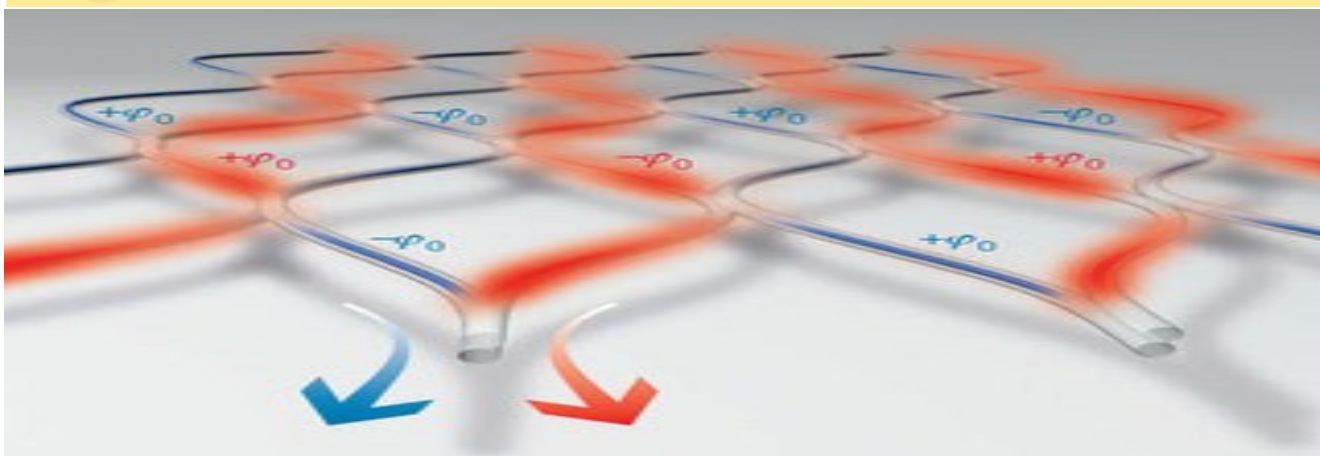


Annual Report

2012



University of Central Florida
CREOL – The College of Optics and Photonics



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Message from the Dean

One of the world's foremost institutions for research and education in optics and photonics, CREOL, The College of Optics and Photonics, started in 1987 as the *Center for Research in Electro-Optics and Lasers* (CREOL) and became a College in 2004, the first such college in the US. With the year 2012 marking our 25th anniversary we had a grand celebration and a technical symposium on March 15-16, 2012, with 330 attendees, including 3 Nobel Laureates, 15 world-renowned scientists, and representatives from key international optical societies. The CREOL@25 event was highlighted on the cover of the September 2012 issue of OSA's Optics and Photonics News.



During the last 25 years CREOL has graduated a total of more than 220 PhD and 330 MS students. World-renowned for their scholarly contributions to fundamental and applied optics and photonics, the faculty have published 27 books and more than 1,900 journal papers, which were cited more than 26,800 times.

The College has been an exciting place to have an outstanding educational experience leading to the MS and the PhD degrees, and to engage in research in a broad spectrum of programs covering materials, devices, and systems for applications including photonic technologies such as lasers; optical fibers; semiconductor and integrated photonic devices; nonlinear and quantum optics; and imaging, sensing and display. These technologies have applications in industry, communication and information technology, biology and medicine, energy and lighting, aerospace, and homeland security and defense. Advanced topics such as nanophotonics, attosecond optics, plasmonics, and biophotonics, are embraced as areas of strength and future growth. We are well positioned to take advantage of the revolution that is taking place in several fields enabled by optics and photonics. The College houses the *Florida Photonics Center of Excellence* (FPCE) and the *Townes Laser Institute*.

CREOL was initially founded to promote growth in optics and related fields here in central Florida and has maintained this tradition over the years. We provide the well-trained workforce that keeps the industry growing. The Florida Photonics Cluster is working to coordinate this industry's efforts and needs, and we also receive strong support from the Florida High Tech Corridor Council and Enterprise Florida. Since the founding of CREOL more than 170 industrial partners were affiliated with us and the faculty produced a total of 230 patents and spun off 23 photonics-based companies involving a wide variety of technologies.

Highlights of 2012

Several new faculty members were recruited this year. Dr. Konstantin Vodopyanov, an expert in nonlinear optics and biophotonics applications from Stanford University, has joined the faculty in January 2013 as the *21st Century World Class Scholar* in the area of biophotonics and laser applications. Dr. Kathleen Richardson, an expert in optical ceramics from Clemson University and former UCF faculty, has rejoined the faculty at the rank of Professor in Fall 2012. Also, Dr. Mercedeh Khajavikhan, an expert in nano-lasers from UCSD, has joined the faculty as Assistant Professor in Fall 2012. Another addition to the university in the nanophotonics area is Debashis Chanda. An expert in metamaterials and nano-photonics from UIUC, Dr. Chanda joined the NanoScience Technology Center with a joint appointment at CREOL.

The faculty continue to receive awards and recognitions at a national and international level. This year, Eric Van Stryland and CREOL alumnus Mansoor Sheik-Bahae, received the Optical Society (OSA) R. W. Wood Prize for their invention, implementation and development of the Z-scan method of measuring optical nonlinearities. Two other CREOL faculty are also recipients of the Wood prize: Demetrios Christodoulides in 2011 and George Stegeman in 2003. The National Academy of Inventors has named Leonid Glebov, S.T. Wu and M.J. Soileau as Charter Fellows for their highly prolific spirit of innovation. Guifang Li became Fellow of the IEEE and Eric Van Stryland became Fellow of APS. At the university level, Eric Van Stryland received a UCF Trustee Chair Professorship and Martin Richardson became Pegasus Professor.

In AY 2011-2012, 120 graduate students were enrolled and 12 PhD degrees and 18 MS degrees were awarded. The research performed by the faculty, students, and scientists was disseminated nationally and internationally in 3 books and 5 book chapters, 152 journal papers published in the reviewed literature, 139 conference papers and presentations, and 26 invited lectures. The College hosted 33 seminars delivered by external and internal speakers. Research and educational programs were funded by contracts and grants totaling approximately \$10.6M, including \$6.9M of federal funding. In 2012, we received approximately \$2.3M from industry or from federal grants flow through industrial partners, a connection that gives our students experience and a leg up on industry positions after they graduate. Our tradition of innovation has also continued; in 2012, the faculty were inventors or co-inventors on 23 issued patents, 15 provisional applications, and 19 patent disclosures. UCF was ranked 20th among US universities in the IEEE Spectrum 2012 Patent Power Scorecard; the rich IP productivity in optics and photonics has contributed significantly to this ranking.

This annual report provides a detailed description of the education, research, and partnership activities of the faculty, staff, and students during the 2012 calendar year. Key data for this year are also compared to previous years to show progress and identify trends. Information on more recent activities are regularly reported in the College's website <http://www.creol.ucf.edu/>. We hope you can find the information you need in this Annual Report or in the website.

Bahaa Saleh

1. Faculty and Staff

1.1 Faculty



Ayman F. Abouraddy

Assistant Professor of Optics

PhD, Electrical Engineering, Boston University, 2003

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Research

- Fabrication of multi-material micro-structured optical fibers
- Photonic band gap fibers
- Optical thermal, electric, and magnetic sensing using fibers
- Nonlinear fiber optics, supercontinuum generation
- Mid-infrared fibers, chalcogenide glass fibers
- Fibers for solar applications
- Quantum optics and quantum information processing
- Optical generation of entangled states for sensing and imaging
- Nanowire and nanoparticle synthesis

Other Experience

- Postdoctoral Fellow, 2003-05, Research Scientist, 2005-08, Research Laboratory of Electronics (RLE), M.I.T.

Professional Activities

- Program committee member, SPIE DSS, 2009
- Subcommittee member, CLEO, 2012

Honors and Awards

- Boston University President University Graduate Fellowship, 1997
- Ralph E. Powe Junior Faculty Enhancement Award



Rodrigo Amezcua Correa

Research Assistant Professor of Optics

Ph.D. Optoelectronics, University of Southampton, 2009

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Research

- Advanced optical fiber design and fabrication
- Photonic crystal fibers
- Fiber laser development
- Optical fiber devices and components
- Optical fiber sensors
- Nonlinear propagation in optical fibers
- Optical fiber for biomedical applications

Other Experience

- Laser Development Engineer, 2009-11, Powerlase Photonics
- Postdoctoral Researcher, 2007-09, University of Bath

Professional Activities

- Technical Committee Member, "2nd Workshop on specialty optical fibers and their applications", Oaxaca Mexico

Honors and Awards

- Graduate Student Scholarship, CONACYT, Mexico, 2004



Matthieu Baudelet

Research Assistant Professor of Optics

Ph.D., Physics, Université Claude Bernard Lyon 1, France, 2008

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Research

- Laser Spectroscopy and Sensing
- Analytical Spectroscopy
- Atomic and molecular spectroscopy
- Chemometrics and quantitative spectral analysis
- Stand-off-detection
- Laser Filamentation
- Molecular alignment
- Laser-induced plasmas
- Laser-matter interaction

Other Experience

- Section co-chair for SciX, conference of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)
- Manager of the LinkedIn group "Laser-induced breakdown spectroscopy"

Professional Activities

- Secretary of the North-American Society of Laser-Induced Breakdown Spectroscopy
- Member of the editorial advisory board of Spectroscopy magazine

Honors and Awards

- 2012 UCF Research Millionaire



Zenghu Chang

Distinguished Professor of Physics & Optics

Ph.D., Optics, Xi'an Institute of Optics & Precision Mechanics, 1988

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Research

- Attosecond science
- Terawatt femtosecond laser
- Ultrafast atomic physics
- Coherent XUV and x-ray sources
- High order harmonic generation
- X-ray streak camera and other detectors
- Near and mid-infrared femtosecond sources

Other Experience

- Ernest & Lillian Chapin Chair Prof., Kansas State University, 2009-10
- Professor, Department of Physics, Kansas State University, 2006-09
- Associate Prof. Dept. of Physics, Kansas State University, 2001-06
- Assistant Research Scientist, University of Michigan, 1999-01

Professional Activities

- Guest editor, Journal of Physics B., Attosecond special issue, 2012
- Co-chair, 5th Intl. Symposium, Ultra-fast Phenomena and THz Waves, China, 2010
- Co-chair of the 2nd International Conference on Attosecond Physics, Kansas, 2009

Honors and Awards

- Fellow, American Physical Society
- Mercator Professorship, German Science Foundation (DFG), 2007
- Huber Schardin Gold Medal, 1996



Demetrios Christodoulides

Professor of Optics

Ph.D., Electrical Engineering, Johns Hopkins University, 1986

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Research

- Nonlinear wave propagation
- Nonlinear optics
- Beam synthesis and dynamics
- Optical solitons
- Periodic and random optical structures
- Nonlinear optics in soft matter
- Quantum transport in arrays and photonic lattices

Professional Activities

- QELS Program Chair, CLEO/QELS, May 6-11, 2012, San Jose, CA
- Committee Chair, CLEO/QELS—QELS5, May 1-6, 2011, Baltimore, MD
- Committee Chair, CLEO/IQEC-IQEC5, May 18-20, 2010, San Jose, CA
- Committee Chair, CLEO/IQEC-IQE5, May 31-June 5, 2009, Baltimore, MD

Honors and Awards

- OSA's R. W. Wood Prize, 2011
- Fellow, Optical Society of America
- Fellow, American Physical Society
- Provost Research Enhancement Position (PREP) award



Peter J. Delfyett

Trustee Chair Professor of Optics, EE & Physics

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Research

- Fundamental ultrafast laser physics
- Ultrafast semiconductor lasers
- Stabilized optical frequency combs
- Optoelectronic device development
- Quantum dot based semiconductor devices for optical networks
- Ultrafast photonic networks and systems
- Optical clock distribution, synchronization & recovery
- Photonics ADC's and DAC's
- Coherent optical signal processing, DWDM, OTDM, and OCDMA Links

Other Experience

- Member of the Technical Staff, Bell Communications Research
- President, National Society of Black Physicists
- Founder - Raydiance, Inc.

Professional Activities

- Board of Directors, OSA; Board of Governors, IEEE - LEOS
- Editor in Chief, IEEE J. Selected Topics in Quantum Electronics
- General Chair, CLEO; General Chair IEEE LEOS Annual Meeting

Honors and Awards

- NSF Presidential Early Career Award for Scientists & Engineers
- Fellow, OSA, IEEE, APS
- APS Edward Bouchet Award
- UCF Pegasus Professor



Dennis Deppe

FPCE Endowed-Chair Professor of Optics

Ph.D., Electrical Engineering, University of Illinois, 1988

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Research

- Semiconductor devices
- Epitaxial crystal growth
- Nano-structures
- Nanophotonics

Other Experience

- ECE Department, UT Austin, 1990-05
- Member of Technical Staff, AT&T Bell Laboratories, 1988-90

Professional Activities

- Guest Editor, IEEE J. Selected Topics in Quantum Electronics, 1999
- Associate Editor, IEEE Photonics Letters, 1999-02
- Technical Program Committees, IEEE LEOS Annual Meeting, SPIE Photonics West, IEEE
- IEEE Semiconductor Laser Workshop Chair, 1998
- SPIE Conference Chair on VCSELs, 1997
- IEEE, LEOS Chair of the Semiconductor Laser Technical Committee, 99-02

Honors and Awards

- IEEE LEOS Engineering Achievement Award, 2003
- IEEE LEOS Distinguished Lecturer Award, 2001-02
- IEEE Fellow, 2000; OSA Fellow, 2000
- OSA Nicholas Holonyak Award
- NSF Presidential Young Investigator Award, 1991
- ONR Young Investigator Award, 1991



Aristide Dogariu

Professor of Optics

Ph.D., Engineering, Hokkaido University, Japan 1994

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Research

- -Optics of complex media
- -Waves propagation and scattering
- -Statistical optics
- -Optical sensing and imaging
- -Near field optics
- -Biophotonics
- -Optical systems analysis, modeling, and design

Other Experience

- Chair, "Mesoscale Photonics Incubator Meeting", OSA May 2012
- Chair, "Computational Optical Sensing and Imaging", OSA, 2009
- Chair, Topical Meeting "Computational Optical Sensing and Imaging", OSA, 2007
- Chair Biosensing Committee, "Topical meeting Coherent Optical Technologies and Applications", OSA, 2006
- Chair, Topical Meeting "Photon Correlation and scattering", OSA, 2004

Professional Activities

- Division Editor, Applied Optics - Optical Technology
- Member OSA Board of Editors
- Editorial Board: Journal of Holography and Speckle

Honors and Awards

- Fellow of American Physical Society
- Fellow of Optical Society of America
- Florida Photonics Center of Excellence (FPCE) Professorship



Sasan Fathpour

Assistant Professor of Optics & EE

Ph.D., Electrical Engineering, University of Michigan, 2005

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Research

- Silicon Photonics
- Optical Interconnects
- Electronic-Photonics Integrated Circuits
- Hybrid III-V Lasers on Silicon
- Nonlinear Integrated Optics
- Nonlinear Photovoltaic Effect in Semiconductors
- Integrated Plasmonics on Silicon

Other Experience

- Senior Researcher, Ostendo Technologies, Carlsbad, CA 2008
- Visiting Assistant Professor, Electrical Engineering Dept., UCLA 2007
- Postdoctoral Research Fellow, Electrical Engineering Dept., UCLA, 2005-07

Professional Activities

- Senior Member, SPIE
- Member, IEEE Photonics Society
- Senior Member, OSA

Honors and Awards

- NSF CAREER Award, 2012
- UCLA Chancellor's Award for Postdoctoral Research, 2007
- International Graduate Student Fellowship, University of Michigan, 2000



Romain Gaume

Assistant Prof. of Optics & NanoScience Technology

Ph.D., Materials Science; Paris VI University, France, 2002

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Research

- Fabrication of transparent ceramics: powder processing, shaping and sintering
- Applications of transparent ceramics to lasers and scintillators
- Gain-engineered solid state lasers
- Nuclear and radiological scintillation detectors
- Thermoelectric ceramic materials

Other Experience

- Postdoctoral Research scientist, Applied Physics Dept., Stanford University 2002-06
- Research Scientist, Applied Physics Dept., Stanford University, 2006-11
- Consultants: Shasta Crystals, Cyanto Corporation, Silicon Light Machines

Professional Activities

- Member: SPIE, ACerS

Honors and Awards

- Dissertation Thesis Award, 2002



Leonid B. Glebov

Research Professor of Optics

Ph.D., Physics, State Optical Institute, Leningrad, 1976

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Research

- Optical properties of glasses
- Photosensitive glasses for hologram recording
- Nonlinear phenomena, including laser-induced damage
- Holographic optical elements
- High Power laser systems

Other Experience

- Founder, Vice President and CTO of OptiGrate Corporation

Professional Activities

- Member, SPIE
- Member, Optical Society of America
- Member, American Ceramic Society
- Member, Directed Energy Professional Society

Honors and Awards

- Dennis Gabor Award in Holography
- Fellow, OSA
- Fellow, American Ceramics Society
- Fellow, National Academy of Inventors (NAI)
- Florida Photonics Center of Excellence (FPCE) Professorship



David J. Hagan

Associate Dean of Academic Programs, Professor of Optics & Physics

Ph.D., Heriot Watt University, 1985

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Research

- Nonlinear Optics
- Fundamental limits for nonlinear optical coefficients
- Nonlinear Optical Switching
- Semiconductors and Quantum dots
- Organics and Polymers
- Optical limiting and suppression
- Ultrasensitive techniques for measuring optical nonlinearities
- Ultrafast spectroscopy

Other Experience

- Founder, Polara, LLC.
- Photonics consultant, National Research Council "Defense After Next"

Professional Activities

- Editor-in-Chief, Optical Materials Express (current)
- Topical Editor, J. Opt. Soc. Am. B., (2006-10)
- Principal Editor, Journal of Materials Research (2001-06)
- Program Chair, Frontiers in Optics (2013)
- Senior Member, IEEE

Honors and Awards

- Fellow of OSA
- Ranked by ISI as "Highly Cited Researcher"
- College of Optics & Photonics Excellence in Research Award (2010-11)



Aravinda Kar

Professor of Optics, MMAE, EECS & Physics

Ph.D., Nuclear Engineering, University of Illinois at Urbana, 1985

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Research

- Laser-Advanced materials Science (LAMS)
- Lasers in manufacturing (LIM)
- Thermal science for LAMS and LIM
- Laser and optical science and technology
- Process modeling and diagnostics
- Semiconductor and optoelectronic materials processing
- Materials synthesis and development of new materials
- Medical materials
- Novel sensors, detectors and light-emitters

Other Experience

- Interdisciplinary science and technology
- Cross disciplinary courses (thermal science, materials and optics)
- Technology transfer from research to industrial implementation

Professional Activities

- Member, Laser Institute of America
- Editorials Board Member

Honors and Awards

- Fellow, Laser Institute of America
- Numerous Patents



Mercedeh Khajavikhan

Assistant Professor of Optics

Ph.D., Electrical Engineering, University of Minnesota, 2009

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Research

- Nanophotonics and silicon photonics
- Plasmonics and applied electromagnetics
- Laser Physics
- Quantum Optics
- Nano Fabrication

Other Experience

- Post-Doctoral Researcher, University of California, 2009-11
- Staff Researcher, University of California, 2012

Professional Activities

- Member, Optical Society of America, SPIE
- Reviewer, Optics letters, Optics Express, Applied Physics letter, IEEE Photonics Technology Letter, Applied Optics, Optical Communication, Journal of Optical Society A and B

Honors and Awards

- Norton Fellowship, University of Minnesota, 2005



Pieter G. Kik

Associate Professor of Optics & Physics

Ph.D., Physics, FOM Institute of Atomic Molecular Physics, Amsterdam (AMOLF), 2000

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Research

- Nanophotonics and near-field optics
- Near-field scanning optical microscopy
- Nanostructured optical waveguides
- Nanolithography
- Tunable plasmon optical nanosensors for biochemical detection
- Numerical modeling of nanophotonic integrated circuits
- Surface enhanced raman spectroscopy
- Rare earth doped optical materials
- Waveguide amplifiers

Other Experience

- Post-Doctoral Researcher, California Institute of Technology, 2001-03

Professional Activities

- Editor, Optics Communications
- Member, Materials Research Society
- Member, IEEE, SPIE
-

Honors and Awards

- 2007 NSF CAREER Award



Stephen Kuebler

Associate Professor of Chemistry & Optics

D.Phil, Chemistry, University of Oxford, 1998

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Research

- Laser-based patterning and material processing
- Laser beam shaping
- Nanophotonic structures and devices
- 3D nano and microfabrication
- Nonlinear optical Materials

Other Experience

- Assistant Staff Scientist, Chemistry, University of Arizona, 2001-03
- Research Associate, Chemistry, University of Arizona, 1999-01
- Post-Doctoral Researcher, California Institute of Technology, 1998-99

Professional Activities

- Editorial Board, J. of Micro/Nanolithography, MEMS, and MOEMS
- Editorial Board, Journal of Experimental Nanoscience
- Member of MRS, OSA, SPIE, and ACS
- Chair, Orlando Section of the American Chemical Society
- Marshall Scholarship Selection Committee, Atlanta Region

Honors and Awards

- NSF Career Award, January 2008
- Teaching Incentive Program Award, UCF, May 2009
- Excellence in Undergraduate Teaching Award, College of Sciences, UCF, March 2008
- Marshall Scholar, Association of Commonwealth Universities, UK, 1991
- NSF Graduate Fellowship, 1993
- Barry Goldwater Fellowship for physical sciences, 1989



Guifang Li

Professor of Optics, Physics & EECS

Ph.D., Electrical Engineering, University of Wisconsin- Madison, 1991

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Research

- Fiber-optic transmission systems
- All-optical signal processing
- Free-space optical communication
- Optical networking
- Fiber optics
- Microwave photonics
- Coherent detection and imaging

Other Experience

- Nonlinear surface polaritons
- Phase conjugation
- Nonlinear dynamics

Professional Activities

- Deputy Editor, Optics Express
- Associate Editor, IEEE Photonics Technology Letters

Honors and Awards

- ONR Young Investigator Award, 1995
- NSF CAREER Award, 1996
- IEEE EDS Distinguishes Lecturer
- Fellow of OSA and SPIE
- Florida Photonics Center of Excellence (FPCE) Professorship



Patrick L. LiKamWa

Associate Professor of Optics & ECE

Ph.D., Electronic & Electrical Engineering, University of Sheffield, UK, 1987

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Research

- Optoelectronics
- Integrated Optics Devices with Gain using resonant
- Novel semiconductor nanostructures for advanced optoelectronics
- Implement Monolithic All-Optical Switching Circuits
- Multi-platform integration using multilayer dielectric films for integrated
- Integrated optic bio-sensors
- Monolithically integrated wavelength tunable optical emitters

Other Experience

- Co-founder, Optium Inc.

Professional Activities

- Senior Member IEEE/LEOS

Honors and Awards

- IEEE/LEOS Orlando Chapter Engineer of the Year
- UCF Teacher Incentive Program
- College of Optics Excellence in Graduate Teaching Award



M. G. "Jim" Moharam

Professor of Optics

Ph.D., EE, University of British Columbia, Canada, 1978

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Research

- Diffractive holographic optics
- Integrated photonics grating based devices
- Computational photonics
- Theory and analysis of periodic structures
- Subwavelength periodic structures and devices
- Guided-waves grating resonant devices
- Analysis and design artificial metamaterial devices
- Novel integrated antireflective surfaces
- Grating based plasmonic structures

Other Experience

- Wave propagation in periodic and anisotropic media
- Analysis and design of optical filters
- Thin film optics

Professional Activities

- Topical Editor - JOSA - A
- Conference Chair, Topical meeting on diffractive optics
- Program Committee, SPIE Europe

Honors and Awards

- Fellow, Optical Society of America
- Senior Member, IEEE
- UCF Graduate Teaching Award



Kathleen A. Richardson

Professor of Optics

Ph.D., Ceramics, Alfred University, 1992

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Research

- Infrared Optical glass and glass ceramics
- Photosensitive infrared materials
- Integrated MIR Planar sensors
- Optics manufacturing science
- Mid-infrared optical metrology
- Precision Glass Molding (PGM)
- Graded Index Optical Materials

Professional Activities

- Member of the Board of Directors Society of Photo-Optical Instrumentation Engineers (SPIE)
- Associate Editor, International Journal of Applied Glass Science
- Advisory Board member, Virginia Tech's Materials Science and Engineering Dept.
- Coordinating Technical Council, International Commission on Glass
- Member of the Board of Trustees, Alfred University

Honors and Awards

- Fellow, Optical Society of America
- Outstanding Education Award, American Ceramic Society
- Tau Beta Pi Honor Society
- Samuel R Scholes Lecture and Award, Alfred University
- Fellow, SPIE
- Fellow, ACerS
- Fellow, Society of Glass Technology, United Kingdom



Martin C. Richardson

FPCE Trustee Chair; Northrop Grumman Prof. of X-ray Photonics; Prof. of Optics, Physics & ECE; Director, Townes Laser Institute
Ph.D., Physics; London, University, 1967
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Research

- Laser system development
- Femtosecond laser-aided materials processing
- Laser-induced-breakdown spectroscopy (LIBS)
- Biological x-ray microscopy
- Laser medicine
- Optical tweezers
- Physics of laser plasmas
- Plasma & radiation modeling - X-ray sources
- Ultra-fast X-ray production; interaction with matter diffraction studies
- X-ray and EUV optics
- Laser plasma EUV sources for lithography
- High energy lasers
- Solid state lasers
- High power fiber lasers development & High power ultrafast lasers
- Laser spectroscopy and sensing

Professional Activities

- Member, SPIE, APS, Program Committee; LEOS
- Directed Energy Consortium (UCF rep.), 2003
- Member, Expert Review Panel - Canadian Institute for Photonic Innovations, Canadian Govt.

Honors and Awards

- Fellow, OSA; Senior Member, IEEE
- Schardin Medal



Bahaa E. A. Saleh

Dean & Director, Professor of Optics

Ph.D., Electrical Engineering, Johns Hopkins University, 1971

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Research

- Nonlinear and quantum optics
- Quantum information processing
- Coherence and statistical optics
- Optical imaging and sensing

Other Experience

- Chair of ECE, Boston University, 1994-07
- Chair of ECE, University of Wisconsin-Madison, 1990-94
- Assoc. Director, ERC Center for Subsurface Imaging, 2000-09

Professional Activities

- Member, Board of Directors, LIA, 2011-present
- Founding Editor, *Advances in Optics and Photonics*, 2008-present
- Editor, *Journal of Optical Society of America A*, 1991-97
- Author, *Introduction to Subsurface Imaging*, Cambridge 2011
- Co-author of *Fundamentals of Photonics*, Wiley, 2nd ed., 2007
- Author, *Photoelectron Statistics*, Springer, 1978

Honors and Awards

- OSA Distinguished Service Award, 2009
- OSA Esther Hoffman Beller Medal, 1999
- Kuwait Prize, 2006
- SPIE BACUS Prize, 2004
- Fellow: IEEE, OSA, SPIE
- Fellow: Guggenheim Foundation



Winston V. Schoenfeld

Associate Professor of Optics

Ph.D., Materials Science, Univ. of California, Santa Barbara, 2000

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Research

- MBE growth of oxide semiconductors (wurtzite and cubic)
- Binary cubic oxide semiconductor solar-blind detectors
- Hybrid homoepitaxial zinc oxide-nitride laser diodes
- cSi photovoltaics
- Passive/active photonic crystal nanocavity systems

Other Experience

- Director, cSi Photovoltaic Manufacturing Consortium (PVMC)
- President/CEO, Medical Lighting Solutions, 2003-04
- Device Manager, Uniroyal Optoelectronics, 2000-03

Professional Activities

- Principal Editor, Journal of Materials Research
- Chair, MOEMS/MEMS Conference - Photonic West
- Executive Committee, Florida Chapter of the AVS

Honors and Awards

- Fellow of SPIE
- UCF TIP Award, 2010
- College Excellence in Graduate Teaching, 2009
- UCF Presidential Initiative Award, 2006



Axel Schülzgen

Professor of Optics

Ph.D., Physics, Humboldt University, 1992

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Research

- Fiber laser devices
- Fiber optic sensors
- Linear and nonlinear light propagation in fiber
- Nanostructured and functionalized fibers
- Design and fabrication of specialty optical fiber
- Advanced optical materials
- Linear and nonlinear optical spectroscopy

Other Experience

- College of Optical Sciences, The University of Arizona, 1996-09
- Department of Physics, Trinity College, Dublin, Ireland, 1995
- Department of Physics, Humboldt University, Berlin, Germany, 1991-95

Professional Activities

- Associate Editor, Applied Optics, Ultrafast Lasers and Optics
- Member, OSA, SPIE, German Physical Society

Honors and Awards

- Habilitation Fellowship, German Research Foundation, 1993
- Carl Ramsauer-Magnus Award, AEG Corporation, 1992
- Heinrich Gustav - Magnus Award, Humboldt University, Berlin, 1988



Lawrence Shah

Research Assistant Professor of Optics

Ph.D., Physics, University of Central Florida, 2001

lshah@creol.ucf.edu
(407) 823-2066

Research

- Fiber Laser
- Ultrafast Lasers
- Thin Disk Lasers
- Nonlinear optics for wavelength generation in the near-and mid-IR
- Laser Materials Processing

Other Experience

- Post doc, Lawrence Livermore National Laboratory, 2001-02
- Application Development and Laser Development Research Scientists, IMRA America Inc, 2002-08
- Senior Research Scientists, Laser Plasma Laboratory, 2008-12

Professional Activities

- Member, SPIE
- Member, OSA
- Member, DEPS
- Ultrafast sub-committee member for CLEO, 2006-08



M.J. Soileau

Vice Pres., Research & Commercialization
and Prof. of Optics, ECE & Physics

Ph.D., Quantum Electronics, University of Southern California, 1979

mj@ucf.edu
(407) 823-5538

Research

- Nonlinear optical properties of materials
- Laser-induced damage; Laser-induced damage to optical materials
- Nonlinear refraction nonlinear absorption; Sensor protection

Other Experience

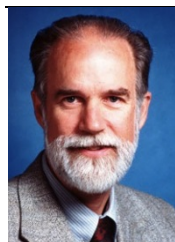
- Physicist, Naval Weapons Center Physics Div., China Lake, 1973-80
- Professor of Physics, North Texas State University, 1980-87
- Director, School of Optics/CREOL, 1987-99
- Chair of the Board, Orlando Science Center, 2002
- Technology-Based Economic Development; Technology Transfer
- Board of Directors, BEAM, Inc.; Board of Directors, Aquafiber

Professional Activities

- Member, SPIE, OSA, IEEE, LEOS, LIA, ASEE; President, SPIE, 1997
- International Advisory Committee on Coherent and Nonlinear Optics, 2001
- Co-Chair, OSA/SPIE Joint Task Force, 1998-99

Honors and Awards

- Director's Award, SPIE, 1999
- Fellow, OSA, IEEE, SPIE, AAAS; Senior Member, LIA
- Fellow, National Academy of Inventors (NAI)
- Outstanding Engineer Award, State of Florida, 1994
- Gold Medal of SPIE
- Esther Hoffman Beller Award of OSA
- Distinguished Service Appreciation Medal, presented by the Institute of Photonic Sciences, Barcelona, Spain



Eric W. Van Stryland

Professor of Optics, Past Dean

Ph.D., Physics; Optical Sciences, University of Arizona 1976

ewvs@creol.ucf.edu
(407) 823-6835
<http://nlo.creol.ucf.edu/>

Research

- Develop NLO spectroscopic techniques, e.g. Z-scan
- Measure nonlinear absorption spectra, e.g. two-photon absorption, 2PA
- Measure nonlinear refraction dispersion, e.g. bound electronic n₂
- Model material nonlinearities, 2PA, n₂, excited-state absorption, etc.
- Measure ultrafast NLO response and temporally resolve
- Develop nonlinear devices - e.g. widegap IR detectors using 2PA

Other Experience

- Dean, CREOL, The College of Optics and Photonics, 2004-09
- Director, School of Optics/CREOL, 1999-04
- Visiting Professor, Heriot-Watt University, 1985
- Chair, Center for Applied Quantum Electronics, U. of N. Texas, 1983-86
- Center for Laser Studies, University of South California, 1976-78

Professional Activities

- President, Optical Society of America (OSA), 2006, Board of Directors,
- Fellow, OSA, SPIE, IEEE-LEOS, APS; Senior member, LIA (Board of Directors)
- Topical Editor, Optics Letters, 1994-98

Honors and Awards

- UCF Pegasus Award, 2003
- UCF Researcher of the Year, 1990 and 2009; R&D 100 Award, 2001
- ISI Highly Cited Author
- OSA R. W. Wood Prize, 2012



Shin-Tson Wu

Pegasus Professor of Optics

Ph.D., Physics, University of Southern California, 1981

swu@creol.ucf.edu
(407) 823-4763
<http://lcd.creol.ucf.edu>

Research

- Next-Generation Liquid Crystal Displays
- Adaptive Lenses
- Adaptive Optics
- Biosensors
- Laser Beam Steering
- New Photonic Materials

Other Experience

- Senior Research Scientist, Hughes Research Labs

Professional Activities

- SID Honors and Awards Committee
- SPIE G.G. Stokes Award Committee
- Vice Chair, OSA Publication Council
- Founding Editor-In-Chief, IEEE/OSA Journal Display Technology

Honors and Awards

- 2011 SID Slottow-Owaki Prize
- 2010 OSA Joseph Fraunhofer Award
- 2008 SPIE G.G. Stokes Award
- 2008 SID Jan Rajchman Prize
- Florida Photonics Center of Excellence (FPCE) Professorship
- Provost Research Enhancement Position (PREP) award
- Fellow, National Academy of Inventors (NAI)



Boris Y. Zeldovich

Professor of Optics & Physics

Ph.D., Physics, Institute of Theoretical and Experimental Physics, Moscow, 1969

boris@creol.ucf.edu
(407) 823-6831

Research

- Physical optics and propagation
- Wave propagation in multimode optical waveguides and irregularly inhomogeneous media
- Beam clean-up and combining via nonlinear-optical processes
- Nonlinear optics, including liquid crystals

Other Experience

- Vice President, Beam Engineering for Advanced Measurements Co., Winter Park, FL
- Head of Joint Nonlinear Optics Laboratory, Electrophysics Institute of the Russian Academy of Sciences and Chelyabinsk Technical University, Russia, 1987-94
- Principal Senior Scientific Researcher, Institute for Problems in Mechanics, Moscow, 1981-87
- Lecturer on Nonlinear & Statistical Optics, Moscow Institute for Physics and Technology, 1969-1987

Professional Activities

- Editorial Board Member, Optics Communications; Pure & Applied Optics; Optical and Quantum Electronics; International Journal of Nonlinear Optical Physics & Materials Topical Editor, J. of Optical Society of America B

Honors and Awards

- Max Born Award, OSA, 1997
- Fellow, OSA
- Member of the Russian Academy of Sciences
- USSR State Prize for the discovery of optical phase conjugation, 1983

Emeritus Faculty



Larry C. Andrews

Emeritus Professor of Mathematics & Optics

Ph.D., Engineering, Michigan State University, 1970

Larry.andrews@ucf.edu
407-823-2418

Research

- Propagation of laser beams through random media
- Laser communication and laser radar

Other Experience

- Staff Mathematician, Antisubmarine Warfare Operation, Magnavox Co., Fort Wayne, IN
- Assistant Professor of Mathematics and Mechanics, Tri-State University, Angola, IN

Professional Activities

- Author of many textbooks and monographs on wave propagation through random media, applications to laser communications and radar, atmospheric optics, and advanced applied mathematics.

Honors and Awards

- Fellow, SPIE



Michael Bass

Professor Emeritus of Optics, Physics & ECE

Ph.D., Physics, University of Michigan, 1964

bass@creol.ucf.edu
(407) 823-6977
<http://bass.optics.ucf.edu/>

Research

- Display technologies; all-optical 2- and 3-dimensional displays
- Up-conversion processes in dielectric materials
- Laser systems development
- Solid state laser design
- Models for high-average-power solid state lasers
- Pump requirements, performance potentials and Limitations
- Spray cooling of diode laser bars
- Thermal management of diode laser arrays sources for solid state lasers

Other Experience

- Senior Research Scientist, Raytheon, 1966-73
- Director, Center for Laser Studies, USC, 1977-84
- Chair, EE Electrophysics, USC, 1984-87
- Vice President for Research, UCF, 1988-93

Professional Activities

- Associate Editor, Optics Express
- Editor-in-chief "Handbook of Optics, 2nd and 3rd editions, OSA
- Associate Editor, 100th Anniversary of OSA commemorative books

Honors and Awards

- Fellow, Optical Society of America (OSA)
- Fellow, IEEE



Ronald L. Phillips

Emeritus Professor of EECS & Optics

Ph.D., Electrical Engineering, Arizona State University, 1971

Ronald.phillips@ucf.edu

Research

- Laser Space Communication Systems
- Laser Radar
- Detection Theory and Math Modeling
- Optical Wave Propagation Through Random Media
- Random Field Theory

Other Experience

- Academic positions at Arizona State University and the University of California, San Diego.

Professional Activities

- Founding Director, UCF Florida Space Institute (FSI)
- Founding Director of CREOL
- Author of 3 books in the topic of wave propagation through random media and applications to laser communications and radar.
- Co-author of a text on advanced applied mathematics.

Honors and Awards

- Senior NATO Post-doctoral Fellow
- ASEE 1983 Medal Outstanding Contributions to Research
- Florida Space Business Roundtable Explorer Award for education
- Fellow, OSA, SPIE



William Silfvast

Emeritus Professor of Optics

Ph.D., Physics, University of Utah, 1965

silfvast@creol.ucf.edu

(407) 823-6855

<http://silfvast.creol.ucf.edu/>

Research

- X-Ray science and technology
- EUV lithography and microscopy
- X-Ray theory - X-Ray Lasers

Other Experience

- Chair, UCF Department of Physics, 1994-97
- Distinguished Member Technical Staff, ATT-Bell Labs, 1994-97

Professional Activities

- Co-Chair, CLEO, 1983
- Board of Directors, OSA. 1986-00
- Program Committee Member, LEOS, 1994-00
- Author, Textbook: "Laser Fundamentals," Cambridge University Press

Honors and Awards

- Fellow, Optical Society of America, American Physical Society, IEEE
- Guggenheim Fellow, Stanford University
- Distinguished Member Technical Staff, ATT-Bell Labs, 1983
- NATO Postdoctoral Fellow
- Researcher of the Year, University of Central Florida, 2000



George I. Stegeman

Emeritus Professor of Optics, Physics & EECS

Ph.D., Physics, University of Michigan, 1964

george@creol.ucf.edu

(407) 629-2944

Research

- Discrete optics, linear and nonlinear, solitons

Other Experience

- Distinguished Professor, University of Toronto

Professional Activities

- Editor-in-Chief, Journal of the OSA B
- Organizing Committee, NOA 2011, Torun Poland, June 2011
- Editorial Board, Physics Reports, Responsible for Optics, 2005-present
- Chair Professor, College of Engineering, King Fahd University, Saudi Arabia

Honors and Awards

- Cobb Family Chair, UCF
- Fellow, Optical Society of America
- Fellow, American Physical Society
- Hertzberg Medal for Achievement in Physics
- R. W. Wood Prize for the Optical Society of America (2003)
- Bluto Award of the Polish Photonics Society, 2011
- Doctor Honoris Causa, Instituto Nacional de Astrofísica, Óptica y Electrónica (INAE), 2011

Visiting Faculty

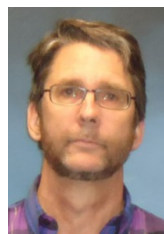


ANGELA GUZMAN

Visiting Research Associate
Professor

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KEITH KASUNIC

Adjunct Professor, Instructor

kkasuni@creol.ucf.edu



MALVIN C. TEICH

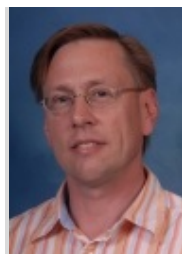
Visiting Research Professor

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Quantum Optics

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Joint Appointments



KEVIN D. BELFIELD

Department Chair & Prof. of Chemistry
and Optics

Ph.D., Syracuse University

Multiphoton Absorbing Materials

Belfield@ucf.edu



DEBASHIS CHANDA

Assistant Professor, AMPAC/NSTC

Ph.D., University of Toronto

Debashis.Chanda@creol.ucf.edu



LOUIS CHOW

Professor and Univ. Chair of MMAE

Ph.D., University of California,
Berkeley

Heat Transfer Issues in Electro-Optics

Louis.chow@ucf.edu



ANDRE GESQUIERE

Assoc. Prof., Nanoscience Technology
Center, Chemistry, and Optics

Ph.D., University of Leuven

Optoelectronic Materials, Nanobiology

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FLORENCIO E. HERNANDEZ

Assoc. Prof. of Chemistry & Optics

D.Sc., Universidad Central de
Venezuela & Université Franche-comté

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DAVID KAUP

Provost Distinguished Research Prof.
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MICHAEL LEUENBERGER

Assoc. Prof. of Physics and Optics

Ph.D., University of Basel

Quantum Information

Michael.leuenberger@ucf.edu



ROBERT E. PEALE

Professor of Physics and Optics

Ph.D., Cornell University

Defects in Semiconductors

Robert.peale@ucf.edu



ALFONS SCHULTE

Professor of Physics and Optics

Dr. rer. Nat, Technical University of
Munich

Near-IR Raman Spectroscopy

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MUBARAK A. SHAH

Agere Chair Professor of Computer
Science and Optics

Ph.D., Wayne State University

Computer Vision

Mubarak.shah@ucf.edu

**MICHAEL SIGMAN**

Associate Professor of Chemistry and Optics

Ph.D., Florida State University

Explosives, Chemistry & Forensics

Michael.sigman@ucf.edu

**JAYAN THOMAS**

Assistant Professor of Nanoscience & Technology

Ph.D., Cochin University of Science & Technology

Jayan.Thomas@ucf.edu

**THOMAS X. WU**

Associate Professor of EECS & Optics

Ph.D., University of Pennsylvania

Numerical Techniques in Electromagnetics

Thomas.wu@ucf.edu

**CYNTHIA YOUNG**

Professor of Math and Optics

Ph.D., University of Washington

Laser Propagation in Random Media

Cynthia.young@ucf.edu

Courtesy Appointments

**Glenn D. Boreman**

Professor and Chair
Univ. North Carolina

Ph.D., Optical Sciences, University of Arizona, 1984

gboreman@uncc.edu

**KURT BUSCH**

Prof. of Physics, Univ. Karlsruhe

Ph.D., University of Karlsruhe

kurt@tfp.uni-karlsruhe.de

**BRUCE H. CHAI**

President, Crystal Photonics

Ph.D., Yale University

chai@crystalphotonics.com

**JASON EICHENHOLZ**

Divisional Technology Director, Halma
CEO, Open Photonics, Inc.

Ph.D., CREOL, University of Central Florida

jason@open-photonics.com

**James E. Harvey**

Associate Professor of Optics & ECE

Ph.D., Optical Sciences, University of Arizona, 1976

harvey@creol.ucf.edu

**HANS P. JENSSEN**

AC Materials

Ph.D., MIT

h.jenssen@ac-materials.com

**ERIC G. JOHNSON**

Professor of Physics & Optical Science

University of North Carolina Charlotte

Ph.D., University of Alabama

egjohnso@uncc.edu

**JANNICK ROLLAND**

Brian J. Thompson Prof. of Optical Engineering, Prof. of Biomedical Engineering, University of Rochester

Ph.D., University of Arizona

Optical Diagnostics & Applications

rolland@optics.rochester.edu

**EMIL WOLF**

Wilson Professor of Optical Physics

Ph.D., Bristol University, England

Optical Coherence

ewlupus@pas.rochester.edu

Awards and Honors



1997 Max Born Award
 1999 Nicholas Holonyak Award
 1999 Esther Hoffman Beller Award
 2008 Esther Hoffman Beller Award
 2008 Distinguished Service Award
 2010 Joseph Fraunhofer/Robert M. Burley Prize
 2003 R. W. Wood Prize
 2011 R. W. Wood Prize
2012 R. W. Wood Prize

Boris Zeldovich
 Dennis Deppe
 Bahaa Saleh
 M.J. Soileau
 Bahaa Saleh
 Shin-Tson Wu
 George Stegeman
 Demetrios Christodoulides
Eric Van Stryland



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 Advancing light.
SPIE is the international society
 for optics and photonics

1995 Kingslake Medal and Prize
 2004 Bacus Award
 2008 Dennis Gabor Award
 2008 G. G. Stokes Award
 2008 Gold Medal Award

Glenn Boreman
 Bahaa Saleh
 Leonid Glebov
 Shin-Tson Wu
 M.J. Soileau



2003 Engineering Achievement

Dennis Deppe



2008 Jan Rajchman Prize
 2011 Slottow–Owaki Prize

Shin-Tson Wu
 Shin-Tson Wu



2011 Edward A. Bouchet Award

Peter Delfyett



NSF Presidential Early Career Award (PECASE)(1997)
 NSF Presidential Young Investigator Award (1991)
NSF CAREER Award (2012)
 NSF CAREER Award (2007)
 NSF CAREER Award (2008)
 NSF CAREER Award (1996)

Peter Delfyett
 Dennis Deppe
Sasan Fathpour
 Pieter Kik
 Stephen Kuebler
 Guifang Li



ONR Young Investigator Award (1991)
 ONR Young Investigator Award (1995)

Dennis Deppe
 Guifang Li



Ralph E. Powe Junior Faculty Award (2009)

Ayman Abouraddy

John Simon Guggenheim
 Memorial Foundation

Guggenheim Fellow (1984)

Bahaa Saleh



ACS Outstanding Educator Award (2009)

Kathleen Richardson

International Awards

Foreign Member, Russian Academy of Science (1994)
 Hubert Schardin Gold Medal Medal (1996)
 Hubert Schardin Gold Medal Medal (1976)
 Kuwait Prize (2006)
 Habilitation Grant, German Research Foundation (1993)
 Carl-Ramsauer-Award of the AEG AG (1992)
ICFO's Distinguished Service Appreciation Medal (2012)
 USSR Academy of Sciences (1987)
 USSR State Prize (1983)

Michael Bass
 Zenghu Chang
 Martin Richardson
 Bahaa Saleh
 Axel Schülzgen
 Axel Schülzgen
M.J. Soileau
 Boris Zeldovich
 Boris Zeldovich

Fellows of Professional Societies



Michael Bass
 Glenn Boreman
 Demetrios Christodoulides
 Peter Delfyett
 Dennis Deppe

Aristide Dogariu
 Leonid Glebov
 David Hagan
 Guifang Li
 Jim Moharam

James Pearson
 Kathleen Richardson
 Martin Richardson
 Bahaa Saleh
 William Silfvast

M.J. Soileau
 George Stegeman
 Eric Van Stryland
 Shin-Tson Wu
 Boris Zeldovich



Michael Bass
 Peter Delfyett
 Dennis Deppe
Guifang Li
 James Pearson

Bahaa Saleh
 William Silfvast
 M.J. Soileau
 Eric Van Stryland
 Shin-Tson Wu



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 Guifang Li
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 Bahaa Saleh
 Winston V. Schoenfeld
 M.J. Soileau
 Eric Van Stryland
 Shin-Tson Wu



Zenghu Chang
 Aristide Dogariu
 Demetrios Christodoulides
 Peter Delfyett
 Eric Van Stryland



Shin-Tson Wu



Laser Institute
 of America

Aravinda Kar



Leonid Glebov
 Kathleen Richardson



Leonid Glebov
M.J. Soileau
Shin-Tson Wu

Presidents, Directors and Officers of Professional Societies



Eric Van Stryland
Michael Bass
Peter Delfyett
Bahaa Saleh
Eric Van Stryland

President (2006)
Board of Directors Member (1989-1992)
Board of Directors Member (2004-2006)
Board of Directors Member (1998-2005)
Board of Directors Member (1998-2001)



SPIE

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SPIE is the international society
for optics and photonics

M.J. Soileau
Glenn Boreman
James Harvey
Kathleen Richardson

President (1997)
Board of Directors Member (1997-1999)
Board of Directors Member (2001-2003)
Board of Directors Member (2012-2015)



Shin-Tson Wu
Peter Delfyett
Jim Moharam

Board of Governors (2003-present)
Board of Governors (2000-2002)
Vice-President (1997-1999)



**Laser Institute
of America**

Michael Bass
Michael Bass
Aravinda Kar
Bahaa Saleh
Eric Van Stryland

President (1988)
Board of Directors Member (1985-1989)
Board of Directors Member (2005)
Board of Directors Member (2010- present)
Board of Directors Member (1992-1994)



**National Society of
Black Physicists**

Peter Delfyett

President (2008-2011)



Kathleen Richardson

Board of Directors Member (2008-2011)



**National Institute of
Ceramic Engineers
(NICE)**

Kathleen Richardson

President (2008-2009)

Journal Editors & Associate Editors

Journal Editors

Journal of the Optical Society of America B (1984–1987)	Michael Bass
Applied Optics (2000–2005)	Glenn Boreman
Applied Optics/Optical Technology (1998–2003)	Glenn Boreman
Applied Optics/Optical Technology (2004–2010)	Aristide Dogariu
IEEE Journal of Selected Topics in Quantum Electronics (2001–2006)	Peter Delfyett
IEEE/LEOS Newsletter (1995–2000)	Peter Delfyett
Optics Communications (2011–2012)	Pieter Kik
Optical Materials Express (2010–present)	David Hagan
Journal of the Optical Society of America A (1991–1997)	Bahaa Saleh
Advances in Optics & Photonics (2008–present)	Bahaa Saleh
IEEE/OSA Journal of Display Technology (2004–2008)	Shin-Tson Wu

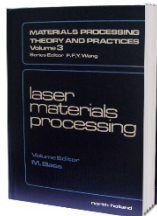
Associate/Topical Editors

Optics Express (2001–2001)	Michael Bass
Optical Engineering (Radiometry & Detectors) (1998–1999)	Glenn Boreman
Applied Optics (Radiometry & Detectors) (1992–1997)	Glenn Boreman
Optics Express (2009–present)	Glenn Boreman
International Journal of Optics (2008–present)	Glenn Boreman
IEEE Photonics Technology Letters (1995–2003)	Peter Delfyett
IEEE J. of Quantum Electronics (1996–2001)	Demetrios Christodoulides
Journal of the Optical Society of America B (2001–2003)	Demetrios Christodoulides
Journal of the Optical Society of America B (2007–2013)	David Hagan
Journal of Materials Research (2000–2007)	David Hagan
Optics Express (2007–present)	Guifang Li
Photonics Technology Letters (2007–present)	Guifang Li
Journal of the Optical Society of America A (1998–2004)	Jim Moharam
International Journal of Applied Glass Science (2009–present)	Kathleen Richardson
Journal of Quantum Electronics (1980–1986)	Martin Richardson
Journal of the Optical Society of America A (1984–1990)	Bahaa Saleh
Journal of the Optical Society of America (1980–1983)	Bahaa Saleh
Journal of Materials Research (2007–present)	Winston Schoenfeld
Applied Optics (2008–present)	Axel Schülzgen
Optics Letters: Nonlinear Optics (1995–1998)	Eric Van Stryland
Reviews of Scientific Instruments (1978–1981)	Eric Van Stryland
IEEE/OSA Journal of Display Technology (2008–present)	Shin-Tson Wu
Liquid Crystals (2009–present)	Shin-Tson Wu

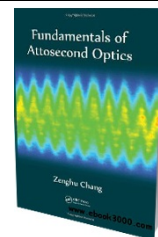
Authors & Editors of Books

Michael Bass,

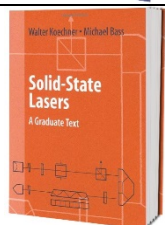
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Elsevier (1983).



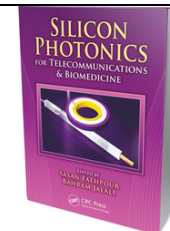
Zenghu Chang, *Fundamentals of Attosecond Optics*, CRC Press (2011).



Walter Koechner and **Michael Bass,**
Solid-State Lasers: A Graduate Text,
Springer (2003).



Sasan Fathpour and Bahram Jalali,
Silicon Photonics for Telecommunications and Biomedicine, CRC Press (2012).



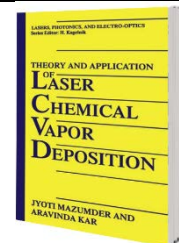
Michael Bass, Casimer DeCusatis,
Jay Enoch and Vasudevan
Lakshmina-rayanan, **Guifang Li**,
Carolyn MacDonald, Virenda
Mahajan, and **Eric Van Stryland**,
Handbook of Optics, 3rd ed.,
McGraw-Hill (2009).



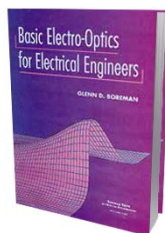
Alexander V. Dotsenko, **Leonid B. Glebov** and Victor A.
Tsechomsky, *Physics and Chemistry of Photochromic
Glasses*, CRC Press (1997).

Volume I: *Geometrical and Physical Optics, Polarized
Light, Components and Instruments*. Volume II:
*Design, Fabrication and Testing, Sources and
Detectors, Radiometry and Photometry*.
Volume III: *Vision and Vision Optics*.
Volume IV: *Optical Properties of Materials, Nonlinear
Optics, and Quantum Optics*.
Volume V: *Atmospheric Optics, Modulators, Fiber
Optics, X-Ray and Neutron Optics*.

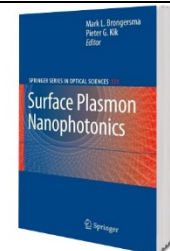
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*Theory and Application of Laser
Chemical Vapor Deposition*, Springer
(1995).



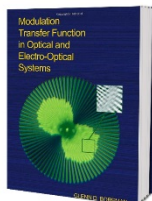
Glenn D. Boreman, *Basic Electro
Optics for Electrical Engineers* (SPIE
Tutorial Texts in Optical Engineering
Vol. TT31), SPIE (1998). Translated
to Spanish, “Fundamentos de
ElectroOptica para Ingenieros”, SPIE
Tutorial Texts in Optical Engineering
Vol. TT37 (1999).



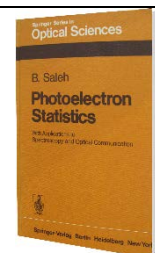
Mark L. Brongersma and **Pieter G.
Kik**, *Surface Plasmon
Nanophotonics*, Springer (2010).

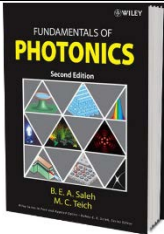
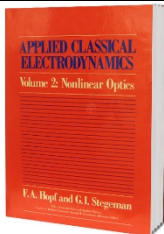
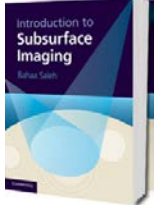
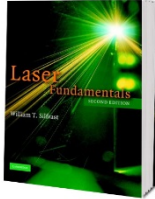
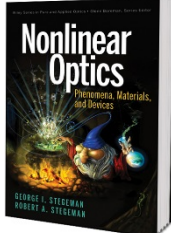
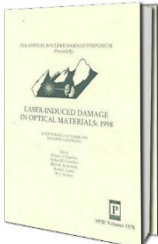
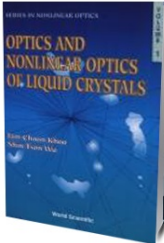
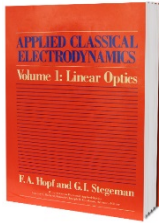
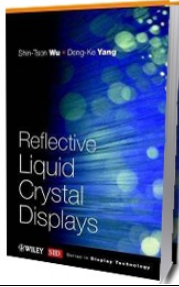
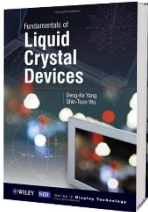
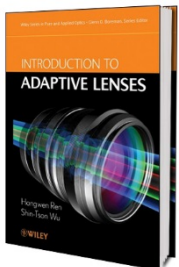


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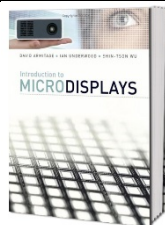


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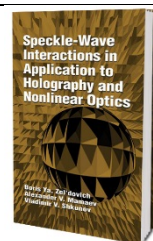


<p>Bahaa E. A. Saleh, and Malvin C. Teich, <i>Fundamentals of Photonics</i>, Wiley 2nd ed. (2007). German edition, <i>Grundlagen Der Photonik</i>, Wiley-VCH (2008).</p> 	<p>George I. Stegeman and Frederic A. Hopf, <i>Applied Classical Electrodynamics</i>, Vol. 2: <i>Nonlinear Optics</i>, Wiley (1986).</p> 
<p>Bahaa E. A. Saleh, <i>Introduction to Subsurface Imaging</i>, Cambridge University Press (2011).</p> 	<p>Carlo G. Someda and George I. Stegeman, <i>Anisotropic and Nonlinear Optical Waveguides</i>, Elsevier (1992).</p>
<p>William T. Silfvast, <i>Laser Fundamentals</i>, Cambridge University Press, 2nd ed. (2008).</p> 	<p>George I. Stegeman and Robert Stegeman, <i>Nonlinear Optics, Phenomena, Materials and Devices</i>, Wiley, (2012).</p> 
<p>Gregory J. Exarhos, Arthur H. Guenther, Mark R. Kozlowski, Keith L. Lewis and M. J. Soileau, <i>Laser-Induced Damage in Optical Materials</i>, SPIE (1997).</p> 	<p>Robert Crane, Monte Khoshnevisan, Keith Lewis, Eric Van Stryland, Eds., <i>Materials for Optical Limiting</i>: Volume 374 (MRS Proceedings), (1995).</p>
<p>Arthur H. Guenther, Mark R. Kozlowski, M.J. Soileau and Gregory J. Exarhos (Eds.) <i>Laser-Induced Damage in Optical Materials</i>, SPIE (1999).</p>	<p>Iam-Choon Khoo and Shin-Tson Wu, <i>Optics and Nonlinear Optics of Liquid Crystals</i>, Wiley (1993).</p> 
<p>Frederic A. Hopf and George I. Stegeman, <i>Applied Classical Electrodynamics</i>, Vol. 1: <i>Linear Optics</i>, Wiley (1985).</p> 	<p>Shin-Tson Wu and Deng-Ke Yang, <i>Reflective Liquid Crystal Displays</i>, Wiley (2001).</p> 
<p>Shin-Tson Wu and Deng-Ke Yang, <i>Fundamentals of Liquid Crystal Devices</i>, Wiley (2006).</p> 	<p>Hongwen Ren and Shin-Tson Wu, <i>Introduction to Adaptive Lenses</i>, Wiley, (2012)</p> 

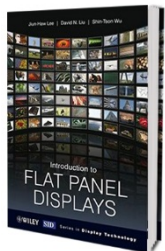
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Jun-Haw Lee, David N. Liu and **Shin-Tson Wu**, *Introduction to Flat Panel Displays*, Wiley (2009).



Awards & Honors (2012)

National/International

OSA R. W. Wood Prize

IEEE Fellow

APS Fellow

National Academy of Inventors (NAI)

ICFO's Distinguished Service Appreciation Medal

NSF Career Award

Eric Van Stryland

Guifang Li

Eric Van Stryland

Leonid Glebov, M.J. Soileau, S.T. Wu

M.J. Soileau

Sasan Fathpour

University

Pegasus Professor

Trustee Chair Professorship

Teaching Incentive Program Award (College Level)

Teaching Incentive Program Award (College Level)

Research Incentive Award (College Level)

Excellence in Graduate Teaching Award (college level)

Excellence in Research Award (college level)

Martin Richardson

Eric Van Stryland

Patrick LiKamWa

Demetrios Christodoulides

David Hagan

Peter Delfyett

Aristide Dogariu

M.J. Soileau (left) receiving the Distinguished Service Appreciation Medal for his outstanding dedication to the development of ICFO–The Institute of Photonic Sciences in Barcelona, Spain, in the areas of institutional organization and technology transfer.



1.2 Research Staff

Senior Research Scientist

Ivan Divliansky (Prof. Glebov's group)
Sabine Freisem (Prof. Deppe's group)
Julien Lumeau (Prof. Glebov's group)

George Venus (Prof. Glebov's group)
Ilja Mingareev (Prof. M. Richardson's group)
Scott Webster (Groups of Profs. Bass, Hagan, Van Stryland)

Research Scientist

Andrey Krywonos (Prof. Harvey's group)
Shivappa Gadag (Prof. Kar's group)
Qi Hong (Prof. Wu's group)
Guy Zummo (Prof. Boreman's group)
Haiqing Xianyu (Prof. Wu's group)
Igor Ciapurin (Prof. Glebov's group)
Larissa Glebova (Prof. Glebov's group)
Payam Rabiei (Prof. Fathpour's group)

Sergey Sukhov (Prof. Dogariu's group)
Vadim Smirnov (Prof. Glebov's group)
Homaira Parchamy Araghy (Prof. M. Richardson's group)
Hong Shu (Prof. Bass' group)
Karima Chamma (Prof. Glebov's group)
Christine Spiegelberg (Prof. Glebov's group)
Giorgio Turri (Prof. Glebov's group)
Yeong-Ren Lin (Prof. Chow's group)

Post-doctoral Research Associate

Dmitry Fishman (Profs. Hagan & Van Stryland group)
Samuel Paul David (Prof. Gaume's group)
Magali Durand (Prof. Richardson's group)

Ibrahim Ozdur (Prof. Li's group)
Majid Masnavi (Prof. Richardson's group)

Visiting Research Scientists

Hongyun Chen (Prof. Wu's group)
Ashraf Elsharif (Prof. Richardson's group)
Olga V. Przhonska (Prof. Hagan/Van Stryland)
Matthias Heinrich (Prof. Christodoulides's group)
Bruno Bousquet (Prof. Richardson's group)
Nikolai Vorobiev (Prof. Glebov's group)
Harby Ahmed (Prof. Richardson's group)
Giovanni Di Giuseppe (Prof. Saleh's group)
Irina Popkova (Prof. Glebov's group)
Fedor Kompan (Prof. Glebov's group)
Dagong Jia (Prof. Li's group)
Jing Zhang (Prof. Li's group)
Julio Cesar Hernandez Herrejon (Prof. Christodoulides' group)
Juangying Zhao (Prof. Christodoulides' group)

Binfeng Yun (Prof. Kik's group)
Armando Perez Leija (Prof. Christodoulides's group)
Jose Antonio Lopez (Prof. Amezcua/Schülzgen group)
Sergiy Mokhov (Prof. Glebov's group)
Dijun Chen (Prof. Bass' group)
Jun Hyup Lee (Prof. Wu's group)
Yi-Fen Lan (Prof. Wu's group)
Hector Moya Cessa (Prof. Christodoulides's group)
Felix Jose Salazar Bloise (Prof. Dogariu's group)
Amarendra Sarma (Prof. Christodoulides' group)
Chun-Da Tu (Prof. Wu's group)
Xunsi Wang (Prof. Abouraddy's group)
Hongxia Zhang (Prof. Wu's group)

Lab Technicians

Arthur Freeman (Prof. M. Richardson's group)
Lorrene Denney (Prof. Dogariu's group)

Senior Electrical Engineer

Somsak (Tony) Teerawattanasook (Prof. M. Richardson's group)

Special Assistants



DR. JAMES PEARSON

Special Consultant

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(407) 823-6858



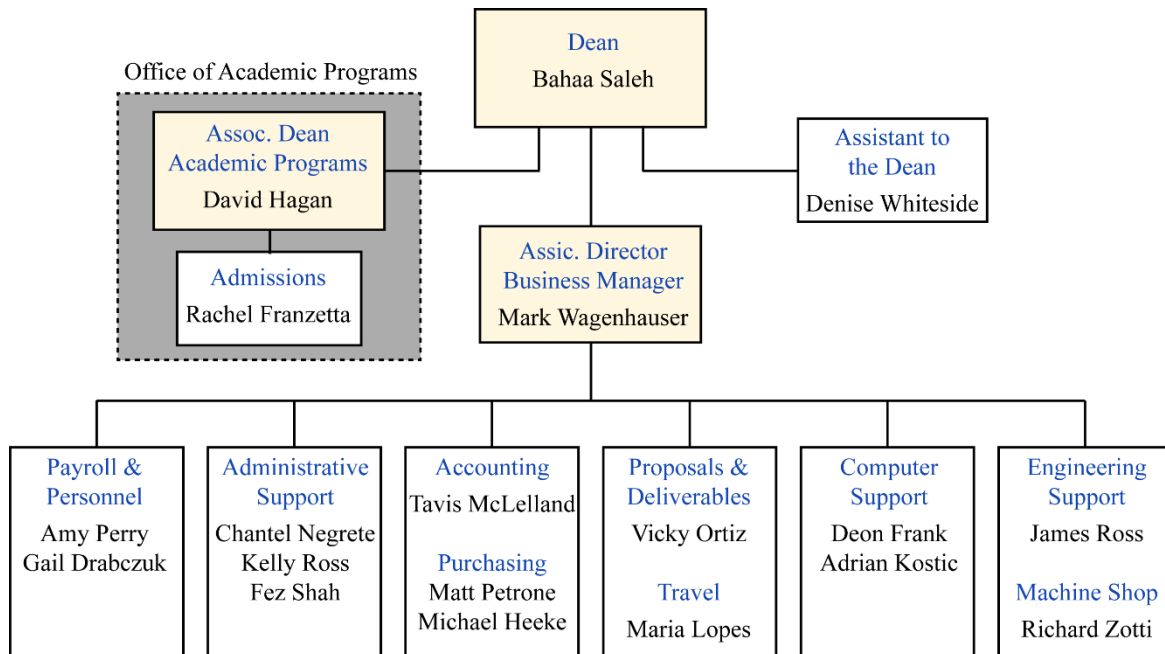
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Special Assistant to the Vice
President, Research and
Commercialization

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(407) 628-2514

1.3 Organization and Administrative Staff

Organization Chart



The CREOL Building

Administrative Staff



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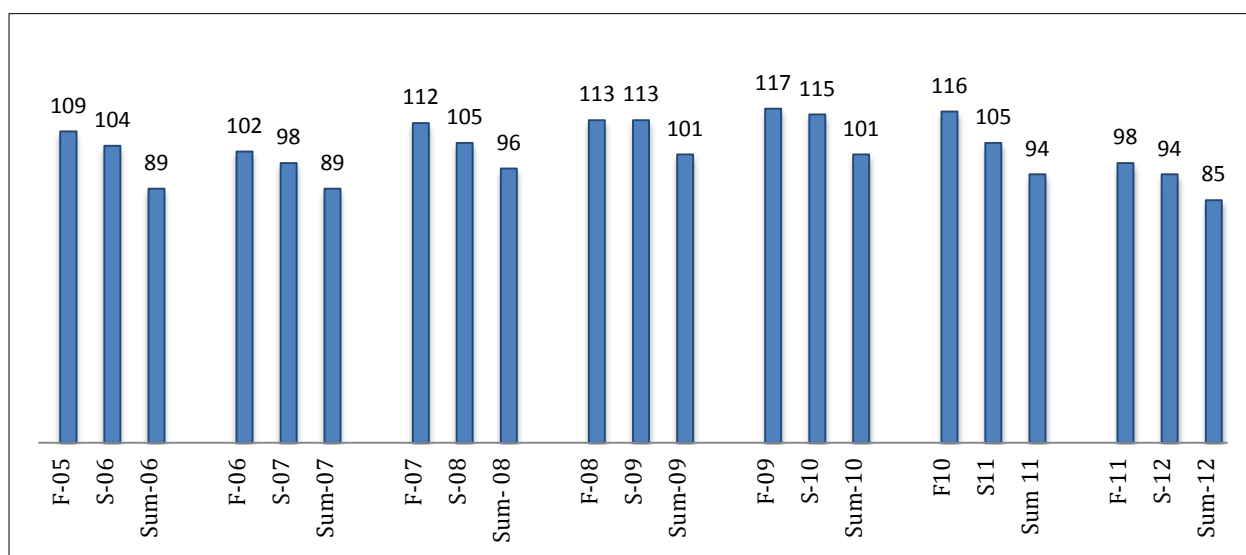
RICHARD ZOTTI
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2. Academic Programs

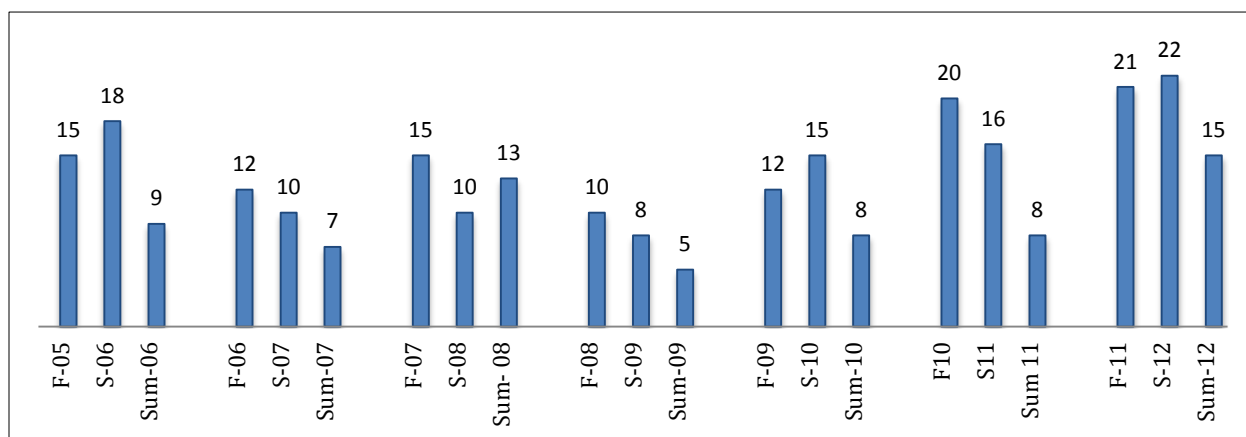
The College has a strong focus on education at the MS and PhD levels through both coursework and research. Our graduates are highly educated and well prepared for the modern-day work force and consequently they are highly sought after in both the private sector and in top research universities. We also contribute to the undergraduate teaching mission of the university by teaching optics and photonics courses for undergraduates in other programs.

2.1 Graduate Recruitment and Enrollment

Enrollment in the PhD program has dropped slightly in AY 2011-2012 at 85–98, while the MS enrollment is experiencing a slight growing trend, with between 15–22 students. A total of 27 new students (10 Ph.D. and 17 MS) enrolled this year. The GRE scores of admitted students were similar to 2010-11 but higher than in previous years. Overall, we received 475 pre-applications and 210 full applications to the graduate programs, which is an increase over previous years. The pre-application is a preselecting tool run through our own web site that allows us to make contact with applicants early and to help advise international students as to whether to apply officially, which is an expensive undertaking for many international students..



History of PhD Enrollment since 2005



History of MS Enrollment since 2005

New Matriculants for Fall 2011 - Summer 2012										
		Male	Female	FT	PT	CREOL Fellow	UCF Award*	UCF Trustee	UCF Dean	UCF Provost
PhD	US	3	2	5	0	4	1	1	1	0
	Intl	4	1	4	0	4	0	0	0	0
MS	US	11	1	5	5	0	0	0	0	1
	Intl	4	1	4	0	0	0	0	0	0
Total New Students		27								

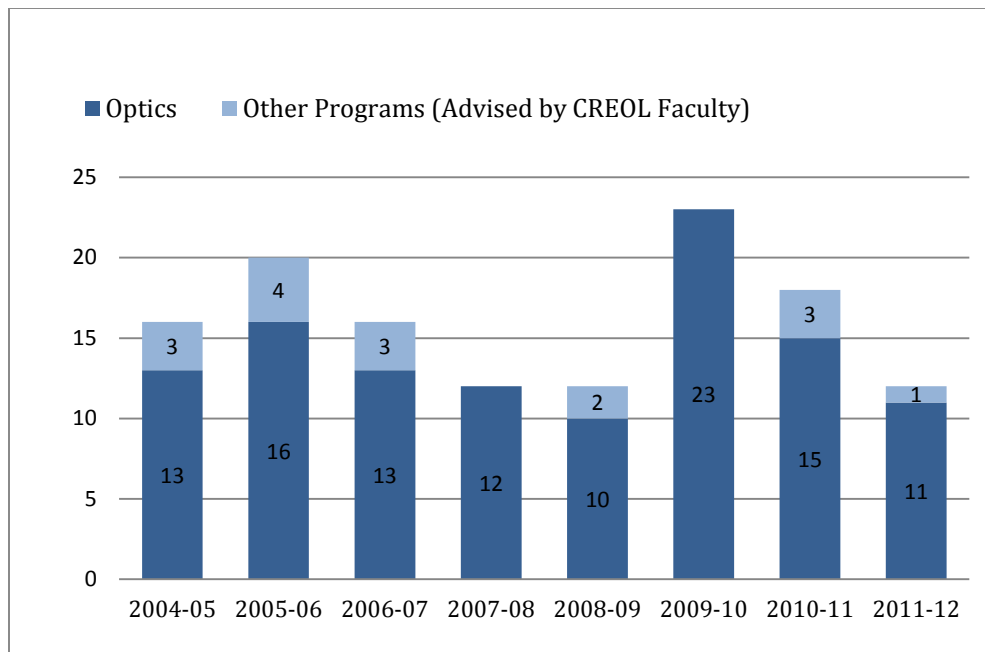
* Northrop Grumman, Schwartz, Suchoski, Frances Townes

Fall 2011 Mean GRE Scores							
		Quantitative		Verbal		Analytic Writing	
			%		%		%
PhD	US	788	91%	624	89%	4	49%
	Intl	783	90%	348	26%	3	9%
MS	US	714	74%	531	69%	4	47%
	Intl	753	83%	448	48%	2.4	4%
Mean		760		488		3	

Spring 2012 Mean GRE Scores							
		Quantitative		Verbal		Analytic Writing	
			%		%		%
PhD	US	-		-		-	
	Intl	770	86%	230	1%	3	10%
MS	US	705	72%	510	64%	3.5	28%
	Intl	-		-		-	
Mean		738		370		3	

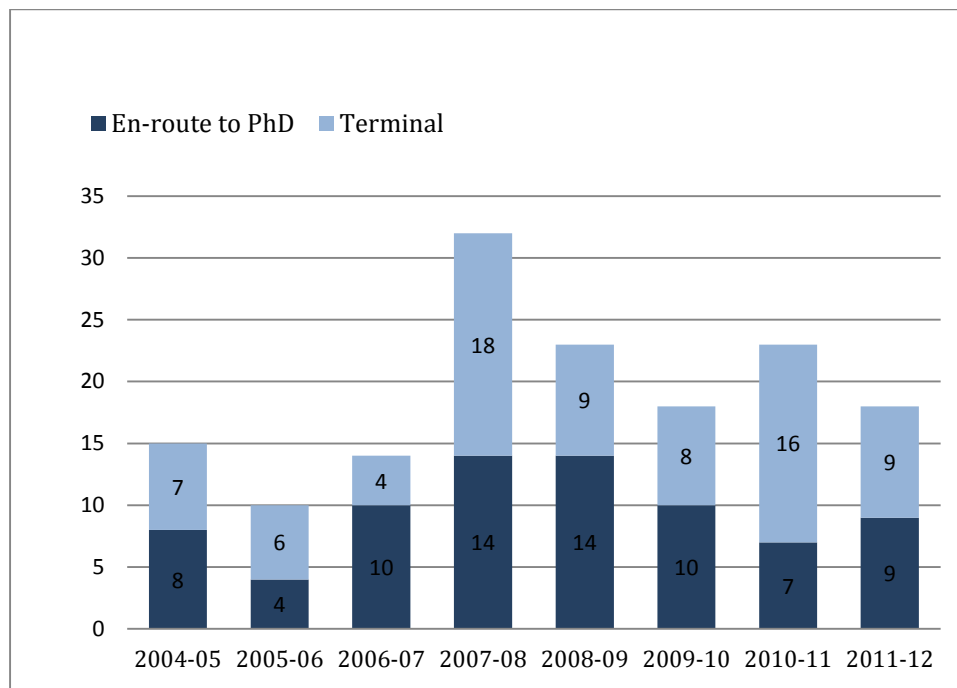
2.2 Degrees Awarded

As shown in the chart below,[†] there was a slight decrease in the number of PhD degrees awarded in the past year. This does not appear to be related to any particular trend, as the recruitment rate has remained constant over the past few years. A higher than normal graduation rate in 2009-2011 may be partly responsible. Overall, we have a continuing trend of students achieving PhD candidacy status sooner in the program than has been historically the case. This may be related to a new advising database that the college has implemented to monitor student progress. This is also resulting in students passing their proposal examinations sooner.



PhD degrees awarded to students in the College of Optics and Photonics and students in other UCF colleges with College of Optics and Photonics advisors.

The number of MS degrees awarded in academic year 2011-2012 (18) is roughly similar to previous years. This number tends to fluctuate on a year-to-year basis.



MS degrees awarded. Recipients of these degrees are classified into two groups: those who leave with an MS degree ("Terminal MS") and those who are continuing on to the PhD degree ("En-route to PhD").

[†] Data on enrollment and awarded degrees are taken from UCF's official reports, which consider Summer 10, Fall 10 and Spring 10 as the Academic year 2010-11.

2.3 Ph.D. Dissertations

Academic Year Fall 2011 – Summer 2012

Student	Advisor	Dissertation Title
Derrek Drachenberg	Leonid Glebov	Ultra High Density Spectral Beam Combining by Thermal Tuning of Volume Bragg Gratings in Photo-Thermo-Refractive Glass
Likai Zhu	Guifang Li	Computationally Efficient Digital Backward Propagation for Fiber Nonlinearity Compensation
Narak Choi	James Harvey	Image Degredation Due To Surface Scattering In The Presence Of Aberrations
Kuan-Ming Chen	Shin-Tson Wu	Submillisecond-Response Blue Phase Liquid Crystals For Display Applications
Yat Ming "Tony" Ho	Patrick LiKamWa	Non-Reciprocal Wave Transmission in Integrated Waveguide Array Isolators
Sen-Yong Chen	Aravinda Kar	Phonon Modulation By Polarized Lasers For Material Modification
Louis Florence	Glenn Boreman	Infrared Tapered Slot Antennas Coupled To Tunnel Diodes
Nazanin Hoghooghi	Peter Delfyett	Injection-Locked Semiconductor Lasers For Realization Of Novel RF Photonics Components
Honghua Hu	Eric Van Stryland/ David Hagan	Third Order Nonlinearity of Organic Molecules
Linghui Rao	Shin-Tson Wu	Low Voltage Blue Phase Liquid Crystal Displays
Guowei Zhao	Dennis Deppe	Lithographic Vertical-Cavity Surface-Emitting Lasers

2.4 Student Scholarships and Awards

National Scholarships, Fellowships, and Awards (2012)

Neng Bai, SPIE Scholarship in Optics and Photonics
 Sharad Bhoolapur, IEEE Orlando Section Graduate Student Scholarship
 Hui-Chuan Cheng, SID distinguished student paper award
 Kyle Douglas, SPIE Scholarship in Optics and Photonics
 Daniel Ott, Directed Energy Professional Society (DEPS) Fellowship
 Jie Sun, 2012 IEEE Outstanding Graduate Student Award and \$1000 Scholarship
 Christina C.C. Willis, Directed Energy Professional Society (DEPS) Fellowship
 Jin Yan, SPIE Scholarship in Optics and Photonics
 Jin Yan, IEEE/IPS Graduate Student Fellowship
 Jin Yan, SID distinguished student paper award.

UCF Scholarships and Fellowships (AY 2011-2012)

Corey Butler, Provost Scholarship
 Jeffrey Chiles, Trustee Scholarship
 Eric Cunningham, Dean's Scholarship
 Amy Van NewKirk, Frances Townes Fellowship

College of Optics & Photonics Awards (2012)

Nazanin Hoghooghi, College of Optics & Photonics Student of The Year Award
 Mohammad Umar Piracha, finalist, 2012 Student-of The Year Award
 Linghui Rao, finalist, 2012 Student of The Year Award
 Thomas Kohlgraf-Owens, 2012 Best Poster Award



2012 Student-of-The-Year Award
winner Nazanin Hoghooghi

Travel Grants (2012)

Casey Boutwell, American Vacuum Society (AVS), Dorothy M. and Earl S. Hoffman travel grant.

Kumel Kagalwala, 2012 OSA Incubic/ Milton Chang travel grant.

Chatdanai Lumdee, SPIE travel grant.

Daniel Ott, UCF Student Government Assoc. (SGA) travel fellowship,

Daniel Ott, UCF College of Graduate Studies travel fellowship.

Seyfollah Toroghi, UCF College of Graduate Studies travel fellowship.

2.5 Courses Taught

Core Graduate Courses		Fall 2011	Spring 2012	Summer 2012
OSE 5203	<i>Geometrical optics and imaging systems</i>		Moharam	
OSE 5312	<i>Light matter interaction</i>	Kik		
OSE 6111	<i>Optical wave propagation</i>	Moharam		
OSE 6115	<i>Interference, diffraction and coherence</i>	Dogariu		
OSE 6432	<i>Guided waves and optoelectronics</i>		LiKamWa	
OSE 6525	<i>Laser engineering</i>		Schulzgen	

Other OSE graduate courses		Fall 2011	Spring 2012	Summer 2012
OSE 5041	<i>Introduction to wave optics</i>	Christodoulides		
OSE 5414	<i>Fundamentals of optoelectronics</i>	LiKamWa		
OSE 6118	<i>Optical properties in inhomogeneous materials</i>		Dogariu	
OSE 6234L	<i>Applied optics laboratory</i>		Li	
OSE 6315	<i>Liquid crystal materials & devices</i>			Wu
OSE 6319	<i>Optical waves and materials</i>			Zeldovich
OSE 6330	<i>Stimulated & holographic scattering</i>	Zeldovich		
OSE 6334	<i>Nonlinear optics</i>		Van Stryland	
OSE 6347	<i>Quantum optics</i>		Zeldovich	
OSE 6349	<i>Applied quantum mechanics for optics</i>	Abouraddy		
OSE 6445	<i>High speed photonics</i>	Delfyett		
OSE 6455L	<i>Photonics laboratory</i>	Li		
OSE 6526C	<i>Laser engineering laboratory</i>	Richardson		Richardson
OSE 6536	<i>Semiconductor lasers</i>		Deppe	
OSE 6615L	<i>Optoelectronic device fabrication laboratory</i>	Schoenfeld		

OSE 6650	Optical properties of nanostructured materials	Kik		
OSE 6938	<i>St: fiber lasers</i>	Schulzgen		
OSE 6938	<i>St: research seminar in optics and photonics</i>	Christodoulides/ Abouraddy		
OSE 6938	<i>St: frontiers of ultrafast photonics</i>	Chang		
OSE 6938	<i>St: semiclassical laser theory</i>	Van Stryland		
OSE 6938	<i>St: photonics polymer materials</i>	Thomas		
Other Courses		Fall 2011	Spring 2012	Summer 2012
IDS 6416	<i>St: history of physical science, cultural connections and other issues</i>		Bass	
EEL 4440	<i>Optical engineering</i>	Wu		
EEL 4932	<i>Optical fiber communications</i>		Fathpour	
EML 4142	<i>Heat transfer</i>		Kar	
PHY 4424	<i>Optics</i>		Soileau	
EMA 6611	<i>Optoelectronic materials processing</i>	Kar		

2.6 Course and Program Development

Graduate Education

In 2011-2012, there were few changes to the curriculum, which had already been significantly overhauled the year before. These changes to the PhD core in 2009-2010 necessitated changes to be made to the PhD qualifying exam in 2010-2011. In addition to changes in content, the qualifying exam was also modified so that problems are more integrated across disciplines, instead of being tied to individual course. Thanks to the hard work of the examination committee, these changes were successfully implemented. Some new new graduate courses were introduced: *Fiber Lasers*, taught by Dr. Axel Schulzgen; *Frontiers of Ultrafast Optics*, taught by Dr. Zenghu Chang; and *Photonics of Polymer Materials* was taught by Dr. Jayan Thomas, of the NanoScience and Technology Center. New faculty member, Dr. Romain Gaume, taught *Materials for Optical Systems*, which we had not been able to offer for many years.

Undergraduate Education

A proposal has been submitted to the university administration to establish a new Bachelor of Science degree program, titled *Photonic Science and Engineering*. The proposed program will be jointly offered and administered by the College of Optics and Photonics and the College of Engineering and Computer Science. Similar to most US universities that are now offering Bachelor's degrees in the field of Optics and Photonics, it is planned that this degree program will be accredited as an engineering degree by the Engineering Accreditation Commission of ABET. The total number of credit hours will be 128, consistent with other accredited engineering degree programs on campus, and there are no plans for tracks or specializations within the degree at present. The proposed program aims to prepare students for the wide variety of jobs in optics and photonics, and to give the students an opportunity to pursue graduate studies here or elsewhere.

2.6 Students

Ph.D. Students

Aleahmad, Parinaz, (Optics, GRA), Advisor: Christodoulides
Anderson, Brian, (Optics, GRA), Advisor: Glebov
Anderson, James, (Optics, GRA), Advisor: Vodopyanov
Ardey, Abhijeet, (Physics, GRA), Advisor: Delfyett
Bagnell, Kristina, (Optics, GRA), Advisor: Delfyett
Bagnell, Marcus, (Optics, GRA), Advisor: Delfyett
Bai, Neng, (Optics, GRA), Advisor: Li
Banaei, Esmail 'Hooman', (EE, GRA), Advisor: Abouraddy
Barbieri, Nicholas, (Physics, GRA), Advisor: M. Richardson
Bhooplapur, Sharad, (Optics, GRA), Advisor: Delfyett
Boutwell, Ryan, (Optics, GRA), Advisor: Schoenfeld
Bradford, Joshua, (Optics, GRA), Advisor: M. Richardson
Broky, John, (Optics, GRA), Advisor: Dogariu
Chantharasupawong, Panit, (Optics, GRA), Advisor: Thomas
Chen, Yuan, (Optics, GRA), Advisor: Wu
Cheng, Yang, (Physics, GRA), Advisor: Chang
Chiles, Jeffrey, (Optics, GRA), Advisor: Fathpour
Chini, Michael, (Physics, GRA), Advisor: Chang
Constant, Colin, (Optics, GRA), Advisor: Dogariu
Cunningham, Eric, (Optics, GRA), Advisor: Chang
Darchangel, Jeffrey, (Optics, GRA), Advisor: Schoenfeld
Davila-Rodriguez, Josue, (Optics, GRA), Advisor: Delfyett
Davis, Kristopher, (Optics, GRA), Advisor: Schoenfeld
Digaum, Jennefir, (Optics, GRA), Advisor: Kuebler
Douglass, Kyle, (Optics, GRA), Advisor: Dogariu
Ensley, Trenton, (Optics, GRA), Advisor: Hagan/VanStryland
Fardad, Shima, (Optics, GRA), Advisor: Christodoulides
Ferdinandus, Manuel, (Optics, GRA), Advisors: Hagan/VanStryland
Gleason, Benjamin, (Mat. Sci, GRA), Advisor: K. Richardson
Grabill, Chris, (Chemistry, GRA), Advisor: Kuebler
He, Sihui, (Optics, GRA), Advisor: Wu
Hofmann, Peter, (Optics, Visiting/ U. Arizona), Advisor: Schulzgen
Huang, Bin, (Optics, GRA), Advisor: Li
Jang, Yuseong, (Optics, GRA), Advisor: M. Richardson
Jeon, Cheonha, (Optics, GRA), Advisor: M. Richardson
Jollivet, Clemence, (Optics, GRA), Advisor: Schulzgen
Kadwani, Pankaj, (Optics, GRA), Advisor: M. Richardson
Kagalwala, Kumel, (Optics, GRA), Advisor: Saleh
Kaim, Sergiy, (Physics, GRA), Advisor: Zeldovich
Kajorndejnkul, Veerachart, (Optics, GRA), Advisor: Dogariu
Karnemaat, Ryan, (Optics, GRA)
Kaufman, Joshua, (Optics, GRA), Advisor: Abouraddy
Khan, Saeed, (EE, GRA), Advisor: Fathpour
Klee, Anthony, (Optics, GRA), Advisor: Delfyett
Kohlgraf-Owens, Dana, (Optics, GRA), Advisor: Dogariu
Kondakci, Hasan, (Optics, GRA), Advisor: Saleh
Leblanc, Richard, (Optics, GRA)
Li, Jie, (Optics, GRA), Advisor: Chang
Li, Mingxin, (Optics, GRA), Advisor: Deppe
Lim, Khan, (Optics, GRA), Advisor: M. Richardson
Lim, Geunsik, (Mat's Sci), Advisor: Kar
Liu, Yifan, (Optics, GRA), Advisor: Wu
Liu, Xiaohang, (Optics, GRA), Advisor: Deppe
Liu, Yuan, (Optics, GRA), Advisor: M. Richardson
Lumdee, Chatdanai, (Optics, GRA), Advisor: Kik
Luo, Zhenyue, (Optics, GRA), Advisor: Wu

Ma, Jichi, (Optics, GRA), Advisor: Fathpour
Martin, Lane, (Optics, GRA), Advisor: Saleh
McKee, Erik, (Optics, GRA), Advisor: M. Richardson
Mills, Matthew, (Optics, GRA), Advisor: Christodoulides
Miri, Mohammad, (Optics, GRA), Advisor: Christodoulides
Nguyen, Dat, (Physics, GRA), Advisor: Delfyett
Novak, Spenser, (Mat's Sci, GRA, Visiting/ Clemson U.), Advisor: K. Richardson
Ogutman, Nizamettin, (Optics, GRA), Advisor: Dogariu
Ott, Daniel, (Optics, GRA), Advisor: Glebov
Ozcan, Ali, (Chemistry, GRA), Advisor: Kuebler
Pattanaik, Himansu, (Optics, GRA), Advisors: Hagan/VanStryland
Peceli, Davorin, (Optics, GRA), Advisor: Hagan/VanStryland
Peng, Fenglin, (Optics, GRA), Advisor: Wu
Ramme, Mark, (EE, GRA), Advisor: M. Richardson
Reichert, Matthew, (Optics, GRA), Advisor: Hagan/VanStryland
Sanjabi Eznaveh, Zeinab 'Zahoorah', (Physics, GRA), Advisor: Amezcua
Sarailou, Edris, (Optics, GRA), Advisor: Delfyett
Segall, Marc, (Optics, GRA), Advisor: Glebov
Shabahang, Soroush, (Optics, GRA), Advisor: Abouraddy
Shoulders, Taylor, (Mat's Sci, GRA), Advisor: Gaume
Sims, Robert, (Optics, GRA), Advisor: M. Richardson
Sincore, Alex, (Optics, GRA), Advisor: K. Richardson
Sisken, Laura, (Optics, GRA), Advisor: K. Richardson
Sun, Jie, (Optics, GRA), Advisor: Wu
Szilagy, John, (EE, GRA), Advisor: M. Richardson
Tao, Guangming, (Optics, GRA), Advisor: Abouraddy
Toroghi, Seyfollah, (Optics, GRA), Advisor: Kik
Van Newkirk, Amy, (Optics, GRA), Advisor: Schulzgen
Vaupe, Andreas, (Optics, GRA), Advisor: M. Richardson
Vazquez-Guardado, Abraham, (Optics, GRA), Advisor: Chanda
Wang, Tiansi, (Optics, GRA), Advisor: Kar
Wang, Yang, (Optics, GRA), Advisor: Chang
Webb, Benjamin, (Optics, GRA), Advisor: M. Richardson
Weed, Matthew, (Optics, GRA), Advisor: Schoenfeld
Wei, Ming, (Optics, GRA), Advisor: Schoenfeld
Williams, Charles, (Optics, GRA), Advisor: Delfyett
Williams, Henry, (Chemistry, GRA), Advisor: Kuebler
Willis-Ott, Christina, (Optics, GRA), Advisor: M. Richardson
Wu, Yi, (Optics, GRA), Advisor: Chang
Xia, Cen, (Optics, GRA), Advisor: Li
Xu, Daming, (Optics, GRA), Advisor: Wu
Yan, Jin, (Optics, GRA), Advisor: Wu
Yang, Xu, (Optics, GRA), Advisor: Deppe
Zakariya, Abdullah, (EE, GRA), Advisor: LiKamWa
Zhang, Yu, (Optics, GRA), Advisor: Deppe
Zhang, Qi, (Optics, GRA), Advisor: Chang
Zhao, Jian, (Optics, GRA), Advisor:
Zhao, Peng, (Optics, GRA), Advisor: Hagan/VanStryland
Zhu, Ruidong, (Optics, GRA), Advisor: Wu

MS Students

Alvarez Perez, Oseas, (Optics)
Anderson, Scott, (Optics, part time)
Bodnar, Nathan, (Optics), Advisor: M. Richardson
Bourgade, Thomas, (Optics, MILMI), Advisor: Glebov
Butler, Corey, (Optics, MILMI), Advisor: M. Richardson
Butrimas, Steven, (Optics, part time)
Chatterton, Amanda, (Optics), Advisor: Bass
Creekmore, Amy, (Optics, part time)
Farrell, Matthew, (Optics, part time)
Gaida, Christian, (Optics, MILMI), Advisor: M. Richardson

Lin, Yu-wei, (Optics, GRA), Advisor: Kik
Lui, Eric, (Optics), Advisor: Chanda
Matz, Gregor, (Optics, MILMI), Advisor: Li
Modak, Sushrut, (Optics), Advisor: Chanda
Mueller, Michael, (Optics, MILMI), Advisor: M. Richardson
Münich, Matthias, (Optics, MILMI), Advisor: Hagan/VanStryland
Patil, Aniket, (Optics)
Popoola, Atiloluwa, (Optics)
Relina, Victoriya, (Optics), Advisor: Wu
Schick, Ryan, (Optics, part time)

Gebhardt, Martin, (Optics, MILMI), Advisor: M. Richardson
 Georgiev, Nikolay, (Optics, part time)
 Grafer, Elliott, (Optics)
 Hardin, James, (Optics, part time)
 Huang, Bin, (Optics)
 Kazemi Jahromi, Ali, (Optics, GRA), Advisor: Gaume
 Kennedy, Christopher, (Optics), Advisor: Bass
 Knebl, Andreas, (Optics, MILMI), Advisor: M. Richardson
 Lantigua, Christopher, (Optics, GRA), Advisor: Glebov
 Levy, Melissa, (Optics, part time)

Schneider, Larry, (Optics)
 Shamieh, Frederick, (Optics, part time)
 Shappard, Todd, (Optics, part time)
 Sincore, Alex, (Optics, MILMI), Advisor: M. Richardson
 Tan, Felix, (Optics), Advisor: Abouraddy
 Temple, Sarah, (Optics, part time)
 Tiess, Tobias, (Optics, MILMI)
 Turnbull, Brendan, (Optics), Advisor: Hagan/VanStryland
 Villinger, Massimo Maximilian, (Optics, part time)

2.7 Instructional Laboratories

OSE 6234C Applied Optics Laboratory

Laboratory Techniques for observing optical phenomena and quantitative experimental study of geometrical optics, optical interferometry, diffraction, and image processing. Prerequisite Course: Graduate standing and OSE 5203 or consent of the instructor.



OSE 6526C Laser Engineering Laboratory

Designing and device implementation of diode pumped solidstate lasers, nonlinear frequency conversion, Q-switching, mode locking, and pulse second harmonic generation. Prerequisite Course: Graduate standing and OSE 6525 or consent of the instructor.



OSE 6455C Photonics Laboratory

Experimental study of photonic devices and systems including liquid crystal displays, fiber-optic sensors, laser diodes, electro optic modulation, acousto-optic modulation, lightwave detection, optical communications, and photonic signal processing. Prerequisite Course: Graduate standing and OSE 6432 or consent of the instructor.



OSE 6615L Optoelectronic Device Fabrication Laboratory

Design and micro-fabrication of semiconductor optoelectronics devices including passive waveguides, light emitting diodes (LEDs), laser diodes (LDs), photodetectors. Prerequisite Course: Graduate standing or consent of the instructor.



2.8 Colloquia and Seminars

DATE	SPEAKER	TITLE
1/11/2012	Igor Sokolov Clarkson University	Nanoporous silica as photonic nanocomposite.
1/12/2012	Jason M. Eichenholz Ocean Optics, Inc.	Spectral sensing: Seeing more than your eye can see.
1/26/2012	Alexander Szameit Department of Applied Optics University of Jena	Modeling relativistic quantum mechanics in optical waveguiding structures.
1/17/2012	Vladimir G. Chigrinov Hong Kong University of Science and Technology	Fast switchable liquid crystal cells for field sequential color and 3D displays. (SID Student Chapter Seminar Series)
1/30/2012	Joseph W. Goodman Stanford University	Some properties of speckle from smooth surfaces.
1/31/2012	Robert R. Alfano CCNY	Underlying physics of biomedical optical imaging.
2/2/2012	Sébastien Chénais Laser Physics Laboratory University of France	Organic VECSELs: Towards low-cost UV-visible lasers.
2/3/2012	Thomas W. Hussey AFOSR	Basic research for the United States Air Force.
3/9/2012	Kamran Badizadegan Nemours Children's Hospital Orlando, Florida	Five easy pieces, lost in translation.
3/14/2012– 3/15/2012		CREOL@25 Symposium & Industrial Affiliates Seminars (see page 67)
3/23/2012	Song Hu Optical Imaging Laboratory Dept. of Biomedical Engineering, Washington U.	Multi-contrast photoacoustic microscopy: listening to anatomy, function, metabolism, and biomarkers in vivo.
3/26/2012	Jon A. Schuller EFRC	Dielectric and molecular optical antennas.
3/30/2012	Mercedeh Khajavikhan UCSD	Thresholdless nanoscale lasers.
4/05/2012	Katsumi Kishino Sophia University	GaN-based nanocolumn emitter and related technologies. (IEEE Student Chapter Seminar Series)
4/6/2012	Laura Waller Princeton University	Computational wave-field imaging.
4/13/2012	Bruno Viana LCMCP University of Paris	Materials for lasers and medical imaging at the LCMCP Paric.
4/20/2012	Peter Moselund NKT Photonics	Supercontinuum mid-IR sources.
4/25/2012	Christian Spielmann Friedrich Schiller University	Development and application of laser driven coherent x-ray sources.
5/29/2012	Kostantine Vodopyanov E.L. Ginzton Lab. Stanford University	Rethinking diagnostics: Mid-IR/THz frequency combs as enabling technology for noninvasive medical testing.

8/09/2012	Kenji Kamada AIST Kansai Center Osaka, Japan	Cubic nonlinearity of organic molecules: the properties and methodologies.
8/13/2012	Lawrence Shah CREOL – The College of Optics and Photonics	Pushing the limits of peak power in fiber lasers.
8/25/2012	Angela Guzman CREOL– The College of Optics and Photonics	Non-Markovian quantum dynamics to improve quantum gate fidelity.
8/31/2012	Leonid Glebov CREOL– The College of Optics and Photonics	New optical elements in PTR glass and their applications in laser and photonic devices.
8/31/2012	Luciano De Sio University of Calabria	Soft Matter: from Plasmonics to Optofluidics. (IEEE & SPIE Student Chapter Symposium)
9/14/2012	M. Baudalet CREOL – The College of Optics and Photonics	New Perspectives in Laser Spectroscopy as A Science for Sensing, Monitoring and Diagnostics.
9/20/2012	L. Wöste Institut für Experimentalphysik, Freie Universität Berlin	From Laser Remote Sensing of the Atmosphere to the Remote Control of Weather Phenomena
9/27/2012	Paul F. McManamon University of Dayton & Stephen G. Anderson SPIE Industry & Market Strategist	Presenting the recently released National Academy Optics and Photonics report (Harnessing Light II)
10/02/2012	Mark Flynn Director of Displays & Hardware Engineering, Infinite Z	zSpace: Description & Demo of a New Type of Stereoscopic Display. (SID Student Chapter Seminar Series)
10/15/2012	A. Mysyrowicz LOA, ENSTA, École Polytechnique Palaiseau, France	Femtosecond laser filamentation.
10/18/2012	Benjamin J. Eggleton School of Physics, IPOS Univ. of Sydney, Australia	Nonlinear photonic circuits transforming the new information age: Faster, smaller and smarter. (OSA Student Chapter Seminar Series)
10/18/2012	Tong Li Chinese Academy of Sciences (CAS), China	Waveguide Application in Flat Panel Display Technology —Focus Backlight. (SID Student Chapter Seminar Series)
11/09/2012	Jay Jeong Newport	Meeting Measurement Challenges for Low-Power, Pulsed, or Modulated Light Sources.
11/28/2012	Mark Himel SPIE Strategic Planning Committee	SPIE wants to hear from you! SPIE Student Chapter
11/29/2012	Juejun (JJ) Hu University of Delaware	Planar chalcogenide photonics: from mid-infrared spectroscopy to flexible substrate integration.

2.9 International Collaboration

International REU Program

Research Experiences for Undergraduates in Optics, Lasers, Photonics and Optical Materials



The NSF International REU Program in Optics, Lasers, Photonics & Optical Materials, directed by UCF, is a special program that seeks to provide promising undergraduates in physics, engineering, materials science and other related disciplines, an opportunity to fast track into the research world in these areas. The NSF-sponsored International REU program in Optics, Lasers Photonics and Optical Materials will again run in 2011. This program offers students a comprehensive introduction into the research area of lasers, optics, and photonics, new engineering modalities with lasers, including ultra-fast lasers, and the development of new optical materials. Students are associated with an international research collaboration that usually results in research publications and presentations at international conferences.

The program is a two-summer internship. The first summer is usually spent in a research group at UCF or Clemson University's School of Material Science & Engineering. Throughout the following semester, the student stays engaged with the research project. The second summer the student spends 12 weeks working in the laboratories of our international collaborators in Europe (France, Germany or Italy) in institutes and universities in cities that include, Bordeaux, Berlin, Paris, Turin, Lyon, Jena.

The Atlantis- MILMI Program

The Atlantis-MILMI Program is a Masters Degree program, offering dual Masters degrees in the interdisciplinary field of Lasers, Photonics and Material Science by a consortium of four institutions, the Physics and Chemistry departments of the University of Bordeaux, France; the Friedrich Schiller University in Jena, Germany; CREOL, the College of Optics & Photonics of the University of Central Florida; and the School of Material Science & Engineering, Clemson University in South Carolina. Twelve scholarships are offered each year to allow students in this dual Masters degree program to take courses and perform research for up to 12 months at institutions across the Atlantic. Six different choices of Dual Masters are offered under the Atlantis-MILMI Program and unique opportunities to work with different professors are available.



Resulting from a long history of scientific collaboration between these institutions, this advanced degree program creates individualized education and training in optics, lasers, photonics, optical materials and the interaction of light with matter, drawing on their unique expertise, research programs, and educational curricula. CREOL, The College of Optics & Photonics at UCF, provides comprehensive education and research training in optics, photonics and lasers. Friedrich Schiller University is renowned for its expertise in advanced lasers and laser material processing. The University of Bordeaux will introduce non-linear science and the optical properties of materials. A foundation in chemistry and physics is complemented by dedicated programs in organic and inorganic materials science and engineering at Clemson University.

Each semester, the students attend existing selected technical courses taught in English at all four institutions. The latest technology in teleconferencing and "podcasting" solutions is used to accompany the mobility of students. First class training facilities will be offered to participants along with strong tutorship. Special (existing) intensive language classes in the national languages of the consortium (German, French and English) are made available to participants along with particular courses that will foster mutual integration of the scientific community. The students are also involved in research activities and exposed to research seminars and courses. Faculty exchanges also support a summer school each year in Europe or the US. To encourage entrepreneurship experience, every effort is made to match each student's program to a technical project having scientifically and technologically maturity in his home university.

MILMI Students

AY 2011-2012
Christian Gaida
Jocelain Trela
Marie Vanheluwe

AY 2012-2013	
Thomas Bourgade	Gregor Matz
Corey Butler	Matthias Munnich
Martin Gebhardt	Michael Mueller
Andreas Knebl	

Fraunhofer-Townes Collaboration

Research and academic collaboration between the Townes Laser Institute, UCF and the Fraunhofer Institute for Laser Technology, RWTH Aachen University (Germany) has been established in August 2009. Under this collaboration agreement a joint research program in the fields of laser development, material processing, novel system technology, and life sciences is being created, including the exchange of scientist and students.

The Fraunhofer Institute for Laser Technology (ILT) located in Aachen, Germany is the leading industrial laser and laser applications facility in Europe. For more than 20 years, ILT has stood for concentrated expertise in the field of laser technology. The innovative solution to manufacturing and production problems, the development of new technical components, competent consultancy and training, highly specialized personnel, the latest technology as well as an international reputation: all these factors make for long-term partnerships.

Fraunhofer ILT's interdisciplinary research activities cover a wide range of areas such as the development of new laser beam sources and components, the use of modern laser measurement and testing technology and laser-supported manufacturing. This includes for example laser cutting, caving, drilling, welding and soldering as well as surface treatment, micro-processing and rapid-prototyping. Furthermore, ILT's research involves laser plant technology and versatile system technology including process control. Besides solving questions of laser technology, the institute develops high-energy sources for soft X-rays for use in semiconductor production and in X-ray microscopy.

The close contact to the Department of Laser Technology at the RWTH Aachen University ensures that a continuous access to a wide knowledge base in the field of laser technology is ensured. RWTH Aachen University has achieved international recognition in several fields of engineering and science, currently ranked the first place in Germany in the fields of mechanical engineering, electrical engineering, and computer science. Several scientists affiliated with RWTH Aachen have won world-wide acclamations, including Nobel Prizes in physics and chemistry.

Research Topics:

- Laser-assisted fabrication of graphene
- Selective laser etching of dielectrics and semiconductors
- Mid-IR optical phase microscopy
- Manufacturing of biocompatible substrates
- Ultrafast laser materials processing



Martin Richardson, Director of the Townes Laser Institute (left), UCF President John Hitt (Center) and Reinhart Poprawe, Director of the Fraunhofer Institute for Laser Technology (right), at the signing of the collaboration agreement between the Townes Laser Institute, UCF and the Fraunhofer Institute for Laser Technology, RWTH Aachen University (Germany)

3. Research

The faculty, scientists, and students of CREOL, The College of Optics and Photonics, engage in research in areas utilizing radiation at wavelengths extending from millimeter waves to X-rays and cover the basic science and physics of optics and photonics, as well as prototyping development and demonstration of feasibility of applications. They vigorously pursue joint research projects with industry, academia, and government laboratories. In addition to CREOL (*Center for Research and Education in Optics and Lasers*), which is the primary research arm of the College, two centers are also active:

Florida Photonics Center of Excellence (FPCE)

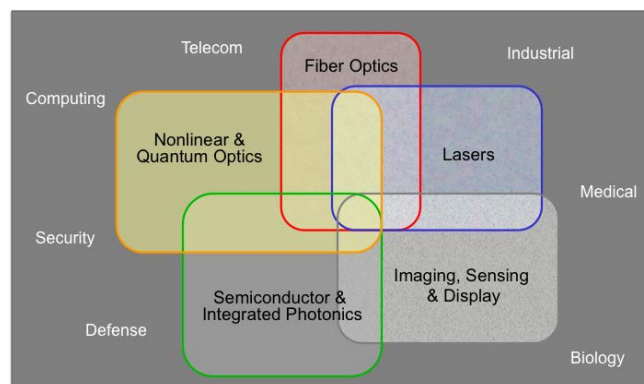
The FPCE was established with a \$10 million grant from the State of Florida to create a new center of excellence within The College of Optics and Photonics at the University of Central Florida. The program began in 2003 with three primary goals: Advance excellence in research and graduate education to serve existing and emerging industry clusters in the state (photonics, optics, lasers), leverage state resources via partnerships with industry and government, and work in partnership with local, state and regional economic development organizations to attract, retain and grow knowledge-based, wealth producing industries to Florida. The focus of the FPCE research and education work has been on the technologies of nanophotonics, biophotonics, advanced imaging and 3D displays, and ultra-high bandwidth communications, all of which are forecast to experience rapid market growth. The grant has been used for developing the research infrastructure (new faculty, new facilities, new equipment), funding competitive R&D Partnership Projects at Florida universities in partnership with Florida industry, and pursuing commercialization and outreach with the help of the FPCE Industrial Advisory Board, the UCF Technology Incubator, and the Florida Photonics Cluster.

Townes Laser Institute

The Townes Laser Institute was established in 2007 in the presence of and in honor of Charles Townes, inventor of the concept of the laser, and a 1964 Nobel Laureate for Physics. Established for the development of next-generation lasers and their uses in medicine, advanced manufacturing and defense applications, the Institute was funded by a \$4.5M grant from the State of Florida, together with matching funds from UCF for 5 faculty positions and \$3M for start-ups and infrastructure. Since its founding, the Townes Laser Institute has grown to a faculty of 14 and has developed major capabilities in optical fibers, attoscience and new laser materials. It has made significant investments in optical fiber pulling facilities, pre-form fabrication, glass science and processing. It is currently building up a comprehensive capability in transparent ceramic laser materials. Future areas of investment include mid-infrared sources and materials, medical laser technology, laser-bioengineering, advance laser-based manufacturing and new defense-related laser technologies including long-distance laser light propagation through the atmosphere. The Townes Laser Institute is directed by Prof. Martin Richardson.

3.1 Areas of Research

Five major photonic technologies are pursued in the College: 1) lasers, 2) optical fibers, 3) semiconductor and integrated photonic devices, 4) nonlinear and quantum optics, and 5) imaging, sensing and display. Each of these technologies have applications in industry, communication and information technology, biology and medicine, energy and lighting, aerospace, and homeland security and defense. Design of optical systems, which has been the core of optical engineering, remains a principal component of the optics discipline, but advanced topics such as nanophotonics, atto-second optics, meta-materials, plasmonics, and biophotonics, are being embraced as areas of strength and future growth. The College is well positioned to take advantage of the revolution taking place in several areas enabled by optics and photonics. The following list describes some of the details of each research area and the applications pursued. A list of the faculty active in each of these areas and their specializations is available at <http://www.creol.ucf.edu/Research/ResearchArea.aspx>



Areas of research and applications

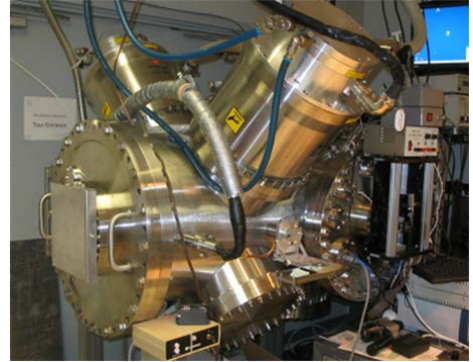
Lasers

Science & Technology

- Solid State Lasers
- Ceramic Lasers
- Semiconductor Lasers
- EUV & X-ray Lasers
- High Power Lasers
- Ultrafast Lasers
- Optical Frequency Combs

Applications

- Laser Fabrication & Lithography
- Laser Material Processing
- Lasers in Medicine



Laser and Plasma Laboratory

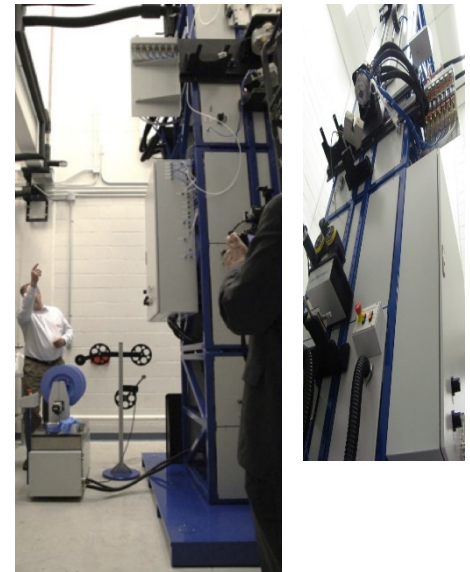
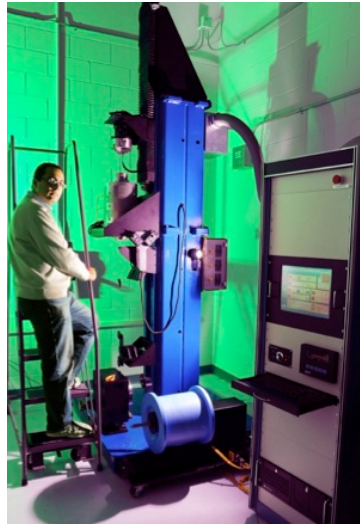
Fiber Optics

Science & Technology

- Fiber Fabrication Technology
- Multimaterial Fibers
- Nano-structured Fibers
- Mid Infrared Fibers
- Fiber Lasers

Applications

- Fiber Optic Communication
- Fiber Optic Networks
- Fiber Optic Sensing



Fiber Drawing Towers

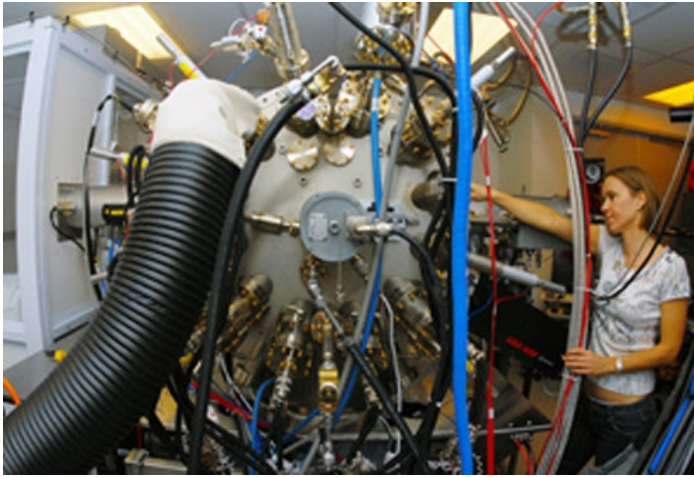
Semiconductor & Integrated Photonics

Science & Technology

- Epitaxial Growth
- LEDs & Laser Diodes
- Quantum Dots & Nanostructures
- Optoelectronics
- Oxide Semiconductors
- Photovoltaics
- Integrated Optics
- Periodic Structures & Photonic Crystals
- Nanophotonics & Plasmonics
- Silicon Photonics
- Gratings & Holographic Optical Elements

Applications

- Optical Communication
- Optical Processing & Switching
- Solar Energy Applications
- Integrated-Optic Sensing
- Integrated-Optic Signal Processing



MBE Facility



Nanophotonics Fabrication Facility

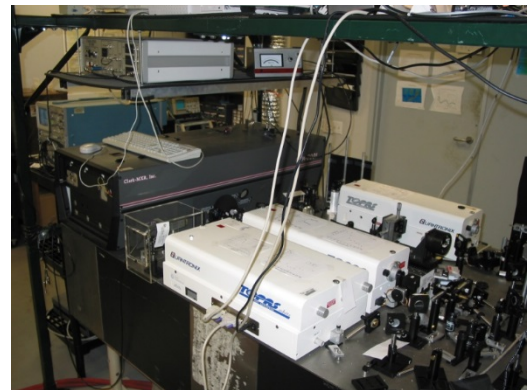
Nonlinear & Quantum Optics

Science & Technology

- Nonlinear Guided Waves & Fibers
- Nonlinear Optical Materials
- Nonlinear Optics & Spectroscopy
- Nonlinear Optics in Periodic Structures
- Photosensitive Glasses
- Quantum Optics
- Solitons

Applications

- Laser Protectors
- Quantum Communication & Information



Femto-second Nonlinear Optics Laboratory

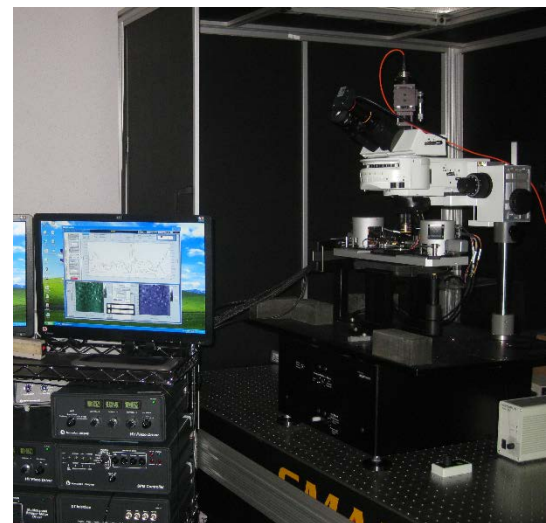
Imaging, Sensing & Display

Science & Technology

- Optical Design & Image Analysis
- Near Field Imaging
- Propagation in Random Media
- X-ray & EUV Technology
- Infrared Sensors & Systems
- Millimeter & THz Technology
- Optics of Liquid Crystals

Applications

- Optical Sensing & Imaging
- Biological & Medical Imaging
- Microscopy
- Optical EUV & X-ray Astronomy
- Optical EUV & X-ray Lithography
- Displays
- Optical Signal Processing



Near field microscope in the Photonic Diagnostic of Random Media Laboratory

3.2 Laboratories & Facilities

The main facilities of the College are housed in a state-of-the art 104,000 sq. ft. building dedicated to optics and photonics research and education.

Shared Facilities

Nanophotonics Systems Fabrication Facilities. A 3,000 ft² multi-user facility containing Class 100 and Class 1000 cleanrooms and a Leica 5000+ e-beam lithography instrument capable of 10-nm resolution. These facilities are used for fabrication and study of nanostructured materials and nanophotonic integrated circuits. The Laboratory is designed and operated as a multi-user facility, with availability to companies and other outside users. Rm 180.

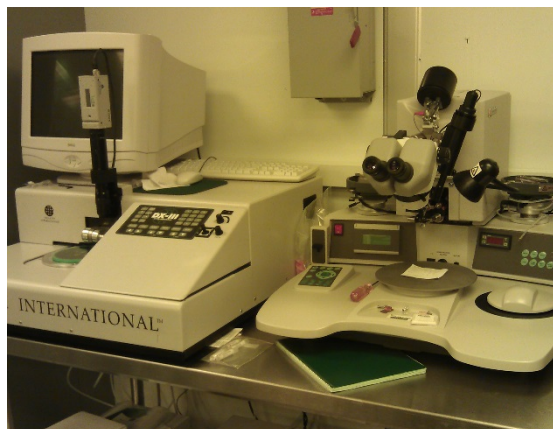
Optoelectronic Fabrication Cleanroom. 800 sq. ft. multiuser facility consisting of class 100 and class 10,000 cleanrooms. Used in the development of optoelectronic semiconductor devices. The facility equipment includes a Suss MJB-3 aligner, a Plasma-Therm 790 RIE/PECVD, an Edwards thermal evaporator, along with a bonder, a scribe and microscope. Rm 211

Scanning Electron Microscope (SEM) Facility. Vega SBH system built by Tescan is a tungsten-filament scanning electron microscope. The system is designed with a fully electronic column and is capable of imaging from 1–30 keV with nanometer scale resolution. Additionally, the system is equipped with the state of the art sample positioning stage with 5 nm resolution and a full scale travel of 42 mm. The shared SEM is ideal for checking the fidelity of travel of 42 mm. The shared SEM is ideal for checking the fidelity of the microfabrication routinely performed in the CREOL cleanroom. Rm 176

Cary Spectra-Photometer and Microscope. Cary 500 is Spectrophotometer that is capable of measuring light absorption in both transmitted and reflected light in the UV, visible and near IR spectrum. Rm 159

Zygo Facility. Rm 211B. Shared facility administered by [Martin Richardson](#).

Machine Shop. Has two modern Sharp LMV milling machines and a 16–50G lathe capable of achieving the tolerances required for the instruments used in CREOL. Classes are offered to qualify research scientists and students to safely modify and construct instruments critical to their research. Rm A106. [Richard Zotti](#).



Photolithographic and device packaging equipment in the Optoelectronic Fabrication Cleanroom

Faculty Labs

Northrup Grumman EUV Photonics Lab. Also referred to as the **Laser Plasma Lab**. Conducting research on X-ray and EUV optics and sources, X-ray microscopy, laser-aided material processing, and laser generated plasmas. [Martin Richardson](#).

Laser Aided Materials Processing Labs. Investigating the interaction of lasers with absorbing and non-absorbing materials, growth, solidification, and plasma effects; laser CVD; laser ablation, laser drilling, cutting, welding; developing process-monitoring and diagnostic techniques. [Stephen Kuebler](#) (NPM) and [Martin Richardson](#) (LPL).

Laser System Development Labs. Developing new solid-state lasers, external cavity semiconductor lasers and amplifiers, seeding lasers, laser-induced damage, far infrared semiconductor lasers, high-average-power solid state lasers, semiconductor and solid state volume Bragg lasers, high power laser beam combining, ultra-high-intensity femtosecond lasers, new solid state lasers and materials development (crystals & glasses). [Michael Bass](#), [Martin Richardson](#), [Peter Delfyett](#), [Leonid Glebov](#).

Laser Advanced Material Processing (LAMP). Engaged in novel manufacturing technology; new materials synthesis including optical, electronic and magnetic materials for a variety of applications such as sensors, detectors and medical devices; and process physics modeling. [Aravinda Kar](#).

Diffraction and Holographic Optics Lab. Conducting rigorous analysis, design, and demonstration of diffractive and holographic optical elements, subwavelength grating structures and their applications, E-M theory of grating diffraction, holographic optical information processing and storage, volume holography. [Leonid Glebov](#).

Optical Glass Sciences & Photo-Induced Processing Lab. Conducting studies of new materials for high-efficiency, robust holographic optical elements; high power laser beam combining, glass spectroscopy, refractometry and interferometry; photo-induced processes in glasses; technology of optical quality and high-purity glasses. [Leonid Glebov](#).

Optical Ceramics Lab. conducting research on the synthesis of transparent ceramics, powder processing, ceramic casting, vacuum and pressure sintering, diffusion bonding, dopant diffusion, and crystal growth for laser and nuclear detector applications. [Romain Gaume](#).

Ultrafast Photonics Laboratory. Conducting research on ultrafast high power optical pulses from semiconductor diode lasers, for applications in applied photonic networks and laser-induced materials modification. [Peter Delfyett](#).

Florida Attosecond Science and Technology Lab. Generation of attosecond (10^{-18} s) and zeptosecond (10^{-21} s) X-ray pulses. [Zenghu Chang](#).

Fiber Optics Lab. Research in fiber fabrication technology, nano-structured fibers, nonlinear fiber materials, fiber lasers, and fiber sensing applications. [Axel Schülzgen](#), [Rodrigo Amezcua](#).

Multi-Material Optical Fiber Devices Lab. Research on novel optical fiber structures, nanophotonics, fiber-based optoelectronic devices, optical imaging using large-scale three-dimensional arrays constructed from photosensitive fibers, and mid-infrared fiber nonlinear optics. [Ayman Abouraddy](#).

Optical Communication Lab. High-capacity optical communication through linear and nonlinear channels including free space and optical fiber using synergy of advanced optical and electronic techniques. [Guifang Li](#).

Semiconductor Lasers Lab. A III-V epitaxial growth facility used to research new types of semiconductor heterostructures and devices that include quantum dots, quantum dot laser diodes, vertical-cavity surface-emitting laser diodes, spontaneous light sources, and single quantum dots. A characterization laboratory is used to study the optical properties of the samples, including their light emission, microcavity effects, and laser diode characteristics. [Dennis Deppe](#).

Nanophotonic Devices Lab. Research in epitaxial growth and properties of oxide semiconductors, oxide and nitride-semiconductor light emitting diodes, self-assembled quantum dots, and e-beam nano-lithography. [Winston Schoenfeld](#).

Nanophotonics Characterization Lab. Optical analysis tools for investigation of nanostructured devices including Near-field Scanning Optical Microscope, fiber-coupled microscope for single particle spectroscopy, leakage radiation setup for surface plasmon imaging, near-infrared waveguide analysis setup, and variable temperature photoluminescence setup. Projects include manipulation of surface plasmon dispersion in nanoscale thin films, enhancement of erbium excitation in semiconductor nanocrystal doped oxides, and enhancement of optical nonlinearities using plasmon resonances. [Pieter Kik](#).

Multiple Quantum Wells Lab. Research on the design, fabrication and testing of novel all-optical switching devices using III-V multi-quantum well semiconductors, and the integration of high-speed optical and optoelectronic devices to form monolithic integrated optical circuits for high data throughput optical networks. [Patrick LikamWa](#)

Integrated Photonics & Energy Solutions Lab. Specializing in fundamental and technological aspects of silicon-based optoelectronic devices and chips, including their energy efficiency issues. The lab encompasses near- and mid-infrared setups for characterizing the devices fabricated in CREOL's Nano Fabrication Facility. [Sasan Fathpour](#).

Nonlinear Optics Labs. Conducting research on a variety of nonlinear optical effects, materials, and devices including nonlinear interactions in waveguides, nonlinear signal processing, optical power limiting, and characterizing materials response at picosecond and nanosecond scales. [Eric Van Stryland](#) and [David Hagan](#)

Nonlinear Waves Lab. Research in nonlinear optics, spatial and spatio-temporal solitons, discrete solitons in photonic lattices, and curved beams. [Demetrios Christodoulides](#).

Quantum Optics Lab. Conducting research on the generation and detection of nonclassical light, such as entangled photons, and its quantum information applications, including quantum imaging and quantum communication. [Bahaa Saleh](#), [Ayman Abouraddy](#).

Photonics Diagnostic of Random Media. Exploring different principles for optical sensing, manipulation of electromagnetic fields, and phenomena specific to optical wave interactions with complex media. [Aristide Dogariu](#).

Liquid Crystal Display Lab. Investigating 1) advanced liquid crystal display materials, display devices, and device modeling, 2) electronic laser beam steering and adaptive optics using fast-response spatial light modulators, 3) adaptive liquid crystal and liquid lenses for foreveated imaging and zoom lens, and 4) bio-inspired tunable optical filters using cholesteric liquid crystals. [Shin-Tson Wu](#).

Plasmonics and Applied Quantum Optics Lab. Developing nanoscale emitters using metallic structures, study the dynamic response of nanoscale lasers. Generation and characterization of non-classical light. ([Mercedeh Khajavikhan](#)) (PAQO).

3.3 Publications

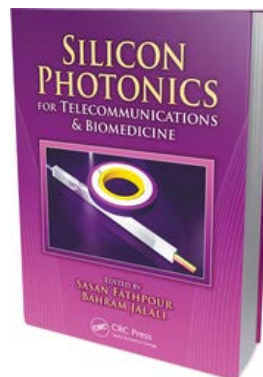
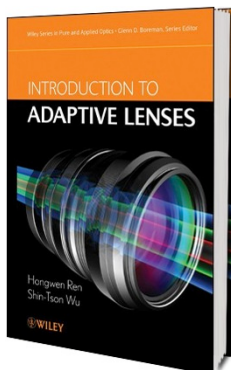
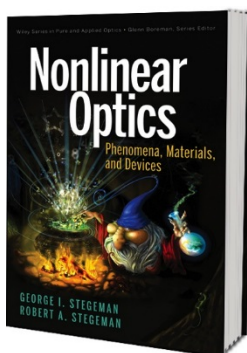
Names of full-time CREOL faculty authors are highlighted in black; those of joint and courtesy appointments who listed CREOL as one of their affiliations are highlighted in blue; names of CREOL scientists and also students with no faculty co-authors are highlighted in green.

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- N. Hoghooghi, S. Bhooplapur, J. Davila-Rodriguez and P. J. **Delfyett**, "Measurement of the spur-free dynamic range of an analog link with a semiconductor resonant cavity interferometric linear intensity modulator," IEEE Avionics, Photonics and Fiber Optics (AVFOP), ThD6, Cocoa Beach, FL (2012).
- S. Bhooplapur, N. Hoghooghi and P. J. **Delfyett**, "Measuring the Modulation Properties of Injection-Locked VCSELs Using Coherent Optical Demodulation," IEEE Avionics, Photonics and Fiber Optics (AVFOP), ThB5, Cocoa Beach, FL (2012).
- A. Klee, J. Davila-Rodriguez, M. Bagnell and P. J. **Delfyett**, "Multiheterodyne Detection for Self-Referenced Characterization of Complex Arbitrary Waveforms from Largely Detuned Optical Frequency Combs," IEEE Avionics, Photonics and Fiber Optics (AVFOP), ThD1, Cocoa Beach, FL (2012).
- S. Shabahang, G. Tao, M. Piracha, D. Nguyen, P. **Delfyett**, A. **Abouraddy**, "Octave-spanning Infrared Supercontinuum Generation in Robust Chalcogenide Nano-tapers," OSA Nonlinear Photonics Topical Meeting, (2012).
- A. Ardey, J. Kim, E. Sarailou and P. J. **Delfyett**, "Optical and RF Stabilization of a Coupled Cavity Colliding Pulse Mode-Locked Laser via Four-Wave Mixing," IEEE Avionics, Photonics and Fiber Optics (AVFOP), ThB4, Cocoa Beach, FL (2012).
- A. Klee, J. Davila-Rodriguez, M. Bagnell and P. J. **Delfyett**, "Self-referenced Spectral Phase Retrieval of Dissimilar Optical Frequency Combs via Multiheterodyne Detection," IEEE Photonics Conference, W12, (2012).
- S. Bhooplapur, N. Hoghooghi and P. J. **Delfyett**, "Simultaneous Measurements of the Optical Phase & Amplitude Modulation of Injection-Locked VCSELs Modulated at GHz Rates," IEEE Photonics Conference, MN5, (2012).
- D. Nguyen, M. U. Piracha and P. J. **Delfyett**, "Spectral Pulse Shaping with Adaptive Feedback in Fiberized CPA Systems for Sub-Picosecond, High Contrast Pulses," IEEE Photonics Conference, ThQ5, (2012).

- C. Williams, J. Davila-Rodriguez, K. Bagnell, P. J. **Delfyett**, "Stabilization of an Injection Locked Harmonically Mode Locked Laser via Polarization Spectroscopy for Frequency Comb Generation," CLEO:2012 - Laser Science to Photonic Applications, San Jose, California, p. JTh2A50, (2012).
- D. Nguyen, M. U. Piracha and P. J. **Delfyett**, "Sub-Picosecond, Transform Limited Pulse Generation in Fiber CPA Systems Utilizing Spectral Pulse Shaping with Adaptive Feedback Loop," IEEE Avionics, Photonics and Fiber Optics (AVFOP), ThD3, Cocoa Beach, FL (2012).
- E. Sarailou, A. Ardey, N. Hoghooghi, P. J. **Delfyett**, "Towards Linear Interferometric Intensity Modulator for Photonic ADCs Using an Injection Locked AlInGaAs Quantum Well Fabry-Pérot Laser," CLEO, Laser Science to Photonic Applications, p. CM1A.7, San Jose, California, (2012).
- C. Williams, J. Davila-Rodriguez, K. Bagnell and P. J. **Delfyett**, "Tunable Frequency Combs for Photonic Applications," IEEE Avionics, Photonics and Fiber Optics (AVFOP), TuA4 Cocoa Beach, FL (2012).
- M. Bagnell, J. Davila-Rodriguez and P. J. **Delfyett**, "Tunable Optoelectronic Oscillator with 10^5 Finesse Fabry Perot Etalon as a Photonic Filter and Optical Frequency Reference," IEEE Photonics Conference, MC2 (2012).
- A. Ardey, J. Kim, E. Sarailou, and P. J. **Delfyett**, "Injection Locked Coupled Cavity Mode-locked Quantum Dot Laser for Coherent Communication," Frontiers in Optics (FIO) (2012).
- E. Sarailou, A. Ardey, and P. J. **Delfyett**, "Direct RF Synchronization of a 22 GHz Monolithic AlInGaAs Quantum Well Laser with Sub-picosecond Pulse Generation," IEEE Photonics Society Annual Meeting (LEOS) (2012).
- E. Sarailou, A. Ardey, and P. J. **Delfyett**, "Direct RF Synchronization of a 22 GHz Monolithic AlInGaAs Quantum Well Laser with Sub-picosecond Pulse Generation," IEEE Photonics Society Annual Meeting (LEOS) (2012).
- E. Sarailou, A. Ardey, and P. J. **Delfyett**, "Low Noise Subpicosecond Pulse Generation from a 22 GHz AlInGaAs Multiple Quantum Well Laser by Direct RF Modulation," Avionics, Fiber-Optics and Photonics Technology Conference, IEEE. (2012).
- V. Kajorndejnukul, S. Sukhov, D. Haefner, G. Agarwal, and A. **Dogariu**, Surface Induced Anisotropy and its Optical Manifestation: Anomalous Spin Hall Effect, FIO, Rochester (2012)
- K. M. Douglass, S. Sukhov, and A. **Dogariu**, optically-controlled active media, FIO, Rochester (2012)
- Kohlgraf-Owens, L. Greusard, S. Sukhov, R. Colombelli, Y. De Wilde, and A. **Dogariu**, Optical multifrequency scanning probe microscopy, FIO, Rochester (2012)
- Kohlgraf-Owens, L. Greusard, S. Sukhov, R. Colombelli, Y. De Wilde, and A. **Dogariu**, The Topography of light, NFO12, San Sebastian, Spain, (2012)
- L. Greusard, Kohlgraf-Owens, S. Sukhov, R. Colombelli, Y. De Wilde, and A. **Dogariu**, Optical Multifrequency Atomic Force Microscopy, NFO12, San Sebastian, Spain, (2012)
- K. M. Douglass, A. Fears, L. Denney, and A. **Dogariu**, Passive Optical Measurements of Local Viscoelastic Properties in Pluronic Systems, Biological & Pharmaceutical Complex Fluids, Tomar, Portugal (2012)
- K. M. Douglass, L. Denney, C. Toma, and A. **Dogariu**, Real-time Optical Monitoring of Blood Viscoelasticity, Biological & Pharmaceutical Complex Fluids, Tomar, Portugal (2012).
- J. Ma and S. **Fathpour**, "Analytical Modeling of Mid-Infrared Silicon Raman Lasers," SPIE Photonics West, Proc. SPIE 8264, pp. 82640B-1-B6 (January 2012).
- S. Khan and S. **Fathpour**, "Complementary Apodized Grating Waveguides for Tunable Photonic Delay Lines," CLEO Science and Innovations (IEEE+OSA), Paper CTu3I.6, San Jose, CA (May 2012).
- R. **Gaume**, Y. He, A. Markosyan and R. L. Byer, "Effect of Si-induced defects on 1 μ m absorption losses in laser-grade YAG ceramics," Conference 8235: Solid State Lasers XXI: Technology and Devices, Photonics West (January 22, 2012).
- R. **Gaume**, A. Markosyan, Y. He, R.L. Byer, "Effect of Si-Induced Defects on 1 μ m-Absorption Losses in Laser-Grade YAG Ceramics," Materials Science & Technology, Symposium on Novel Sintering Processes and News in Conventional Sintering and Grain Growth (2012).
- D. Ott, V. Rotar, J. Lumeau, S. Mokhov, I. **Divliansky**, A. Rysnyanskiy, N. Vorobiev, V. Smirnov, C. Spiegelberg, L. B. **Glebov**, "Longitudinal mode selection in laser cavity by moiré volume Bragg grating" Paper 8236-71, Photonics West, San Francisco, CA (January 25, 2012).
- I. **Divliansky**, D. Ott, B. Anderson, D. R. Drachenberg, V. Rotar, G. Venus, L. B. **Glebov**, "Multiplexed Volume Bragg Gratings for Spectral Beam Combining of High Power Fiber Lasers," Photonics West, Paper 8237-4 (2012).
- I. **Divliansky**, D. Ott, B. Anderson, D. Drachenberg, V. Rotar, G. Venus, and L. B. **Glebov**, "Multiplexed

volume bragg gratings for spectral beam combining of high power fiber lasers," SPIE Photonics West Proc. of SPIE 8237-05 (2012).

D. Ott, V. Rotar, J. Lumeau, S. Mokhov, I. Divliansky, A. Rysanyanskiy, N. Vorobiev, V. Smirnov, C. Spiegelberg, L. B. **Glebov**, "Longitudinal mode selection in laser cavity by moiré volume Bragg grating," SPIE Photonics West, Proc. SPIE 8236, 823621 (2012).

A. Jain, C. Spiegelberg, V. Smirnov, L. B. **Glebov**, "Coherent Beam Combining of Single-Mode Fiber Lasers using Multiplexed Volume Bragg Gratings," SPIE Defense, Security, and Sensing (DSS) Meeting, Baltimore, MD (April 24, 2012).

L. Glebova, V. Smirnov, J. Lumeau, G. Venus, and L. B. **Glebov**, "Low losses volume Bragg gratings recorded in photo-thermo-refractive glass," Photonics West, San Francisco, CA, Paper 8257-44 (January 25, 2012).

A. Jain, L. Glebova, J. Lumeau, V. Smirnov, A. Rappaport, M. Bass, C. Spiegelberg, M. Krainak, and L. B. **Glebov**, "Rare-Earth Doped Photo-Thermo-Refractive Glass for Monolithic Solid State Lasers," SPIE Photonics West, Paper 8235-51 San Francisco, CA, (January 25, 2012).

A. I. Rysanyanskiy, N. Vorobiev, V. Smirnov, J. Lumeau, L. Glebova, O. Mokhun, E. Rotari, C. Spiegelberg, A. Podvyaznyy, and L. B. **Glebov**, "Single frequency fiber laser with external volume Bragg resonator," SPIE Defense, Security, and Sensing (DSS) Meeting, Baltimore, MD (April 24, 2012).

J. Lumeau, C. Koc, O. Mokhun, V. Smirnov, M. Lequime, and L. B. **Glebov**, "Single resonance monolithic Fabry-Perot filters formed by volume Bragg gratings and multilayer dielectric mirrors," SPIE Photonics West, San Francisco, CA, (January 25, 2012).

S. Mokhov, L. B. **Glebov**, and B. **Zeldovich**, "The beam quality of self-phase modulated Gaussian beams," SPIE Photonics West, San Francisco, CA, Paper 8236-65 (January 26, 2012).

C. Lantigua, J. Lumeau, V. Smirnov, S. Mokhov, and L. B. **Glebov**, "The quality of the ultrashort pulse laser beams stretched and compressed by chirped Bragg gratings in PTR glass," South East Ultra-Fast Conference. Orlando, FL (January 12, 2012).

M. R. Ferdinandus, M. Reichert, T. R. Ensley, H. Hu, D. A. Fishman, S. Webster, **D. J. Hagan**, and **E. W. Van Stryland**, "Dual-Arm Z-scan for measuring nonlinearities of solutes in solution," IEEE, Nonlinear Photonics 2012, Colorado Springs, CO, (June 17-21, 2012).

H. Pattanaik, D. Fishman, S. Webster, **D. J. Hagan**, **E. W. Van Stryland**, "IR detection in wide-gap semiconductors using extreme nondegenerate two-

photon absorption," CLEO/QELS, paper QF2G.7, San Jose, CA (2012).

M. R. Ferdinandus, M. Reichert, T. R. Ensley, D. A. Fishman, S. Webster, **D. J. Hagan**, and **E. W. Van Stryland**, "Measuring small solute nonlinearities in solution by dual-arm Z-Scan technique," OSA Frontiers in Optics, Rochester, NY (2012).

D. Peceli, H. Hu, S. Webster, D. Fishman, O. Przhonska, V. V. Kurkyukow, Y. L. Slominsky, A. D. Kachkovski, **D. J. Hagan**, **E. W. Van Stryland**, "Nonlinear optical study of oxygen-sulfur squaraines," CLEO/QELS, paper JW4A.48, San Jose, CA, (2012).

N. Choi and J. E. **Harvey**, "Comparison of the Domain of Validity of Several Approximate Surface Scatter Theories," Reflection, Scattering and Diffraction from Surfaces III; Conference at SPIE's International Symposium on Optics and Photonics, San Diego, CA, (August 12–16, 2012).

J. E. **Harvey**, N. Choi and A. Krywonos, "Domain of Validity of the Equation for Total Integrated Scatter (TIS)," Reflection, Scattering and Diffraction from Surfaces III Conference at SPIE's International Symposium on Optics and Photonics, San Diego, CA, (August 12–16, 2012).

J. E. **Harvey**, "Radiometry Rocks!," Tribute to William L. Wolfe Conference at SPIE's International Symposium on Optics and Photonics, San Diego, CA, (August 12–16, 2012).

G. Lim, T. Manzur and A. **Kar**, "Uncooled silicon carbide sensor producing optical signal," Symp. Unmanned Sensor Network, SPIE Defense, Security, and Sensing (DSS) Meeting, Baltimore, MD (April 23–27, 2012).

K. J. **Kasunic**, M. Bagnell, J. D'Archangel, A. W. Dillard, K. M. Douglass, M. S. Mills, D. Ott, V. Relina, and B. Webb, "Research-Centric Project-Based Learning of Optomechanical Design," SPIE, 8481 (2012).

S. M. **Kuebler**, H. E. Williams, D. J. Freppon, and R. C. Rumpf, "Fabrication of polymeric micro-phonic structures on the tip of optical fibers," Advanced Photonics Congress, Specialty Optical Fibers, Colorado Springs, CO (June 17–21, 2012).

Y. F. **Lan**, C. Y. Tsai, P. J. Ku, L. Y. Wang, T. H. Huang, C. Y. Liu, N. Sugiura, "Identification of blue-phase liquid crystal by CIE," Boston, SID, 16–4 (2012).

J. Giammarco, B. Zdryko, I. Luzinov, J. Wilkinson, J.D. Musgraves, **K. Richardson**, A. Agarwal, L.C. Kimerling, J. Hu, "Enrichment polymer systems for FT-IR detection of chemical vapors," 243rd American Chemical Society National Meeting, Philadelphia, PA (August, 19–23, 2012).

H. Lin, Y. Sou, S. Danto, J.D. Musgraves, **K.**

Richardson, P. Lin, V. Singh, A. Agarwal, L.C. Kimerling, J. Hu, "Mid infrared As_2Se_3 chalcogenide glass-on-silicon waveguide," IEEE International Conference on Group IV Photonics, San Diego, CA (August 29–31, 2012).

G. Guery, J.D. Musgraves, F. Smektala, V. Rodriguez, T. Cardinal, **K. Richardson**, "Synthesis of high-purity tellurite glasses and glass-ceramics for optical fiber applications," International Symposium on Non-Oxide and New Optical Glasses, Saint-Malo, France (July 1–5, 2012).

B. Gleason, P. Wachtel, D. Musgraves, **K. Richardson**, "Physical, Structural, and Optical Changes in Infrared Glasses as Prepared by Precision Glass Molding (PGM)," Optical Fabrication and Testing Workshop, OSA Congress on Optics, Monterey, CA (June 2012).

G. Guery, M. Dussauze, T. Cardinal, F. Adamietz, V. Rodriguez, **K. Richardson**, "New understanding in TeO_2 -based glass structure by Hyper-Raman/Hyper-Rayleigh for the measure of the Raman gain," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

Y. Zou, O. Ogubuu, S. Novak, J. Wilkinson, J. Musgraves, **K. Richardson**, J. Hu, "Physio-chemical properties of spin-coated As_2Se_3 chalcogenide glass thin films," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

E. Koontz, V. Blouin, J.D. Musgraves, P. Wachtel, **K. Richardson**, "Structural relaxation spectra in N-BK7," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

P. Lin, N. Patel, V. Singh, L. Kimerling, A. Agarwal, J. Scherer, M. Bawendi, J. Musgraves, **K. Richardson**, C. Dimas, "Two-dimensional photonic crystals on hybrid quantum dots/chalcogenide films and their emission properties," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

S. Novak, J. Wilkinson, L. Scarpantonio, J.D. Musgraves, M. Dussauze, A. Martucci, M. Dai Prè, N. McClenaghan, **K. Richardson**, "Near-infrared emitting quantum dots in solution-derived chalcogenide glass films," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

J. Wilkinson, S. Novak, M. Dussauze, F. Adiametz, J.D. Musgraves, **K. Richardson**, and E. Fargin, "Characterization and optimization of solution-derived chalcogenide glass thin films," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

T. Shoulders, J. Wilkinson, M. Dussauze and **K. Richardson**, "Thermal Poling Behavior and SHG Stability of Multi-component Chalcogenide Glasses," Glass and Optical Materials Division meeting

(GOMD), St. Louis, MO (May 20–24, 2012)

J. Musgraves, S. Danto, P. Wachtel, **K. Richardson**, "Thermal properties of chalcogenide glasses," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

V. Singh, A. M. Agarwal, L. C. Kimerling, J. Hu, J. Wilkinson, J.D. Musgraves, **K. Richardson**, J. Giammarco, I. Luzinov, J.M. Hensley, K.M. Parameswaran, D.M. Scherer, B.D.F. Casse, C.S. Kim, W.W. Bewley, C.L. Canedy, I. Vurgaftman, J. Abell, J.R. Meyer, M. Kim, "Thermally evaporated chalcogenide thin films for mid-infrared applications: materials analysis, device design, fabrication and testing," Glass and Optical Materials Division meeting (GOMD), St. Louis, MO (May 20–24, 2012).

D. R. Scherer, J. M. Hensley, K. M. Parameswaran, B. D. F. Casse, V. Singh, P. Lin, A. M. Agarwal, L. C. Kimerling, J. Giammarco, J. Wilkinson, I. Luzinov, J. D. Musgraves, **K. Richardson**, J. Hu, C. S. Kim, W. W. Bewley, C. L. Canedy, I. Vurgaftman, J. Abell, J. R. Meyer, M. Kim, "Characterization of mid-infrared interband cascade laser coupling to a GeSbS chalcogenide glass waveguide," CLEO:2012, San Jose, CA (May 6–11, 2012)

R. Burtovyy, B. Gleason, D. J. Musgraves, **K. Richardson**, I. Luzinov, "Carbon nanocoatings via carbonization of poly (bisphenol A carbonate)," In Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, COLL-709, (March 25–29, 2012).

P. Kadwani, J. Bradford, R. A. Sims, L. **Shah**, **M. Richardson**, J.D. Musgraves, **K. Richardson**, "Transmission and thermo-optic characterization of near-IR and mid-IR materials," SPIE Fiber Laser Applications, San Diego, CA (February 1–3, 2012).

M. C. Richardson, J.-C. Diels, A. Aceves, L. Arissian, M. Baudelet, E. Johnson, Z. Chang, N. Litchinitser, T. Seideman, X.-C. Zhang, R. Hammond, "The ARO MURI Program on Air Filamentation Science After One Year," 10th annual ultrashort pulse laser workshop, Directed Energy Professional Society; Broomfield, CO (June 12, 2012).

M. C. Richardson, M. Baudelet, M. Sigman, and A. Miziolek, "Stand-off chemical and biological sensing," Frontiers in Optics 2012, Laser Science XXVIII, Rochester, NY, USA. (October 14–18, 2012). (Invited)

B. E. A. **Saleh**, "The Future of optics & photonics," SPIE's International Symposium on Optics and Photonics, San Diego, CA, (August 12, 2012). (Plenary Talk)

B. E. A. **Saleh**, "Classical & quantum binary, quaternary, and M-ary optics," Latin American Optics and Photonics (LAOP) workshop, Cancun, Mexico, (November 4–8, 2012). (Invited)

- R. C. Boutwell, M. Wei, and W. V. **Schoenfeld**, "Effect of Growth Conditions on Cubic ZnMgO films," TF+AS-WeA7, AVS 59th International Symposium, (2012).
- M. Wei, R. C. Boutwell, and W. V. **Schoenfeld**, "High Quality ZnMgO Thin Films Grown on Sapphire and ZnO Substrates by Molecular Beam Epitaxy," TF+AS-WeA7, AVS 59th International Symposium (2012).
- R. C. Boutwell, M. Wei, and W. V. **Schoenfeld**, "Homoepitaxial growth of MgO and cubic ZnMgO by plasma-enhanced molecular beam epitaxy," Florida AVS Symposium, Orlando, FL (2012).
- M. Wei, C. Boutwell, and W. V. **Schoenfeld**, "Lattice-Matched Molecular Beam Epitaxy of Oxide Semiconductors for UV Applications," Florida AVS Symposium, Orlando, FL (March 6, 2012). (Invited Talk).
- A. Mafi, P. Hofmann, C. Jollivet, N. Peyghambarian and A. **Schülzgen**, "Low-Loss Coupling Between Single-Mode Optical Fibers with Very Different Mode-Field Diameters," Specialty Optical Fibers and Applications (2012).
- S. Raghavan, A. S. Jones, G. Freihofer, K. Lautenslager, W. Gysi, S. Frank, and A. **Schülzgen**, "Embedded Alumina Nanoparticles as Diagnostic Coatings for Structures," SAMPE (Society for the Advancement of Material and Process Engineering), Advances in NDE/NDI, Baltimore, MD (2012).
- W. Gysi, K. Lautenslager, G. Freihofer, A. S. Jones, C. Jollivet, A. Van Newkirk, A. **Schülzgen**, and S. Raghavan, "GOALI: Developing Piezospectroscopic Sensing Systems in Adhesives and Coatings," NSF CMMI Engineering Research and Innovation Conference, paper: E144, Boston, MA (2012).
- A. Mafi, P. Hofmann, C. Jollivet Salvin, N. Peyghambarian, and A. **Schülzgen**, "Low-Loss Coupling Between Single-Mode Optical Fibers with Very Different Mode-Field Diameters," Specialty Optical Fibers & Applications – SOF, paper: SW4F.5, Colorado Springs (2012).
- P. Hofmann, A. Mafi, C. Jollivet, T. Tiess, N. Peyghambarian, and A. **Schülzgen**, "Low-Loss, Broad-Band Coupling Between Single-Mode Optical Fibers with Very Different Mode-Field Diameters," CLEO, paper: CM1N.4, San Jose, CA (2012).
- G. Freihofer, S. Frank, E. Ergin, A. S. Jones, A. Stevenson, A. **Schülzgen**, S. Raghavan, and H. Tat, "Measurement of Load Transfer within Alumina Nanoparticle Epoxy Composites Using Piezospectroscopy," SAMPE (Society for the Advancement of Material and Process Engineering), Nanomaterials 1, Baltimore, MD (2012).
- C. Jollivet, T. T. Alkeskjold, L. Leick, P. Kadwani, R. A. Sims, L. **Shah**, M.C. Richardson, R. **Amezcuacorreia**, and A. **Schülzgen**, "Modal properties of photonic crystal fibers for high power 2 μ m fiber laser systems," Proc. SPIE 8381-4 (2012).
- P. Kadwani, R.A. Sims, L. **Shah**, M. C. **Richardson**, "Q-switched PM Tm: fiber laser oscillator for mid-IR generation," SPIE Photonics West, paper 8237-124, San Francisco (2012).
- P. Kadwani, N. Modsching, R.A. Sims, L. Leick, J. Broeng, L. **Shah**, M. C. **Richardson**, "Q-switched thulium doped photonic crystal fiber laser as a source for nonlinear generation," CLEO: Science and Innovations, paper CTu2M.6, Baltimore, MD (2012).
- C. Jollivet, T. T. Alkeskjold, L. Leick, P. Kadwani, R. A. Sims, L. **Shah**, M. C. **Richardson**, R. Amezcuacorreia, and A. **Schülzgen**, "Modal Properties of Photonic Crystal Fibers for High Power 2 μ m Fiber laser Systems," Proceedings SPIE 8381-4 (2012).
- C. Jollivet Salvin, C. Loussert, T. Alkeskjold, Lasse Leick, R. A. Sims, P. Kadwani, L. **Shah**, M. C. **Richardson**, R. **Amezcuacorreia**, and Axel **Schülzgen**, "Modal Analysis of Large-Mode-Area Photonic Crystal Fiber for High Power 2 μ m Fiber Lasers," Fiber Laser Applications - FILAS, paper: FTh4A.5, OSA Technical Digest (2012).
- W. Chang, T. Zhou, L. **Siiman**, and A. **Galvanauskas**, "Femtosecond pulse coherent combining and spectral synthesis using four parallel chirped pulse fiber amplifiers," in Lasers, Sources, and Related Photonic Devices, OSA Technical Digest, paper AM4A.25 (2012).
- E. W **Van Stryland**, H. S. Pattanaik, D. A. Fishman, S. Webster, D. J. **Hagan**, "Nondegenerate 2-Photon Absorption Spectroscopy and Detection," NLO50, 50 Years of Nonlinear Optics International Symposium, ICFO, Barcelona, Spain, (Oct. 7-10, 2012).
- E. W. **Van Stryland**, "Nonlinear Spectroscopy Comes of Age," 2012 PSROC annual meeting of the Physical Society of Republic of China, Taiwan, Jan. 17-19, 2012. (2012).
- S. T. **Wu**, "Blue-phase LCD: A disruptive technology?," (Plenary Talk) Symposium on Liquid Crystal Photonics, Guilin, China (March 24–27, 2012).

Invited Lectures and Tutorials

M. Baudelet, "New Perspectives in Laser Spectroscopy as A Science for Sensing, Monitoring and Diagnostics," CREOL, University of Central Florida, FL, (September 14, 2012).

M. Baudelet, Y. Liu, M. Weidman, M. E. Sigman, M. C. Richardson, "Fifty years of LIBS and no limits for analysis," SciX 2012; Kansas City, MO (October 2, 2012).

Y. Liu, **M. Baudelet**, M. C. Richardson, "Microwave-assisted LIBS: Signal enhancement and beyond," SciX 2012; Kansas City, MO (October 2, 2012).

Z. Chang, "Probing excited-state electron dynamics in atoms with attosecond pulses," Seminar, University of Ottawa, Canada (November 28, 2012).

Z. Chang, "Probing excited-state electron dynamics with attosecond pulses," Seminar, University of Texas A & M. (December 7, 2012).

Z. Chang, "The attosecond laser, a new solution seeking problems," Physics and Astronomy Colloquium, Vanderbilt University (February 2, 2012).

Z. Chang, "Broadband isolated attosecond pulses," CREOL@25, University of Central Florida. (March 15-16, 2012).

Z. Chang, "En route to high flux attosecond source," Workshop on attosecond science and Engineering, Orlando, FL (April 16-17, 2012).

Z. Chang, "Characterization of isolated 67 attosecond pulses with an advanced PROOF method," Workshop on Super Intense Laser-atom Physics, Suzhou, China (September 23-26, 2012).

Z. Chang, "Observing bound and auto-ionizing state dynamics with attosecond transient absorption," Townes Symposium on Ultrafast Science. Orlando, FL (November 7, 2012).

Z. Chang, "Probing excited state dynamics with isolated attosecond pulses," ARO MURI annual meeting, Santa Fe, NM (October 5, 2012).

D. N. Christodoulides, "PT-Symmetric Optical Structures and Materials," Emory University, Physics Department (April 13, 2012).

D. G. Deppe, "High efficiency semiconductor lasers with low internal optical loss," Lasertel, Inc., Tuscon, AZ (March 25, 2012).

S. Fathpour, "Silicon Photonics: A Versatile Technology for Visible to Mid-Infrared Wavelengths," Department of Mechanical and Materials Engineering, Florida International University (October 20, 2012).

R. Gaume, "Seminar on optical ceramics," Clemson University (October 2012).

L. B. Glebov, "Volume Bragg gratings: transitioning technology to industry," 25th Anniversary of CREOL. (2012).

P. G. Kik, "New approaches in nanoscale plasmon resonance control," Optics and Electronics Seminar, Stanford University, Stanford, CA (2012).

P. G. Kik, "Plasmonic metamaterials for ultrafast nonlinear optical switching," AEgis Workshop Linear and Nonlinear Optical Interactions in Metamaterials and Plasmonic Nanostructures, Huntsville, AL (2012).

S. M. Kuebler, H. E. Williams, D. J. Freppon, R. C. Rumpf, and M. A. Melino, "Creation of three-dimensional micro-photon structures on the end-face of optical fibers," in LPM2012: 13th International Symposium on Laser Precision Microfabrication, Catholic University of America, Washington, D.C., (2012).

K. Richardson, "Engineering glasses for next generation optics," F. Schiller University, Fraunhofer, IOF, Jena Germany (March 2012).

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Patents and Disclosures

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R. Lu, **S.T. Wu**, W. Y. Li, C.K. Wei, "Transflective Liquid Crystal Display," U.S. Patent 8,089,590 B2, January 3, 2012.

C.C. Tsai, **S.T. Wu**, W. Y. Li, C.K. Wei., "Polarizing Lamp," U.S. Patent 8,115,999 B2, February 14, 2012.

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Provisional/Utility

D. Deppe, "Optical Isolator and Laser Apparatus, Method, and Applications," Provisional Patent 61/554,678, Filed November 2, 2011.

G. Li, N. Bai, X. Cen, "Supermodes for Optical Transmission," Provisional Patent 61/522,970, Filed July 12, 2011.

G. Li, I. Oxdur, "Systems and Methods for Amplifying Space-Multiplexed Optical Signals," Provisional Patent 61/543,524, Filed October 5, 2011.

A. Santhanam, "Method and System for Real-Time Radiation Delivery Dose Monitoring," Provisional Patent 61/514,991, Filed August 4, 2011.

E. Van Stryland, **D. Hagan**, "Optical Sensing Method, Apparatus, and Applications," Provisional Patent 61/563,182, Filed November 23, 2011.

G. Boreman, "Tunable Optical Diffraction Grating Apparatus and Related Methods," Utility Patent 13/206,861, Filed August 10, 2011.

P. J. Delfyett, J. Davila-Rodriguez, N. Hoghooghi, "Optical Modulator with Linear Response," Utility Patent 13/394,934, Filed March 8, 2012.

D. Deppe, **S. Freisem**, "Semiconductor Light Sources Including Selective Diffusion for Optical and Electrical Confinement," Utility Patent 13/352,050, Filed January 17, 2012.

L. Glebov, A. Jain, G. Venus, "Laser Apparatus, Component, Method and Applications," Utility Patent 13/370,729, Filed February 10, 2012.

A. Kar, "Surface Modification of Materials for Tailoring Responses to Electromagnetic Fields," Utility Patent 13/476,730, Filed May 21, 2012

G. Li, L. Zhu, "Efficient Computation And Compensation Of Linear And Nonlinear Distortion in Dispersion-Managed Fiber-Optic Transmission," Utility Patent 13/404,770, Filed February 24, 2012

G. Li, **B. Saleh**, "Systems And Methods For Performing Digital Holography," Utility Patent 13/417,822 Filed March 12, 2012.

G. Li, F. Yaman, "Waveguides Configured to Simultaneously Guide Electromagnetic Waves of Different Wavelengths," Utility Patent 13/315,723, Filed December 9, 2012.

S.T. Wu, M. Jiao, Y. Li, "Display Device," Utility Patent 13/348,652, Filed January 12, 2012.

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S.T. Wu, H. C. Cheng, J. Yan, "Display Device,"

Patent Disclosures

N. Bai, **G. Li**, "Frequency-domain equalization for few-mode fiber transmission."

M. Bass, "System for Generating Two or More Laser Pulses with Selectable Inter Pulse Interval."

M. Bass, Y. Chen, "A novel diode pumped, end pumped, rod shaped solid state laser."

G. Boreman, "Ultrafast Metamaterials Based Beam Steering."

P. J. Delfyett, D. Nguyen, M. Piracha, "A chirped fiber Bragg grating with ripple - free group delay."

D. G. Deppe, "Integrated Optical Isolator and Laser Mount."

G. Li, I. Ozdur, "Photonic Signal Processor for Multi-Core Fibers."

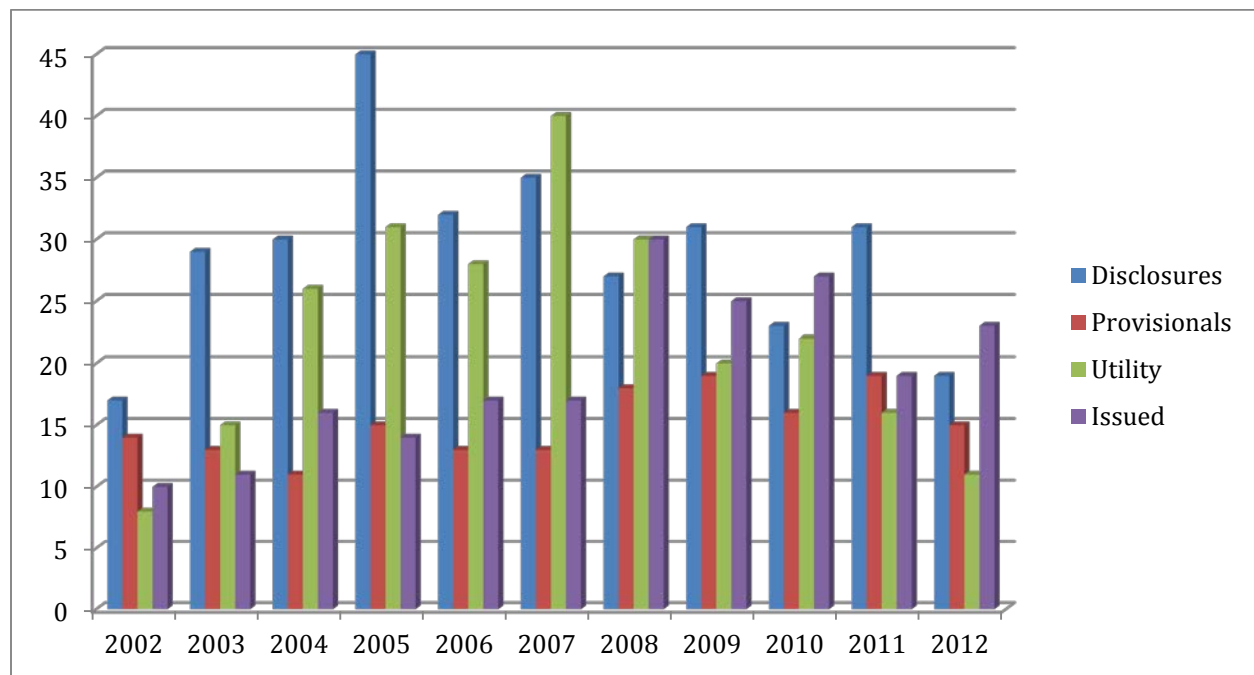
G. Li, "Architecture and Protocol for Spatial Mode-Routed Optical Networks."

M. C. Richardson, Y. Liu, M. Baudelet, "LIBS Moisture Monitoring System."

A. Santhanam, "Method and System for Real-Time Radiation Delivery Dose Monitoring."

E. Van Stryland, D. Hagan, "Extreme Nondegenerate Two-Photon Absorption in Semiconductors."

C. Williams, **P. J. Delfyett**, "Widely Tunable Optical Frequency Comb Source."



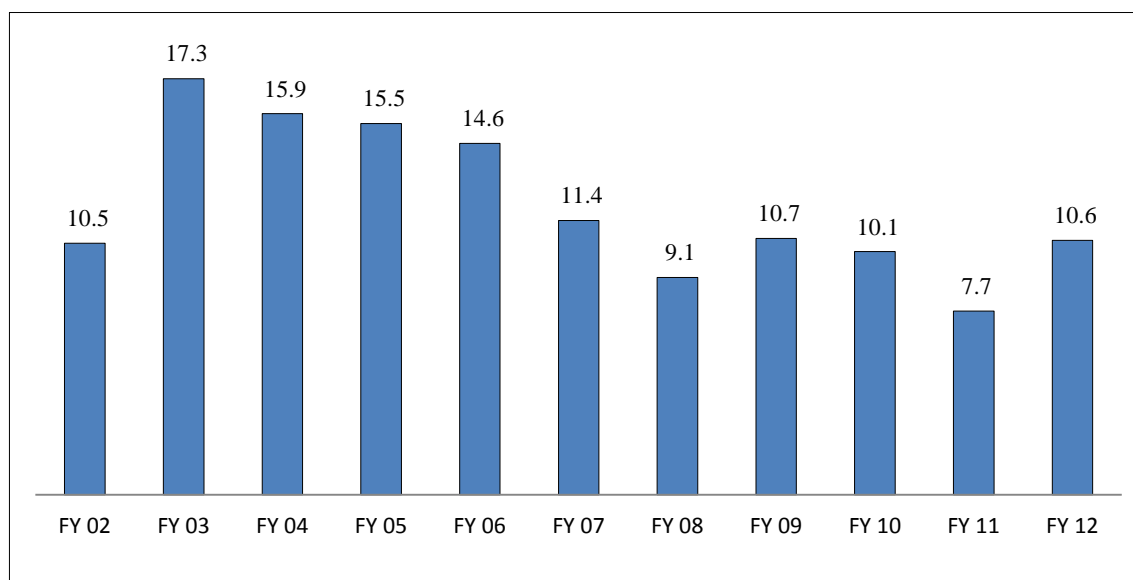
History of disclosures, applications, and issued patents by FY

3.4 Research Funding

Research has been funded by a combination of federal, industrial, and state grants. The amounts shown below are actual funds received for each year, with each grant covering a different period. Some of the industrial grants include federal funding that has come via industry. Not included in the chart of funding history are the state grants. These include a \$10M fund received in FY 2004 for the Florida Photonics Center of Excellence (FPCE) and a \$4.5M grant received in FY2007 to establish the Townes Laser Institute (TLI). These funds continue to support the research and educational activities of these centers.

Federal	Industry	Educational	International	Total
\$6,937,511	\$2,275,623	\$0	\$1,423,366	\$10,636,500

Grants received in FY 2012



History of funding from various sources since 2002

Research Funding (FY 2012)

Recipient	Source	Title of Award	Begin	End	Awarded 2012	Cumulative Funding
Abouraddy, A	Massachusetts Institute of Technology	CMSE IRG 3 - Multimaterial, Multifunction Nano-structured Fibers	2/1/2012	1/31/2013	\$55,000	\$55,000
Abouraddy, A	National Science Foundation	Mid-infrared, wide-bandwidth, stable coherent optical sources generated by multi-material, nonlinear chalcogenide-glass fibers	4/15/2010	3/31/2013	\$136,930	\$320,752
Abouraddy, A, Christodoulidis, D	DOD/AF/Air Force Office of Scientific Research	Large-scale Fabrication of Macroscopic All-Polymer PT-Materials	4/15/2012	4/14/2015	\$162,484	\$162,484
Abouraddy, A, Schoenfeld, W	PICO Technologies	Hybrid Solar Lighting System for Military Expeditionary Shelters	2/1/2012	8/5/2012	\$26,024	\$26,024
Bass, M	E6	10.6 Micron Calorimetric Measurement of Diamond Absorption	2/1/2011	1/31/2012	\$15,000	\$15,000
Bass, M	E6	Calorimetric Measurement of Diamond Absorptance at 10.6 Micron	4/23/2012	6/30/2012	\$1,000	\$1,000

Bass, M	Powerlase Limited	Design of a KW class, Pulsed, ~1mm, 10kHz, Diode Pumped Slab Solid State Laser System	3/19/2012	9/18/2012	\$44,951	\$76,058
Bass, M	Honeywell Federal Manufacturing & Technologies, LLC	Fiber Optic Cable Modeling	4/9/2012	9/28/2012	\$225,000	\$225,000
Bass, M	Naval Air Warfare Center WPN Division	Laser Calorimetry	8/14/2010	8/31/2012	\$5,000	\$214,000
Bass, M	Technology Assessment & Transfer Inc	Optical properties of ceramic Ti doped spinel	7/15/2011	12/31/2011	\$10,000	\$10,000
Bass, M	Technology Assessment & Transfer Inc	Optical Properties of Ceramic Ti Doped Spinel - Phase 2	4/11/2012	11/30/2012	\$22,000	\$22,000
Bass, MI	American Medical Systems, Inc.	High Power CW Yb:YAG Laser Design Studies	9/6/2011	3/30/2012	\$40,000	\$40,000
Chang, Z	Kansas State University	Attosecond Optical Technology Based on Recollision and Gating	8/8/2010	9/27/2012	\$173,627	\$1,203,813
Christodoulides, D	Israel Ministry of Defense	Airy Wavepackets and wavefront Engineering for Beam Filamentation Studies	7/13/2011	8/31/2013	\$300,000	\$300,000
Christodoulides, D	National Science Foundation	IDR: Collaborative Research: Novel Photonic Materials and Devices based on Non-Hermitian Optics	9/1/2011	8/31/2014	\$179,731	\$179,731
Christodoulides, D	University of Arizona	Mathematical Modeling and Experimental Validation of Ultrafast Nonlinear Light-Matter Coupling Associated with Filamentation in Transparent Media	9/30/2010	11/29/2012	\$90,318	\$192,620
Christodoulides, D	United States-Israel Binational Science Foundation	Sub-wavelength Linear and Non-Linear Optics	10/1/2011	9/30/2012	\$20,677	\$37,177
Delfyett, P	University of Washington	Science and Technology Center at the University of Washington	8/1/2005	7/31/2012	\$50,000	\$420,000
Deppe, D	DOD/Defense Advanced Research Projects Agency	TEP Laser	9/15/2011	1/15/2013	\$288,834	\$288,834
Deppe, D	DOD/Army/Army Research Office	WDM Nanoscale Laser Diodes for Si Photonic Interconnects	2/1/2012	1/31/2013	\$121,838	\$121,838

Divliansky, I	OptiGrate	Narrow band blue laser for submarine laser communications	9/1/2011	8/26/2012	\$78,000	\$78,000
Dogariu, A	KaMin LLC	Light Scattering Properties of Load Pigment Layers	7/15/2010	7/14/2012	\$15,434	\$123,472
Dogariu, A	National Science Foundation	Optical Control of Cellular Biomechanics	7/1/2012	6/30/2015	\$164,882	\$191,109
Fathpour, S	National Science Foundation	CAREER: Mid-Infrared Photonic Devices and Integrated Circuits on Silicon	2/1/2012	1/31/2017	\$400,000	\$400,000
Fathpour, S	National Science Foundation	Silicon Photonic Devices for Optical Delay Line Integrated Circuits	9/1/2011	8/31/2014	\$328,289	\$328,289
Gaume, R	Duke University	High-throughput computational and experimental search of novel phonon mediated covalent metal superconductors and thermoelectric materials	10/1/2011	9/30/2012	\$38,250	\$75,000
Glebov, L	OptiGrate	Compact stretcher/compressor for high power ultrafast laser based on volume chirped Bragg grating in PTR glass	5/1/2012	3/31/2014	\$40,000	\$100,000
Glebov, L	OptiGrate	Development of line-narrowed diode pumps sources for DPAL systems	2/1/2012	7/31/2012	\$33,333	\$33,333
Glebov, L	Emory University	RF: High Power Diode Pumped Alkali Vapor Lasers and Analog Systems	8/15/2007	8/14/2012	\$139,531	\$628,428
Glebov, L	OptiGrate	Volume Bragg gratings for spectral and coherent beam combining in MWIR spectral region	11/1/2011	5/31/2012	\$45,000	\$45,000
Glebov, L, Zeldovich, B, Schulzgen, A	Air Force Office of Scientific Research	Volume Bragg Gratings - Research, Testing and High Power Applications	9/27/2010	9/20/2012	\$725,000	\$1,000,010
Hagan, D, Van Stryland, E	Israel Ministry of Defense	Development of new materials for strong, broadband nonlinear transmission (Year 3)	7/28/2009	5/1/2013	\$100,000	\$100,000
Harvey, J	Lockheed Martin Adv Technologies	Solar Ultra-Violet Imager (SUV)	3/24/2008	1/31/2012	\$29,044	\$286,370
Kar, A	Semiconductor Research Corporation	AO Deflector for Laser Beam Scanning in Material Processing	10/1/2011	9/30/2012	\$100,000	\$200,000
Kar, A	Naval Undersea Warfare Center	Uncooled MWIR SiC Detector	4/12/2012	9/30/2012	\$20,000	\$20,000
Kik, P	NanoSpective	RF - Research Nanophotonic Material and Devices	7/1/2011	4/15/2015	\$500	\$500

Kik, P, Hagan, D, Van Stryland, E	Air Force Office of Scientific Research	High-Speed Scanning Spectroscopic Ellipsometer for the Rapid Optical Mapping of Large-Area Plasmonic Nanocomposites	8/18/2011	8/17/2012	\$125,000	\$125,000
Kuebler, S	National Science Foundation	CAREER: Three-Dimensional Multi-Scale Metallodielectric Materials	2/15/2008	1/31/2013	\$34,490	\$574,840
Kuebler, S	Lockheed Martin - Missles & Fire Control	Direct Laser Writing of Micro-IR components	6/7/2012	11/30/2012	\$6,000	\$20,000
Kuebler, S	Academy of Applied Science	Kuebler Group AAS-REAP Program 2012	2/8/2012	9/30/2012	\$780	\$2,600
Li, G	Ocean Optics	Novel Tunable Mid IR Laser Sources for Spectroscopy Using Silicon Photonic Crystal Fibers	11/1/2011	6/30/2012	\$10,000	\$10,000
Li, G	NEC Laboratories America, Inc.	RF - Li Group Research	3/1/2010	4/15/2013	\$20,000	\$69,500
Li, G	AT&T	RF: Support of Research on Supermode Propagation over coupled few-mode fiber	4/3/2012	3/7/2013	\$20,000	\$20,000
Lumeau, J	OptiGrate	Compact robust stretcher/compressor of ultrashort laser pulses	9/1/2011	8/26/2012	\$79,500	\$79,500
Lumeau, J	OptiGrate	Monolithic rare earth doped PTR glass laser	6/1/2011	6/30/2012	\$90,000	\$180,000
Richardson, M	Embassy of France	Advanced Ultrashort Laser Development in the IR and Mid-IR	8/1/2011	11/30/2012	\$19,452	\$19,452
Richardson, M	KLA-Tencor Corporation	DUV Laser Plasma Studies	10/10/2011	10/9/2013	\$252,052	\$252,052
Richardson, M	US Army Research Office	Engineered laser filaments in air for defense stand-off sensing and interaction applications	9/5/2009	9/4/2012	\$136,918	\$787,461
Richardson, M	Naval Postgraduate School	Localized High Power RF Generation at Large Distances Using Self-Channeled Laser Beams	9/14/2011	9/13/2012	\$188,000	\$188,000
Richardson, M	University of North Carolina Charlotte	Novel GMRF devices for integration with Tm: fiber lasers	12/1/2010	9/30/2013	\$57,513	\$111,583
Richardson, M, Baudet, M	Air Force Office of Scientific Research	Fundamentals of Filament Interaction	10/15/2010	10/14/2015	\$704,918	\$979,918
Richardson, M, Baudet, M, Chang, Z	DOD/Army/Army Research Office	Light Filamentation Science	8/1/2011	12/31/2012	\$1,708,854	\$1,770,833

Richardson, M, Bradford, J, Willis, C, Liu, Y	US Army Research Office	ARO High School Apprenticeships in Laser Development and Spectroscopy at the Townes Laser Institute	9/5/2009	9/4/2012	\$6,000	\$6,000
Richardson, M, Hagan, D	US Department of Education- FIPSE	MILMI - International Masters in Laser Materials and Interactions	9/1/2008	8/31/2013	\$112,177	\$447,582
Richardson, M, Shah, L	Office of Naval Research	Femtosecond TM:Fiber Laser (FTFL) Facility	12/1/2011	11/30/2012	\$169,635	\$169,635
Richardson, M, Shah, L	Genia Photonics	6-10um DFG project	9/8/2011	7/31/2012	\$123,326	\$123,326
Saleh, B	Emerging Technology Commission	FPCE - Competitive Project Awards	7/1/2003	12/31/2012	-\$32,302	\$4,100,000
Saleh, B	UCF Foundation, Inc	RF - FPCE Professorships/Program Fund	1/1/2007	4/15/2014	\$50,000	\$150,000
Schoenfeld, W	US Army Research Office	Deep-UV Emitters and Detectors Based on Lattice-Matched Cubic Oxide Semiconductors	7/1/2010	12/31/2012	\$100,000	\$220,000
Schulzgen, A, Abouraddy, A, Richardson, M, Glebov, L, Delfyett, P	National Science Foundation	MRI: Acquisition of analysis tools for rapid optical fiber characterization with nm- scale resolution	10/1/2011	9/30/2012	\$129,500	\$129,500
Seetha R, Schulzgen, A	National Science Foundation	GOALI: Developing Piezospectroscopic Sensing Systems in Adhesives and Coatings	10/1/2011	9/30/2014	\$227,094	\$498,157
Van Stryland, E, Hagan, D	DOD/Army/Arm y Research Office	Extremely Non-Degenerate (END) 2-Photon Detection	10/1/2011	6/30/2012	\$50,000	\$50,000
Van Stryland, E, Hagan, D	Georgia Tech Research Corporation	MURI: Nonlinear Optical Characterization	9/30/2010	11/30/2012	\$249,803	\$533,694
Van Stryland, E, Hagan, D	UES, Inc.	Task 1: Semiconductor Nonlinear Optical Response in the IR	10/14/2011	10/13/2012	\$65,000	\$65,000
Van Stryland, E, Hagan, D	UES, Inc.	Task 2: Semiconductor Nonlinear Optical Response in the IR	10/14/2011	10/13/2012	\$50,000	\$50,000
Van Stryland, E, Hagan, D	Georgia Tech Research Corporation	Zeno Project for Georgia Tech	9/30/2009	11/30/2012	\$192,043	\$375,000
Webster, S	PL Systems	Feasibility Study - High Power Laser Damage Study for Laser Safety Curtains and Barriers (Seed Project)	10/1/2011	12/31/2011	\$4,833	\$4,833
Wu, ST	AU Optronics Corporation	Advanced Liquid Crystal Displays	7/1/2010	6/30/2013	\$300,000	\$450,000

Wu, ST	ITRI Display Technology Center	Blue-Phase Liquid Crystals	4/1/2010	3/31/2012	\$58,750	\$295,000
Wu, ST	Kent Optronics, Inc.	Electronically switchable IR beam splitter technology	1/7/2012	1/6/2014	\$292,000	\$292,000
Wu, ST	AFOSR	Fast response and low voltage dual frequency liquid crystals	3/1/2009	11/30/2012	\$140,000	\$590,000
Wu, ST	Raytheon	Fast-Response Liquid Crystals	8/25/2010	11/30/2011	\$20,000	\$150,000
Wu, ST	Kent Optronics, Inc.	Switchable IR beam splitter	9/7/2011	1/6/2012	\$25,000	\$25,000
Wu, ST, Fang, J	ITRI Display Technology Center	Novel Display and Biosensor Devices	12/1/2011	12/31/2014	\$624,488	\$629,117

TOTAL **\$10,636,501 \$22,065,425**

Continuing Projects

Recipient	Source	Title of Award	Begin	End
Deppe, D, Freisem, S	National Science Foundation	Research into the P-N Junction Thempotonic Effect	9/15/2010	8/31/2013
Dogariu, A	AFOSR	Sensing Random Electromagnetic Fields and Applications	5/1/2010	4/30/2013
Dogariu, A	Mayo Clinic	Intraoperative, Real-Time Monitoring of Coagulation with Laser Spectroscopy	8/15/2007	3/31/2013
Fathpour, S	National Science Foundation	Cladding-Pumped Silicon Raman Amplifiers with In(Ga)As Quantum Dot Laser Pumps	8/15/2009	7/31/2012
Kik, P	National Science Foundation	CAREER: Silicon Compatible Hybrid Nanophotonic Systems	2/1/2007	1/31/2013
Li, G	NSG America, Inc	10 Gb/s APD Packaging	6/1/2009	5/31/2013
Richardson, M	National Science Foundation	REU Site: International Program on Optics, Lasers, Photonics and Optical Materials	4/15/2007	3/31/2012
Richardson, M	National Science Foundation	Long Range Laser Measurements and Signature Intelligence	9/1/2008	8/31/2012
Richardson, M, Sigman, M	US Army Research Office	Ultrafast Laser Interaction Processes for Libs and other Sensing Technologies	6/15/2006	9/14/2012
Schoenfeld, W	US Army Research Laboratory	Hybrid MgZnO/AlGa/N Ultra-violet Lasers	3/3/2011	7/1/2013
Schoenfeld, W, Hagan, D	National Science Foundation	REU Site: Research Experience for Undergraduates in Optics and Laser	3/1/2009	5/31/2013
Van Stryland, E, Hagan, D, Kik, P	US Army Research Office	Engineered Multifunctional Nanophotonic Materials for Ultrafast Optical Switching	5/15/2006	8/14/2012

3.5 Affiliated Research Centers

The University of Central Florida has several nationally and internationally recognized research institutes in addition to the three at CREOL, The College of Optics and Photonics that are devoted to research and development.

Advanced Materials Processing and Analysis Center

The Advanced Materials Processing and Analysis Center (AMPAC) is an interdisciplinary research and education center for materials science and engineering, one of two major UCF research centers that comprise the Center of Advanced Materials and Nanotechnology. Our two university-wide multi-user facilities — the Materials Characterization Facility (MCF) and the Advanced Microfabrication Facility (AMF) - are available to all researchers at UCF and from outside companies, government labs, and universities, enabling them to perform cutting-edge research, and to train and educate students and other personnel in the use of state-of-the-art equipment. AMPAC's vision is to make UCF an international leader in materials science and engineering research and education by excelling in the development, processing and characterization of advanced materials to achieve prominence in targeted research areas; providing leadership to the UCF Materials Science and Engineering research and education program; and enhancing economic growth and promoting industrial development through effective partnerships with industry.

NanoScience Technology Center

In 2003 the Nanoscience Technology Center (NSTC) was formed with a \$4M grant from the state of Florida when leaders recognized the potential of nanotechnology as its applications in medicine, materials, computing and electronics began entering the mainstream. Since that time, NSTC has consolidated UCF researchers across multiple disciplines and hired many more to better respond to nanoscience funding opportunities and to develop the technologies demanded by the industries of the future. In 2007 the NSTC officially opened a 20,000- square-foot renovated research facility in the Central Florida Research Park. A total of 15 faculty and 42 graduate students at the center are creating tools to treat neurological diseases; materials that can advance solar and fuel cell technology; and longer batteries that can make ever-smaller electrical devices a reality. Current research areas include Green Energy, In Vitro Test Systems, Functional Nanomaterials, Computer/Mathematical Simulations, Quantum Dynamics, Bio-Imaging, NanoElectronics & NanoPhysics, and Integrated Device Development.

Biomolecular Science Center

The Burnett School of Biomedical Sciences became an integral part of the UCF College of Medicine in 2007, making the college a research-intensive medical school where cutting edge medical research spans the entire spectrum from laboratory bench to bedside of the patients, providing a great environment of training physicians and biomedical researchers. We vigorously pursue our mission, to build nationally recognized research programs and undergraduate and graduate programs in biomedical sciences. The School is well on its way of accomplishing its goal towards hiring faculty members to build vigorous research programs focused on cancer, cardiovascular diseases, neurological diseases and infectious diseases. The School has formed active partnerships with other units such as the College of Optics and Photonics, the School of Electrical Engineering and Computer Science and the NanoScience Technology Center to build interdisciplinary research and education programs in the innovative applications of photonics and nanoscience to biomedical problems. The School recently updated its undergraduate curriculum to better prepare students for health professions and graduate studies in biomedical sciences. The School also provides pre-health advisement for UCF students to prepare them for entry into health professional schools. Our BS degree program in Biotechnology started Fall 2007 and graduated the first students in Spring 2009.



Florida Solar Energy Center

The Florida Solar Energy Center (FSEC) was created in 1975 to serve as the State's energy research institute. The main responsibilities of the center are to conduct research, test and certify solar systems and develop education programs. Our mission is to research and develop energy technologies that enhance Florida's and the nation's economy and environment and to educate the public, students and practitioners on the results of the research. As Florida's energy research institute — with a 35-year history of unique expertise, experience and infrastructure — we are leading research and development efforts to bring our vision of Energy Independence to fruition.



Florida Space Institute



FSI is located at the space center, in Brevard County in East Central Florida, so as to provide a focus on space for the research and education programs of its institutional members. Classrooms, faculty offices and laboratories are located at the Kennedy Space Center Visitors Center, in the Astronaut Memorial Foundation's Center for Space Education facility. While the academic program is at the core of FSI, providing Masters and Ph.D. level programs of study, the Institute also has a strong engineering support staff, and performs research on contracts and grants, providing real-life opportunities for student research and thesis projects. The organizational structure also encourages research on the individual campuses of the member schools, allowing the development of space hardware, and then "flowing" that hardware through the FSI facilities at the space center for processing and then on to space flight. Since its founding in 1990 as a consortium of state universities, community colleges, and private schools, the consortium has expanded, and now counts as its members UCF, Florida Institute of Technology, Brevard Community College, Embry-Riddle Aeronautical University, Florida Agricultural & Mechanical University, University of Miami, Florida Atlantic University, University of South Florida, University of Florida, and Broward Community College. Additionally, through NASA's Florida Space Grant Consortium program resident with FSI, some 16 additional universities and colleges throughout Florida enjoy an indirect relationship with the Institute.

Institute for Simulation and Training

IST is an internationally recognized research institute that focuses on advancing modeling and simulation technology and increasing our understanding of simulation's role in training and education.

Founded in 1982 as a research unit of the University of Central Florida, the institute provides a wide range of research and information services for the modeling, simulation and training community. Faculty and staff are distributed among IST's three Central Florida Research Park buildings, the Progress building, Partnership II, and the Simulation and Training Technology Center.



Innovative Science & Technology Facility (ISTEF)

The ISTEF site is located at the Kennedy Space Center, Florida. It is a Navy SSC PAC facility operated by CSC. ISTEF was originally built in 1989 to support the Strategic Defense Initiative Organization's Innovative Sciences and Technology Office (SDIO/ISTEF). Today ISTEF has a much broader mission; it supports research and development of electro-optics sensing technologies for DOD, commercial and academic applications. DOD customers include: the Army, Navy Air Force, DARPA, and DIA. The facilities include a laser and optics laboratory, 1 km laser test range, a precision tracker (gimbal) with a coude mirror feed (for laser transmission), and several transportable trackers capable of supporting active (laser) or passive testing. Additionally, ISTEF maintains an assortment of telescopes, optics, and sensors to support data collection requirements. ISTEF is a tenant of the 45th Space Wing at Cape Canaveral Florida and has operating agreements that allow tasking Eastern Range assets as needed. It also has standardized range operations for laser testing against boosting rockets, satellites, and other targets. ISTEF has a close partnership with the CREL, The UCF College of Optics and Photonics, which provides access to cutting edge R&D and expertise in atmospheric propagation of lasers, laser communications, laser radar (LADAR), fiber-optic lasers, passive imaging, and optical design.



Other Facilities & Centers

Other organized programs at UCF offer researchers and students additional support in pursuit of their research goals. These include:

- National Center for Simulation (NCS)
- Center for Advanced Transportation Systems Simulation (CATSS)
- National Center for Forensic Science (NCFS)
- Small Business Development Center (SBDC)
- University of Central Florida Business Incubation Program (UCFBIP)

4. Partnership

Since its early years, the College has benefitted from a strong partnership with industry. It endeavors to transfer the technology developed by the faculty, scientists, and students to industry, particularly Florida industry, and to assist in forming, recruiting, and retaining optics and optics-related industries in Florida. The College has established a large industrial affiliates program (with current membership of 63 companies, sustained over many years). Our Industrial Affiliates Day brings in optics companies from around the country to learn about the ongoing research, recruit students, and identify new partnering opportunities.

4.1 Industrial Affiliates Program

Membership in the Industrial Affiliates (IA) program provides to industrial corporations, organizations, and individuals many benefits, most of which are also of mutual benefit to The College of Optics and Photonics. One of these mutual benefits is the regular communication and contact the program provides between the research faculty and students at the College and the IA member company's engineers and scientists who are developing new technologies and products for their business. Other benefits include:

- Establishing a close association with this leading institute in optics, lasers, and photonics
- Exposure to the latest research and developments in cutting edge technologies
- Membership certificate or plaque for display in your facility
- Availability of sophisticated measurement, test, and calibration facilities
- Early notice of students approaching graduation (the next generation of experts in the field). See our Student Resumes.
- Ability to post your job openings on our website (exclusive benefit for IA members)
- Close interactions with our faculty, each of whom are leaders in their fields
- Opportunity to make presentations about your company and products to the faculty and students of the College
- Opportunity to participate in our Industrial Advisory Board, a committee of our senior stakeholders that provides advice on the long-term direction of CREOL, The College of Optics & Photonics
- Copies of the College's periodic newsletter, Highlights, and monthly e-Highlights
- Notification of seminars at the College
- Opportunity for free presentation space at our annual Industrial Affiliates Day meeting
- Several Web-based benefits, including linkage to your company's web site from the College website
- For companies who donate equipment, getting their hardware/software in the hands of some of the leading researchers – faculty and students– in the field provides visibility to future customer prospects and information on its impact in leading-edge research
- Demonstration by the company of their support of CREOL, The College of Optics & Photonics, its research programs, and its effective corporate cooperation and partnership activities

In addition, we use many mechanisms to give visibility to our Industrial Affiliates that can be valuable to them in marketing their products. Wherever possible, the level of the membership is indicated. Examples of current practices include:

- Listing in CREOL, The College of Optics & Photonics Highlights quarterly newsletter
- Special recognition at the annual Industrial Affiliates Day
- Listing in other CREOL, The College of Optics & Photonics publications, where appropriate, including on CREOL, The College of Optics & Photonics website (with a link to the company's website)
- Company name plaque prominently displayed in the entrance lobby of the CREOL building of CREOL, The College of Optics & Photonics

There are also many intangible benefits that accrue from association with this dynamic research and education institution. Among these are facilitated access to and collaboration with other specialized facilities within the University of Central Florida and the central Florida area. In addition to resources in the Center for Research & Education in Optics & Lasers (CREOL) and the Florida Photonics Center of Excellence (FPCE), UCF facilities include the following major research centers:

- Nano-Sciences & Technology Center (NSTC)
- Advanced Materials Characterization Facility (AMPAC)

- Materials Characterization Facility (MCF)
- Biomolecular Science Center
- Institute for Simulation and Training (IST)
- Center for Distributed Learning
- National Center for Forensic Science (NCFS)
- Florida Solar Energy Center (FSEC)
- Florida Space Institute (FSI)

The College's faculty and students play leading roles in both local and international professional associations and can provide effective introductions to the extensive network of industry and expertise to which CREOL, The College of Optics & Photonics connects. Through the IA program, your company can also readily connect with other optics, photonics, and industrial organizations through local Florida organizations in which the College maintains an active participation, including the Florida Photonics Cluster (FPC), the Laser Institute of America (LIA), Florida High Technology Corridor Council (FHTCC), the UCF Technology Incubator — ranked #1 in the US in 2004 — and a large family of laser and optics companies in the Central Florida region.

4.2 Industrial Affiliates Members

Life Members

Cobb Family Foundation
Northrop Grumman Corporation
Nufern

Memoriam Members

Dr. Arthur H. Guenther and Dr. William C. Schwartz

Medallion Members

Breault Research
FLIR

Newport Corporation
Northrop Grumman Laser

Optical Research Associates
Paul G. Suchoski, Jr

Senior Members

Coherent, Inc.
CST of America
Cubic Defense Applications
Edmund Optics
ER Precision Optical
Lambda Research Corp.

LAS-CAD GmbH
LightPath Technologies
Lockheed Martin
Ocean Optics
Ophir-Spiricon
Optimax Systems

Radiant Zemax, LLC
Tektronix
Thorlabs
TRUMPF, Inc.
V & N
Zygo Corporation

Affiliate Members

Aerotech Inc.
AFL
Analog Modules
Applicote Associates, LLC
eVision, LLC
Florida Turbine Tech. Inc.
Gentec-EO, Inc.
Gooch & Housego, LLC
Harris Corporation
HORIBA Jobin Yvon
Inrad Optics
JENOPTIK Optical Systems Inc.
L-3 Communications

Laser Institute of America
Lee Laser
NKT Photonics
Optigrate Corp.
OIDA
Photonics Online
Photonics Spectra
Princeton Instruments
Qioptic
QPC Lasers/Laser Operations LLC
Quantum Technologies
Ray Williamson Consulting
R-Soft Design Group

Resonetics, LLC
Sciperio, Inc.
SPIE- The Int'l Society for Optics & Photonics
StellarNet, Inc.
Teledyne ODI
The Optical Society
Tower Optical Corporation
TwinStar Optics, Coatings & Crystals
Vytran LLC
Yokogawa Corporation of America

4.3 Industrial Affiliates Day & 25th Anniversary Celebration

CREOL celebrates its 25th Anniversary

On March 15-16, the CREOL faculty, students and staff were treated to a wonderful show. It was the 25th Anniversary of the founding of CREOL – and what a celebration! A technical symposium was attended by 280 people including industrial affiliates, exhibitors, guests from industry and academia, and representatives from optics and photonics professional societies (OSA, SPIE, and LIA). Nobel Laureate John Hall in the conference keynote address described the incredible array of applications of optical frequency combs, from ultra-precise clocks to super-resolution telescopes. Nobel Laureate Nicolaas Bloembergen gave some history of nonlinear optics (NLO), which now allows, e.g., the production of attosecond pulses and controls telecommunication systems. Fourteen distinguished speakers from the US and Europe and nine speakers from CREOL described advances in optics and photonics in areas in which the CREOL faculty members are performing state-of-the-art research.



Group photo of banquet attendees

The symposium included six technical sessions covered the following topics:

- **Ultrafast Optics:** this covered among other topics, ultrastable microwaves, tabletop production of coherent X-rays, optical signal processing, and attosecond sources.
- **High Power Lasers:** as part of the Townes Laser Institute 5th year anniversary we had a summary of progress to date by the Director, [Martin Richardson](#). Talks discussed work on fibers, ceramics lasers, additive manufacturing, volume holograms and [Bob Byer](#) discussed the history leading to these advances.
- **Imaging and Display:** bio-imaging, organic solar cells and 3D display technologies were discussed.
- **Nonlinear Optics:** besides hearing about the origin of NLO from Nicolaas Bloembergen, we heard about NLO in microstructured media, using wide-gap semiconductors for IR detection via 2-photon absorption and how special light beams can go around corners.
- **Semiconductor Lasers:** talks covered polariton lasers, quantum-dot laser diodes and mode locking and nano VCSELS.
- **Fiber Optics:** [David Payne](#) discussed some history of optical fiber technology and what to expect in the future, and other talks discussed fiber sensors, 40 years of fiber innovations and the next challenge in keeping up with bandwidth requirements, i.e. multi-core and multi-spatial modes.

In addition to these technical talks, [Jim Pearson](#), who was one of CREOL's initial Industrial Affiliates when he was at [United Technologies](#), and later worked in the CREOL administration, talked about our commitment to industrial relevance and partnership. Several current industrial affiliate members described how their partnering with CREOL has helped their company.



From left to right: Eric Van Stryland (Former Dean), Martin Richardson (Director of Townes Laser Institute), Nobel Laureates Charles Townes, Nicolaas Bloembergen, John Hall; Bahaa Saleh (Dean), M.J. Soileau (Vice President, Research and Commercialization)

One of the highlights of the event was the banquet held on the March 15 evening and attended by 333 people, including President Hitt and Provost Waldrop and many of CREOL's affiliates and long-time supporters. Senator Bill Nelson made some recorded congratulatory remarks. CREOL's founding Director, M.J. Soileau, gave us an entertaining history of the trials and tribulations of developing a program that eventually became the first College devoted to optics and photonics in the United States. He also reminded us of the fun of those early days when we were all focused on starting a new 'center' devoted to optics research and education. Ron Phillips, who played a large role in creating CREOL and hiring M.J. as its first director, was unable to attend but provided a video recording also reminisced about the very early days. We also heard from several of our CREOL alumni about how their time at CREOL has influenced their careers. It was great fun for us to watch the video recordings.

We also celebrated the 5th anniversary of the founding of the Townes Laser Institute and, happily, Nobel Laureate Charles Townes himself, at the age of 96 made a surprise trip across the country to wish us well. What a wonderful testament to crown our celebration!

Finally, Dean Bahaa Saleh discussed what the future of CREOL may look like, and how bright it is likely to be! The future, of course, depends on the research of exceptional students such as Student-of-the-Year Nazanin Hoghooghi and Best-Poster-Award winner Thomas Kohlgraf-Owens. The students of today become the alumni of tomorrow; the career success and accomplishments of alumni such as Distinguished Alumni Award winner Jason Eichenholz of Ocean Optics, is a case in point.

All in all, everyone (that means 280 conference attendees, 333 people at dinner, and 23 exhibitors) had a great time, and we all went away with an increased knowledge of optics and photonics as well as a better appreciation of what we have here at CREOL. We thank Senator Bill Nelson for his kind remarks about our progress and thank both the OSA and SPIE for sending representatives to congratulate us on our progress. We all look forward to the next 25 years! And to more Spring Things at M.J. Soileau's "Soggy Acres" for more roast pig, alligator and libations!



MJ Soileau, UCF Vice President for Research and Commercialization and Founder of CREOL speaking at the banquet

Symposium Program



25 Years of Excellence in Optics and Photonics

Thursday, 15 March, Morning Session – UCF Alumni Center

8:00 Continental Breakfast and Walk-in Registrations – Alumni Center

Inaugural Session

8:30	<i>Welcoming Remarks</i>	Tony Waldrop	UCF Provost & Vice President
8:35	<i>Welcome and introduction of special guests</i>	Bahaa Saleh	Dean & Director, CREOL, UCF
8:45	<i>Industry Partnerships – A foundational element of CREOL from the first day.</i>	Jim Pearson	Special Consultant, CREOL, & early Affiliates member
8:55	<i>CREOL industry partnership – what it has meant to my company, Florida, the nation, and the world</i>	CREOL Industrial Partners	

Technical Symposium

Plenary Talk

9:30	<i>Precision Optical Measurements</i>	John Hall	NIST; JILA; 2005 Nobel Prize in Physics
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10:00 BREAK & EXHIBITS

Session I. Ultrafast Optics – Eric Van Stryland

10:30	<i>Stabilized optical frequency combs</i>	Scott Diddams	NIST
11:00	<i>Deep-UV and soft x-ray ultrashort pulses</i>	Henry Kapteyn	University of Colorado; JILA
11:30	<i>Ultrafast optical signal processing</i>	Peter Delfyett	CREOL, UCF
11:50	<i>Attosecond optics</i>	Zenghu Chang	CREOL, UCF

12:10 LUNCH Served Alumni Center

Tabletop Exhibits – Alumni Center



CREOL Students with Charles Townes

Thursday Afternoon Session

Presentations – Alumni Center

Session II. High Power Lasers

Arvi Kar, CREOL, President

1:00	<i>Townes Laser Institute – 5 year anniversary</i>	Martin Richardson	CREOL, UCF Director, Townes Laser Institute
1:20	<i>Solid state lasers</i>	Robert Byer	Stanford University
1:50	<i>High power laser technology</i>	Richard Martukanitz	Penn State University
2:20	<i>Volume Bragg gratings: Transitioning technology to industry</i>	Leon Glebov	CREOL, UCF
2:40	<i>Ceramic laser materials</i>	Romain Gaume	CREOL, UCF

3:00 BREAK & EXHIBITS

Session III. Imaging & Display

*Aristide Dogariu, CREOL,
President*

3:30	<i>Sub-wavelength microscopy</i>	Claude Boccara	Institut Langevin, ESPCI
4:00	<i>OLED displays</i>	Ching Tang	University of Rochester; NAE Member
4:30	<i>3D display and interactive technologies</i>	Bounds Huang	Cornell University
5:00	<i>Light emitting fibers using up-conversion</i>	Mike Bass	CREOL, UCF

5:20 END OF SESSION

6:30 **Reception & Awards Banquet**

Cypress Room

Banquet Speaker: MJ Soileau, VP for Research, UCF & Founding Director, CREOL
History of CREOL – opportunities and challenges of the early days

Tabletop Exhibits – Alumni Center



UCF President John Hitt (left) with Nobel Laureate Charles Townes at the Banquet

Friday, 16 March, Morning Session –UCF Alumni Center

Presentations & Exhibits – Alumni Center

8:00	Continental Breakfast and Walk-in Registrations – Alumni Center		
8:30	<i>CREOL's Next 25 Years – The Future of Optics</i>	Bahaa Saleh	Dean & Director, CREOL, UCF

9:00	<i>Nonlinear optics</i>	Nicolaas Bloembergen	University of Arizona; 1981 Nobel Prize in Physics
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Session IV. Nonlinear Optics

George Stegeman, CREOL, Presider

9:30	<i>Novel nonlinear photonic devices</i>	Alex Gaeta	Cornell University
9:55	<i>Microstructured nonlinear optical devices</i>	Martin Fejer	Stanford University

10:20 BREAK & EXHIBITS

10:45	<i>Detecting IR with wide-gap semiconductors</i>	David Hagan	CREOL, UCF
11:05	<i>Linear and nonlinear optics of Airy beams</i>	Demetri Christodoulides	CREOL, UCF

Session V. Semiconductor Lasers

Winston Shoenfeld, CREOL, Presider

11:25	<i>Nitride nanolasers and polariton lasing</i>	Pallab Bhattacharya	University of Michigan
11:50	<i>Quantum dot laser diodes and mode locking</i>	Luke Lester	University of New Mexico
12:15	<i>Nanolasers and integrated photonic heat pumps</i>	Dennis Deppe	CREOL, UCF

12:35 LUNCH SERVED; EXHIBITS

Alumni Center

Friday Afternoon Session

Presentations – Alumni Center. Posters, Tours, Award presentations, Reception – CREOL Bldg

Session VI. Fiber Optics

Axel Schülzgen, CREOL, Presider

1:20	<i>Optical amplifiers</i>	David Payne	University of Southampton; CBE, FRS, FREng
1:50	<i>Fiber optic sensors</i>	Brian Culshaw	University of Strathclyde
2:20	<i>Progress in Nonlinear Fibers</i>	Alan Evans	Corning
2:50	<i>Fiber optics communication</i>	Guifang Li	CREOL, UCF

3:10 EXHIBITS & Walk to CREOL

4:00 POSTER SESSION; LAB TOURS (contiguous)

CREOL rooms 102 & 103; Tours start from lobby

5:30-6:30 Award Presentations; RECEPTION

CREOL

Tabletop Exhibits – Alumni Center

4.4 Industrial Projects

Recipient	Source	Title of Award	Begin	End	Awarded 2012	Cumulative Funding
Abouraddy, A, Schoenfeld, W	PICO Technologies	Hybrid Solar Lighting System for Military Expeditionary Shelters	2/1/2012	8/5/2012	\$26,024	\$26,024
Bass, M	American Medical Systems, Inc.	High Power CW Yb:YAG Laser Design Studies	9/6/2011	3/30/2012	\$40,000	\$40,000
Bass, M	E6	Calorimetric Measurement of Diamond Absorptance at 10.6 Micron	4/23/2012	6/30/2012	\$1,000	\$1,000
Bass, M	E6	10.6 Micron Calorimetric Measurement of Diamond Absorption	2/1/2011	1/31/2012	\$15,000	\$15,000
Bass, M	Honeywell Federal Manufacturing & Technologies, LLC	Fiber Optic Cable Modeling	4/9/2012	9/28/2012	\$225,000	\$225,000
Bass, M	Powerlase Limited	Design of a KW class, Pulsed, ~1mm, 10kHz, Diode Pumped Slab Solid State Laser System	3/19/2012	9/18/2012	\$44,951	\$76,058
Bass, M	Technology Assessment & Transfer Inc	Optical properties of ceramic Ti doped spinel	7/15/2011	12/31/2011	\$10,000	\$10,000
Bass, M	Technology Assessment & Transfer Inc	Optical Properties of Ceramic Ti Doped Spinel - Phase 2	4/11/2012	11/30/2012	\$22,000	\$22,000
Christodoulides, D	Israel Ministry of Defense	Airy Wavepackets and wavefront Engineering for Beam Filamentation Studies	7/13/2011	8/31/2013	\$300,000	\$300,000
Christodoulides, D	United States-Israel Binational Science Foundation	Sub-wavelength Linear and Non-Linear Optics	10/1/2011	9/30/2012	\$20,677	\$37,177
Divliansky, I	OptiGrate	Narrow band blue laser for submarine laser communications	9/1/2011	8/26/2012	\$78,000	\$78,000
Dogariu, A	KaMin LLC	Light Scattering Properties of Load Pigment Layers	7/15/2010	7/14/2012	\$15,434	\$123,472
Glebov, L	OptiGrate	Compact stretcher/compressor for high power ultrafast laser based on volume chirped Bragg grating in PTR glass	5/1/2012	3/31/2014	\$40,000	\$100,000
Glebov, L	OptiGrate	Development of line-narrowed diode pumps sources for DPAL systems	2/1/2012	7/31/2012	\$33,333	\$33,333
Glebov, L	OptiGrate	Volume Bragg gratings for spectral and coherent beam combining in MWIR spectral region	11/1/2011	5/31/2012	\$45,000	\$45,000

Hagan, D, Van Stryland, E	Israel Ministry of Defense	Development of new materials for strong, broadband nonlinear transmission (Year 3)	7/28/2009	5/1/2013	\$100,000	\$100,000
Harvey, J	Lockheed Martin Advanced Technologies	Solar Ultra-Violet Imager (SUV)	3/24/2008	1/31/2012	\$29,044	\$286,370
Kar, A	Semiconductor Research Corporation	AO Deflector for Laser Beam Scanning in Material Processing	10/1/2011	9/30/2012	\$100,000	\$200,000
Kik, P	NanoSpective	RF - Research Nanophotonic Material and Devices	7/1/2011	4/15/2015	\$500	\$500
Kuebler, S	Academy of Applied Science	Kuebler Group AAS-REAP Program 2012	2/8/2012	9/30/2012	\$780	\$2,600
Kuebler, S	Lockheed Martin - Missles & Fire Control	Direct Laser Writing of Micro-IR components	6/7/2012	11/30/2012	\$6,000	\$20,000
Li, G	AT&T	RF: Support of Research on Supermode Propagation over coupled few-mode fiber	4/3/2012	3/7/2013	\$20,000	\$20,000
Li, G	NEC Laboratories America, Inc.	RF - Li Group Research	3/1/2010	4/15/2013	\$20,000	\$69,500
Li, G	Ocean Optics	Novel Tunable Mid IR Laser Sources for Spectroscopy Using Silicon Photonic Crystal Fibers	11/1/2011	6/30/2012	\$10,000	\$10,000
Lumeau, J	OptiGrate	Compact robust stretcher/compressor of ultrashort laser pulses	9/1/2011	8/26/2012	\$79,500	\$79,500
Lumeau, J	OptiGrate	Monolithic rare earth doped PTR glass laser	6/1/2011	6/30/2012	\$90,000	\$180,000
Richardson, M	Embassy of France	Advanced Ultrashort Laser Development in the IR and Mid-IR	8/1/2011	11/30/2012	\$19,452	\$19,452
Richardson, M	KLA-Tencor Corporation	DUV Laser Plasma Studies	10/10/2011	10/9/2013	\$252,052	\$252,052
Richardson, M, Shah, L	Genia Photonics	6-10um DFG project	9/8/2011	7/31/2012	\$123,326	\$123,326
Van Stryland, E, Hagan, D	Georgia Tech Research Corporation	MURI: Nonlinear Optical Characterization	9/30/2010	11/30/2012	\$249,803	\$533,694
Van Stryland, E, Hagan, D	Georgia Tech Research Corporation	Zeno Project for Georgia Tech	9/30/2009	11/30/2012	\$192,043	\$375,000
Van Stryland, E, Hagan, D	UES, Inc.	Task 1: Semiconductor Nonlinear Optical Response in the IR	10/14/2011	10/13/2012	\$65,000	\$65,000
Van Stryland, E, Hagan, D	UES, Inc.	Task 2: Semiconductor Nonlinear Optical Response in the IR	10/14/2011	10/13/2012	\$50,000	\$50,000

Webster, S	PL Systems	Feasibility Study - High Power Laser Damage Study for Laser Safety Curtains and Barriers (Seed Project)	10/1/2011	12/31/2011	\$4,833	\$4,833
Wu, ST	AU Optronics Corporation	Advanced Liquid Crystal Displays	7/1/2010	6/30/2013	\$300,000	\$450,000
Wu, ST	ITRI Display Technology Center	Blue-Phase Liquid Crystals	4/1/2010	3/31/2012	\$58,750	\$295,000
Wu, ST	Kent Optronics, Inc.	Electronically switchable IR beam splitter technology	1/7/2012	1/6/2014	\$292,000	\$292,000
Wu, ST	Kent Optronics, Inc.	Switchable IR beam splitter	9/7/2011	1/6/2012	\$25,000	\$25,000
Wu, ST	Raytheon	Fast-Response Liquid Crystals	8/25/2010	11/30/2011	\$20,000	\$150,000
Wu, ST, Fang J	ITRI Display Technology Center	Novel Display and Biosensor Devices	12/1/2011	12/31/2014	\$624,488	\$629,117



Industrial Affiliates members providing financial support for research projects

4.5 Alumni

Jason Eichenholz (MS, '95, PhD, '98) received the 2012 **Professional Achievement Award** for the College of Optics and Photonics at UCF's Alumni Association's annual Black & Gold Gala on November 1, 2012. He also received the College's **Distinguished Alumni Award** and was honored at the Banquet of the CREOL@25 Symposium on March 15, 2012. Eichenholz, who now holds a Courtesy Faculty appointment in the College of Optics and Photonics, is being recognized for his photonics research, his successful product development and commercialization of photonics technology, and his commitment to promoting innovation programs in the area of optical sensing and spectroscopy. Upon graduating from Rensselaer Polytechnic Institute with a BS degree in Physics, Eichenholz came to UCF where he received graduate degrees in optics. He went on to industry and served a dual role as the CTO of Ocean Optics and as the Divisional Technology Director for Halma's Health Optics and Photonics Divisions. He developed miniature spectrometers that revolutionized the way data and measurements were obtained. Eichenholz is now CEO and a founder of Open Photonics, a crowd sourcing and Open Innovation company designed to accelerate the adoption of optics and photonics technology.



Jason Eichenholz (left) and Bahaa Saleh at the Black & Gold Gala

4.6 Visitors

Tim Fritzley, FAZTech, January 4, 2012; April 16, 2012; December 13, 2012
John Fourkas, University of Maryland, January 11, 2012
Cathy Fore, ORAU Director, January 19, 2012
Cliff Gabay, President, Resonetics LLC, March 19, 2012
Indrek Grabbi, International Trade Commission, April 12, 2012
Paul Van Reel, Furgo Corp., April 17, 2012
Sheila Gutierrez de Pineres, Aces Fellow, April 30, 2012
Jared Stout, Rep. Sandy Adams office, May 1, 2012
Toyohiko Yatagai, Yoshio Hayasaki, Director, Center for Optical Research and Education Utsunomiya, May 3, 2012
Luis Gamarra, Simon Nava, Erwin Scholtz, Beckman Coulter Life Sciences, June 20, 2012
Wonho Jhe, Namkyoo Park, Inuk Kang, Seoul National University, August 7, 2012
Zafar Iqbal, Quaid-i-Azam University, August 20, 2012
David E. Bartine, Lighting Science Group Corp., August 29, 2012
Jonathan Friedman, Carlos M. Padin Biblioni, Puerto Rico Photonics Institute, UMET, September 9, 2012
Baoli Yao, Zhao Wei, Xi'an Institute of Optics and Precision Mechanics, October 10, 2012
Bülent Yilmaz, Burak Asiliskender and Irfan Alan, Abdullah Gül University, October 18, 2012
Đình Xuân, Khoa Vihn University, Vietnam, October 24, 2012
Julie Payette, former Astronaut and Québec Scientific Delegat, October 30, 2012
Mike Molino and David Lyman, SAIC, November 8, 2012
Han-Ping Shieh, and Ray-Kuang Lee, National Chiao Tung University and National Tsing Hua University; Fu-Jen Kao, Wen-Chuan Kuo, Po-Tsung Lee, Te-Yuan Chung, National Yang Ming University, and National Central University, November 16, 2012
Rick Plympton and Anne Tausch, Optimax Systems, November 30, 2012
Chris Duston, L-3 Communications, December 13, 2012

5. CREOL Association of Optics Students



CAOS, the *CREOL Association of Optics Students*, is a student organization founded in 1999 to bring together the diverse population of graduate students of CREOL, The College of Optics and Photonics. CAOS facilitates communication and integration of the student chapters of four optics and photonics professional societies: OSA-The Optical Society, IEEE-Photonics Society, SPIE-The International Society for Optics and Photonics, and SID-The Society for Information Display.

5.1 Officers

Elected officers of CAOS and the professional societies' student sections in 2009-2010 are listed below:



President – Anthony Klee
Vice President – Josh Bradford
Secretary- Matt Reichert
Treasurer – Cheonha Jeon



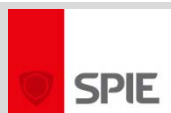
President – Yifan Liu
Vice President – Jie Sun
Treasurer – Dat Nguyen
Secretary – Sihui He



President – Sharad Bhooplapur
Vice President – Esmaeil-Hooman Banaei
Treasurer – Benjamin Webb
Secretary – Abhijeet Ardey



President – Jin Yan
Vice-President – Yuan Chen
Treasurer – Daming Xu
Secretary – Zhenyue Lou



President – Apurva Jain
Vice President – Pankaj Kadwani
Treasurer – Christina Willis
Secretary – Erdem Erden

5.2 Educational Outreach

Expanding Your Horizons – February 28, 2012

Expanding Your Horizons (EYH) is a day long program that supports young girls' interest in science, engineering, and mathematics through hands-on demonstrations and lectures. Approximately 200 girls in grades six through eight attended this year's EYH program at the University of Central Florida. Members of CREOL's SPIE student chapter organized and performed three sections of demonstrations, two optical and one with liquid nitrogen. Principles of waveguiding were introduced through a discussion on total internal reflection and reflection/refraction phenomena with various demonstrations. Additionally, an introduction to diffraction and the spectral content of different light sources was provided. Finally, the crowd pleaser, students learned about liquid nitrogen and used it to make ice cream.

Optics Day – April 6, 2012

This spring, CAOS held Optics Day for the 10th time. As in each of the past nine years, the doors of CREOL were opened to both the UCF community and the surrounding Orlando area to not only demonstrate the fundamentals of optics and teach about its many applications, but also to show why CREOL is considered one of the nation's top optics colleges. Being a college offering only graduate degrees, just a small fraction of the larger UCF student body know about what goes on in CREOL. Through Optics Day, CAOS promotes our world-renowned institute to our fellow students and to local middle school, high school, and home school students and parents. Between multiple speakers, excellent visual demonstrations, and open lab tours, we aim to raise the general knowledge base of optics, inform the local community of the quality of research conducted here, and hopefully inspire students to pursue a career in optics or science.

Science Olympiad – May 18, 2012

On May 18th, 2012, tens of thousands of students from across the country converged on the University of Central Florida campus to participate in the 2012 Science Olympiad National Tournament. A celebration of science, engineering, and mathematics and an opportunity to excite teens about careers in such fields, the Science Olympiad represented a national stage to showcase the quality of research and facilities at CREOL, the College of Optics & Photonics. Prior to the competition, CREOL opened its doors to the young science enthusiasts to come and learn about some fundamental principles of optics and how those principles are being exploited in exciting new research areas. Graduate student volunteers explained a variety of exhibits in the lobby which demonstrated the effect of total internal reflection, optical waveguides using total internal reflection, and optical communication systems based on waveguides. Visitors transitioned from these general demonstrations to lab tours to see how optical fibers are made, how to build a laser for a communication system, how to create self-healing laser beams, and other exciting projects. The day was a great success, with over 200 guests coming through CREOL's doors in just four hours, all leaving thoroughly impressed and excited to learn more about the increasingly large role of optics in everyday life.



Eager Science Olympiad participants wait for CREOL lab tours to start



Felix Tan and Kumel Kagalwala teach visitors about waveguides

STEM Educators Workshop – July 30, 2012

Students Matt Reichert and Tony Klee met with local Florida teachers at Memorial Middle School on July 30 to present a number of optics demonstrations which illustrate concepts in Florida's Science, Technology, Engineering, and Mathematics (STEM) teaching curriculum. Matt and Tony helped the teachers develop easy demonstrations of their own to incorporate in their classrooms. They also exhibited some of the many applications of liquid nitrogen, including the making of liquid nitrogen ice cream.

Colonial High School Chemistry Class Tour and Demo Session - October 31, 2012

Juniors and seniors at Colonial High School had the opportunity to visit UCF to conduct a spectroscopy experiment in the chemistry department. At the conclusion of their lab, the students stopped by CREOL to learn more about how their spectrometer worked and how to make sense of their spectra. The students also saw demos on optical communication and holography.

Elementary School Science Night - November 13, 2012

CREOL was the main exhibitor at Whatley Elementary School's science night, held at its Apopka campus. Students began the night doing word problems and math-minded magic tricks with their teachers. The CREOL crew amazed the students by drawing sugar glass into a fiber and racing solar toy cars.

Middle School Science Teach In - Wednesday November 14, 2012

As part of an initiative by Orange County Public schools to increase science education, November 17th was designated the city-wide science teach-in. CREOL students traveled to Liberty Middle School to give an optics presentation to 7th and 8th grade students. The concepts of wavelength, emission spectrum, Snell's law were covered. Additionally, fiber and rigid glass waveguides were used to transmit beams from a laser pointer, and a Morse code signal was sent across the classroom to demonstrate the basic concepts of optical communication. Like many events in the past, giveaways of diffraction glasses were the highlight for many young students.

Society of Women Engineers Parent Lab Tours - November 17, 2012

The past few years, CREOL students have partnered with the society of woman engineers (SWE) to entertain parents with tours of the fiber draw tower and laser research labs while their elementary and middle school aged girls take part in activities in the engineering department.

Student Open Houses

When schedules permit, members of our OSA chapter have put aside time to host small groups (<10) of students and their parents or teachers at CREOL. For example, twice we've had home-schooled students in a study group come visit the building to learn about the impact of the material they were learning.

5.3 Professional Development

SID & IEEE-PS Tour Series: April 5, 2012

BEAM Co., Winter Park, FL

BEAM Co., founded in 1996, offers advanced optical technologies and materials based on the expertise of its world-renowned founders and researchers in nonlinear- and electro-optics, lasers and photonics, liquid crystals, polymers, composites and complex materials.

SID Conferences: June 4-10, 2012

SID Display Week 2012, Boston, MA

SID student chapter members traveled to Boston in June to attend the annual Display Week, meeting with leaders in the field of display technology, networking with peers, and learning about the latest technological advances.

SID & IEEE-PS Tour Series: September 21, 2012

Dr. Ming Su's lab in NanoScience Technology Center, Orlando, FL



SID Student Chapter members visit with Dr. Ming Su and chapter advisor Dr. S.T. Wu.



Student members and Chapter advisor Dr. S.T. Wu are with Dr. Nelson Tabirion (Front Left) at Beam Co.

OSA Conferences: October 12-18, 2012

Frontiers in Optics 2012, Rochester, NY

OSA student chapter members traveled to Rochester in October to attend the annual Frontiers in Optics conference. At the conference, they gave a number of technical presentations, listened to presentations concerning breakthrough research, and reported on the chapter's activities for the past academic year.

SPIE Tea Time Series: October 26, 2012

Bring Up Local Industries: LightPath Technologies with Alan Symmons

V.P. Alan Symmons will present a review of the lessons learned from the 25+ year history of LightPath Technologies along with his own personal experiences in the industry. The discussion will focus on an overview of dealing with change, acquisitions, innovation, global workforce, working as a public company and what it takes to survive in the optics and photonics industry. The intent is for an open forum and will follow with a question and answer session. LightPath Technologies, Inc. is a global manufacturer, distributor and integrator of proprietary optical components and high-level assemblies. LightPath was incorporated under Delaware Law in June, 1992, and has been in business for over 25 years innovating and producing optical solutions for a broad range of market applications including industrial, communications, medical, defense, testing, and measurement. LightPath is headquartered in Orlando, Florida, and has a wholly-owned manufacturing subsidiary, LightPath Optical Instrumentation Co. Ltd., in Shanghai, China. LightPath produces many different types of optical components and is well known as the inventor of axial gradient index optics and fiber fused collimators and is widely regarded as the world's experts in Precision Glass Molding. LightPath has issued over 50 patents and has more than 30 technical publications during its history.

IEEE-PS Guest Speaker Series: November 15, 2012

How to Prepare to be a Faculty with Mercedeh Khajavikhan

The majority of the students that enter graduate school, especially at the doctorate level, have thought about pursuing academic career at some point. No need to say, after graduation, only a few successfully launch their own group in academia. Graduate students, deeply involved in the scientific/technical aspects of their projects, are usually blind to many other aspects of the academic process and that creates confusion, uncertainty, and disappointment when it comes to applying for academic positions. In this talk, Mercedeh Khajavikhan, a new faculty at CREOL, shares her recent experiences in searching for faculty positions. She will pass on some of the advice that she received as well as some of her own experiences on how to prepare for academic jobs during the graduate school days, whether and where you should go for a postdoctoral position, how to prepare your application, when and where to apply, and how to prepare for interviews.

SPIE Tea Time Series: December 13, 2012

From a technologist to an entrepreneur: Mesdi Systems with Brandon Lojewski

SPIE invites you to enjoy an afternoon tea and a great journey of Brandon Lojewski. At this young age, he brought up what he had learned from his research into a business plan competition, won the award and started up a company. He will be sharing his experience of competing in various student business plan competitions and what it is like being a technologist and entrepreneur.

5.4 Public Service

Congressional Visit Day: April 24-25, 2012

Congressional Visit Day is an annual event sponsored by several professional societies comprising the Science, Engineering, and Technology industries. The purpose of CVD is two-fold: expose scientists and engineers to public science policy, and provide feedback to lawmakers and their staffs about how public research funding impacts their districts. Matt Weed and Casey Boutwell traveled to Washington, D.C. to attend as representatives from CREOL for the April 24-25 2012 visit, meeting with the staff of Florida legislators Sandy Adams and Bill Nelson as well as representatives from Virginia and Oregon.

5.5 Seminars

DATE	SPEAKER	TITLE & ORGANIZER
1/17/2012	Vladimir G. Chigrinov Hong Kong University of Science & Technology	Fast switchable liquid crystal cells for field sequential color and 3D displays. SID Student Chapter Seminar Series
2/15/2012	Nazanin Hoghooghi, Mohammad Umar Piracha, Linghui Rao	CREOL Student-Of-The-Year finals
4/05/2012	Katsumi Kishino Sophia University	GaN-based nanocolumn emitter and related technologies. IEEE Student Chapter Seminar Series
4/06/2012	Multiple speakers	Optics Day CAOS
8/01/2012	REU students CREOL	REU Student Poster Presentation
8/21/2012	Matt Weed	“The Five Grand Challenges of Optics & Photonics”, National Academy of Sciences, Committee on Harnessing Light
8/31/2012	Luciano De Sio University of Calabria	Soft Matter: from Plasmonics to Optofluidics. IEEE & SPIE Student Chapter Symposium
10/02/2012	Mark Flynn Director of Displays & Hardware Engineering, Infinite Z	zSpace: Description & Demo of a New Type of Stereoscopic Display. SID Student Chapter Seminar Series
10/18/2012	Benjamin J. Eggleton School of Physics, IPOS Univ. of Sydney, Australia	Nonlinear photonic circuits transforming the new information age: Faster, smaller and smarter. OSA Student Chapter Seminar Series
10/18/2012	Tong Li Chinese Academy of Sciences (CAS), China	Waveguide Application in Flat Panel Display Technology – Focus Backlight. SID Student Chapter Seminar Series
10/26/2012	Alan Symmons VP of Corporate Engineering, LightPath Technologies	BRING UP LOCAL INDUSTRIES: LightPath Technologies SPIE Student Chapter Tea Time Series
11/15/2012	Mercedeh Khajavikhan CREOL	Prepare to be a faculty/how to get a faculty position. IEEE Student Chapter Seminar Series
11/28/2012	Marc Himel SPIE Strategic Planning Committee	“How SPIE can best meet our needs and make SPIE membership valuable” SPIE Student Chapter
12/13/2012	Brandon Lojewski Founder and President of Mesdi Systems, Inc	From a technologist to an entrepreneur SPIE Student Chapter Tea Time Series