielson, Joseph Tomaino, and Andrew Jameson) received their Ph.D. degrees. They are professionals working in academia, industry, and national laboratory.
 - Academia: Naaman Amer, a postdoctoral researcher at Bar Ilan University, Israel
 - Industry: Joe Tomaino and Andrew Jameson, development engineers at Intel Inc., and Walter Hurlbut, a senior research scientist at Microtech Instruments Inc.
 - National lab: Jeremy Danielson is a research staff at Los Alamos National Lab
- Four students (Grant Eastland, Bryan Norton, Joel Wetzel, and Louis Maizy) received their MS degrees under my supervision. Bryan Norton is a staff engineer in Lockheed Martin Aculight. Grant Eastland is a graduate student in Washington State University. Joel Wetzel is working as a freelance programmer in Seattle.
- I am supervising one senior student (Mackenzie Lenz) working on her senior thesis at present (Winter 2014). I advised five senior students (Modesto Godinez, Ae Kim, Brent Valle, Matthew Cibula, and Andrew Stickel) working on their Senior Thesis and one junior student, Doug Fettig, working as an undergraduate research assistant. Modesto Godinez got his MS degree at Portland State University and is working in an optics company. Brent Valle and Doug Fettig are graduate students in Case Western University and University of Rochester, respectively. I advised two undergraduate students participated in the REU program associated with my NSF grant: Howard Hui and Matt Cibula are graduate students at Caltech and University of Michigan, respectively.

Other Advising Activities

- Every year I counsel several (4~5) graduate and undergraduate students on their job searches and applications to graduate programs.
- I attended Society of Physics Student meeting on November 11th, 2005 to present my research program and to introduce undergraduate research opportunities in my laboratory.

C. SCHOLARSHIP AND CREATIVE ACTIVITY

1. Publications

1.1. Book

Title: *Principles of Terahertz Science and Technology*

Author: Yun-Shik Lee

Publisher: Springer, 1 ed. (2009).

ISBN: 978-0-387-09539-4

1.2. Refereed Papers

During 2001 ~ 2014, I have written 41 peer-reviewed journal articles (39 published, 2 submitted) and 82 conference abstracts/proceedings.

1.2.1. Articles in Journals/Contributions to Books

Since 2001: I am the corresponding author of 38 among the 41 articles. My students are the first authors of 33 papers, and I am the first author of 5 papers. All the experimental works for these papers were done in my laboratory under my supervision. My collaborators assisted the works either by fabricating and characterizing the samples or by performing theoretical calculations.

1. Z. J. Thompson, A. D. Stickel, Y.-G. Jeong, S.-H. Han, B. H. Son, M. J. Paul, A. Mousavian, G. Seo, H.-T. Kim, Yun-Shik Lee, and Dai-Sik Kim, “*Terahertz-triggered phase transition in a nanoantenna patterned vanadium dioxide film*,” submitted to *Nature Photonics* (2014).
2. M. J. Paul, B. Lee, J. L. Wardini, Z. J. Thompson, A. D. Stickel, A. Mousavian, H. Choi, E. D. Minot, and Yun-Shik Lee, “*Terahertz Induced Transparency in Single-Layer Graphene*,” submitted to *Nano Letters* (2014).
3. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S.W. Koch, “*Terahertz Induced Quantum Dynamics of Exciton-Polaritons in Quantum-Well Microcavity*,” submitted to *Nature Photonics* (2014).
4. Yun-Shik Lee, “Tabletop high-power terahertz pulse generation techniques,” in *Terahertz Biomedical Science and Technology* (ed. Joo-Hiuk Son), Chapter 3, (CRC Press, 2014).
5. J. Kim, J. Oh, C. In, Yun-Shik Lee, T. B. Norris, S. C. Jun, H. Choi, “*Unconventional Terahertz Carrier Relaxation in Graphene Oxide: Observation of Enhanced Auger Recombination due to Defect Saturation*,” *ACS nano* 8, 2486 (2014).
6. Y. -G. Jeong, M. J. Paul, S. -H. Kim, K. -J. Yee, D. -S. Kim, and Yun-Shik Lee, “*Large enhancement of nonlinear terahertz absorption in intrinsic GaAs by plasmonic nano antennas*,” *Appl. Phys. Lett.* 103, 171109 (2013).
7. A. C. Klettke, M. Kira, and S.W. Koch, J. L. Tomaino, A. D. Jameson, Yun-Shik Lee, G. Khitrova, and H. M. Gibbs, “*Terahertz excitations of lambda Systems in semiconductor microcavity*,” *Physica Status Solidi C* 10, 1222 (2013).
8. M. J. Paul, Y.-C. Chang, Z. J. Thompson, A. Stickel, J. Wardini, H. Choi, E. D. Minot, T. B. Norris, and Yun-Shik Lee, “*High-field terahertz response of graphene*,” *New J. Phys.* 15, 085019 (2013).

9. S. Sim, J. Park, J.-G. Song, C. In, Yun-Shik Lee, H. Kim, and H. Choi, “*Exciton dynamics in atomically thin MoS₂: Interexcitonic interaction and broadening kinetics*,” *Phys. Rev. B* **88**, 075434 (2013).
10. M. J. Paul, J. L. Tomaino, A. D. Jameson, T. Scharf, E. D. Minot, N. Khuta, V. Podolskiy, and Yun-Shik Lee, “*Terahertz transmission ellipsometry of vertically grown carbon nanotubes*,” *Appl. Phys. Lett.* **101**, 111107 (2012).
11. M. J. Paul, J. L. Tomaino, J. W. Kevek, T. DeBorde, Z. J. Thompson, E. D. Minot, and Yun-Shik Lee, “*Terahertz Imaging and Time-Domain Spectroscopy of Single-Layer Graphene Embedded in Dielectric Media*,” *Appl. Phys. Lett.* **101**, 091109 (2012).
12. J. L. Tomaino, A. D. Jameson, Yun-Shik Lee, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S.W. Koch, “*Terahertz-Driven Three-Level Λ System in Quantum-Well Microcavity*,” *Phys. Rev. Lett.* **108**, 267402 (2012).
13. Yun-Shik Lee, “*Introduction to the Special Issue on Terahertz Spectroscopy of Carbon Nanomaterials*,” *J Infrared Milli Terahz Waves* **33**, 795 (2012).
14. A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, “*High-contrast imaging of graphene via time-domain terahertz spectroscopy*,” *J Infrared Milli Terahz Waves* **33**, 839 (2012).
15. J. L. Tomaino, A. D. Jameson, Yun-Shik Lee, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S.W. Koch, “*Terahertz induced optical modulation in quantum-well microcavity*,” *Proc. SPIE* **8240**, 824008 (2012).
16. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, “*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*,” *Proc. SPIE* **8260**, 82600Z (2012).
17. A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, M. Hemphill-Johnston, M. Koretsky, E. D. Minot, and Yun-Shik Lee, “*Terahertz spectroscopy of Ni-Ti alloy thin films*,” *Proc. SPIE* **8260**, 82601Q (2012).
18. A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, M. Hemphill-Johnston, M. Koretsky, E. D. Minot, and Yun-Shik Lee, “*Terahertz spectroscopy of Ni-Ti alloy thin films*,” *Appl. Phys. Lett.* **98**, 221111 (2011).
19. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, “*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*,” *Opt. Express* **19**, 141-146 (2011).
20. J. L. Tomaino, A. D. Jameson, Yun-Shik Lee, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Ultrafast Nonlinear Optical Effects in Semiconductor Quantum Wells Resonantly Driven by Strong Few-Cycle Terahertz Pulses*,” *Solid State Electron.* **54**, 1125 (2010).
21. Yun-Shik Lee, A. D. Jameson, J. L. Tomaino, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Terahertz and optical frequency mixing in semiconductor quantum-wells*,” *Proc. SPIE* **7582**, 75820Y (2010).
22. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Transient optical response of quantum well excitons to intense narrowband THz pulses*,” *Appl. Phys. Lett.* **95**, 201107 (2009).

23. Yun-Shik Lee, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Terahertz-induced extreme nonlinear transients in semiconductor quantum wells*,” Phys. Stat. Sol. (C). **6**, 457 (2009).
24. J. R. Danielson, A. D. Jameson, J. L. Tomaino, H. Hui, J. D. Wetzel, Yun-Shik Lee, and K. L. Vodopyanov, “*Intense narrow band terahertz generation via type-II difference-frequency generation in ZnTe using chirped optical pulses*,” J. Appl. Phys. **104**, 033111 (2008).
25. J.R. Danielson, Yun-Shik Lee, J.P. Prineas, J.T. Steiner, M. Kira, and S.W. Koch, “*Interaction of Strong Single-Cycle Terahertz Pulses with Semiconductor Quantum Wells*,” Phys. Rev. Lett. **99**, 237401 (2007).
26. W. Hurlbut, Yun-Shik Lee, K. L. Vodopyanov, P. S. Kuo, and M. M. Fejer, “*Multi-photon absorption and nonlinear refraction of GaAs in the mid-infrared*,” Opt. Lett. **32**, 668 (2007).
27. Yun-Shik Lee , J. R. Danielson, and N. Amer, “*Arbitrary terahertz pulse shaping via optical rectification in fanned-out periodically-poled lithium niobate*,” Proc. SPIE **6455**, 64550J (2007).
28. Yun-Shik Lee, W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, and V. G. Kozlov, “*Coherent detection of multicycle terahertz pulses generated in periodically inverted GaAs structures*,” Proc. SPIE **6455**, 64550G (2007).
29. J. R. Danielson, N. Amer, and Yun-Shik Lee, “*Generation of arbitrary THz waveforms in fanned-out periodically-poled lithium niobate*,” Appl. Phys. Lett., **89**, 211118 (2006).
30. Yun-Shik Lee, W. Hurlbut, K. L. Vodopyanov, M. M. Fejer, and V.G.Kozlov, “*Generation of multi-cycle terahertz-pulses via optical rectification in periodically-inverted GaAs structures*,” Appl. Phys. Lett. **89**, 181104 (2006).
31. K. L. Vodopyanov, M. M. Fejer, X. Yu, J. S. Harris, Y. -S. Lee, W. C. Hurlbut , V.G.Kozlov, “*Terahertz wave generation in quasi-phase-matched GaAs*,” Appl. Phys. Lett. **89**, 141119 (2006).
32. Yun-Shik Lee, K. L. Vodopyanov, W. C. Hurlbut, J. R. Danielson, V. G. Kozlov, D. F. Bliss, and M. M. Fejer, “*Generation of multi-cycle THz- pulses via optical rectification in periodically inverted GaAs*,” Proc. SPIE **6120**, 612003 (2006).
33. W. C. Hurlbut, B. J. Norton, N. Amer, and Yun-Shik Lee, “*Manipulation of terahertz pulses in nonlinear optical crystals via shaped optical pulses*,” J. Opt. Soc. Am. B **23**, 90-93 (2006).
34. N. Amer, W. C. Hurlbut, B. J. Norton, Yun-Shik Lee, S. L. Etringer, and B. K. Paul, “*Terahertz wave propagation in one-dimensional periodic dielectrics*,” Appl. Opt. **45**, 1857-1860 (2006).
35. Yun-Shik Lee, N. Amer, W. C. Hurlbut, B. J. Norton, and J. R. Danielson, “*Generation and manipulation of multi-cycle terahertz pulses via optical rectification in poled lithium niobate*,” Proc. SPIE **6002**, 600211 (2005).
36. N. Amer, W. C. Hurlbut, B. J. Norton, Yun-Shik Lee, and T. B. Norris, “*Generation of terahertz pulses with arbitrary elliptical polarization*,” Appl. Phys. Lett. **87**, 221111 (2005).
37. T. Meier, C. Sieh, S. W. Koch, Y. -S. Lee, T. B. Norris, G. Khitrova, and H. Gibbs, “*Nonlinear optical properties of semiconductor quantum wells inside microcavities*,” in

Optical Microcavities: Advanced Series in Applied Physics vol. 5 (ed. Kerry Vahala), pp. 239-318 (World Scientific, 2004).

38. Y. -S. Lee, N. Amer, and W. C. Hurlbut, “THz pulse shaping in time-domain via optical rectification in poled lithium niobate crystals,” *Optics & Photonics News* **14**, 42 (2003). – Featured in *Optics in 2003*
39. M. Kira, W. Hoyer, S. W. Koch, Y. -S. Lee, T. B. Norris, G. Khitrova, and H. M. Gibbs, “Incoherent pulse generation in semiconductor microcavities,” *Phys. Status. Sol. (C)* **0**, 1397-1400 (2003).
40. Y. -S. Lee, N. Amer, and W. C. Hurlbut, “Terahertz pulse shaping via optical rectification in poled lithium niobate,” *Appl. Phys. Lett.* **82**, 170-172 (2003). – Featured in *Photonics Spectra* March 2003 issue p.110.
41. Y. -S. Lee and T. B. Norris, “Terahertz pulse shaping and optimal waveform generation in poled ferroelectric crystals,” *J. Opt. Soc. Am. B.* **19**, 2791-2794 (2002) .
42. Y. -S. Lee, T. Meade, and T. B. Norris, “Tunable narrow-band terahertz generation from periodically poled lithium niobate,” *Optics & Photonics News* **12**, No. 12, 46 (2001). – Featured in *Optics in 2001*
43. Y. -S. Lee, T. B. Norris, A. Maslov, D. S. Citrin, J. Prineas, G. Khitrova, and H. M. Gibbs, “Large-signal coherent control of normal modes in quantum-well semiconductor microcavity,” *Appl. Phys. Lett.* **78**, 3941-3943 (2001).
44. Y. -S. Lee, T. Meade, T. B. Norris, and A. Galvanauskas, “Tunable narrow-band terahertz generation from periodically poled lithium niobate,” *Appl. Phys. Lett.* **78**, 3583-3585 (2001).
45. Y. -S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, G. Khitrova, and H. M. Gibbs, “Coherent control and quantum correlations in quantum-well semiconductor microcavity,” *Proc. SPIE Int. Soc. Opt. Eng.* 3940, 16 (2000).
46. Y. -S. Lee, T. Meade, M. L. Naudeau, T. B. Norris, and A. Galvanauskas, “Domain mapping of periodically-poled lithium niobate via terahertz waveform analysis,” *Appl. Phys. Lett.* **77**, 2488-2490 (2000).
47. Y. -S. Lee, T. B. Norris, J. Prineas, G. Khitrova, and H. M. Gibbs, “Nondegenerate coherent control of polariton modes in a quantum-well semiconductor microcavity,” *Phys. Stat. Sol. (B)* **221**, 121-125 (2000).
48. Y. -S. Lee, T. Meade, M. DeCamp, T. B. Norris, and A. Galvanauskas, “Temperature dependence of narrow-band terahertz generation from periodically poled lithium niobate,” *Appl. Phys. Lett.* **77**, 1244-1246 (2000).
49. Y. -S. Lee, T. Meade, V. Perlin, H. Winful, T. B. Norris, and A. Galvanauskas, “Generation of narrow-band terahertz radiation via optical rectification of femtosecond pulses in periodically poled lithium niobate,” *Appl. Phys. Lett.* **76**, 2505-2507 (2000).
50. Y. -S. Lee and M. C. Downer, “Reflected optical fourth harmonic generation at crystalline surfaces,” *Thin Solid Films* **364**, 80-85 (2000).

51. Y. -S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, G. Khitrova, and H. M. Gibbs, “*Intraband quantum correlations in semiconductor quantum-well microcavity*,” Phys. Stat. Sol. (A) **178**, 391-396 (2000).
52. Y. -S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, G. Khitrova, and H. M. Gibbs, “*Quantum correlations and intraband coherences in semiconductor cavity QED*,” Phys. Rev. Lett. **83**, 5338-5341 (1999).
53. M. K. Grimes, A.R. Rundquist, Y. -S. Lee, and M. C. Downer, “*Experimental identification of “Vacuum Heating” at femtosecond-laser-irradiated metal surfaces*,” Phys. Rev. Lett. **82**, 4010-4013 (1999).
54. Y. -S. Lee, A. Maslov, T. B. Norris, D. S. Citrin, J. Prineas, G. Khitrova, H. M. Gibbs, “*Coherent control of normal modes in quantum-well semiconductor microcavity*,” Optics & Photonics News **9**, No. 7, 60 (1998).
55. P. T. Wilson, Y. -S. Lee, Y. Jiang, D. Lim, R. Kempf, R. Bungener, X. F. Hu, J. I. Dadap, Jr., M. H. Anderson, M. ter Beek, Z. Xu, N. M. Russell, John G. Ekerdt, P. S. Parkinson, E. D. Mishina, O. A. Aktsipetrov, and Michael C. Downer, “*New directions in surface spectroscopy enabled by ultrafast lasers*,” Proc. SPIE Int. Soc. Opt. Eng. **3272**, 51 (1998).
56. Y. -S. Lee and M. C. Downer, “*Reflected fourth-harmonic radiation from a centrosymmetric crystal*,” Opt. Lett. **23**, 918-920 (1998).
57. Y. -S. Lee, M. H. Anderson, and M. C. Downer, “*Fourth-harmonic generation at a crystalline GaAs(001) surface*,” Opt. Lett. **22**, 973-975 (1997).
58. X. Y. Wang, D. M. Riffe, Y. -S. Lee, and M. C. Downer, “*Time-resolved electron-temperature measurement in a highly excited gold target using femtosecond emission*,” Phys. Rev. B **50**, 8016-8019 (1994).

1.2.2. Conference Proceedings and Abstracts

When my student is the speaker, his/her name is underlined. My name is asterisked when I am the corresponding author.

1. Yun-Shik Lee “High-field terahertz phenomena in two dimensional electron systems” 5th International Symposium on Terahertz Nanoscience – **invited paper**
2. Yun-Shik Lee “Terahertz experiments on microcavities” Frontiers in Optics/Laser Science 2014 (FiO/LS 2014) – **invited paper**
3. Yun-Shik Lee “Terahertz Control of Semiconductor Quantum Wells and Microcavity” US-Korea Conference 2014 (UKC2014) – **invited paper**
4. M. J. Paul, B.-H. Lee, J. Wardini, Z. J. Thompson, A. Stickel, A. Mousavian, E. D. Minot, and Yun-Shik Lee*, “Terahertz Induced Transparency in Single-Layer Graphene,” FM2D.6, CLEO 2014
5. J. Kim, J. Oh, C. In, Yun-Shik Lee, T. B. Norris, S. C. Jun, and H. Choi, “Observation of rapid carrier relaxation in graphene oxide probed by ultrafast terahertz spectroscopy,” FTu2B.2, CLEO 2014

6. P. Tekavec, D. Fast, I. McNee, V. Kozlov, Yun-Shik Lee, and K. L. Vodopyanov, "Video Rate THz imaging based on frequency upconversion using a near-IR CMOS camera," STh4F, CLEO 2014
7. A. Stickel, Z. Thompson, Y. Jeong, M. J. Paul, A. Mousavian, D.-S. Kim, and Yun-Shik Lee*, "Terahertz spectroscopy of metal-insulator transition in vanadium dioxide," 15th Annual Meeting of the Northwest Section of APS
8. M. J. Paul, Y. Jeong, S. H. Kim, K. J. Yee, D.-S. Kim, and Yun-Shik Lee*, "Large enhancement of nonlinear terahertz absorption in intrinsic GaAs by plasmonic nano antennas," 15th Annual Meeting of the Northwest Section of APS
9. Z. Thompson, M. J. Paul, A. Stickel, J. Wardini, E. D. Minot, and Yun-Shik Lee*, "Nonlinear terahertz spectroscopy of single-layer grapheme," 15th Annual Meeting of the Northwest Section of APS
10. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, J. P. Prineas, A. C. Klettke, M. Kira, and S. W. Koch, "Terahertz control of excitonic states in GaAs quantum wells and microcavity," Fundamental Optical Processes in Semiconductors (FOPS 2013) – **invited paper**
11. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S. W. Koch, "Terahertz Excitation of a Coherent Lambda-Type Three-Level System of Exciton-Polariton Modes in a Quantum-Well Microcavity," JF2K.3, CLEO 2013
12. M. J. Paul, J. Wardini, Z. J. Thompson, A. Stickel, E. D. Minot, and Yun-Shik Lee*, "Nonlinear Terahertz Spectroscopy of Single-Layer Graphene," JF2K.4, CLEO 2013
13. Y.-G. Jeong, M. J. Paul, S.-H. Kim, K.-J. Yee, D.-S. Kim, and Yun-Shik Lee*, "Large Enhancement of Nonlinear Terahertz Absorption in Intrinsic GaAs by Plasmonic Nano Antennas," QF2D.7, CLEO 2013
14. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, J. P. Prineas, A. C. Klettke, M. Kira, and S. W. Koch, "Quantum control of electron-hole wave packets in semiconductor nanostructures with strong terahertz pulses," W1-3, International Workshop on Optical Terahertz Science and Technology (OTST 2013) – **invited paper**
15. M. J. Paul, J. L. Tomaino, J. W. Kevek, T. A. Deborde, Z. J. Thompson, E. D. Minot, Yun-Shik Lee*, "Terahertz Imaging and Spectroscopy of Single-Layer Graphene embedded in dielectrics," W4-05, International Workshop on Optical Terahertz Science and Technology (OTST 2013)
16. M. J. Paul, N. A. Kuhta, J. L. Tomaino, A. D. Jameson, T. Sharf, N. L. Rupesinghe, K. B. K. Teo, V. A. Podolskiy, E. D. Minot, Yun-Shik Lee*, "Terahertz Ellipsometry of Vertically Grown Carbon Nanotubes," 14th Annual Meeting of the Northwest Section of APS
17. Z. J. Thompson, M. J. Paul, J. L. Tomaino, J. W. Kevek, T. A. Deborde, P. L. McEuen, E. D. Minot, Yun-Shik Lee*, "Terahertz Imaging and Spectroscopy of Single-Layer Graphene Embedded in Dielectrics," 14th Annual Meeting of the Northwest Section of APS
18. Yun-Shik Lee*, "Quantum Dynamics in Semiconductor Nanostructures Driven By Strong Terahertz Pulses," Frontiers of THz Science 2012. – **invited paper**

19. M. J. Paul, J. L. Tomaino, A. D. Jameson, J. W. Kevek, T. A. Deborde, Z. J. Thompson, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, Yun-Shik Lee*, “Terahertz Imaging and Spectroscopy of Single-Layer Graphene,” SW1C.1, OSA Sensors 2012 – **invited paper**
20. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, S. W. Koch, “Terahertz Excitation of Three-Level Λ -Type Exciton-Polariton Modes in Quantum-Well Microcavity,” SW3C.2, OSA Sensors 2012
21. M. J. Paul, N. A. Kuhta, J. L. Tomaino, A. D. Jameson, T. Sharf, N. L. Rupesinghe, K. B. K. Teo, V. A. Podolskiy, E. D. Minot, Yun-Shik Lee*, “Terahertz Ellipsometry of Vertically Grown Carbon Nanotubes,” SW3C.4, OSA Sensors 2012
22. M. J. Paul, N. A. Kuhta, J. L. Tomaino, A. D. Jameson, T. Sharf, N. L. Rupesinghe, K. B. K. Teo, V. A. Podolskiy, E. D. Minot, Yun-Shik Lee*, “Terahertz Ellipsometry of Vertically Grown Carbon Nanotubes,” CM1L.3, CLEO 2012
23. M. J. Paul, J. L. Tomaino, J. W. Kevek, T. A. Deborde, Z. J. Thompson, P. L. McEuen, E. D. Minot, Yun-Shik Lee*, “Terahertz Imaging and Spectroscopy of Single-Layer Graphene Embedded in Dielectrics,” CTu3B.1, CLEO 2012
24. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, S. W. Koch, “Terahertz Excitation of Three-Level Λ -Type Exciton-Polariton Modes in Quantum-Well Microcavity,” QTu1H.1, CLEO 2012
25. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee*, “*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*,” 8260-35, 2012 Photonics West
26. A. D. Jameson, J. L. Tomaino, M. J. Paul, J. W. Kevek, M. Hemphill-Johnston, J. Ong, M. Koretsky, E. D. Minot, and Yun-Shik Lee*, “*Terahertz spectroscopy of Ni-Ti alloy thin films*,” 8260-62, 2012 Photonics West
27. A. D. Jameson, J. D. Tomaino, Yun-Shik Lee*, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, “*Terahertz-induced optical modulation in quantum-well microcavity*,” 8240-7, 2012 Photonics West
28. Yun-Shik Lee*, “New Frontiers in Optical Science: Terahertz Spectroscopy of Two Dimensional Systems,” 13th Annual Meeting of the Northwest Section of APS – **plenary paper**
29. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee*, “*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*,” 13th Annual Meeting of the Northwest Section of APS
30. M. J. Paul, A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. Hemphill-Johnston, J. Ong, M. Koretsky, E. D. Minot, and Yun-Shik Lee*, “*Terahertz spectroscopy of Ni-Ti alloy thin films*,” 13th Annual Meeting of the Northwest Section of APS
31. A. D. Jameson, J. D. Tomaino, Yun-Shik Lee*, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, “*Interaction of Strong Terahertz Pulses with Semiconductor Quantum Wells*,” 13th Annual Meeting of the Northwest Section of APS

32. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee*, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, "*Interaction of Strong Few-Cycle terahertz Pulses with Semiconductor Quantum Wells*," PM4, Fundamental Optical Processes in Semiconductors 2011
33. J. L. Tomaino, A. D. Jameson, Yun-Shik Lee*, G. Khitrovah, H.M. Gibbs, A. Stroeck, M. Kira, and S.W. Koch, "*Ultrafast Exciton-Polariton Bleaching and Recovery in a Quantum-Well Microcavity Induced by Strong Terahertz Pulses*," PM5, Fundamental Optical Processes in Semiconductors 2011
34. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S.W. Koch, "*Interaction of strong terahertz pulses with exciton-polaritons in quantum-well microcavity*," QMB2, CLEO 2011
35. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee*, "*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*," CThEE4, CLEO 2011.
36. A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, M. Hemphill-Johnston, M. Koretsky, E. D. Minot, and Yun-Shik Lee*, "*Terahertz spectroscopy of Ni-Ti Alloy Thin Films*," CThEE3, CLEO 2011
37. J. W. Kevek, J. L. Tomaino, A. D. Jameson, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, "*Terahertz imaging of graphene*," Graphene 2011, April 2011, in Bilbao, Spain.
38. E. D. Minot, J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, and Yun-Shik Lee, "*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*," T28.00006, APS March Meeting 2011
39. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee*, "*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*," MC3, International Workshop on Optical Terahertz Science and Technology (OTST 2011)
40. J. L. Tomaino, A. D. Jameson, Yun-Shik Lee*, G. Khitrovah, H.M. Gibbs, A. Stroeck, M. Kira, and S.W. Koch, "*Ultrafast Exciton-Polariton Bleaching and Recovery in a Quantum-Well Microcavity Induced by Strong Terahertz Pulses*," International Workshop on Optical Terahertz Science and Technology (OTST 2011)
41. A. D. Jameson, J. D. Tomaino, Yun-Shik Lee*, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, "*Interaction of Strong Few-Cycle Terahertz Pulses with Semiconductor Quantum Wells*," WD2, International Workshop on Optical Terahertz Science and Technology (OTST 2011)
42. A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, M. Hemphill-Johnston, J. Ong, M. Koretsky, E. D. Minot, and Yun-Shik Lee*, "*Terahertz spectroscopy of Ni-Ti alloy thin films*," International Workshop on Optical Terahertz Science and Technology (OTST 2011)
43. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee*, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, "*Transient optical response of quantum well excitons to intense narrowband terahertz pulses*," QFI6, CLEO/QELS 2010

44. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee*, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, “*Transient optical response of quantum well excitons to intense narrowband terahertz pulses*,” X25.00004, APS March Meeting 2010
45. Yun-Shik Lee*, A. D. Jameson, J. L. Tomaino, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, “*Terahertz and optical frequency mixing in semiconductor quantum-wells*,” 7582-32, 2010 Photonics West
46. Yun-Shik Lee*, A. D. Jameson, J. L. Tomaino, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, “*Ultrafast Nonlinear Optical Effects in Semiconductor Quantum Wells Resonantly Driven by Few-Cycle Terahertz Pulses*,” FA5-6, ISDRS 2009
47. Yun-Shik Lee*, A. D. Jameson, J. L. Tomaino, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, F1D01, “*THz-Induced Nonlinear Optical Transients of Coherent Excitons in Semiconductor QWs*,” IRMMW-THz 2009 – **Invited paper**
48. Yun-Shik Lee*, A. D. Jameson, J. L. Tomaino, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, “*Interaction of intense narrowband THz pulses with coherent excitons in semiconductor QWs*,” IThC1, CLEO/IQEC 2009
49. Yun-Shik Lee*, “*New light and new science: Terahertz-induced extreme nonlinear optical transients in semiconductor quantum wells*,” G1.00001, 11th Annual Meeting of the Northwest Section of APS – **Invited paper**
50. J. R. Danielson, Yun-Shik Lee*, and K. V. Vodopyanov, “*Intense narrowband terahertz generation via type-II DFG in ZnTe*,” J. L. Tomaino, A. D. Jameson, G1.00002, 11th Annual Meeting of the Northwest Section of APS
51. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee*, J. -Y. Seo, and O. -P. Kwon, “*Terahertz properties of an organic nonlinear optical crystal*,” G1.00003, 11th Annual Meeting of the Northwest Section of APS
52. Yun-Shik Lee*, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Terahertz-induced extreme-nonlinear optical transients in semiconductor quantum wells*,” SuB4, International Workshop on Optical Terahertz Science and Technology (OTST 2009)
53. Yun-Shik Lee*, “*New light and new science: Terahertz Optics of Semiconductors*,” Quantum Optics Workshop 2008- Convergence Research for slow light in Quantum/Nano/Fiber/SPPs – **Tutorial paper**
54. Yun-Shik Lee*, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Terahertz-induced extreme-nonlinear optical transients in semiconductor quantum wells*,” Quantum Optics Workshop 2008- Convergence Research for slow light in Quantum/Nano/Fiber/SPPs – **Invited paper**
55. Yun-Shik Lee*, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*THz-Induced Ultrafast Dynamics and Extreme Nonlinear Optical Effects in Semiconductor Quantum Wells*,” LMB5, 2008 Frontiers in Optics/Laser Science XXIV Conference
56. Yun-Shik Lee*, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, “*Terahertz-induced extreme nonlinear transients in semiconductor quantum wells*,” UD II-3, Ninth International Workshop on Nonlinear Optics and Excitation Kinetics in Semiconductors (NOEKS 9) – **Invited paper**

57. J. T. Steiner, M. Kira, S. W. Koch, J. P. Prineas, J. R. Danielson, and Yun-Shik Lee*,
“Semiconductor excitons in strong terahertz fields,” P-51, Ninth International Workshop on
Nonlinear Optics and Excitation Kinetics in Semiconductors (NOEKS 9)
58. Yun-Shik Lee*, J. R. Danielson, J. Steiner, M. Kira, S. W. Koch, and J. P. Prineas,
“*Coherent Nonlinear Optical Effects in Semiconductor QWs Induced by Intense Single-
Cycle THz Pulses*,” ThB1-2, CLEO/Pacific Rim 2007
59. Jeremy R. Danielson, Joel D. Wetzel, K. L. Vodopyanov, and Yun-Shik Lee*, “*Tunable
Narrow-band THz Generation by Type-II DFG with Linearly Chirped Optical Pulses in
ZnTe*,” FH1-4, CLEO/Pacific Rim 2007
60. Yun-Shik Lee*, “*Multi-Cycle THz Pulse Generation and Manipulation in Poled Lithium
Niobate*,” FH1-1, CLEO/Pacific Rim 2007 – **Invited paper**
61. J. R. Danielson, Yun-Shik Lee*, J. Steiner, M. Kira, S. W. Koch, and J. P. Prineas,
“*Coherent Nonlinear Optical Effects in Semiconductor QWs Induced by Intense Single-
Cycle THz Pulses*,” QMA6, 2007 CLEO/QELS
62. K. L. Vodopyanov, J.E. Schaar, P. S. Kuo, M. M. Fejer, X. Yu, J. S. Harris V. Kozlov, W.
C. Hurlbut, Yun-Shik Lee*, C. Lynch, and D. Bliss, “*New Light from Gallium Arsenide:
Micro-Structured GaAs for Mid-IR and THz-Wave Generation*,” QMJ1, 2007 CLEO/QELS
– **Invited paper**
63. Yun-Shik Lee*, N. Amer, and J. R. Danielson, “*Arbitrary THz pulse shaping via optical
rectification in fanned-out periodically-poled lithium niobate*,” MC2, 2007 Optical
Terahertz Science and Technology
64. Yun-Shik Lee*, W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, and V. G. Kozlov,
“*Generation of multi-cycle terahertz pulses in a periodically inverted GaAs structures*,”
WB2, 2007 Optical Terahertz Science and Technology
65. Yun-Shik Lee*, N. Amer, and J. R. Danielson, “*Arbitrary THz pulse shaping in fanned-out
periodically-poled lithium niobate*,” 6455-19, 2007 Photonics West
66. Yun-Shik Lee*, W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, and V. G. Kozlov,
“*Generation of multi-cycle THz- pulses via optical rectification in periodically inverted
GaAs*,” 6455-16, 2007 Photonics West
67. Naaman Amer, Jeremy R. Danielson, and Yun-Shik Lee*, “*Generation of arbitrary THz
waveforms via optical rectification in fanned-out periodically-poled lithium niobate*,”
CTuGG7, 2006 CLEO/QELS
68. W. C. Hurlbut, K. L. Vodopyanov, P. S. Kuo, M. M. Fejer, and Yun-Shik Lee*, “*Multi-
photon absorption and nonlinear refraction of GaAs in the mid-infrared*,” CThM3, 2006
CLEO/QELS
69. W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, V.G. Kozlov, and Yun-Shik Lee*, “*Quasi-
phasematched THz generation in GaAs*,” CTuGG6, 2006 CLEO/QELS
70. Yun-Shik Lee*, K. L. Vodopyanov, W. C. Hurlbut, J. R. Danielson, V. G. Kozlov, D. F.
Bliss, and M. M. Fejer, “*Generation of multi-cycle THz- pulses via optical rectification in
periodically inverted GaAs*,” 6120-03, 2006 Photonics West

71. Y. –S. Lee*, N. Amer, W. C. Hurlbut, and B. J. Norton, “*Generation and manipulation of multi-cycle THz pulses via optical rectification in periodically-poled lithium niobate*,” 6002-37, 2005 Optics East – **Invited paper**
 72. Y. –S. Lee*, W. C. Hurlbut, N. Amer, B. J. Norton, and T. B. Norris, “*THz Pulse Shaping and Ellipticity Control via Optical Rectification in Nonlinear Optical Crystals*,” QThI4, 2005 CLEO/QELS
 73. K. L. Vodopyanov, D. M. Simanovskii, M. M. Fejer, V.G. Kozlov, Y.-S. Lee*, “*Terahertz-wave generation in periodically-inverted GaAs*,” CWM1, 2005 CLEO/QELS
 74. Walter Hurlbut, Bryan Norton, Naaman Amer, and Yun-Shik Lee*, “*Three photon absorption and the nonlinear index of refraction in GaAs*,” APS Northwest Section Meeting 2005, University of Victoria, BC
 75. Y. –S. Lee*, N. Amer, and W. C. Hurlbut, “*Generation of elliptically polarized THz waves*,” JThB4, 2004 Frontiers in Optics/Laser Science XIX Conference, Rochester, NY
 76. W. C. Hurlbut, N. Amer, J. Förstner, A. Knorr, S. W. Koch, J. W. Nibler, and Y. –S. Lee*, “*THz coherent transients of HCl molecular rotational transitions via shaped THz pulses and coherent control*,” APS Northwest Section Meeting 2004, Moscow, ID and Pullman, WA
 77. N. Amer, W. C. Hurlbut, S. L. Etringer, B. K. Paul, and Y. –S. Lee*, “*THz wave propagation in 1D and 2D photonic crystals*,” APS Northwest Section Meeting 2004, Moscow, ID and Pullman, WA
 78. Y. –S. Lee*, N. Amer, and W. C. Hurlbut, “*Terahertz pulse shaping and generation of continuously tunable narrow-band terahertz wave in poled lithium niobate crystals*,” ThG3, 2003 Frontiers in Optics/Laser Science XIX Conference
 79. Y. –S. Lee*, N. Amer, and W. C. Hurlbut, “*Terahertz pulse shaping via optical rectification in lithium niobate*,” QWB3, 2003 CLEO/QELS
 80. N. Amer, W. C. Hurlbut, and Y. –S. Lee*, “*Continuously tunable THz generation in pan-out structure of periodically poled lithium niobate*,” 2003 APS Northwest Section Meeting, Portland, OR
 81. W. C. Hurlbut, N. Amer, and Y. –S. Lee*, “*Time-domain THz spectroscopy on rotational states of HCl and H₂O*,” 2003 APS Northwest Section Meeting, Portland, OR
 82. Y. –S. Lee* and T. B. Norris, “*Terahertz pulse shaping and optimal waveform generation in poled ferroelectric crystals*,” QWA24, 2002 CLEO/QELS
- Before 2001: The speaker name is underlined.
83. C. Sieh, T. Meier, S.W. Koch, F. Jahnke, Y. –S. Lee*, T. B. Norris, G. Khitrova, and H. M. Gibbs, “*Coherent optical nonlinearities in normal mode microcavities*”, 2001 AMFOPS
 84. Y. –S. Lee, T. Meade, T. B. Norris and A. Galvanauskas, “*Tunable narrow-band terahertz generation from periodically-poled lithium niobate*,” QMM1, 2001 CLEO/QELS – **Invited Paper**
 85. Y. –S. Lee, T. B. Norris, G. Khitrova, H. M. Gibbs, C. Sieh, Th. Meier, S. W. Koch, and F. Jahnke, “*Coherent optical nonlinearities in normal mode microcavities*,” QThL2, 2001 CLEO/QELS

86. Y. –S. Lee, T. B. Norris, A. V. Maslov and D. S. Citrin, “*Coherent control and nonlinear interactions of semiconductor cavity polaritons*,” TuD2, 2000 Ultrafast Phenomena
87. Y. –S. Lee, T. Meade, V. Perlin, H. Winful, and T. B. Norris, “*Generation of narrow-band terahertz pulses by optical rectification in periodically-poled lithium niobate*,” MD6, 2000 Ultrafast Phenomena
88. Y. –S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, G. Khitrova, and H. M. Gibbs, “*Quantum correlation induced intraband coherences in a quantum-well microcavity*,” QTuB6, 2000 CLEO/QELS
89. Y. –S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, G. Khitrova, and H. M. Gibbs, “*Coherent control of cavity-polariton secondary emission*,” QThQ4, 2000 CLEO/QELS
90. T. B. Norris, Y. –S. Lee, T. Meade, M. DeCamp, C. Herne, V. Perlin, and H. Winful, “*Narrow-band THz waveforms from optical rectification of femtosecond optical pulses in periodically poled lithium niobate*,” CPD2, 2000 CLEO/QELS – **Postdeadline Paper**
91. T. Meade, Y. –S. Lee, V. Perlin, H. Winful, and T. B. Norris, “*Narrow-band terahertz waveform generation in periodically poled lithium niobate*,” 11th International Symposium on Space Terahertz Technology, 2000
92. Y. –S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, A. Maslov, D. S. Citrin, G. Khitrova, and H. M. Gibbs, “*Coherent control and quantum correlations in quantum-well semiconductor microcavity*,” 3940-04, 2000 Photonics West – **Invited Paper**
93. M. K. Grimes, A. Rundquist, Y. –S. Lee, and M. C. Downer, “*Experimental identification of vacuum heating at femtosecond-laser-irradiated metal surfaces*,” ThGG4, 1999 OSA Annual Meeting
94. Y. –S. Lee, T. B. Norris, M. Kira, F. Jahnke, S. W. Koch, A. Maslov, D. S. Citrin, G. Khitrova, and H. M. Gibbs, “*Correlation and coherent control of polaritons in Microcavity*,” TuP08, 1999 Optics of Excitons in Confined Systems (OECS-6)
95. Y. –S. Lee, T. B. Norris, A. Maslov, D. S. Citrin, J. Prineas, G. Khitrova, and H. M. Gibbs, “*Coherent control of polaritons in a quantum-well microcavity*,” QMF1, 1999 CLEO/QELS
96. M. K. Grimes, A. Rundquist, Y. –S. Lee, and M. C. Downer, “*Experimental identification of vacuum heating at femtosecond-laser-irradiated metal surfaces*,” JTuD6, 1999 CLEO/QELS
97. Y. –S. Lee, A. Maslov, T. B. Norris, D. S. Citrin, J. Prineas, G. Khitrova, and H. M. Gibbs, “*Coherent control of normal modes in quantum-well semiconductor microcavity*,” FH6, 1998 OSA Annual Meeting
98. Y. –S. Lee, A. Maslov, T. B. Norris, D. S. Citrin, J. Prineas, G. Khitrova, and H. M. Gibbs, “*Coherent control of normal modes in quantum-well semiconductor microcavity*,” QPD2, 1998 CLEO/IQEC – **Postdeadline Paper**
99. Y. –S. Lee and M. C. Downer, “*Fourth-harmonic generation at crystalline Si(001) interfaces*,” QFC1, 1998 CLEO/IQEC
100. Y. –S. Lee, M. H. Anderson, and M. C. Downer, “*Fourth-harmonic generation at a crystalline GaAs(001) surface*,” QWC6, 1997 CLEO/QELS – **Invited Paper**

101. M. C. Downer, O. A. Aktsipetrov, M. H. Anderson, M. ter Beek, J. I. Dadap, J. G. Ekertdt, X. F. Hu, Y. Jiang, Y. –S. Lee, D. Lim, J K. Lowell, E. D. Mishina, N. M. Russell, P. T. Wilson, Z. Xu, “*Nonlinear spectroscopy and process monitoring of Si(001) interfaces*,” CFG3, 1997 CLEO/QELS – **Invited Paper**
102. Y. –S. Lee, M. K. Grimes, and M. C. Downer, “*Solid to plasma transition in fs-laser-irradiated Fe: Collapse of the spin-orbit gap*,” 1996 APS Texas Section Meeting

1.2.3. Publications in Popular Press

1. The article “*Crystals shape terahertz pulses*” in *Photonics Spectra*, March 2003 issue (p.110) presents our research on THz pulse shaping.
2. I authored an article “*Poled lithium niobate crystals enable multicycle THz pulse generation*” in *Laser Focus World* April 2005 issue (pp. 67-72).
3. The article “*Advance made toward communication, computing at ‘terahertz’ speeds*” published in Gazette Times on July 19, 2010 presents our research on THz-rate switching in semiconductor nanostructures.

2. Professional meetings, Symposia, and Conferences

2.1. Conference Presentations since 2002

1. Yun-Shik Lee “High-field terahertz phenomena in two dimensional electron systems” 5th International Symposium on Terahertz Nanoscience – **invited paper**
2. Yun-Shik Lee “Terahertz experiments on microcavities” Frontiers in Optics/Laser Science 2014 (FiO/LS 2014) – **invited paper**
3. Yun-Shik Lee “Terahertz Control of Semiconductor Quantum Wells and Microcavity” US-Korea Conference 2014 (UKC2014) – **invited paper**
4. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, J. P. Prineas, A. C. Klettke, M. Kira, and S .W. Koch, “Terahertz control of excitonic states in GaAs quantum wells and microcavity,” Fundamental Optical Processes in Semiconductors (FOPS 2013) – **invited paper**
5. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S .W. Koch, “Terahertz Excitation of a Coherent Lambda-Type Three-Level System of Exciton-Polariton Modes in a Quantum-Well Microcavity,” JF2K.3, CLEO 2013
6. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, J. P. Prineas, A. C. Klettke, M. Kira, and S .W. Koch, “Quantum control of electron-hole wave packets in semiconductor nanostructures with strong terahertz pulses,” W1-3, International Workshop on Optical Terahertz Science and Technology (OTST 2013) – **invited speaker**
7. Yun-Shik Lee*, “Quantum Dynamics in Semiconductor Nanostructures Driven By Strong Terahertz Pulses,” Frontiers of THz Science 2012. – **invited speaker**
8. M. J. Paul, J. L. Tomaino, A. D. Jameson, J. W. Kevek, T. A. Deborde, Z. J. Thompson, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, Yun-Shik Lee*, “Terahertz Imaging and Spectroscopy of Single-Layer Graphene,” SW1C.1, OSA Sensors 2012 – **invited paper**

9. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, S. W. Koch, "Terahertz Excitation of Three-Level Λ -Type Exciton-Polariton Modes in Quantum-Well Microcavity," SW3C.2, OSA Sensors 2012
10. M. J. Paul, N. A. Kuhta, J. L. Tomaino, A. D. Jameson, T. Sharf, N. L. Rupesinghe, K. B. K. Teo, V. A. Podolskiy, E. D. Minot, Yun-Shik Lee*, "Terahertz Ellipsometry of Vertically Grown Carbon Nanotubes," SW3C.4, OSA Sensors 2012
11. Yun-Shik Lee*, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, S. W. Koch, "Terahertz Excitation of Three-Level Λ -Type Exciton-Polariton Modes in Quantum-Well Microcavity," QTu1H.1, CLEO 2012
12. J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, "*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*," 8260-35, 2012 Photonics West – contributed speaker
13. A. D. Jameson, J. L. Tomaino, M. J. Paul, J. W. Kevek, M. Hemphill-Johnston, J. Ong, M. Koretsky, E. D. Minot, and Yun-Shik Lee, "*Terahertz spectroscopy of Ni-Ti alloy thin films*," 8260-62, 2012 Photonics West – contributed speaker
14. A. D. Jameson, J. D. Tomaino, Yun-Shik Lee, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, "*Terahertz-induced optical modulation in quantum-well microcavity*," 8240-7, 2012 Photonics West – contributed speaker
15. Yun-Shik Lee, "New Frontiers in Optical Science: Terahertz Spectroscopy of Two Dimensional Systems" 13th Annual Meeting of the Northwest Section of APS – **plenary speaker**
16. A. D. Jameson, J. L. Tomaino, Yun-Shik Lee, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, "*Interaction of Strong Few-Cycle terahertz Pulses with Semiconductor Quantum Wells*," PM4, Fundamental Optical Processes in Semiconductors 2011 – contributed speaker
17. J. L. Tomaino, A. D. Jameson, Yun-Shik Lee, G. Khitrovah, H.M. Gibbs, A. Stroech, M. Kira, and S.W. Koch, "*Ultrafast Exciton-Polariton Bleaching and Recovery in a Quantum-Well Microcavity Induced by Strong Terahertz Pulses*," PM5, Fundamental Optical Processes in Semiconductors 2011 – contributed speaker
18. "*Interaction of strong terahertz pulses with exciton-polaritons in quantum-well microcavity*," Yun-Shik Lee, J. L. Tomaino, A. D. Jameson, G. Khitrova, H. M. Gibbs, A. C. Klettke, M. Kira, and S.W. Koch, QMB2, CLEO 2011 – contributed speaker
19. "*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*," J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande, R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, CThEE4, CLEO 2011 – contributed speaker
20. "*Terahertz spectroscopy of Ni-Ti Alloy Thin Films*," A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, M. Hemphill-Johnston, M. Koretsky, E. D. Minot, and Yun-Shik Lee, CThEE3, CLEO 2011 – contributed speaker
21. "*Terahertz Imaging and Time-Domain Spectroscopy of Large-Area Single-Layer Graphene*," J. L. Tomaino, A. D. Jameson, J. W. Kevek, M. J. Paul, A. M. van der Zande,

- R. A. Barton, P. L. McEuen, E. D. Minot, and Yun-Shik Lee, MC3, International Workshop on Optical Terahertz Science and Technology (OTST 2011) – contributed speaker
22. “*Ultrafast Exciton-Polariton Bleaching and Recovery in a Quantum-Well Microcavity Induced by Strong Terahertz Pulses*,” J. L. Tomaino, A. D. Jameson, Yun-Shik Lee, G. Khitrovah, H.M. Gibbs, A. Stroech, M. Kira, and S.W. Koch, International Workshop on Optical Terahertz Science and Technology (OTST 2011) – contributed speaker
 23. “*Interaction of Strong Few-Cycle Terahertz Pulses with Semiconductor Quantum Wells*,” A. D. Jameson, J. D. Tomaino, Yun-Shik Lee, J. P. Prineas, J. T. Steiner, M. Kira, and S.W. Koch, WD2, International Workshop on Optical Terahertz Science and Technology (OTST 2011) – contributed speaker
 24. “*Terahertz spectroscopy of Ni-Ti alloy thin films*,” A. D. Jameson, J. L. Tomaino, J. W. Kevek, M. J. Paul, M. Hemphill-Johnston, J. Ong, M. Koretsky, E. D. Minot, and Yun-Shik Lee, International Workshop on Optical Terahertz Science and Technology (OTST 2011) – contributed speaker
 25. “*Transient optical response of quantum well excitons to intense narrowband terahertz pulses*,” A. D. Jameson, J. L. Tomaino, Yun-Shik Lee, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, QFI6, CLEO/QELS 2010 – contributed speaker
 26. “*Terahertz and optical frequency mixing in semiconductor quantum-wells*,” Yun-Shik Lee, A. D. Jameson, J. L. Tomaino, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, 7582-32, 2010 Photonics West – contributed speaker
 27. “*Ultrafast Nonlinear Optical Effects in Semiconductor Quantum Wells Resonantly Driven by Few-Cycle Terahertz Pulses*,” Yun-Shik Lee, A. D. Jameson, J. L. Tomaino, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, FA5-6, ISDRS 2009
 28. “*THz-Induced Nonlinear Optical Transients of Coherent Excitons in Semiconductor QWs*,” Yun-Shik Lee, A. D. Jameson, J. L. Tomaino, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, F1D01, IRMMW-THz 2009 – **Invited speaker**
 29. “*Interaction of intense narrowband THz pulses with coherent excitons in semiconductor QWs*,” Yun-Shik Lee, A. D. Jameson, J. L. Tomaino, J. T. Steiner, M. Kra, S. W. Koch, J. P. Prineas, IThC1, CLEO/IQEC 2009 – contributed speaker
 30. “*New light and new science: Terahertz-induced extreme nonlinear optical transients in semiconductor quantum wells*,” Yun-Shik Lee, G1.00001, 11th Annual Meeting of the Northwest Section of APS – **Invited speaker**
 31. “*Terahertz-induced extreme-nonlinear optical transients in semiconductor quantum wells*,” Yun-Shik Lee, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, SuB4, International Workshop on Optical Terahertz Science and Technology (OTST 2009)
 32. “*New light and new science: Terahertz Optics of Semiconductors*,” Yun-Shik Lee, Quantum Optics Workshop 2008- Convergence Research for slow light in Quantum/Nano/Fiber/SPPs – **Tutorial speaker**
 33. “*Terahertz-induced extreme-nonlinear optical transients in semiconductor quantum wells*,” Yun-Shik Lee, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch,

Quantum Optics Workshop 2008- Convergence Research for slow light in
Quantum/Nano/Fiber/SPPs – **Invited speaker**

34. “*THz-Induced Ultrafast Dynamics and Extreme Nonlinear Optical Effects in Semiconductor Quantum Wells*,” Yun-Shik Lee, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, LMB5, 2008 Frontiers in Optics/Laser Science XXIV Conference – contributed speaker
35. “*Terahertz-induced extreme nonlinear transients in semiconductor quantum wells*,” Yun-Shik Lee, J. R. Danielson, J. P. Prineas, J. T. Steiner, M. Kira, and S. W. Koch, UD II-3, NOEKS 9, 2008 – **Invited speaker**
36. “*Coherent Nonlinear Optical Effects in Semiconductor QWs Induced by Intense Single-Cycle THz Pulses*,” Yun-Shik Lee, J. R. Danielson, J. Steiner, M. Kira, S. W. Koch, and J. P. Prineas, THB1-2, CLEO/Pacific Rim 2007 – contributed speaker
37. “*Tunable Narrow-band THz Generation by Type-II DFG with Linearly Chirped Optical Pulses in ZnTe*,” Jeremy R. Danielson, Joel D. Wetzel, K. L. Vodopyanov, and Yun-Shik Lee, FH1-4, CLEO/Pacific Rim 2007 – contributed speaker
38. “*Multi-Cycle THz Pulse Generation and Manipulation in Poled Lithium Niobate*,” Yun-Shik Lee, FH1-1, CLEO/Pacific Rim 2007 – **Invited speaker**
39. “*Coherent Nonlinear Optical Effects in Semiconductor QWs Induced by Intense Single-Cycle THz Pulses*,” Yun-Shik Lee, J. R. Danielson, J. Steiner, M. Kira, S. W. Koch, and J. P. Prineas, QMA6, 2007 CLEO/QELS – contributed speaker
40. “*Arbitrary THz pulse shaping via optical rectification in fanned-out periodically-poled lithium niobate*,” Yun-Shik Lee, N. Amer, and J. R. Danielson, 2007 Optical Terahertz Science and Technology – contributed speaker
41. “*Generation of multi-cycle terahertz pulses in a periodically inverted GaAs structures*,” Yun-Shik Lee, W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, and V. G. Kozlov, 2007 Optical Terahertz Science and Technology – contributed speaker
42. “*Arbitrary THz pulse shaping in fanned-out periodically-poled lithium niobate*,” Yun-Shik Lee, N. Amer, and J. R. Danielson, 2007 Photonics West – contributed speaker
43. “*Generation of multi-cycle THz- pulses via optical rectification in periodically inverted GaAs*,” Yun-Shik Lee, W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, and V. G. Kozlov, 2007 Photonics West – contributed speaker
44. “*Generation of arbitrary THz waveforms via optical rectification in fanned-out periodically-poled lithium niobate*,” Naaman Amer, Jeremy R. Danielson, and Yun-Shik Lee, 2006 CLEO/QELS – contributed speaker
45. “*Multi-photon absorption and nonlinear refraction of GaAs in the mid-infrared*,” W. C. Hurlbut, K. L. Vodopyanov, P. S. Kuo, M. M. Fejer, and Yun-Shik Lee, 2006 CLEO/QELS – contributed speaker
46. “*Quasi-phasematched THz generation in GaAs*,” W. C. Hurlbut, K. L. Vodopyanov, M. M. Fejer, V.G. Kozlov, and Yun-Shik Lee, 2006 CLEO/QELS – contributed speaker

47. “*Generation of multi-cycle THz- pulses via optical rectification in periodically inverted GaAs,*” Yun-Shik Lee, K. L. Vodopyanov, W. C. Hurlbut, J. R. Danielson, V. G. Kozlov, D. F. Bliss, and M. M. Fejer, 2006 Photonics West – contributed speaker
48. “*Generation and manipulation of multi-cycle THz pulses via optical rectification in periodically-poled lithium niobate,*” Yun-Shik Lee, N. Amer, W. C. Hurlbut, and B. J. Norton, 2005 Optics East – **invited speaker**
49. “*THz Pulse Shaping and Ellipticity Control via Optical Rectification in Nonlinear Optical Crystals,*” Yun-Shik Lee, W. C. Hurlbut, N. Amer, B. J. Norton, and T. B. Norris, 2005 CLEO/QELS – contributed speaker
50. “*Generation of elliptically polarized THz waves,*” Yun-Shik Lee, N. Amer, and W. C. Hurlbut, JThB4, 2004 Frontiers in Optics/Laser Science XIX Conference – contributed speaker
51. “*Terahertz pulse shaping and generation of continuously tunable narrow-band terahertz wave in poled lithium niobate crystals,*” Yun-Shik Lee, N. Amer, and W. C. Hurlbut, ThG3, 2003 Frontiers in Optics/Laser Science XIX Conference – contributed speaker
52. “*Terahertz pulse shaping via optical rectification in lithium niobate,*” Yun-Shik Lee, N. Amer, and W. C. Hurlbut, CLEO/QELS 2003, Baltimore, MD – contributed speaker
53. “*Terahertz pulse shaping and optimal waveform generation in poled ferroelectric crystals,*” Yun-Shik Lee and T. B. Norris, CLEO/QELS 2002, Long Beach, CA – contributed speaker

2.2 Seminar Presentations since 2001

1. Apr. 12th, 2013 “New Frontiers in Optical Science: Terahertz Spectroscopy of Nanoscale Materials,” Colloquium, Department of Physics, University of Seoul, Seoul, Korea
2. Mar. 26th, 2013 “New Frontiers in Optical Science: Terahertz Spectroscopy of Nanoscale Materials,” Seminar, School of Electrical and Electronic Engineering at Yonsei University, Seoul, Korea
3. Feb. 8th, 2013 “New Frontiers in Optical Science: Terahertz Imaging and Spectroscopy” Research Seminar, Department of Physics at Oregon State University
4. Jan. 31st, 2013 “New Frontiers in Optical Science: Terahertz Imaging and Spectroscopy” Freshman Seminar, Department of Physics at Oregon State University
5. Oct. 3rd, 2012 ““New Frontiers in Optical Science: Terahertz Spectroscopy of Nanoscale Materials” Seminar, Reed College
6. Feb. 12th, 2012 “New Light and New Science: Optical Terahertz Science and Technology,” Research Seminar, Department of Physics at Oregon State University
7. Oct. 31st, 2011 “Terahertz spectroscopy of two-dimensional systems” Colloquium, Department of Physics, Oregon State University

8. Feb. 4th, 2011 “New Light and New Science: Optical Terahertz Science and Technology,” Research Seminar, Department of Physics at Oregon State University
9. Feb. 12th, 2010 “New Light and New Science: Optical Terahertz Science and Technology,” Research Seminar, Department of Physics at Oregon State University
10. Feb. 27th, 2009 “Optical Terahertz Science and Technology,” Research Seminar, Department of Physics at Oregon State University
11. Feb. 9th, 2009 “New light and New Science: Terahertz-Induced Extreme Nonlinear Optical Transients in Semiconductor Quantum Wells,” Colloquium, Department of Physics at Oregon State University
12. Sept. 18th, 2008 “THz pulse shaping in nonlinear crystals,” Seminar, Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum
13. Feb. 15th, 2008 “Ultrahigh speed movie making with femtosecond lasers: Terahertz time-domain spectroscopy,” Research Seminar, Department of Physics at Oregon State University
14. Nov. 7th, 2007 “Generation and Manipulation of Multi-Cycle Terahertz Pulses in Orientation Inverted Nonlinear Crystals,” Seminar, Faculty of Physics, Philipps-Universität Marburg.
15. Sept. 10th, 2007 “Interaction of Strong Single-Cycle Terahertz Pulses with Semiconductor Quantum Wells,” Seminar, Korea Institute of Science and Technology.
16. Sept. 7th, 2007 “Interaction of Strong Single-Cycle Terahertz Pulses with Semiconductor Quantum Wells,” Condensed Matter Physics Seminar, Department of Physics, Seoul National University.
17. Sept. 7th, 2007 “Interaction of Strong Single-Cycle Terahertz Pulses with Semiconductor Quantum Wells,” Condensed Matter Physics Seminar, Department of Physics, Seoul National University.
18. Sept. 6th, 2007 “Generation and Manipulation of Multi-Cycle Terahertz Pulses in Orientation Inverted Nonlinear Crystals,” Seminar, Korea Research Institute of Standards and Science.
19. Sept. 6th, 2007 “Interaction of Strong Single-Cycle Terahertz Pulses with Semiconductor Quantum Wells,” Seminar, Department of Physics, Korea Advanced Institute of Science and Technology.
20. Jun. 21st, 2007 “THz pulse generation and manipulation in orientation-inverted nonlinear optical crystals,” Seminar, The Institute for Quantum and Complex Dynamics, University of California at Santa Barbara

21. Sep. 14th, 2006 “THz pulse generation and manipulation in orientation-inverted nonlinear optical crystals,” Condensed Matter Physics Seminar, Department of Physics, Seoul National University
22. Sep. 12th, 2006 “THz pulse generation and manipulation in orientation-inverted nonlinear optical crystals,” Special Seminar, Department of Physics, Korea Advanced Institute of Science and Technology
23. Sep. 5th, 2006 “THz pulse generation and manipulation in orientation-inverted nonlinear optical crystals,” Colloquium, Department of Physics, Korea University – invited speaker
24. Nov. 14th, 2005 “Generation and manipulation of multi-cycle terahertz pulses in orientation inverted nonlinear crystals,” Colloquium, Department of Physics, Oregon State University
25. Jan. 27th, 2005 “THz generation via optical rectification in nonlinear crystals,” Nonlinear Optics (PH683), Invited lecture, Oregon State University
26. Oct. 20th, 2004 Solid State Seminar “Wave propagation in photonic crystals,” Department of Physics, Oregon State University
27. Jun. 9th, 2004 “Arbitrary terahertz waveform generation via optical rectification in poled-lithium niobate” Special Seminar at Optical Science Center, University of Arizona Feb. 20th, 2004 “Ultrahigh speed movie making with femtosecond lasers: Terahertz time-domain spectroscopy,” Research Seminar, Department of Physics at Oregon State University
28. Mar. 29th, 2003 “Terahertz pulse shaping via optical rectification in poled ferroelectric crystals and its application to time-domain molecular spectroscopy,” PNACP (Pacific Northwest Association of College Physics) Annual Meeting
29. Mar. 7th, 2003 “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy,” Research Seminar, Department of Physics at Oregon State University
30. Jan. 30th, 2003 “THz generation via optical rectification in nonlinear crystals,” Nonlinear Optics (PH683), Invited lecture, Oregon State University
31. Oct. 28th, 2002 “Terahertz pulse shaping via optical rectification in poled ferroelectric crystals and its application to time-domain molecular spectroscopy” Colloquium, Department of Physics, Oregon State University
32. Oct. 16th, 2002 “Terahertz pulse shaping via optical rectification in poled ferroelectric crystals and its application to time-domain molecular spectroscopy, PAIN, Department of Chemistry, Oregon State University
33. Jan. 18th, 2002 “Ultrahigh-Speed Movie Making with Femtosecond lasers: Terahertz Time-Domain Spectroscopy,” Research Seminar, Department of Physics at Oregon State University

34. Oct. 31th, 2001 “Fourth harmonic generation from crystalline surfaces,” Solid State Seminar, Department of Physics at Oregon State University
35. Oct. 29th, 2001 “Tunable Narrow-band THz generation from PPLN,” Oregon Center for Optics, University of Oregon

2.3. Workshops

1. March 2005, DARPA/MTO Site Review Meeting, Stanford University – invited speaker
2. November 2004, DARPA/MTO TIFT Kickoff Meeting, Sedona, AZ – attendee
3. June 2004, Summer Faculty Workshops: Paradigms in Physics (Spin & Quantum measurements), Corvallis, OR – attendee
4. 2001 AAPT Workshop for New Physics & Astronomy Faculty, One Physics Ellipse, College Park, MD – attendee

3. Grant and Contract Support

3.1 Current

Proposal/Project Title: Quantum control of electron-hole wave packets in semiconductor nanostructures with strong terahertz pulses

Source of Support: National Science Foundation

Project Location: Oregon State University

Total Award Amount: \$330,000

Start Date: 09/01/2011

End Date: 8/31/2014

PI: Yun-Shik Lee (OSU Physics)

Person Months Cal: 0.0 Acad: 0.0 Sumr: 1.0

Proposal/Project Title: Near-field terahertz microscopy for exploring graphene dynamics

Source of Support: National Research Foundation of Korea

Project Location: Oregon State University

Total Award Amount: \$272,000

Start Date: 10/01/2011

End Date: 09/30/2014

PI: Yun-Shik Lee (OSU Physics) and Hyunyong Choi (School of EEE, Yonsei Univ, Korea)

Person Months Cal: 0.0 Acad: 0.0 Sumr: 0.4

3.2 Previous Awards

Proposal/Project Title: Terahertz nanoantenna array based on carbon nanotubes

Source of Support: Oregon Nanoscience and Microtechnologies Institute (ONAMI)

Project Location: Oregon State University

Total Award Amount: \$200,000

Start Date: 07/01/2009

End Date: 12/31/2011

PI: Yun-Shik Lee (OSU Physics), Co-PIs: Ethan Minot, Viktor Podolskiy (OSU Physics)

Person Months Cal: 0.0 Acad: 0.0 Sumr: 1.0

Proposal/Project Title: Nonlinear terahertz electrodynamics in graphene
Source of Support: Oregon Nanoscience and Microtechnologies Institute (ONAMI)
Project Location: Oregon State University
Total Award Amount: \$180,708
Start Date: 07/01/2010
End Date: 12/31/2011
PI: Yun-Shik Lee (OSU Physics), Co-PIs: Ethan Minot, Guenther Schneider (OSU Physics)
Person Months Cal: 0.0 Acad: 0.0 Sumr: 0.5

Proposal/Project Title: Electromagnetically induced transparency in semiconductor nanostructures
Source of Support: University of Oregon
Project Location: Oregon State University
Total Award Amount: \$29,979
Start Date: 07/01/2009
End Date: 12/31/2011
PI: Yun-Shik Lee (OSU Physics)
Person Months Cal: 0.0 Acad: 0.0 Sumr: 0.5

Proposal/Project Title: CAREER: Coherent manipulation of carriers and nonlinear optical processes in semiconductor quantum wells via intense multi-cycle terahertz pulses
Source of Support: National Science Foundation
Project Location: Oregon State University
Total Award Amount: \$697,346
Start Date: 03/01/2005
End Date: 09/30/2011
PI: Yun-Shik Lee (OSU Physics)
Person Months Cal: 0.0 Acad: 0.0 Sumr: 0.0

ONAMI/ONR Nanometrology and Nanoelectronics Initiative (2007 ~ 2008)
Title: Electro-Optic Devices Based on Carbon Nanotubes with Terahertz Switching Capability
Funding agency: Oregon Nanoscience and Microtechnologies Institute/ Office of Naval Research
Award amount: \$100,000
PI: Yun-Shik Lee, Ethan Minot (OSU Physics)

ONAMI/ONR Nanometrology and Nanoelectronics Initiative (2006 ~ 2007)
Title: Terahertz spectroscopy of myoglobin: development of biosensors
Funding agency: Oregon Nanoscience and Microtechnologies Institute/ Office of Naval Research
Award amount: \$100,000
PI: Yun-Shik Lee
co-PIs: Wei Kong (OSU Chemistry), P. Shing Ho (OSU Biochemistry and Biophysics)

DARPA/TIFT (2004 ~ 2006)
Title: Efficient THz source based on cascaded optical down conversion in orientation patterned GaAs
Funding agency: Defense Advanced Research Projects Agency, MTO program

Award amount: \$1,512,802, (OSU \$152,080)

PI: Martin M. Fejer (Stanford University)

co-PIs: Yun-Shik Lee (OSU), David Bliss (Air Force Research Laboratory), Vladimir Kozlov (Microtech Instruments).

Kelley Family Fund (2003)

Title: KHz Ti:sapphire femtosecond laser amplifier system

Funding agency: Kelley Family Fund, Equipment Grants for Materials Science

Award amount: \$135,000

PI: Yun-Shik Lee

OSU Faculty Release Time (Spring 2002)

Award amount: \$4,000

PI: Yun-Shik Lee

4. Patent

(1) US Patent 7339718

Title: Generation of terahertz radiation in orientation-patterned semiconductors

Issue date: March 4, 2008

Inventors: Konstantin L. Vodopyanov, Yun-Shik Lee, Vladimir G. Kozlov, Martin M. Fejer

Note: This patent has been commercialized by Microtech Instruments Inc., a small company in Eugene, OR. The products, Terahertz Parametric Oscillators (model number: TPO-1500 and TPO-850, <http://www.mtinstruments.com/thzsources/index.htm>), were launched in 2011.

(2) Invention Disclosure – provisional patent filed with the USPTO in 2011

Title: Transistor with graphene base layer

Inventors: Ethan Minot, Yun-Shik Lee, John Conley, John Fisher Wager III, Douglas Keszler

5. Other Information

5.1 Collaborations

We have been collaborating with internationally renowned researchers to carry out several research projects. The results of the collaborations are described in detail in the Section C.

The refereed journal articles related to the collaborations are listed below: the reference numbers are from the section C.1.2.1. Articles in Journals.

(1) Study on terahertz-induced quantum dynamics of carriers in semiconductor nanostructures (2005 ~ present).

- Theory: Prof. Stephan W. Koch's group at University of Marburg
- Sample fabrication and characterization: Profs. Hyatt M. Gibbs and Galina Khitrova at University of Arizona and Prof. John Prineas at Iowa State University
- Research grant and publication: 2 NSF grants and 14 journal articles (Refs. 3,4,8,11,12,13,14,16,18,20,24,25,26,27)

(2) High-power terahertz generation in OP-GaAs structures (2004 ~ 2006).

- Sample fabrication: Prof. Martin Fejer and Dr. Konstantin Vodopyanov at Stanford University and Dr. Vladimir Kozlov at Microtech Instruments Inc.
 - Research grant and publication: 1 DARPA grant and 6 journal articles (Refs. 15,17,15,21,22,23)
- (3) Terahertz spectroscopy of graphene and carbon nanotubes (2007 ~ present)
- Sample fabrication: Prof. Paul Mcuen at Cornell University, Prof. Ethan Minot at OSU, Prof. Milo Koretsky at OSU, and Prof. Viktor Podolskiy at University of Massachusetts at Lowell.
 - Research grant and publication: 3 ONAMI/ONR grants and 7 journal articles (Refs. 1,2,5,6,7,9,10)
- (4) Near-field terahertz microscopy of graphene (2011 ~ present)
- Sample preparation: Prof. Hyunyong Choi at Yonsei University in Korea
 - Research grant: 1 National Research Foundation of Korea grant
- (5) Electromagnetically induced transparency in semiconductor nanostructures (2009 ~ present)
- Optical measurements: Prof. Hailin Wang at University of Oregon
 - Research grant: 1 ONAMI/ARL grant

5.2. Hosting Visiting Scholars

I have been hosting four visiting scholars. Working in my laboratory, Prof. Jui-Huik son, Mr. Hyeongmun Kim, and Mr. Hee-Jun Shin from University of Seoul in Korea carried out the research project of nonlinear terahertz spectroscopy of biological media (2011 ~2013). Young-Gyun Jeong from Seoul National University performed nonlinear THz spectroscopy of nanoslit antenna array on various substrates in the Fall of 2012.

D. SERVICE

1. University Service

University

2012 ~ present	College of Science Honors and Awards Committee	
2012	College of Science Interim Dean Screening Committee	
2001 ~ present	Graduate Council Representative	
Al Hamrani	ECE	MS 2002
Xia Ying	ECE	MS 2004
Iva Orhanovic	ECE	Ph.D. 2004
Kyle Harbert	ECE	MS 2004
Ozkan Erdem	EECS	Ph.D. 2005
Xiaochun Duan	EECS	Ph.D. 2005
Yolanda Tennico	CH	MS 2005
David Dutton	EECS	MS 2007
Zhang Wei	EECS	Ph.D. 2009
Karthik Jayaraman	ECE	MS 2009
Bahar Ozmen	CH	Ph. D. 2010
Divya Kesharwani	EECS	MS 2010
Arul Dhamodaran	EECS	MS 2011
Santosh Murali	EECS	MS 2011
Syed Feruz	EECS	Ph.D. candidate
Saurabh Saxena	EECS	Ph.D. candidate

Department

- 2001 Fall Colloquium Committee
- 2002 Winter Colloquium Committee
- 2002 Spring Colloquium Committee
- 2002 Fall Faculty Search Committee
- 2002 Fall Colloquium Committee
- 2003 Winter Faculty Search Committee
- 2003 Winter Chair on Colloquium Committee
- 2003 Spring Colloquium Committee
- 2003 Spring Faculty Search Committee
- 2003 Fall Open House aid
- 2003 Fall Faculty Search Committee
- 2004 Winter Faculty Search Committee
- 2004 Spring Faculty Search Committee
- 2005 Fall Graduate Admission Committee
- 2005 Fall Solid State Physics/Optics Seminar co-chair
- 2006 Spring Comprehensive Exam Committee
- 2006 Fall Comprehensive Exam Committee
- 2006 Fall Graduate Program Task Force
- 2007 Winter Graduate Program Task Force

- 2007 Spring Comprehensive Exam Committee chair
- 2007 Spring Solid State Physics/Optics Seminar chair
- 2008 P&T Committee and Teaching Subcommittee (Viktor Podolskiy)
- 2009 Fall and Winter Graduate curriculum chair
- 2009 Winter Solid State Physics/Optics Seminar chair
- 2009 Spring Graduate Research Award committee
- 2009 P&T Committee (Oksana Ostroverkova)
- 2010 Spring Faculty Search Committee
- 2011 P&T Committee and Teaching Subcommittee (Ethan Minot)
- 2012 P&T Committee and Teaching Subcommittee (Dave Bannon)
- 2012 P&T Committee (David Roundy)
- 2012 P&T Committee Chair (Guenter Schneider)
- 2012 Fall Comprehensive Exam Committee
- 2013 Winter Comprehensive Exam Committee
- 2010 Fall ~ 2012 Fall Department Advisory Council
- 2013 Fall Comprehensive Exam Committee
- 2013 P&T Committee and Teaching Subcommittee (David Roundy)
- 2013 P&T Committee Chair (Guenter Schneider)
- 2013 Fall and Winter Department Head Search committee
- 2013 Fall ~ present Department Advisory Council
- 2009 Fall ~ present Head Graduate Advisor

2. Service to the Profession

Professional Societies: Optical Society of America

Journal Editor: Guest editor of the Journal of Infrared, Millimeter and Terahertz Waves for the Special Issue, "Terahertz Spectroscopy of Carbon Nanostructures," (2011 ~ 2012)

Committees & Review Panels for Funding Agencies:

- Review panel for 2005 National Science Foundation NIRT program
- Review panel for 2006 National Science Foundation ECS program
- Reviewer for 2006 National Science Foundation CHE program
- Reviewer for 2006 National Science Foundation AMOP program
- Reviewer for 2007 National Science Foundation DMR CAREER program
- Reviewer for 2007 National Science Foundation AMOP program
- Reviewer for 2007 National Science Foundation DMR CAREER program
- Reviewer for 2007 National Science Foundation AMOP program
- Reviewer for 2008 National Science Foundation DMR CAREER program
- Reviewer for 2008 National Science Foundation AMOP program
- Review Panel for 2009 National Science Foundation DMR CAREER program
- Reviewer for 2009 National Science Foundation AMOP program
- Reviewer for 2010 National Science Foundation AMOP program
- Reviewer for 2011 Department of Energy Materials Sciences and Engineering program

Conference program committees:

Nonlinear Frequency Generation and Conversion: Materials, Devices, and Applications VII (LA106), *Part of the SPIE International Symposium on Lasers and Applications in Science and Engineering*, 2008 ~ present

Nonlinear Optics and Excitation Kinetics in Semiconductors (NOEKS) 2014

Conference session presiders:

Several international conferences including

CLEO 2011, 2009, 2007, 2006

CLEO/Pacific Rim 2007

OTST 2011, 2009

IRMMW-THz 2009, 2007

Photonics West 2007

Quantum Optics Workshop 2008

Journal Article Review since 2006:

Optics Letters – 9 manuscripts (2006 ~ 2011)

Optics Express – 10 manuscripts (2006 ~ 2011)

Applied Physics Letters – 6 manuscripts (2006 ~ 2011)

Journal of Optical Society of America – 4 manuscripts (2006 ~ 2011)

Proceeding of SPIE – 11, 13, and 7 manuscripts in 2008, 2010, and 2011

Applied Physics B – 2 manuscripts (2007, 2008)

Applied Optics – 2 manuscripts (2007, 2009)

Nature Photonics – 1 manuscript (2010)

IEEE proceedings – 1 manuscript (2007)

Journal of Applied Physics – 1 manuscript (2008)

Physica Status Solidi (C) – 1 manuscript (2008)

Vibrational Spectroscopy – 1 manuscript (2006)

Journal of Vacuum Science and Technology – 1 manuscript (2006)

Book Review:

Springer, Foundations for THz Engineering (2005)

Springer, Optical Millimeter-Wave and Terahertz Generation (2007)

Letters of Recommendation:

I have written letters of recommendation for professional positions for three colleagues. I wrote several letters of recommendation for graduate students applying for scholarships or financial assistance. Every year I write several letters of recommendation for 3~5 undergraduates seeking entrance to graduate school.

3. Service to the Public

- 2006 Family Science and Engineering Nights – Franklin Elementary School
- 2002 Job shadow program – Junction City High School
- 2003 Corvallis-Albany School District Think Tank - professional development opportunity for secondary science and math teachers
- 2003 New Teacher Institute for Physics/Physical science teachers
- 2002 ~ present: Lab tours for visitors (parents, K-12 students and science teachers, college students and instructors, etc. e.g., Pacific University (10-4-04)

E. AWARDS

1. National and International Awards

2007 **Humboldt Research Fellowship**

I am a recipient of the prestigious fellowship awarded by Alexander von Humboldt Foundation in Germany in 2007. I worked as a fellowship scholar in the University of Marburg in Germany between 2007 and 2008. During the period, I performed nonlinear optical spectroscopy of semiconductor QWs advising two graduate students. I also wrote an introductory book about terahertz science and technology, *Principles of Terahertz Science and Technology* published by Springer in 2009.

2005 – 2011 **National Science Foundation CAREER Award (Research)**

NSF CAREER award is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of the early career-development activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization.

2006 – present Marquis Who's Who in America

1992 – 1995 Korean Government Scholarship

2. State and Regional Awards

None

3. University and Community Awards

2012 Milton Harris Award in Basic research

2002 Finalist for the Carter Award (Teaching)