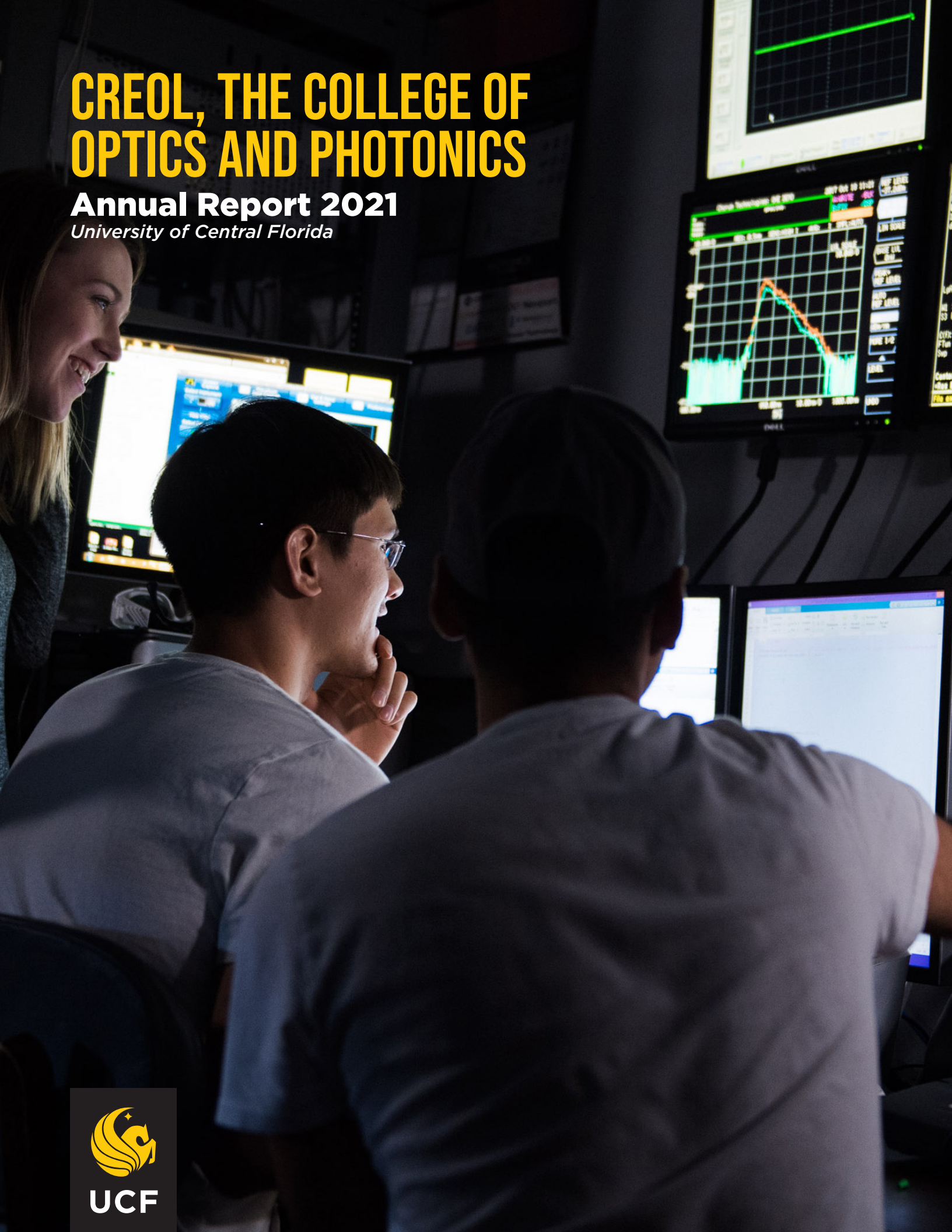


CREOL, THE COLLEGE OF OPTICS AND PHOTONICS

Annual Report 2021

University of Central Florida



UCF

Leading the Charge

The College of Optics & Photonics Executive Committee serves to advise the dean on matters relating to staffing, space and facilities, budget and strategic planning.



David J. Hagan

Dean & Director
Pegasus Professor of Optics & Photonics



M. G. "Jim" Moharam

Interim Associate Dean for Academic Programs
Professor of Optics & Photonics



Mark C. Wagenhauser

Budget Director



Peter J. Delfyett

University Trustee Chair
Pegasus Professor of Optics & Photonics, ECE & Physics
Director, Townes Laser Institute



Demetrios Christodoulides

Cobb Family Endowed Chair
Pegasus Professor of Optics & Photonics



Sasan Fathpour

Professor of Optics & Photonics, and ECE



A Message From the Dean

This has been a great year for CREOL! We notched a record-breaking year for research funding, with our faculty winning over \$21 million in contracts and grants. This is a 40% increase over last year, and significantly higher than in any previous year. Also, despite a year of tremendous interruption and delay, our faculty remained highly productive in generating new intellectual property with 20 granted patents.

One of the biggest causes for celebration this year was the election of Peter Delfyett to the National Academy of Engineering, as reported on page 8. This is one of the highest honors that can be bestowed on an engineer, and the first election to a U.S. national academy by an active UCF faculty member.

Excellence is a hallmark of CREOL faculty, and a recent article in PLOS Biology tells the story. As described on page 4, more than half of CREOL faculty are ranked in the top 2% of their field, as measured by citation metrics. Cobb Family Chair Demetrios Christodoulides leads the way in the top 0.05% in the field of Optics.

This annual report contains many such stories about our faculty, students and alumni. Of course, there are many other news stories, regularly posted in our news section on the CREOL home page and I encourage you check in periodically to keep up with what's new in the college.

This year, we have changed the reporting period for the CREOL annual report from calendar year to the academic year. All our activities other than financial are reported for the academic year, which covers Summer 2020 through Spring of 2021, while patents, contracts and grants are reported for UCF's fiscal year, which runs July 2020 - June 2021. This means that our reporting on news and accomplishments is limited to just a few months truncated in this transition year.

Thank you for your continued allegiance to CREOL. I look forward to meeting and working with each of you as we map the future of optics and photonics together.

David J. Hagan, Ph.D.

Dean & Director

Pegasus Professor of Optics & Photonics

For More Information Visit:
creol.ucf.edu/annual-report

2021 Dean's External Advisory Council

The Advisory Board supports and advises the Photonic Science and Engineering program as it pursues its missions and goals. The program seeks a national and international reputation for excellence in photonics.

Jeffrey Crystal
Elbit Systems of America

Richard DeSalvo '93 Ph.D.
L3Harris

Jihua Du '00 Ph.D.
Lumentum

Orges Furxhi
IMEC

Zhibing Ge '07 Ph.D.

Alexei Glebov
Optigrate Corporation

Carl Kutsche '98 Ph.D.
Idaho National Lab.

Brian Lawrence '97 Ph.D.
Gravity Diagnostics

Teresa Pace
L3Harris

Chrys Panayiotou
Indian River State College

Clara Rivero-Baleine '05 Ph.D.
Lockheed Martin

Al Symmons
Vital Materials Co. Ltd.

Matt Weed '13 Ph.D.
Luminar Technologies, Inc.

2021 Dean's Internal Advisory Council

The Dean's Internal Advisory Council was created in 2020, and is formed from faculty, staff and students. The goal is to provide advice to the dean on all aspects of the college and its programs.

April Lamoureux
Staff

Vicky Ortiz Batson
Staff

Austin Brigham
Undergraduate Student

Jessica Pena
Graduate Student

Zheyuan Zhu
Research Staff

Kyle Renshaw
Faculty

Axel Schulzgen
Faculty

2021 Awards

January - May 2021

EXTERNAL AWARDS

FACULTY

Peter Delfyett

Inducted into the National Academy of Engineering

Ivan Divliansky

Chair, OSA Holography and Diffractive Optics Technical Group

Kathleen Richardson

American Ceramic Society, Life Member

Martin Richardson

Directed Energy Professional Society (DEPS) Fellow

STUDENTS

Teo Malendevych

Imaging and Light in Extended Reality (IMLEX) Fellowship

Irina Sunkara

2021 SPIE Optics and Photonics Education

Scholarship

Imaging and Light in Extended Reality (IMLEX) Fellowship

Lawrence Trask

DoD SMART Scholarship

Brandon Triplett

Purdue University, ECE Star Fellowship

Murat Yessenov

Laser Technology, Engineering, and Applications Scholarship

Kun Yin

2021 SPIE Optics and Photonics Education Scholarship

UNIVERSITY AWARDS

Peter Delfyett

University Distinguished Professor

Carl Kutsche

Distinguished Alumnus Awards, 2020-2021

Jim Moharam

Emeritus Professor

Vicky Ortiz Batson

20 years - Recognition of Service to the University

Kathleen Richardson

UCF Excellence in Research award 2020-2021

Melissa Siver

Founders' Day Award

Shin-Tson Wu

20 years - Recognition of Service to the University

COLLEGE OF OPTICS AND PHOTONICS AWARDS

FACULTY

Peter Delfyett

Excellence in Undergraduate Teaching

Kathleen Richardson

Excellence in Research

Axel Schulzgen

Excellence in Graduate Teaching

STUDENTS

Ricardo Bustos-Ramirez

CREOL Student of The Year Award

Benjamin Croop

Runner up, CREOL Student of the Year Award

Ziqian He

Runner up, CREOL Student of the Year Award



CREOL Lab Expands Capacity of Non-Mechanical Laser Beam Steerers

A new device demonstrated by the laboratory of Professor Shin-Tson Wu, Ph.D. offers a novel method for expanding the capabilities and accuracy of non-mechanical laser beam steerers.

The method, detailed in a new article in *Light Science & Application* titled “Miniature planar telescopes for efficient, wide-angle, high-precision beam steering,” addresses the inherent limitations of current techniques. Namely, that the technology used for everything from light detection and ranging (LiDAR) on autonomous vehicles to high-precision satellite-to-satellite communications, can only provide quasi-continuous steering within a limited range. Wu proposes widening the steering range using the power of a centuries-old scientific tool with a modern twist: telescopes with modern liquid crystal optics. Building upon this idea, Wu and co-workers have demonstrated lightweight, cost effective, miniature planar telescopes for optical angle magnification based on LC polymer flat optics. This represents a new milestone for planar LC optics to go beyond its current development.



CREOL Faculty Recognized Among Top World's Top Scholars

The depth of UCF's research expertise is on full display in a recent compilation of the world's top scholars — including 20 from CREOL, the College of Optics and Photonics.

The list in the journal *PLOS Biology* used a composite indicator, based on six citation metrics, to rank the top 2% scientists from a variety of disciplines and subdisciplines. Fourteen of the current 33 faculty members of CREOL are in the top list — in Optics, Optoelectronics & Photonics or Applied Physics subdisciplines. Professor Demetrios Christodoulides, Ph.D., is ranked among the top 0.05% in Optics (26 out of 56,325). Also notable is Professor Shin-Tson Wu, Ph.D., who is ranked at 115 in Applied Physics (among 224,856 researchers). In addition, the list includes six professors with emeritus or past affiliation with the College. Overall, more than 100 University of Central Florida researchers are in the top 2%, according to the study.

“Innovation and creative thinking are critical components of how we approach our research at CREOL,” says Dean David Hagan, Ph.D. “This list is a testament to the dedication of our faculty to advancing our understanding of the world and to teaching students to do likewise.”

CREOL Provides Launchpad for Exceptional Career



Globally recognized optical and infrared materials scientist Clara Rivero-Baleine, Ph.D., has dedicated her life to the field of optics. In celebration of her many contributions to the field, CREOL, the College of Optics

and Photonics, named Rivero-Baleine the recipient of 2019's Distinguished Alumni Award.

"I am honored to be recognized by an institution that gave me so much as a student," says Rivero-Baleine.

It's been a journey for the accomplished scientist, who sits on Lockheed Martin's Applied Research Sensor System and Technology group and serves as a

Materials Engineer Manager and member of the Group Technical Staff in the Missiles and Fire Control group.

A proud Cuban native, Rivero-Baleine immigrated to the U.S. at 16 after her grandfather actively fought against Fidel Castro's oppressive regime. Her family settled in Orlando to seek political asylum, and she quickly assimilated to life in her new home. She graduated as valedictorian of her class.

Rivero-Baleine entered UCF's Department of Physics in 1999 as a young, Hispanic scientist ready to make history in her field. She got a head start as an undergraduate when CREOL accepted her as a part of their Research Experience for Undergraduate (REU) program — something she points to as the conception of her career in optics.

"It wasn't until I took my classes at UCF that I realized how much I liked optics," says Rivero-Baleine. "Then I was accepted to the REU program at the Center for Education in Optics and Laser (CREOL), and that really exposed me to the field. I was fascinated and certain it was where I was meant to be. I can't thank UCF enough. The opportunities students are given ensure that if you put in the work, you can be successful. You won't find more supportive faculty and staff anywhere else."



Thailand Benefits From CREOL Grad's Expertise

Sarun Sumriddetchkajorn '00, Ph.D., has built an impressive career in optics and photonics following his doctorate graduation in 2000.

His path into optics and photonics began with embossed rainbow holograms he encountered during a job interview at the National Electronics and Computer Technology Center (NECTEC) in his native Thailand. That led him to pursue a degree overseas at CREOL. Sumriddetchkajorn said the friendliness and openness of the faculty helped him feel at home.

His former advisor, Professor Nabeel Riza, Ph.D., stands out in particular.

"I had to study all related works in scientific publications, patents, and products, and then convince him that our ideas were new or had some scientific or engineering advantages," Sumriddetchkajorn recalls. "If he agreed, I went to the lab and proved it."

That foundational experience led to Sumriddetchkajorn's current role, which carries global significance.

At the height of the pandemic technology developed at NECTEC was used for thermal imaging temperature screenings. High-risk locations in Thailand used the technology to identify people with a fever and slow the spread of COVID-19.

The public good of the work inspires Sumriddetchkajorn, as well as the newer employees he mentors.

"I see the new generations are growing in quality, maturity and capability," he said.

See the CREOL news blog at www.creol.ucf.edu for the full interview.



An Energetic Welcome



Pegasus Professor Martin Richardson, Ph.D., was recently admitted as a fellow of the Directed Energy Professional Society (DEPS), one of only a handful of academics to do so.

Richardson, a CREOL professor of optics and founding director of the Townes Laser Institute, was chosen for his “longstanding commitment to directed energy through globally recognized academic research in high energy lasers and laser interaction science, and to the education of the next generation of scientists and engineers,” according to his citation. Richardson is also the director of the newly formed UCF

Research Center on Directed Energy Systems, Science and Technology.

DEPS Director Mark Neice noted in announcing three fellows that the University of Central Florida is uniquely positioned as a the “primary university research group supporting defense applications of high energy lasers, and a prime source of trained scientists and engineers for the directed energy community.”

The other two awardees are U.S. Air Force General Ellen M. Pawlikowski (Ret.) for leading the Airborne Laser Program, and U.S. Navy Capt. Dave Kiel who led the Navy LaWS program, the first maritime tests of directed energy weapons. C. Martin Stickley, Ph.D., was made a fellow of DEPS in 2011.

Founding CREOL Grad Student Blazed Trail at L3Harris



Richard DeSalvo, Ph.D. '93, takes wireless communications further into the future every day, but it's the people of his past that inspire his every step.

DeSalvo was in the inaugural class of graduate students developing laser projects in laboratories on Research Parkway. It was a “pathfinder program” as DeSalvo puts it now, but he thrived in the start-up atmosphere.

“They gave me wings and I just took off,” DeSalvo says.

DeSalvo's gamble paid off. He pursued research in non-linear refraction and two-photon absorption under the direction of his co-advisors, Professor Eric Van Stryland, Ph.D., and Professor David Hagan, Ph.D. The research focused on using the Z-Scan method to measure the anisotropy and dispersion of the nonlinear refractive

index in dielectric materials, including non-centrosymmetric crystals used for harmonic generation.

DeSalvo built a successful career out of his degree, ultimately settling in his current position with L3Harris Technologies, where he is a Senior Scientist and Fellow in the Photonics Department. DeSalvo leads research and development and applied programs in microwave photonics and lightwave communication systems.

DeSalvo finds the work itself rewarding and exciting, but what he enjoys even more is training the next generation of innovators. It often takes a year or more for new hires to gain their security clearance, so DeSalvo spends time with them in the unclassified laboratory teaching them about optical communications and signal processing.

“Paying it forward is the best way to put it,” DeSalvo says. “That's one of the happiest parts of my career.”



Delfyett Earns Major Honors Abroad, On Campus

It was a banner year for Pegasus Professor Peter Delfyett, Ph.D., with preeminent recognitions both nationally and on campus.

Induction into the National Academy of Engineering is one of the highest honors in the scientific community, making him just one of 106 inductees this year. Delfyett was also recognized as a University Distinguished Professor at UCF.

“UCF is clearly a national and international leader when it comes to optics, lasers and photonics. Professor Delfyett, through his amazing work, has proven that he is one of the very best laser and photonics researchers in the world,” UCF President Alexander N. Cartwright says. “This recognition honors his many contributions to society throughout his career and his leadership that has helped develop UCF’s culture of innovation and discovery. I know he will continue to have an impact on the university and inspire his colleagues and our students to reach for the stars.”

New Faculty Member Brings Star Power to CREOL

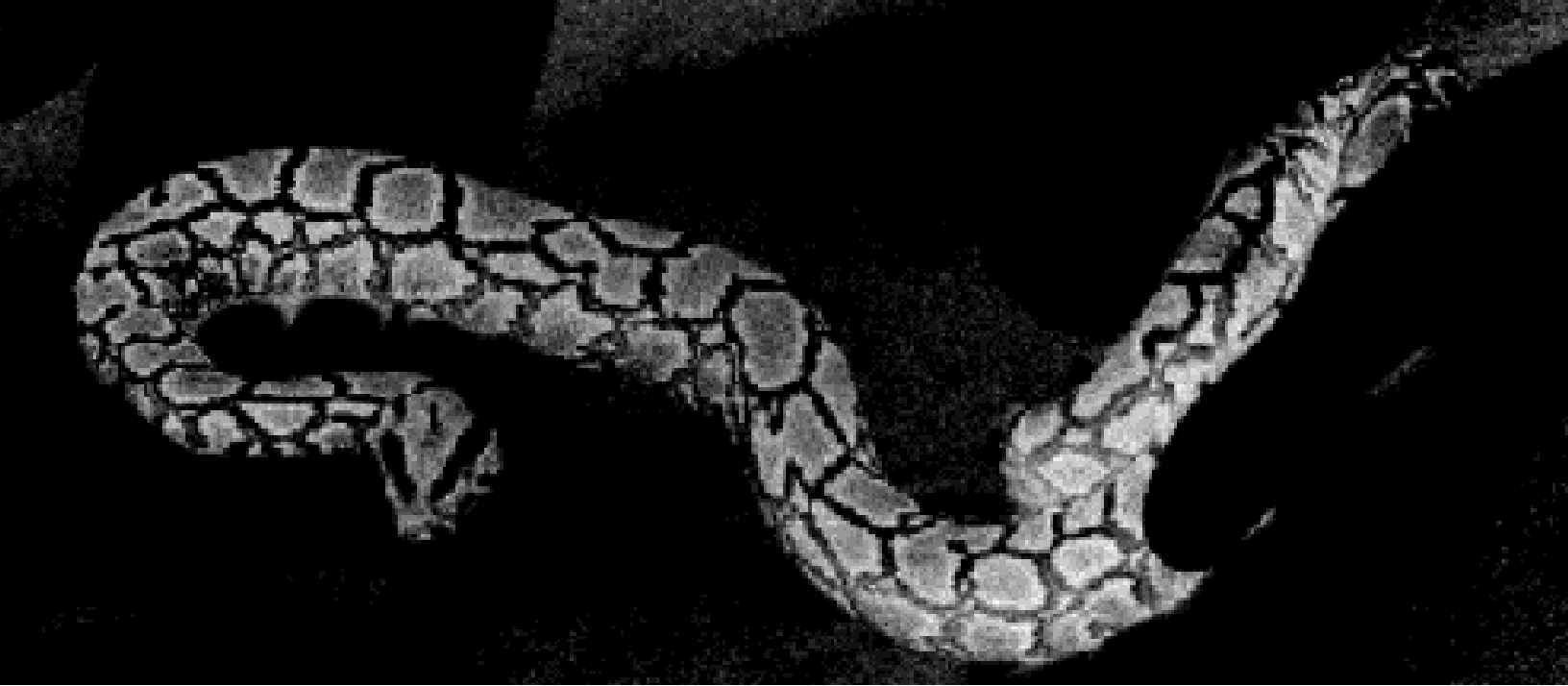
A new astrophotonics program launching this fall will be led by an equally new faculty member, Stephen Eikenberry, Ph.D.

While Eikenberry is a UCF rookie, he brings extensive experience studying the cosmos to the college, including credit for discovering one of the brightest and largest known stars with a four megapixel infrared camera he built. He’s also familiar with his new colleagues, having collaborated with CREOL faculty over the years.

“There are so many forward-thinkers (at UCF),” says Eikenberry, who specializes in the research of black holes, neutron stars and the particles of matter that make them. “I have a lot of room to collaborate with others to help spearhead a program that will be expansive, challenging and growing in relevance around the world.”

UCF is the latest stop for Eikenberry on a long journey of exploring astrophysics. Eikenberry arrives from the University of Florida, where he taught, researched and built astronomical instruments to study black holes and massive stars.





NIR Spectrum Cameras Aid Snake Hunt

CREOL researchers at the University of Central Florida have published a first- of-its-kind study that shows near-infrared (NIR) spectrum cameras can help hunters more effectively track down these invasive snakes, especially at night.

The snakes, which can reach 26 feet in length and 200 pounds, have invaded the Everglades in Florida — threatening native species and disrupting the ecosystem. The number of common native species observed in the Everglades since the snakes were first discovered in the 1990s dropped in some species by 90% through 2010, according to an earlier study. Since then, the state has been implementing mitigation strategies and encouraging residents to hunt down the massive snakes. On average snakes removed from the Everglades are about eight feet long, according to the Florida Fish and Wildlife Conservation Commission.

The new study found that by using NIR cameras, pythons could be detected 20 percent farther away than with visible cameras. Researchers say that with more work they may be able to develop an automated snake detection system. That could be a game changer especially since the pythons are marching northward and could threaten native species as far north as Virginia and Texas to the west.



Grad School Experience Prepared Popescu for Faculty Role

It's been almost 25 years since Gabriel Popescu '02 left his home in Romania, and he still recalls how jarring the journey can be for someone traveling to a foreign place.

"It has been an exciting journey since I first got here," says Popescu. "What I remember most is how overwhelming the transition was when I arrived in America. Orlando was my first introduction to the West. I recall certain things vividly... even the Florida air smelling differently and feeling differently than what I was used to."

Popescu currently teaches at the University of Illinois at Urbana-Champaign as the William L. Everitt Distinguished Professor of Electrical and Computer Engineering, where he directs the Quantitative Light Imaging Laboratory at the Beckman Institute for Advanced Science and Technology.

Popescu and his team develop biophotonics methods for application in biomedicine; for example, using quantitative phase imaging to predict the recurrence of prostate cancer in patients. Their research is primarily broken up into three categories: technological advancement, basic science, and clinical applications.

"To this day I am still using most of what I learned as a student at CREOL," says Popescu. "I work at a large institution with many brilliant scientists. These colleagues are collaborative, which is something that I was exposed to consistently while a student at UCF and came to value greatly in other scientists. CREOL had



the perfect size of 150-200 people — small enough so everybody knew everybody by name, but large enough to make a world-wide impact"

Popescu has pursued scientific endeavors ranging from research done at the Massachusetts Institute of Technology (MIT) under the late Professor Michael Feld and serving as the associate editor of Optics Express and Biomedical Optics Express.

When asked what inspires him the most, Popescu nods to his time as a student at CREOL.

"As is the case perhaps with all international students, it was challenging to take a chance coming to an unfamiliar place," says Popescu. "I've had my struggles and situations to conquer, but I've always been grateful from the moment I became a student at CREOL. I have been trying to emulate the family-like environment in my own group ever since"

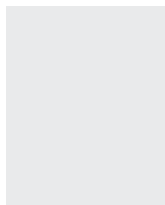
Doctoral Dissertations and Post-Graduation Employment

Optics & Photonics Ph.D.



Sepehr Ahmadzadeh Benis

Nonlinear optical mechanisms in semiconductors
Advisors: David J. Hagan & Eric W. Van Stryland
Title: Sr. Laser and Photonics Engineer
Employer: SiLC Technologies, Inc.



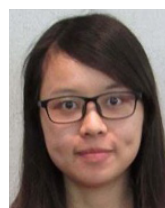
Munan Gao

UV-Ozone Oxide Treatments for High-Efficiency Silicon Photovoltaic Devices
Advisor: Winston V. Schoenfeld
Title: Postdoctoral Associate
Employer: Rutgers University



Juan Carlos Alvarado Zacarias

Novel Fibers and Components for Space Division Multiplexing Technologies
Advisor: Rodrigo Amezcua Correa
Title: Research Scientist
Employer: CREOL-UCF



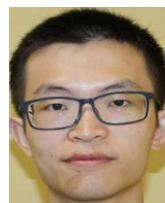
Fangwang Gou

High performance micro-scale light emitting diode display
Advisor: Shin-Tson Wu
Title: Display Hardware Engineer
Employer: Apple, Inc.



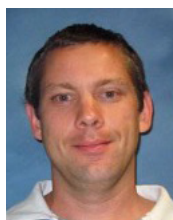
Ricardo Bustos Ramirez

Novel Optical Frequency Combs Injection Locking Architectures
Advisor: Peter Delfyett
Title: Senior Hardware Development Engineer
Employer: Infinera Corporation



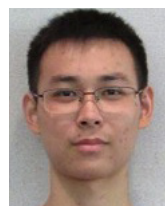
Ziqian He

Novel Liquid Crystal Photonic Devices Enabled by Liquid Crystal Alignment Engineering
Advisor: Shin-Tson Wu
Title: Hardware Engineer
Employer: Apple, Inc.



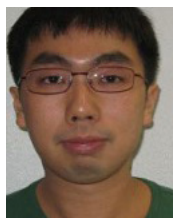
Steven Butrimas

Midwave vs. Longwave Infrared Search And Track And Aerosol Scattering Target Acquisition Performance
Advisor: Ronald Driggers
Title: Senior Sensor Engineer
Employer: NVIDIA Corporation



Jinxin Li

Machine learning inspired optoelectronic devices
Advisor: Jayan Thomas
Title: Adjunct Faculty
Employer: Embry Riddle University



Andrew Chew

Attosecond Transient Absorption in the Water Window
Advisor: Zenghu Chang
Title: TBD
Employer: Singapore



Arifur Rahaman

Enhancement of absorptance by ultrafast laser pulse shaping for efficient laser processing of thin polymeric materials
Advisors: Xiaoming Yu & Aravinda Kar
Title: Laser Process Engineer III
Employer: Applied Materials Inc.



Shengli Fan

Iterative optical diffraction tomography for reconstruction of multiply-scattering objects
Advisor: Guifang Li
Title: Sr. Product Engineer
Employer: ASML Holding



Patrick Roumayah

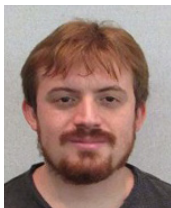
Ultrafast High-Energy Laser Systems for Filament Applications
Advisor: Martin C. Richardson
Title: Fiber laser scientist
Employer: Fibertek, Inc.

**Tracy Sjaardema**

Heterogeneous Integrated Photonics for Nonlinear Frequency Conversion and Polarization Diversity
 Advisor: Sasan Fathpour
 Title: Silicon Photonics Research Postdoctoral Appointee
 Employer: Sandia National Laboratories

**Chenyi Zang**

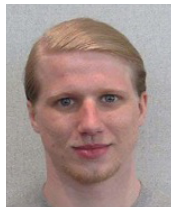
The Physics of Nanoaperture Optical Trapping: Design, Fabrication and Experimentation
 Advisor: Kyu Han
 Title: Sr. Optical Engineer
 Employer: Lumentum Holdings Inc.

**Matthew Suttinger**

High Average Brightness Broad Area Quantum Cascade Lasers
 Advisor: Arkadiy Lyakh
 Title: Physicist
 Employer: Air Force Research Laboratory

**Tao Zhan**

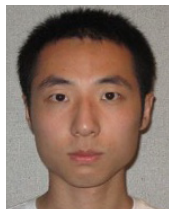
Liquid crystal flat optics for near-eye displays
 Advisor: Shin-Tson Wu
 Title: Display Engineer
 Employer: Apple, Inc.

**Daniel Thul**

Ultrafast High-Energy Laser Systems for Filament Applications
 Advisor: Martin C. Richardson
 Title: Research Scientist
 Employer: Spectral Energies, LLC

**Zheyuan Zhu**

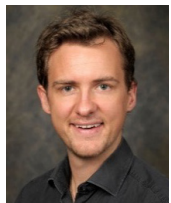
Computational Imaging with Limited Photon Budget
 Advisor: Shuo "Sean" Pang
 Title: Research Scientist
 Employer: CREOL-UCF

**Ning Wang**

Few-Mode Fiber Lasers and Amplifiers
 Advisor: Guifang Li
 Title: Optical Network Engineer
 Employer: China Mobile

Physics Ph.D.**Danielle Reyes**

Laser filament investigations: influence of preconditions and interactions
 Advisor: Martin C. Richardson
 Title: Research Scientist
 Employer: CREOL-UCF

**Steffen Wittek**

Development of High-power Single-mode Yb-doped Fiber Amplifiers and Beam Analysis
 Advisor: Rodrigo Amezcua Correa
 Title: Research Scientist
 Employer: KLA Corporation

**Chi Xu**

High Speed Modulation Characteristics of Semiconductor Nanolasers and Coupled Ring Laser Systems
 Advisor: Patrick LiKamWa
 Title: Optical Sensing Hardware Engineer
 Employer: Aeva Inc.

CREOL, THE COLLEGE OF OPTICS AND PHOTONICS FAST FACTS 2020-2021

2020-2021 Degrees Awarded



UCF Total
18,401

CREOL Total
83

2020-2021 Median Starting Salaries

\$70,000

Bachelor's
2019-2020 Graduates

\$92,500

Master's
2019-2020 Graduates

\$120,000

Doctoral
2019-2020 Graduates

2020-2021 Top Alumni Employers

- Lockheed Martin
- Apple, Inc.
- ASML Holdings
- Infinera Corp.
- Applied Materials Inc.
- Sandia National Laboratories
- Embry Riddle University
- Rutgers University
- Air Force Research Laboratories
- Fibertek, Inc.
- KLA Corp.

2020-2021 Top 5 Principal Investigators

1. Felix Tan
2. Ayman Abouraddy
3. Shin-Tson Wu
4. Demetrios Christodoulides
5. Robert Crabbs

FY 2021 Research Funding

 **21.5M** Fiscal Year
Funding

2020-2021 Patents & Publishing

209 Publications*

20 Patents Awarded

**Refereed Journal Publications*

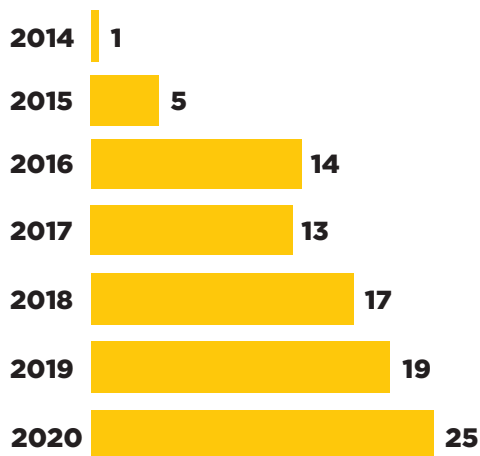
2020-2021 Top Published Faculty

- Shin-Tson Wu
- Rodrigo Amezcua-Correa
- Kathleen Richardson
- Ayman Abouraddy
- Demetrios Christodoulides
- Xiaoming Yu

2020-2021 National Rankings

#12 Atomic/Molecular/
Optical Physics

PSE Degrees per Year



FY21 Funding Distribution



\$9,658,465 Federal

\$8,027,641 Federal Through
Industry

\$3,868,410 Industry

Industrial Affiliates 2020-2021

Membership in the Industrial Affiliates (IA) program provides corporations, organizations and individuals many benefits, most of which are also of mutual benefit to CREOL. One of these is regular communication and contact with CREOL's research faculty and students as well as other IIA members who are developing new technologies and products for their business.

Our 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 connects. Through the IA program companies can also readily connect with other optics, photonics, and industrial organizations through local Florida organizations in which the College maintains an active participation.

Life Members

Cobb Family Foundation
Northrop Grumman Corp.
Nufern

Memorial Members

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

Medallion Members

Breault Research
IPG Photonics
MKS, Newport, Ophir, Spectra-Physics

Northrop Grumman Laser Systems
II-VI Aerospace & Defense
Synopsys
Paul G. Suchoski, Jr

Senior Members

AFL
Amplitude Laser, Inc
ASML US
BAE Systems
CST of America
Facebook Reality Labs
(formerly Oculus)
FARO Technologies

LAS-CAD GmbH
Lockheed Martin
Optimax Systems, Inc
Optronic Laboratories Inc
Tektronix
Zemax
Zygo Corporation

Affiliate Members

Analog Modules
Andor Technology
Applicote Associates, LLC
Asphericon, Inc
AVO Photonics
Beam Co.
Coherent, Inc.
Control Micro Systems
DataRay, Inc.
Edmund Optics
Elbit Systems of America
eVision, LLC
Finetech
Gentec-EO
L3Harris Corporation
HORIBA Jobin Yvon, Inc.
J.A. Woolham Co.
JENOPTIK Optical Systems, Inc.
KBR
Laser Institute of America
LG Electronics

LGS Innovations
Light Path Technologies
Luminar Technologies Inc.
Menlo Systems
NKT Photonics Inc.
nLight
Ocean Insight
Optigrate
OptoSigma Corporation
OIDA
Plasma-Therm
Plasmonics
Q-Peak, Inc
ScannerMax
SPIE - The International
Society for Optics & Photonics
The Optical Society
Thorlabs
TwinStar Optics
ULVAC Technologies, Inc
Vescent Photonics
Yokogawa

* New 2021 Affiliate Members



CREOL The College of
Optics and Photonics

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