CREOL

THE COLLEGE OF OPTICS AND PHOTONICS
UNIVERSITY OF CENTRAL FLORIDA

2024-2025 ANNUAL REPORT

UCF

Annual Report Period:
July 2024 - June 2025

TABLE OF CONTENTS

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CREOL.UCF.EDU/ANNUAL-REPORT
FOR SUPPLEMENTARY DATA OR
TO READ PAST ANNUAL REPORTS.

Annual Report Compilation:
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Associate Dean for Academic Programs
Professor of Optics & Photonics and Electrical & Computer Engineering

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Interim Associate Dean for Research
Professor and Florida Photonics Center of Excellence Nanophotonics Chair

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Professor, Optics & Photonics and Physics

Aristide Dogariu
UCF Trustee Chair
Pegasus Professor of Optics & Photonics

Romain Gaume
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Finance Director

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Idaho National Laboratory

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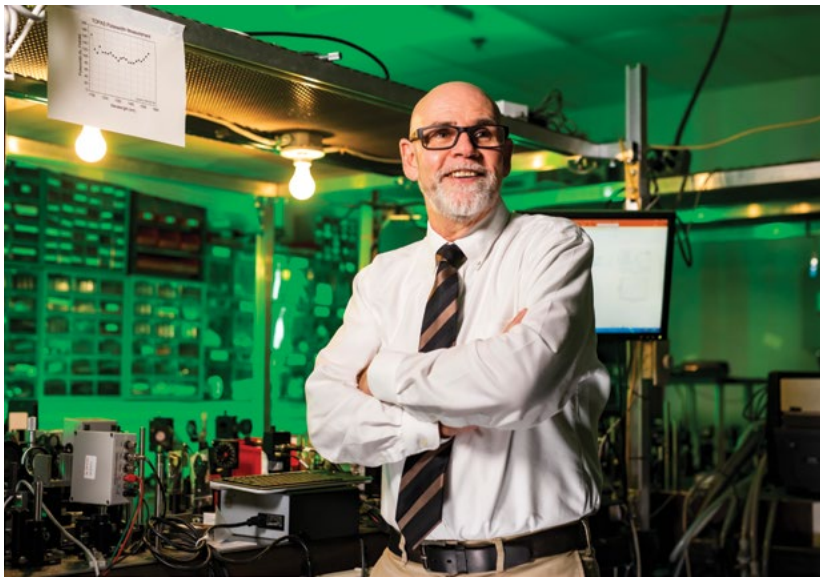
Postdoctoral Researcher

Zachary Zuniga
Undergraduate Student

MESSAGE FROM THE DEAN



It is my pleasure to introduce the 2024-2025 CREOL Annual Report. This past year will be remembered as a period of major continued growth and achievement. CREOL is now ranked among the top 3 public U.S. universities for optics, and among the top 7 overall, placing us in the company of Harvard, MIT, Stanford, and Caltech (see page 6).

Our expanding faculty includes the return of **Eric Johnson**, who I am delighted to reintroduce as a Professor and Nanophotonics Chair of the Florida Photonics Center for Excellence (FPCE). He will also serve as our inaugural Interim Associate Dean for Research. After laying the foundation for a legacy during an 8-year stint at CREOL in the early 2000s, his new role will enable us to further grow our research enterprise through strategic planning.

We also welcomed **Alexander Khanikaev** as our new Cobb Family Eminent Scholar Endowed Chair. His research focus is on the rapidly expanding fields of optical nanomaterials and quantum phenomena. Rounding out our new faculty additions are **Yannick Salamin** and **Christian Heide**. I encourage you to read more about their research on page 9.

This was also a banner year for interdisciplinary collaboration. We forged a new partnership with UCF's College of Medicine, opening a new joint laboratory in Lake Nona Medical City. The space will bridge the connection between doctors and the latest biophotonics research, paving the way for new clinical applications for the healing power of light (page 10).

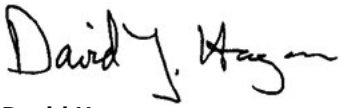
CREOL's community outreach efforts are stronger than ever. Following the success of our first Summer Camp, we expanded the program to three weeks, introducing more high school students to optics and photonics than ever before. We also launched a Teacher Ambassador Program, welcoming Central Florida teachers to experience CREOL and supplying them with lesson plans and experiments to take back to their classrooms. Read more on page 18.

We are also supporting the next generation of our field through new philanthropic initiatives. Former CREOL **Dean Eric Van Stryland** has led the charge to create the Founding Faculty Graduate Fellowship Fund, inspiring several longtime and legacy faculty members to make matching contributions that will support students pursing advanced degrees.

Meanwhile, our collaboration with our industry partners continues to set the standard for excellence. I encourage you to read about our detailed exploration of the rise of regional tech hubs during our Industrial Affiliates Symposium on page 21. We also celebrated the public launch of Relativity Networks, a company co-founded by CREOL faculty member **Rodrigo Amezcua Correa** and alum **Jason Eichenholz '95MS '96PhD** that promises to revolutionize the way power is supplied to next-generation AI data centers.

As you explore more highlights in our Annual Report, please join me in celebrating the achievements of our faculty, researchers, students, and partners – as we look toward the promise of a bright future we're creating in optics and photonics.

Thank you for your continued support as we Light the Way Forward.



David Hagan
Dean and Director
Pegasus Professor of Optics and Photonics

2024-25 AWARDS

EXTERNAL AWARDS

FACULTY

Shin-Tson Wu
Lewis and Beatrice Award, Society for Information Display
Lawrence Tannas Award for Volunteer Service, Society for Information Display
Inaugural Big 12 Faculty Member of the Year

Rodrigo Amezcua Correa
Fellow, Optica

Stephen Eikenberry
Senior Member, SPIE

Alexander Khanikaev
Highly Cited Researcher, Clarivate

Leland Nordin
Early Career Program Award, Army Research Office
Young Investigator Program Award, Air Force Research Office

Kathleen Richardson
President's Award, Internal Commission on Glass

Martin Richardson
Faculty Sabbatical Award, Lawrence Livermore National Laboratory

Yannick Salamin
Ralph E. Powe Junior Faculty Enhancement Award, Oak Ridge Association of Universities

STUDENTS

Debasmita Banerjee
McMurtry Paper Prize, Optica Siegman International School on Lasers
STEM Category Winner, Adobe Digital Edge Awards

Yuqiang Ding
IEEE Outstanding Graduate Scholarship, Orlando Section
3rd Place, SPIE AR/VR/MR Optical Design Contest
Optics and Photonics Scholarship, SPIE
Best Student Paper, Society for Information Display

Emily Kinkead
DoD SMART Scholarship

Layton Hall
Frederick Reines Distinguished Postdoctoral Fellow, Los Alamos National Laboratories

Francisco Hernandez
DoD SMART Scholarship
NDSEG Fellowship

Zhenyi Luo
IEEE Outstanding Graduate Scholarship, Orlando Section
Optics and Photonics Scholarship, SPIE

Yizhou Qian
Optics and Photonics Scholarship, SPIE

Qian Yang
Best Student Paper, Society for Information Display

Timothy Bate
Caleb Dobias
Lashae Smith
Owen Thome
Nicholas Vail
DEPS Graduate Research Award

ALUMNI

Jianghao Ziong '22PhD
Glenn H. Brown Prize, International Liquid Crystal Society

UNIVERSITY AWARDS

FACULTY

Stephen Kuebler
Champion of Undergraduate Research Award

Leland Nordin
Reach for the Stars Award

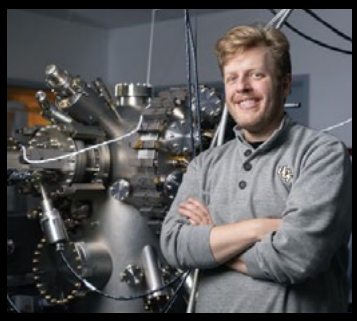
STUDENTS

Gabryella Baldaci
Order of Pegasus

Alejandro Lopez Zelaya
College Founders' Award

ALUMNI

Andrew Caputo '22MS
30 Under 30 Award



Leland Nordin, Reach for the Stars Award

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Stephen Kuebler, Champion of Undergraduate Research Award

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COLLEGE AWARDS

SERVICE TO UCF

James Ross
35 years

Nathan Aultman
Staff Excellence Award

Maria Lopes
Staff Excellence Award

Mark Wagenhauser
Staff Excellence Award

FACULTY

Pieter Kik
Excellence in Graduate Teaching
Teaching Incentive Program Award

Stephen Kuebler
Teaching Incentive Program Award

Guifang Li
Excellence in Research

Konstantin Vodopyanov
Excellence in Undergraduate Teaching

STUDENTS

Shubham Dawda
Student of the Year

Amin Hashemi Shahraki
Student of the Year Finalist

Andrew Howe
Student of the Year Finalist

Daniel Lumpkin
Industrial Affiliates Symposium Best Poster

Gabryella Baldaci '25 (CREOL)
Alejandro Lopez Zelaya '25 (CREOL)
Robert Josephson (CECS)
Luke Reyes (CECS)
Armani Garcia (CECS)
Winning Team: CREOL Senior Design Competition

ALUMNI

Zhibing Ge '04MS, '07PhD
Distinguished Alumnus

For a full list of CREOL scholarships and fellowships, visit page 28

SHIN-TSON WU HONORED WITH INAUGURAL 'BIG 12 FACULTY MEMBER OF THE YEAR' AWARD

The award spotlights exceptional faculty at each of the athletic conference's 16 institutions who shine in research and innovation.

Wu's trailblazing work with liquid crystal displays has led to leading-edge technologies in smart phones, tablets, augmented reality, virtual reality and other devices used around the globe. He is also widely recognized for mentoring his students. Several have gone on to excel at top companies like Apple, Google and Meta.

"Dr. Wu's world-class expertise, impact, and dedication to student success make this honor well-deserved," says Michael D. Johnson, UCF's provost and executive vice president for Academic Affairs. "UCF — and now academics in the Big 12 Athletic Conference — are distinguished by his pioneering work, scholarly excellence and positive influence."

Big 12 institutions nominated their faculty of the year candidates in conjunction with faculty athletics representatives, provosts and other university leaders.

UCF joined the Big 12 in 2023 as the youngest school among the nation's major athletic conferences. In the latest *U.S. News & World Report* Best Colleges Rankings, UCF ties for third among public institutions and sixth overall among Big 12 member schools.

READ MORE

UCF'S OPTICS PROGRAM RANKED IN TOP 3 AMONG U.S. PUBLIC UNIVERSITIES

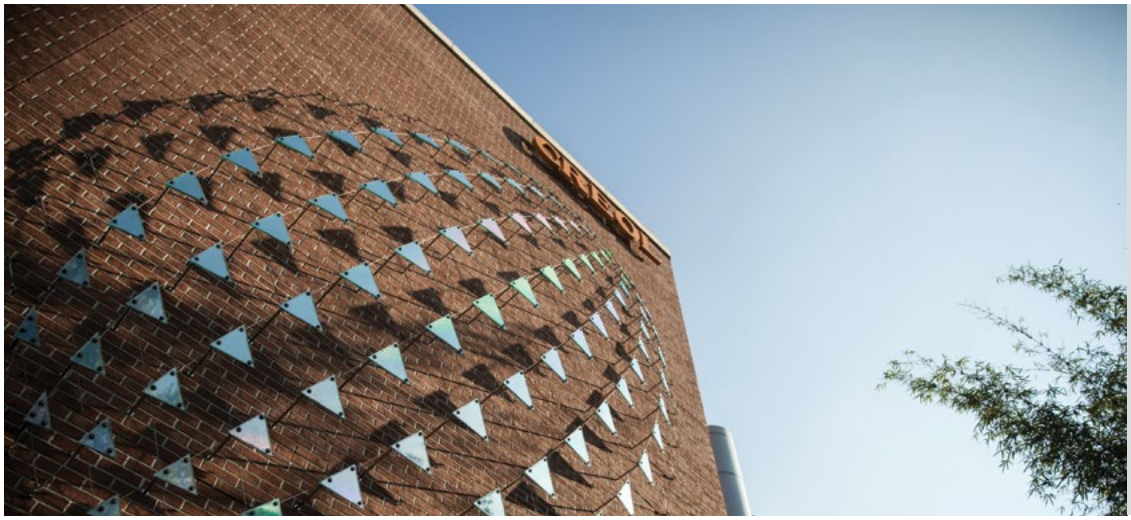
U.S. News & World Report recognized CREOL, The College of Optics and Photonics as a Top 3 public university for optics, and within the Top 7 of all U.S. Universities — a testament to continued excellence in research, academics, and scientific literature contributions.

The rankings place CREOL in the company of Stanford, Harvard, Caltech, MIT, and UCLA.

U.S. News & World Report also named the University of Central Florida one of the top five most innovative public universities. In Florida, UCF was recognized as the state's most innovative university for the seventh consecutive year.

CREOL is a key driver of that innovation, securing more than $92 million in external research funding over the last five fiscal years. The Bachelor of Photonic Science and Engineering degree is the only program of its kind in Florida, and one of only six accredited in the nation. The top rankings place CREOL far ahead of other universities with standalone optics programs.

"I'm proud that CREOL continues to deliver nationally recognized excellence," said CREOL Dean **David Hagan**. "This reflects the dedication our faculty, students, and researchers exemplify every day. I'm confident that our program will continue to earn worldwide recognition as we continue our growth and further expand our research capabilities."



CREOL'S GROWTH CONTINUES WITH NEW NANOPHOTONICS CHAIR

Eric Johnson '89MS

The way **Eric Johnson '89MS** sees it, the best is yet to come.

"I think CREOL's right at a nexus," Johnson says, "All the pieces are in place. Now it's a matter of, let's coalesce around a few things, and get people to come together from a strategic standpoint."

Johnson will serve as Nanophotonics Chair of the Florida Photonics Center of Excellence (FPCE), as well as CREOL's first Interim Associate Dean for Research. His appointment is also a homecoming: his legacy at UCF began when he earned a Master's degree in Electrical Sciences in 1989.

After earning his Ph.D. from the University of Alabama at Huntsville, Johnson's industry career launched at a high-tech startup company, Digital Optics Corporation, where he served as Vice President of Research and Development. His success there ultimately led him back to CREOL in 2000 to be an Associate Professor for the next 8 years.

"I've done a lot of things since then," Johnson says. A few of them:

National Science Foundation: Program Director in photonics within the Electrical, Communications and Cyber Systems (ECCS) Division

University of North Carolina at Charlotte: Professor of Physics, Optical Science, and Electrical and Computer Engineering; Director of the Center for Optoelectronics and Optical Communications

Clemson University: Palmetto-Net Endowed Chair in Optoelectronics and Professor of Electrical and Computer Engineering

Johnson's career research efforts have received more than $20 million in federal grants. His contemplation of his next move led him back to CREOL.

"You get to the latter part of your career, and you start thinking, what else can I do?" he says. "As I keep building, what better place to do it than CREOL?"

Johnson is a Fellow of Optica, SPIE, and a senior member of IEEE. He has served as a commission member for the ABET Engineering Accreditation Committee (EAC) and has served on the Board of Directors for SPIE. Johnson was also an Editor for IEEE Transactions on Electron Devices in optoelectronics, and Optica Applied Optics, and numerous other editorial and committee chair positions for IEEE, Optica and SPIE.

READ MORE

Stephen Eikenberry

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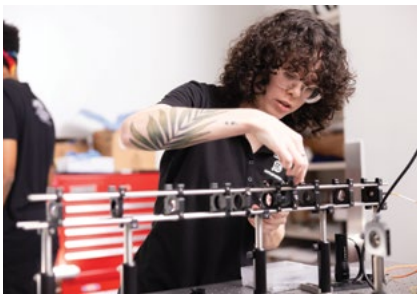


"You either do optics, or you do astronomy, and I really wanted to do both. Surprisingly, there are very few programs that do both."

—Tara Crowe

UCF EXPANDS SPACE PHOTONICS PROGRAM

New research grants and faculty growth plan

A team of CREOL researchers believe photonic technology could be the key to getting deeper, clearer views into the universe than ever before — and their work is creating new opportunities for those who want to reach for the stars.

Led by Professor **Stephen Eikenberry**, the team secured nearly $3.5 million in funding from a MURI (Multidisciplinary University Research Initiatives) grant through the Air Force Office of Scientific Research. Researchers will investigate new ways to view the cosmos — but the applications don't only apply to the deepest reaches of outer space.

"We're collaborating on the photonic technologies that we could apply to exploring the solar system, looking for life on Europa, and doing some of the work we need to do to colonize the moon and Mars," Eikenberry says.

And the list goes on, from accurately identifying and characterizing space debris, to improving communication between satellites, to tracking stars and planets that orbit black holes.

"We could potentially image forming planets around baby stars in a way that hasn't been done before," Eikenberry says.

The team's research focuses on two key technologies: photonic lanterns and heterodyne spectroscopy. By capturing, measuring and combining light waves in specific ways, researchers can synthesize images at scales and resolutions never seen before, further unlocking the mysteries of our reality.

Nearly a third of CREOL's faculty members are involved, including professors **Rodrigo Amezcua-Correa**, **Miguel Bandres**, **Peter Delfyett**, **Darren Hudson** and **Axel Schülzgen**. As of Spring 2025, the CREOL astrophotonics team includes more than 20 undergraduate students and 15 doctoral students. One of them is Tara Crowe, who says she decided to pursue her doctorate at UCF because of the program.

"You either do optics, or you do astronomy," Crowe says. "And I really wanted to do both. Surprisingly, there are very few programs that do both."

The expanding research areas support UCF President Alexander N. Cartwright's mission to strengthen the university's position as a leader in space research. This is implemented through the Space and Planetary Instrumentation, Commercialization, and Education (SPICE) initiative, managed by the Florida Space Institute providing support to multiple colleges and departments, including CREOL for the advancement of space photonics. The SPICE project aims to attract even more funding by empowering researchers with the resources and facilities they need to conduct advanced experiments for space research and to develop emerging space technologies.

CREOL also has plans to hire a space photonics instructor, helping more students to explore their passion for the space industry.

CREOL RESEARCHERS RECEIVE UCF SEED FUNDING

Twenty-one projects representing colleges across UCF and several centers were selected for 2024-25 Seed Funding awards.

The program, a result of a collaboration between the Office of Research and the Office of the Provost, is directed at promoting competitiveness in attracting external funding and enhancing visibility and recognition of UCF.

TIER-1 AWARD:

Yannick Salamin
Quantum Entanglement in Frequency Combs for Next-generation Spectroscopy

TIER-2 AWARDS:

Andrea Blanco-Redondo, Rodrigo Amezcua Correa and Darren Hudson
Sources of Quantum Light in Hollow-Core Fibers

Stephen Eikenberry, Jaesung Lee (CECS), Paola do Vale Pereira (CECS), and Eric Van Stryland
A Space-based Laser Frequency Comb Gravitational Wave Detector

READ MORE

Alex Khanikaev, Yannick Salamin, and Christian Heide

NEW CREOL FACULTY MEMBERS BRING FRESH PERSPECTIVES, RESEARCH AREAS

CREOL's expansion continued in 2024, as the College welcomed faculty members **Alexander Khanikaev**, **Yannick Salamin**, and **Christian Heide**.

Alexander Khanikaev joined CREOL in 2024 as the Cobb Family Eminent Scholar Endowed Chair and Professor in Optics and Photonics. He was previously a faculty member at the City University of New York and a research associate at the University of Texas at Austin. His current research focus is on theory, design, and experimental studies of photonic nanostructures and low-dimensional materials. His current research interests and directions include quantum phenomena and light-matter interactions in engineered optical nanomaterials for photonics applications.

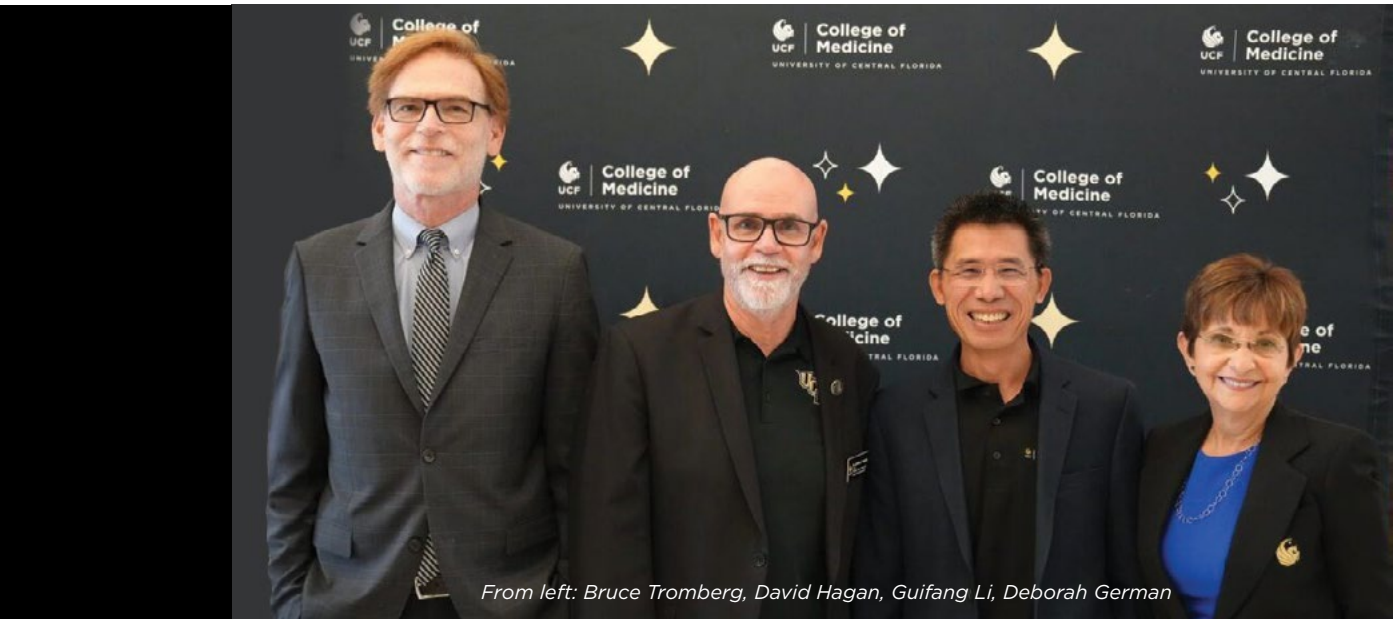
Yannick Salamin joined CREOL in 2024 as an Assistant Professor. Before this, he was a postdoctoral fellow at the Massachusetts Institute of Technology. Salamin leads the quantum nonlinear photonics (QNP) group, which aims to develop experimental systems to study and shape the quantum properties of light.

"Everyone here is dedicated to optics, with expertise spanning from fundamental science to applied research," Salamin says. "It creates a uniquely focused and collaborative environment."

Christian Heide joined UCF in January 2025 as an Assistant Professor with a joint appointment in Physics and CREOL, after conducting postdoctoral research at Stanford University. His research focuses on coherent electron control in solids and nanostructures on ultrafast timescales, including light-field-controlled quantum electronics and advanced spectroscopic techniques to uncover novel quantum phenomena.

"(CREOL's) collaborative environment, cutting-edge research infrastructure, and strong educational programs provide an ideal starting point to tackle grand challenges in next-generation electronics and laser systems," Heide says.

RESEARCH



From left: Bruce Tromberg, David Hagan, Guifang Li, Deborah German

Inside the new joint CREOL-College of Medicine lab

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NEW LAB HIGHLIGHTS CREOL – COLLEGE OF MEDICINE PARTNERSHIP

Scientists from CREOL and physicians and biomedical scientists from the College of Medicine have opened a new lab at the College of Medicine's Burnett Biomedical Sciences building in Lake Nona.

They were joined at the opening ceremony by Dr. Bruce Tromberg, director of the National Institute of Biomedical Imaging and Bioengineering at the National Institutes of Health. He leads a national research team focused on developing technologies for biomedical imaging and therapy to improve health.

"These technologies will allow physicians see how the body works in real time — with noninvasive procedures for patients," said Dr. Deborah German, UCF vice president for health affairs and dean of the College of Medicine. "Working together, we can create advanced technologies that will provide better care to all of us."

CREOL Dean **David Hagan** said the lab will provide opportunities for biophotonics researchers to learn from clinicians. "No matter how smart you are in biophotonics, you don't know what's happening inside the body," he said. "The real trick is getting doctors to talk to scientists. When that happens, we can push the boundaries of what light can do for health."

UCF medical and biophotonics experts are already working on several important research projects, including:

- Using light and sound to improve the placement of epidurals during childbirth. Physicians place the epidural in a mother's back by feel, but in about 30,000 cases a year, the epidural is misplaced, causing temporary paralysis or more serious complications. UCF researchers have created a new technology that uses sound

and light to help physicians better place the anesthetic. Sound bounces off the spinal cord for proper placement. A tiny light in the needle illuminates the area, providing a picture that is 10 times higher resolution than ultrasound.

- Fiber optic sensors that can determine immediately if blood is clotting during heart surgery. Currently, when a patient is on a heart-lung machine during surgery, doctors must use a chemical blood test to see if the blood is clotting. But the test takes 20 to 30 minutes to complete. The fiberoptic sensor can determine immediately if blood cells are clotting so physicians can act faster to minimize the risk of stroke.

Dr. Tromberg said the UCF partnership is coming at the perfect time as the NIH recognizes the power of bioengineering and artificial intelligence to improve healthcare. “This is the right time for you. Traditionally, many medical schools have been reluctant to form partnerships like these because doctors and engineers don’t speak the same language. But Dean German is coming to you guys,” he said, pointing to CREOL faculty and founders who attended the celebration.

CREOL Professor **Guifang Li**, a principal investigator on the epidural study, said he is excited to be using his research to help improve health, “Health is personal,” he said. “And technology is all about looking for solutions. If the doctors can help us understand the need, we can work together to solve it.”

One of his postdoctoral scientists, **Sudip Gurung**, attended the celebration and created a laser ribbon cutting in honor of the partnership. He also will be working in the new lab to perfect the epidural technology. “Fiber optics has changed the world,” he said. “It’s exciting to be creating applications that can change the world for healthcare.”

CREOL COLLABORATION WITH UCF NANOSCIENCE TECHNOLOGY CENTER LEADS TO BREAKTHROUGHS

UCF Professor **Debashis Chanda**, a joint CREOL faculty member, and his team have developed several innovations at the NanoScience Technology Center that promise to drive further medical advancements.

In one study, Chanda’s team developed a rapid, low-cost test to detect dopamine—an essential neurotransmitter. Disruptions in dopamine levels are closely linked to various neurodegenerative and psychological disorders such as Parkinson’s disease and schizophrenia.

In another project, Chanda and his team developed a “barcoding” technique to quickly identify chiral molecules based on their unique infrared fingerprints, potentially speeding up pharmaceutical and medical advancements. The molecules can be identified using a special pixelated 2D sensor array that interacts with precise light with the specific properties of the molecules to capture their unique vibrational absorptions, which are then mapped as a barcode.

“We aim to contribute towards the development of inexpensive and sensitive chiral drug identification methods for chemical, biological and medical research, the fabrication of novel devices exhibiting superior light-matter interaction and the demonstration of a real product with commercial viability,” Chanda says.

In a third breakthrough, Chanda’s team unveiled a new technique to detect long wave infrared (LWIR) photons of different wavelengths or “colors.” The new detection and imaging technique will have applications in analyzing materials by their spectral properties, or spectroscopic imaging, as well as thermal imaging applications.

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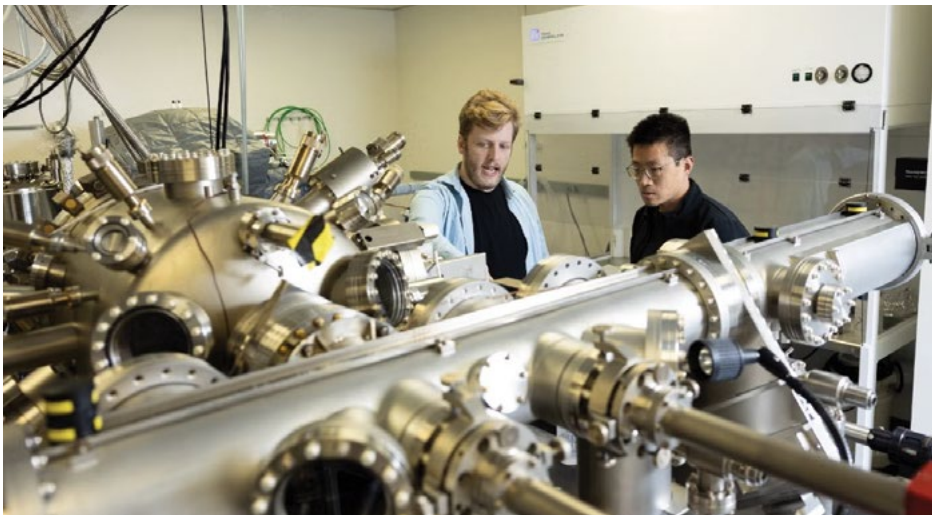
RESEARCH



Leland Nordin and Shuo Sean Pang

SANDIA NATIONAL LABORATORY TAPS CREOL RESEARCHERS TO DEVELOP INFRARED CAMERA FOR SPACE

READ MORE

Pictures of Earth from space are captivating, but not so easy to capture. Down here, we worry about lighting, focus and composition when we snap pics for social media. But in the harsh climate of space, the art of photography is less of a concern. The challenges in that environment include extreme temperatures and high levels of radiation that interfere with the equipment, as well as transmitting high-resolution images across communication systems with low bandwidth.

Two CREOL researchers, Assistant Professor **Leland Nordin**, and Professor **Shuo Sean Pang**, are developing an infrared imager that can overcome these limitations. Their team is led by Sandia National Laboratories, a U.S. Department of Energy (DOE) National Laboratory. The three-year, $450,000 project is funded by the Photonic Enabled Tera-scale InfraRed Imager (PETRI) Grand Challenge Laboratory Directed Research and Development program, which asks researchers to create the next generation of infrared-imaging technologies.

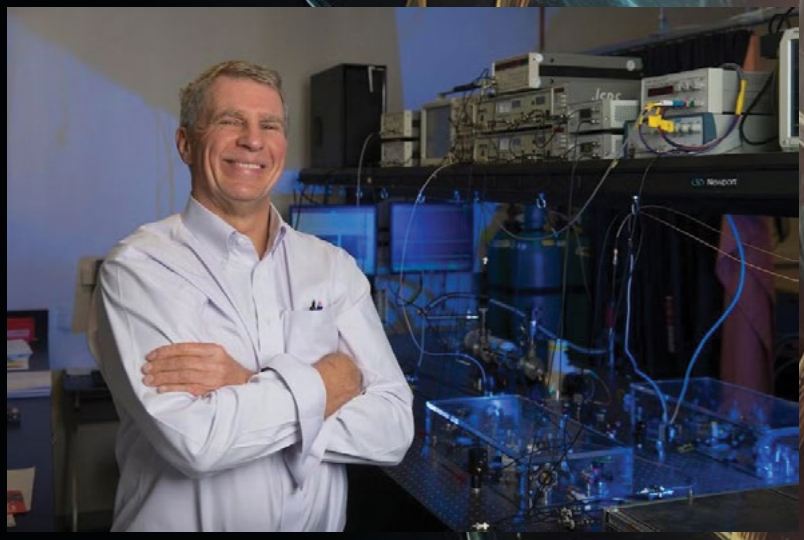
“The Grand Challenge programs bring people with expertise together to solve a problem for a period of three years, says Pang. “Through the program, we can tackle solving a technology problem that we choose.”

Nordin will use radiation-tolerant materials and a form of nanostructuring known as molecular beam epitaxy to fabricate the semiconductor that can detect infrared light.

“You put the wafer, known as the substrate, and different target elements inside the chamber, you then warm up the ovens which hold the elements so they come out of the oven and fly toward the substrate, building it up atomic layer by atomic layer,” he says. “It’s like spray-painting with atoms.”

At the same time, Pang and his team, which includes optics and photonics doctoral student Andrew Klein, will determine how to transmit a high-resolution image from space with minimum energy consumption from the hardware. Pang says the collaboration with Sandia allows them to try out different ideas, including non-traditional forms of data encoding to achieve high efficiency in communication, while maintaining the image quality.

RESEARCH COLLABORATION UNLOCKS NEW INSIGHTS INTO QUANTUM PHYSICS



CREOL Professor **Konstantin Vodopyanov** co-authored a study published in the journal Optica. This research examines electro-optic sampling (EOS), a technique that advances fields such as quantum physics, molecular spectroscopy and biomedical sensing.

The Optica Fellow's research, which combines interdisciplinary work, is shaping the future of quantum physics and other areas of science.

His new study explores how EOS transmits ultrashort laser pulses through crystals that change in response to an applied electric field. This technique allows researchers to accurately capture the shape and timing of electric fields across a broad range of frequencies.

This technique allows researchers to see molecules clearer than ever before, says Vodopyanov.

"By using an optical pulse shorter than half a light wave's cycle to probe it, the amplitude and phase of the wave can be fully characterized," he says. "This technique unlocks the ability to study ultrafast phenomena and capture molecular spectra with unprecedented resolution."

When compared to other methods, Vodopyanov explains how EOS offers higher sensitivity, allowing it to detect faint signals more effectively.

"Moreover, thanks to its exceptional sensitivity, it can even detect vacuum fluctuations — the elusive 'zero-point motion' of the electromagnetic field — providing profound insights into the foundations of quantum physics," he says.

The study explains new techniques to enhance EOS effectiveness, and Vodopyanov says there's significant potential for advancements. With continuous developments, he highlights several promising directions for further research.

"Looking ahead, future developments include extending EOS to the deep and extreme ultraviolet ranges, detecting squeezed vacuum states and enabling quantum field tomography in space-time," Vodopyanov says.

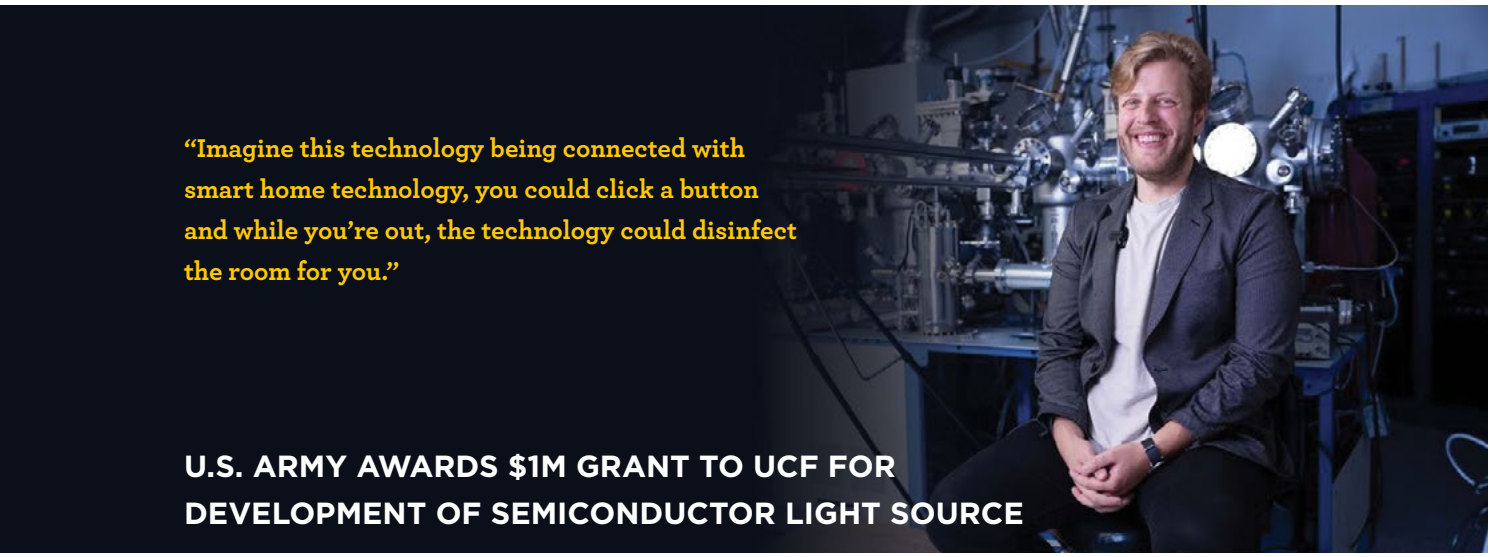
He adds that research can reveal more with the progression of technology and insights on how light behaves.

"Innovations such as on-chip terahertz-wave detectors and investigations into quantum statistics and relativistic effects promise to further expand the capabilities of this powerful technique," says Vodopyanov, who leads the Mid-Infrared Frequency Combs Lab at CREOL.

Vodopyanov's work is not only a breakthrough — it strengthens UCF's position as a leader in innovation and research. By advancing techniques like EOS, Vodopyanov and his collaborators are creating opportunities for new discoveries that could transform industries ranging from quantum physics to medical diagnostics. In the latter case, using frequency comb spectroscopy combined with EOS makes it possible to perform real-time spectroscopic analysis of multiple volatile biomarkers in exhaled human breath. This is a helpful tool in early diagnosis of multiple health conditions.

READ MORE

RESEARCH



"Imagine this technology being connected with smart home technology, you could click a button and while you're out, the technology could disinfect the room for you."

U.S. ARMY AWARDS $1M GRANT TO UCF FOR DEVELOPMENT OF SEMICONDUCTOR LIGHT SOURCE

Disinfecting a room with just the click of a button would be a dream come true for medical professionals, scientists and even homeowners. But that technology isn't just a fantasy: it's currently being developed by CREOL Assistant Professor **Leland Nordin**.

Nordin is leading a project to develop a compact semiconductor light source for defense and civilian applications such as room disinfection. The work is funded through a new, $1 million grant from the U.S. Army Combat Capabilities Development Command Army Research Laboratory.

The laser device would operate at the ultraviolet C (UVC) wavelength, which is the shortest of all forms of UV light.

"UVC is part of the UV spectrum," Nordin says. "When we talk about UV, we talk about what hurts us from the sun — UVA and UVB. UVC has the shortest wavelength and the highest energy. The reason why it's useful is because, unlike longer wavelengths, it doesn't penetrate the skin deeply, but it does provide disinfection and virus protection."

The drawback to UVC semiconductor lasers is their short lifespan. They can last one hour at best, making their use impractical and costly. Nordin plans to develop a UVC laser that can last for at least 10,000 hours by overcoming the electromigration of defects, which can cut the life of a laser short.

"What that means is that while making lasers through crystal growth, defects can occur," Nordin says. "There can be an atom missing or an extra atom generated."

The Army could also use these UVC lasers for non-line-of-sight communication and the detection of chemical or biological weapons and explosives. There are other civilian applications for these lasers. Hospitals could use them to remove viruses from surfaces simultaneously, while wastewater treatment plants could use them to sterilize water. Homeowners could someday benefit from this technology as well.

"Imagine this technology being connected with smart home technology," Nordin says. "You could click a button and while you're out, the technology could disinfect the room for you."

Nordin's co-PI on the project is UCF materials science Research Professor **Leo Schowalter**, who co-created the first UVC laser with Nobel Prize winner Hiroshi Amano at Nagoya University in 2019. They look forward to building a bigger semiconductor ecosystem in Florida and are eager to collaborate with faculty from the University of Florida who are already working on semiconductors with researchers from the Florida Semiconductor Institute.

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QUANTUM NONLINEAR PHOTONICS RESEARCH GROUP SUPPORTED BY RALPH E. POWE JUNIOR FACULTY ENHANCEMENT AWARD

In Assistant Professor **Yannick Salamin's** lab, the shelves are fuller every day. Delivery boxes arrive like clockwork. Students move equipment back and forth. Salamin says, pardon the dust.

"Sorry about the mess," he says, pushing some wires to the side. It's all part of the process to launch a new lab.

Salamin got the keys to the space when he started at CREOL in August 2024. Now his setup process is about to accelerate, thanks to a new infusion of funding from the Ralph E. Powe Junior Faculty Enhancement Award.

"I feel amazing and truly honored by this award," Salamin says. "I'm excited that it's also shining a light on the important work we're doing."

Salamin is one of 36 faculty members nationwide to be honored with the award, which is sponsored by the Oak Ridge Association of Universities (ORAU). The initiative aims to support select junior faculty members with seed funding to help launch their research projects.

In Salamin's case, that's the world of quantum nonlinear photonics (QNP), a group he hopes to grow as fast as his lab. The $5,000 from ORAU, matched with another $5,000 from the university, will allow him to recruit more students as he continues to install equipment. The QNP group's broad goal is to develop experimental systems to study and shape the quantum properties of light.

Quantum light is typically generated within special structures known as optical cavities. Understanding what goes on inside of them is key to improving how we develop and control quantum states of light — and ultimately to advancing quantum technologies.

While optical cavity systems have been around for some time, Salamin says that studying what happens inside them has been challenging. He compares it to a black box.

"You see the output, but you don't know what's happening within," he says. "Yet, that inner process is where the real magic happens."

Now, thanks to recent advances, Salamin and his team can not only peer inside these quantum systems, but they also hope to take things a step further — by coupling other objects, such as atoms and quantum emitters, to their platform. This would allow them to manipulate and control the behavior of these coupled systems using precisely engineered quantum light.

"That's very exciting," Salamin says, "Because you can then use the atom as a quantum sensor."

Real-time sensing at the atomic level has broad applications that include:

- Detecting extremely weak magnetic fields in the brain, helping researchers study neurological disorders like Parkinson's disease and Alzheimer's disease.
- Precision acceleration detection, which is critical for enabling GPS-free navigation, vital for autonomous systems or environments where satellite signals are unavailable.
- Future advances in quantum computing and efficient probabilistic machine learning systems.

Salamin cites the tight-knit atmosphere at CREOL as a significant asset for the optics and photonics community — saying collaboration is easy among his neighbors.

"What amazed me when I came here is that there's really this big sense of family," he says.

READ MORE

MAKING NEWS

WITH EVERYTHING HAPPENING AT CREOL, IT'S NO SURPRISE FACULTY AND STUDENTS ARE OFTEN FEATURED IN NEWS ARTICLES, PODCASTS, AND TV SEGMENTS. SCAN EACH QR CODE TO READ AND WATCH, OR VISIT CREOL.UCF.EDU/NEWS

WKMG News 6 interviewed student **Gabryella Baldaci** about CREOL's Laser & Photonics Summer Camp for high school students.

Picture Courtesy: Central Florida Public Media / CREOL

Professor **Stephen Eikenberry** appeared on the Central Florida Public Media (NPR) podcast *Are We There Yet?* to discuss how black holes have quasi-regular "heartbeat" pulses that can be detected via X-rays.

Picture Courtesy: All Things Photonics

Professor **Kathleen Richardson** was interviewed on the *All Things Photonics* podcast to discuss her work with chalcogenide glass.

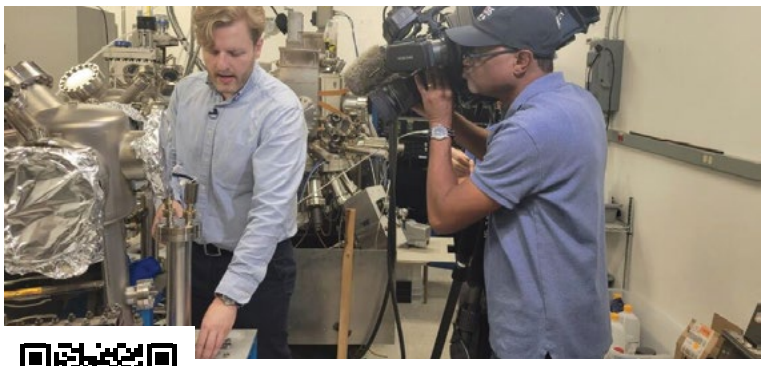
SID The Society for Information Display

CREOL was featured in *Information Display*, as the Society for Information Display's publication looked at how far CREOL has come since it started in a double-wide trailer in 1987.

CREOL alum **Jason Eichenholz ’95MS ’98PHD** and Professor **Rodrigo Amezcua Correa** were interviewed by *Fortune* magazine about the public launch of their startup company, Relativity Networks.

Professor **Shin-Tson Wu** was interviewed by WOFL FOX 35 Orlando to talk about his induction into the Florida Inventors Hall of Fame.

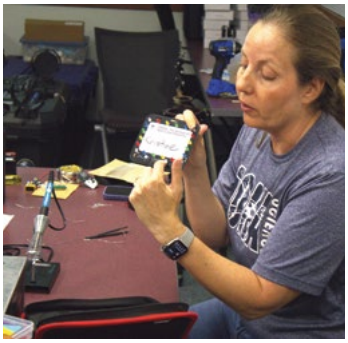
Picture Courtesy: FOX 35 Orlando



Professor **Leland Nordin** was interviewed by WOFL FOX 35 Orlando about his work to develop a semiconductor light source with broad applications.

Professor **Martin Richardson** was interviewed on the *All Things Photonics* podcast to discuss the development and future of directed energy technology.

Picture Courtesy: All Things Photonics



CREOL LAUNCHES
HIGH SCHOOL TEACHER AMBASSADOR PROGRAM

Eric Grenda holds the telescope that he built in CREOL classroom A214.

"I think this is going to be the highlight of my summer," he says.

Grenda teaches physics at Colonial High School. He and seven other teachers from around Central Florida spent three days in June 2025 building photonic devices, doing hands-on experiments with light, and hearing from CREOL's expert faculty members. The teachers will return to CREOL in the fall to continue their engagement with the program.

But while tinkering with lasers is fun, the most important part is what they can bring back to their classrooms. Unlike normal professional development workshops, the sessions also empowered teachers to become representatives for the College — and in turn, introduce more high school students to what CREOL has to offer.

"They're learning a great deal about photonics," CREOL Undergraduate Program Associate Director **Mike McKee** says. "More importantly, they have some great activities to use with their students, so they can see the impact of photonics in their daily lives."

While high school physics courses typically focus on topics like mechanics and electromagnetism, photonics doesn't always make it into the classroom. Introducing high school photonics lessons is therefore a key strategy to inspire the next generation of photonics engineers, which are in high demand. The U.S. Department of Labor projects that each year, there are more than 10,000 job openings for photonics engineers — 700 of which are in Florida. But only 80 to 100 students in the entire U.S. graduate with bachelor's degrees in photonics engineering. UCF and CREOL proudly supply more than one third of those graduates, as one of only six universities in the U.S. with a dedicated photonics bachelor's program.

Besides Telescope Assembly 101, teachers also learned soldering, laser safety, and free-space optical communication. They'll return to their schools with kits full of ready-to-use lab supplies and lesson plans. The activities were planned by CREOL senior **Kiva McCracken**.

"These teachers are already really passionate in their field," McCracken says. "Here, we're not only giving them something new to be passionate about — but also the resources to back that up."

"I need more knowledge about it so I can promote it," Hagerty High School physics teacher Amany Bekheit says. "I didn't imagine how much lasers are involved in many fields."

CREOL plans to continue the Teacher Ambassador Program in 2026, providing an opportunity for more Central Florida teachers to experience the world of photonics.

READ MORE

PHOTONICS SUMMER CAMP EXPANDS TO THREE WEEKS

Following the success of CREOL's first Laser and Photonics Summer Camp in 2023, the program expanded to a full three weeks in July 2024. More than 50 high school students from across Florida (and as far away as New Jersey, Massachusetts, and Pennsylvania) rotated through three week-long camps that focused on lessons, lab activities, and student talks.

To accommodate more students, Undergraduate Program Associate Director **Mike McKee** enlisted the help of students **Gabryella Baldaci** and **Kiva McCracken**, as well as high school science teachers **Jorge Vallin** and **William "Bill" Young**. Campers heard from CREOL professors **Kyu Young Han**, **Joshua Kaufman**, **Xiaoming Yu**, and **Peter Delfyett**, as well as a host of undergrad and graduate CREOL students.

The students visited labs, took a look inside CREOL cleanrooms, and toured facilities at Luminar. WKMG News 6 sent a news crew to cover the camp. With such strong interest and momentum, CREOL will continue the camp in 2025, with plans to implement a long-term fundraising strategy to ensure the next generation of photonics engineers get the chance to experience the program.

READ MORE

CREOL HOSTS NSF-SPONSORED RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU) PROGRAM

CREOL welcomed 10 undergraduate students from across the country for an NSF-sponsored REU program. "Unleashing the Light: Building the Future of Laser Technologies" is a summer program that introduced future engineers to the research happening at CREOL. Funding was provided by the National Science Foundation and the Semiconductor Research Corporation (SRC).

Jason Eichenholz and Rodrigo Amezcua Correa

CREOL ALUM, PROFESSOR TEAM UP TO POWER NEXT-GENERATION AI DATA CENTERS

Keeping pace with the speed of light isn't just a philosophy of chasing the future — for UCF alum **Jason Eichenholz '95MS '98PhD**, it's business.

"We're well positioned to redefine the optical network of the future," Eichenholz says.

That's the vision for Relativity Networks, founded by Eichenholz and CREOL Professor **Rodrigo Amezcua Correa**. As the artificial intelligence (AI) industry grows, so does its need for data processing, which requires large amounts of energy. By 2026, data centers in the U.S. are expected to consume more than twice their current energy usage, and more than 40% of facilities are expected to face power shortages by 2027.

"Currently, new data centers can't be built fast enough to satisfy the rapidly expanding AI-driven economy and the lack of available power is an existential threat to fueling that growth," Eichenholz says.

Their solution? A patent-pending hollow-core fiber (HCF) cable that can transmit data nearly 50% faster than conventional glass fiber. The company has raised millions in seed funding, and has already deployed the technology in multiple installations.

Amezcua Correa's research team at CREOL developed the HCF that Relativity Networks plans to deploy. He has published more than 150 journal articles on the field of optical fiber and laser systems.

This large-scale innovation is familiar territory for Eichenholz. The holder of more than 90 U.S. patents was recently inducted into the National Academy of Inventors and the Academy of Science, Engineering, and Medicine of Florida. He co-founded and served as chief technology officer of Luminar Technologies, one of the leading providers of lidar technology in driverless vehicles.

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2025 CREOL INDUSTRIAL AFFILIATES SYMPOSIUM TECH HUBS IN THE SPOTLIGHT

In April 2025, CREOL hosted more than 230 attendees from around the world for the annual Industrial Affiliates Symposium.

The Symposium brought together members of the CREOL Industrial Affiliates (IA) program in an intentional fusion of academia, industry, and government. Students and faculty also took advantage of the many networking opportunities the three-day program created. This year, the rise of tech hubs was the focus, as speakers discussed the future of photonic sensing, semiconductor manufacturing, and quantum device fabrication.

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On Thursday, April 17, more than 150 students took part in the Spring Optics and Photonics Career Fair. At the same time, representatives from CREOL Industrial Affiliate companies judged the Senior Design Showcase competition, awarding first place to the "Image Surveillance and Protection Yielder" project. Dozens were then welcomed to CREOL for lab tours, and to attend a special guest lecture "Light a Path for Quantum Sensing" presented by Jun Ye from the University of Colorado. The evening concluded with the annual Affiliate-Student Mixer event.

On Friday, after a warm welcome from UCF Provost **Michael Johnson**, CREOL **Dean David Hagan** gave an overview of CREOL, highlighting recent faculty additions and the plans to continue growing.

Participants also heard industry update presentations from SPIE President Peter de Groot and Optica President Jim Kafka. Company spotlight talks were given by Randall Hinton with Edmund Optics, Curtis Sargent and Robert Gappinger with Safran Optics 1, and **Jason Eichenholz '85MS '98PhD** with Relativity Networks.

The tech conference portion of the symposium concluded with the recognition of the student poster presentation winner **Daniel Lumpkin**, 2024-2025 CREOL Student of the Year **Shubham Dawda**, and 2025 Distinguished Alumnus Award Winner **Zhibing Ge '04MS '07PhD**.

Industrial corporations and businesses that are involved in the development or use of optics and photonics, or foresee the company's involvement in future applications and processes using optics and photonics, are encouraged to become involved in our programs through research sponsorship and by enjoying the benefits provided through our Industrial Affiliates program.

IAS'25 TALKS AND PRESENTATIONS

SMART USA: Digital Twins — A Revolution in Advanced Manufacturing and Innovation
Volker Sorger, University of Florida

Expanding Central Florida's Semiconductor Ecosystem
Leland Nordin, University of Central Florida

The Montana Headwaters Tech Hub for Smart Photonic Remote Sensing Systems
Joseph Shaw, Montana State University

Student of the Year Talk: Non-Gaussian Light Scattering Phenomena and Applications
Shubham Dawda, University of Central Florida

Engineering Quantum: Building the National Quantum Nanofab
Scott Diddams, University of Colorado Boulder

UCF's Quantum Leap Initiative
Andrea Blanco-Redondo, University of Central Florida

Unleashing the Florida Photonics Industry: Establishing a Photonics Hub in Florida
Panel Discussion moderated by Leland Nordin, featuring Ty Olmstead, Volker Sorger, Scott Diddams, Joseph Shaw, and Jim McNally

The National Landscape of Photonics Technician Training
Natalia Chekhovskaya, Indian River State College

Valencia College Technical Training Program
Brendon Monize, Valencia College

CREOL FOUNDING FACULTY JOIN FORCES TO FUND

THE NEXT GENERATION

Five current and former faculty members have already spent much of their careers building CREOL into the world-class optics and photonics center it is today.

Now, they're pledging generous gifts to ensure the next generation of students and researchers are well-equipped to light the way forward.

The challenge came from Emeritus Professor **Eric Van Stryland**, who became CREOL's first Dean when the then-School of Optics was elevated to a College in 2004. He and his wife Barbara called on other inaugural faculty members to join them in a pledge to the CREOL Founding Faculty Graduate Fellowship Fund.

Five founding faculty members chipped in $50,000 of their own: Professors **MJ Soileau**, **Peter Delfyett**, **Jannick Rolland**, **Shin-Tson Wu**, and current CREOL **Dean David Hagan**. The Van Strylands matched those contributions at an incredible 4:1 rate, yielding $250,000 endowed graduate fellowship funds.

And it doesn't have to stop there: the opportunity remains for more faculty members to join the pledge, taking advantage of the 4:1 match to create their own fellowships.

The program will financially support students who commit to pursuing advanced degrees in optics and photonics, ensuring CREOL remains a top developer of industry talent and innovative research for years to come.

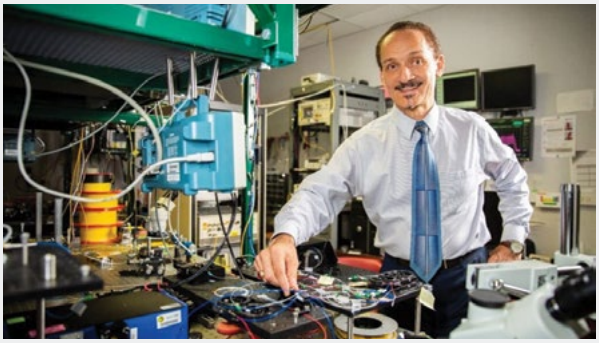
INAUGURAL FIVE FUNDS:

SOILEAU FAMILY GRADUATE ENDOWED FUND

As CREOL's Founding Director in 1987, Dr. MJ Soileau transformed the fledgling research center into one of the world's major educational and research institutions for optics. Dr. Soileau went on to serve as UCF's Vice President for Research and Commercialization for 17 years, and recently joined the ranks of emeritus Professor.

WU FAMILY GRADUATE ENDOWED FUND

UCF Trustee Professor Shin-Tson Wu is CREOL's most-published faculty member, having co-authored 7 books, 685 journal papers, and 320 conference papers. The holder of 98 U.S. Patents was recently awarded UCF's inaugural Medal of Societal Impact in recognition of his pioneering research into the evolution of liquid crystal displays.



DR. PETER DELFYETT GRADUATE ENDOWED FUND

For more than 30 years, Distinguished Professor Peter Delfyett has left an indelible mark on CREOL. The author of more than 200 scientific publications holds 45 U.S. Patents and was recently inducted into the Florida Inventors Hall of Fame. He is UCF's first sitting faculty member to be inducted into the National Academy of Engineering.

DAVID AND MONICA HAGAN GRADUATE ENDOWED FELLOWSHIP

David Hagan joined CREOL in 1987 as an Assistant Professor. Now serving as Dean, he is leading the charge on CREOL's ongoing growth of both student enrollment and research areas. He is a fellow of Optica and SPIE and serves on the SPIE Board of Directors, as he continues to lead a research group focused on nonlinear optics.

JANNICK ROLLAND ENDOWED GRADUATE FUND

Dr. Jannick Rolland is the Brian J. Thompson Professor of Optical Engineering at the University of Rochester, and the CTO and co-founder of LighTopTech. During her 12 years at CREOL, Professor Rolland built the inaugural Optical Diagnostics and Applications Laboratory (ODALab). Dr. Rolland is a member of the National Academy of Inventors, and one of the 101 first inductees in the XR Hall of Fame inaugurated in 2024.

continues on next page

UCF DAY OF GIVING APRIL 10, 2025

RAISES MORE THAN $50K

On April 10, 2025, during UCF's Day of Giving event, CREOL raised thousands of dollars from alumni, faculty, students, and the community. The money raised will go toward student scholarships, the Laser and Photonics Summer Camp, and other outreach efforts to inspire the next generation in the field. CREOL unlocked additional funding by winning the university-wide "#SpaceU" contest after **Christina Moraitis '25 PhD** posted about her experience installing instruments atop La Palma in the Canary Islands.

PHILANTHROPY

continued from page 23

Van Stryland says each of the founding faculty members were instrumental in leading the institution to the place it is today.

"Everything that I've done since I got here has been for the good of CREOL, to make it a success," he says, "And they have been doing the same."

He says that work started in the late 1980s, when CREOL was a double-wide trailer on the site where the building stands today. But appearance aside, Van Stryland says what really set it apart was their "open door" policy that encouraged students and faculty to connect with one another.

"It's really important for the advancement of science that you get to know your colleagues intimately," he says, "In the sense of not just scientifically, or engineeringly, but personally."

That spirit of camaraderie sparked rapid growth. CREOL's building was finally completed in 1995, and it has expanded along with the college's research areas, faculty, and staff. After becoming a college in 2004, Van Stryland served as the first Dean, setting a course that continues to this day.

"This whole growth of optics and photonics during my lifetime has been so dramatic," Van Stryland says.

He points at his cell phone, hinting at the technology that made its display, and how advances in optical lithography allow for the electronic "chips" that make them handheld.

"Just about everything you look at, optics is a piece of that. It's really quite a remarkable thing that's happened, and being part of this during my life has just made it really rewarding."

Reflecting on that history led Barbara and Eric Van Stryland to launch the CREOL Founding Faculty Graduate Fellowship Fund by pledging at least $2 million to match other faculty donors. This marks the largest single planned gift ever made by a faculty member in UCF history.

Barbara and Eric Van Stryland

"It's really important for the advancement of science that you get to know your colleagues intimately. In the sense of not just scientifically, or engineeringly, but personally."

— Van Stryland

Van Stryland says inspiring fellow founding faculty members to support future graduate students is a fitting way to punctuate their legacies.

"It's a passion for us to build this place that will create the future," he says.

Throughout his career, Van Stryland graduated 41 Ph.D.s, published about 300 papers, and was honored for the highest honor UCF bestows, the Pegasus Award. Now retired, he can still be seen in the office most days, usually sporting a Hawaiian shirt as he reads over papers and meets with students.

"It's been a fun career," Van Stryland says, "I don't want to give it up."

READ MORE

Dwight Kimberlin and CREOL Dean David Hagan

NEW CREOL INDUSTRIAL AFFILIATE MAKES A DIFFERENCE BY CREATING ENDOWED FELLOWSHIP

What comes to mind when you think of a typical corporate headquarters? Is it serious, proper, and stuffy?

The Winter Park offices at Industrial Laser Machines (ILM) are anything but that.

“We have a very unique culture here,” CEO Dwight Kimberlin says.

The office dog Willow greets visitors in the conference room as they munch on donuts. The camaraderie between ILM’s 22 employees evokes the feel of a mom-and-pop shop. But don’t be fooled by the size — the growing operation is competing with industry titans.

ILM manufactures powerful solid-state lasers used in manufacturing. Kimberlin says his formula for success blends innovative engineering, responsive customer service, and the passion of his team.

ILM recently joined CREOL’s Industrial Affiliates Program, making a valuable addition to the College’s growing number of industry partners. And Kimberlin’s commitment goes further: His contribution of $25,000 has established a Graduate Endowed Fellowship at CREOL, which will make an advanced degree in optics and photonics possible for more brilliant graduate students that face rising housing, food, and transportation costs.

“Especially today, education is just more important than ever,” Kimberlin says. “I consider CREOL to be a center of excellence in the world of photonics. I’ve seen the quality of the students that have come from CREOL, and I want to give back to UCF.”

READ MORE

Lynn and Art Wilson ’77.

UCF ALUM STARTS ENDOWED SCHOLARSHIP

CREOL extends a special thank-you to **Art Wilson ’77** and Lynn Wilson, for starting an endowed scholarship to support electrical engineering students taking photonics courses.

During his time at UCF, Art served as president of the Amateur Radio Club. He received a degree in systems engineering, specializing in electrical engineering. His career led him to work for companies big and small, from startups to Lockheed Martin and L3Harris.

Now retired, the Wilsons live in Melbourne, where Art continues to work on special projects with L3Harris.

STUDENTS

CREOL STUDENT INDUCTED INTO UCF ORDER OF THE PEGASUS

Weeks before she graduated, undergraduate student **Gabryella Baldaci '25** became one of just 37 UCF students to be inducted into the Order of Pegasus. Students selected for this honor represent the most dedicated, passionate, and highest-achieving Knights.

Baldaci was very involved at CREOL, joining student organizations, volunteering her time to support outreach events, and taking on the role as a student director of the Laser and Photonics Summer Camp for high school students. She conducted research with Associate Professor **Xiaoming Yu** to investigate ways to treat surfaces with lasers for different applications.

"I got to learn from the best," she says. "I had **Dr. Peter Delfyett** for lasers, **Dr. Rodrigo Amezcua Correa** for fiber, **Dr. Bahaa Saleh** for imaging and display, and **Dr. Stephen Eikenberry** for geometric optics. I see them in the hallway, and they know me."

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ANNUAL CREOL SENIOR DESIGN COMPETITION

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Imagine a future where your security system is impossible to hack. That was the idea behind the winner of CREOL's 2025 Senior Design Showcase, "Image Surveillance and Protection Yielder."

"We were transmitting information without wires, without using Wi-Fi," CREOL student **Gabryella Baldaci** explains.

Alongside Baldaci, the winning group comprised Robert Josephson (CECS), Luke Reyes (CECS), **Alejandro Lopez Zelaya**, and Armani Garcia (CECS). The concept started with a new lens design that can capture a wide field of view. The system could also detect how many people were in the frame.

Special thanks to our Industrial Affiliates members and alumni who served as judges: **Ty Olmstead '11PhD**, **Anna Tabirian '00PhD**, **Ed Foote**, **Benjamin Stuart**, and **Tim McComb '06PhD**

CREOL STUDENT OF THE YEAR

Following his presentation on "Non-Gaussian Light Scattering Phenomena and Applications", **Shubham Dawda** was announced as the winner of CREOL's 2024-2025 Student of the Year award. Dawda is advised by Aristide Dogariu. Other Student of the Year finalists were **Amin Hashemi Shahraki '24MS** and **Andrew Howe '23MS**.

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FOR FULL-LENGTH ARTICLES,
SCAN OR VISIT CREOL.UCF.EDU/NEWS

STUDENT POSTER WINNER

Daniel Lumpkin was the winner of the 2025 Industrial Affiliates Symposium Outstanding Student Poster Award for his poster titled "Solid-State Laser Stabilization using Phase-Shifted Volume Bragg Gratings". Lumpkin is a PhD student in the Advanced Holography and Laser Research Laboratory, advised by **Ivan Divliansky**.

DOCTORAL DEGREE GRADUATES

Fatemeh Ghaedi Vanani '21MS '24PhD
Dissertation: Photonic Integrated Circuits for Computation
Advisor: Guifang Li
Employer: University of Central Florida
Title: Postdoctoral Researcher

Farzaneh Arab Juneghani '21MS '24PhD
Dissertation: High-Performance Integrated Photonic on Thin-Film Lithium Niobate
Advisor: Sasan Fathpour
Employer: University of Central Florida
Title: Postdoctoral Researcher

Chase Evan Geiger '23MS '24PhD
Dissertation: A high power picosecond source at 2.05 micrometer for pumping mid-infrared optical parametric chirped pulse amplifiers
Advisor: Zenghu Chang
Employer: University of Ottawa
Title: Postdoctoral Researcher

Shree Ram Thapa '22MS '25PhD
Dissertation: Utilizing Programmable Spatial Light Modulators for Beam Shaping and Spectral Synthesis
Advisor: Darren Hudson
Employer: DEVCOM, US Army Research Laboratory
Title: Postdoctoral Fellow

Ko-Han Shih '21MS '25PhD
Dissertation: Metasurface-refractive hybrid lens design
Advisor: Kyle Renshaw
Employer: Avery Dennison
Title: Optical Engineer

Ross Osborne '25PhD
Dissertation: Additively Manufactured Engineered Transparent Ceramics For Laser Gain Media
Advisor: Romain Gaume
Employer: Lawrence Livermore National Laboratory
Title: Research Scientist

Hayat Soufiani '25PhD
Dissertation: Enhancing the Hardness of the Multispectral ZnS Transparent Ceramics Through Ga2S3 Incorporation
Advisor: Romain Gaume
Employer: University of Central Florida
Title: Postdoctoral Researcher

STUDENTS

SCHOLARSHIPS AND FELLOWSHIPS

GRADUATE

William C. Schwartz Endowed Graduate Fellowship
Ryan Hechmer
Miguel Romer

Northrop Gumman Scholarship Fund
Austin Anderson
Bryan Turo

Suchoski Graduate Fellowship Endowed Fund
Swati Bhargava
James Drake
Amin Hashemi Shahraki
Bethany Hellman
Abdullah Husain

SPIE-Glebov Family Optics and Photonics Graduate Fellowship
Arjent Imeri
Liza Quinn
Gabriel Skowronek
Intouch Srijumnong

George Stegeman Memorial Endowed Scholarship
Yefu Zhang

UNDERGRADUATE

Soileau Family-SPIE Optics and Photonics Undergraduate Scholarship
Jeremy Goodenough
Lauran Infante
Chad Jordan
Edward Perez
Brendan Wilson

Northrop Grumman Undergraduate Scholarship
Alexander Alonzo
Gabryella Baldaci
Austin Naugle

The Ge and Wu Scholarship for CREOL
Kaila Peeples

Lumentum Endowed Scholarship
Sophia Adams

Hispanic Endowed Scholarship
Alejandro Lopez Zelaya

CREOL STUDENT ORGANIZATIONS

The International Society for Optics and Photonics (SPIE)
SPIE was founded in 1955 to advance light-based technologies. Serving more than 235,000 constituents from approximately 155 countries, the not-for-profit society advances emerging technologies through interdisciplinary information exchange, continuing education, publications, patent precedent, and career and professional growth.

Women in Lasers and Optics (WiLO)
The mission of WiLO is to promote personal and professional growth for women of CREOL in the field of Optics, Photonics and Lasers though community building, networking opportunities, and encouraging young women to choose optics as a career. This organization will also work towards preparing all CREOL students, enrolled in undergraduate and graduate degrees, for the transition from student to professional life.

Advancing Optics and Photonics Worldwide (OPTICA)
This Chapter is part of the 100 Optica student societies in the world. It is run by elected graduates students (officers) who organize meetings and activities to promote optics to the community. It is also a platform where interaction between student and researchers is encouraged.

Society for Information Display (SID)
SID is comprised of the top scientists, engineers, corporate researchers, and business people of the display industry. The SID UCF chapter is aimed to disseminate the knowledge of the field of displays to the general public and further the professional development of all our student members

Society of Optics Students (SOS)
This student organization aims to enhance academic excellence, peer mentoring, leadership, and entrepreneurship through the discipline of optics and photonics.

IEEE Photonics Society (IPS)
IPS is the photonics society of the Institute of Electrical and Electronics Engineers (IEEE). The student chapter at CREOL is run by graduate-students to foster learning and professional development in optics. The chapter organizes lectures at the college and outreach activities around the community.

FAST FACTS

U.S. NEWS AND WORLD REPORT

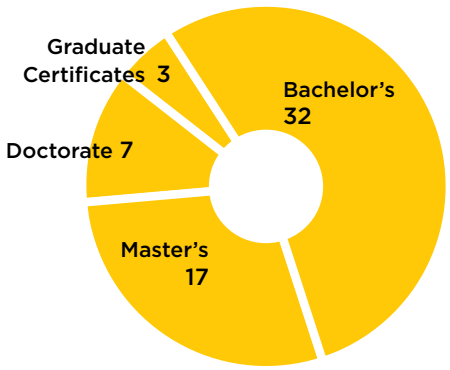
#7
BEST U.S. UNIVERSITIES FOR OPTICS (OVERALL)

#3
BEST U.S. PUBLIC UNIVERSITIES FOR OPTICS

#5
MOST INNOVATIVE UNIVERSITY

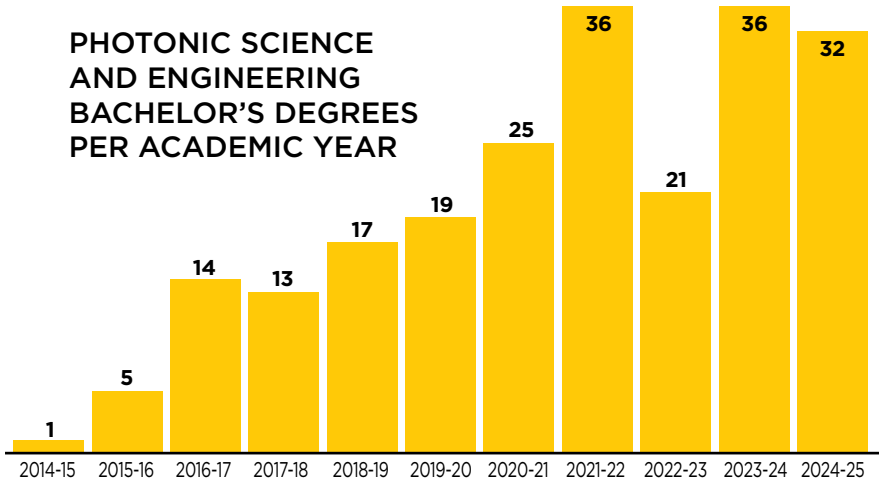
UCF IS A FEDERALLY DESIGNATED HISPANIC SERVING INSTITUTION

DEGREES AWARDED



(summer & fall 2024 + spring 2025)

PHOTONIC SCIENCE AND ENGINEERING BACHELOR'S DEGREES PER ACADEMIC YEAR



TOP ALUMNI EMPLOYERS

Amazon
Apple
Google
Intel
L3Harris
Lockheed Martin
Meta
Microsoft
Northrop Grumman
Academia (Postdoc Research)
National Research Labs

(in alpha order; via UCF first destination survey)

MEDIAN STARTING SALARIES

$83,000
BACHELOR'S

$95,000
MASTER'S

$140,000
DOCTORATE

(Based on UCF first destination survey)

FACULTY

35
CORE FACULTY

13
JOINT FACULTY

PATENTS & PUBLISHING

157
PUBLICATIONS*

14
PATENTS

**Refereed Journal Publications*

MOST PUBLISHED FACULTY

Kathleen Richardson
Romain Gaume
Shin-Tson Wu
Rodrigo Amezcua Correa
Martin Richardson

$17,256,104
RESEARCH FUNDING FY25

HIGHEST FUNDED PRINCIPAL INVESTIGATORS

Guifang Li
Alexander Khanikaev
Kyle Renshaw
Rodrigo Amezcua Correa
Miguel Bandres

$283,508
PHILANTHROPIC SUPPORT

96
DONORS

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Lumentum
MegaWatt Lasers
Meta Reality Labs
Ocean Optics
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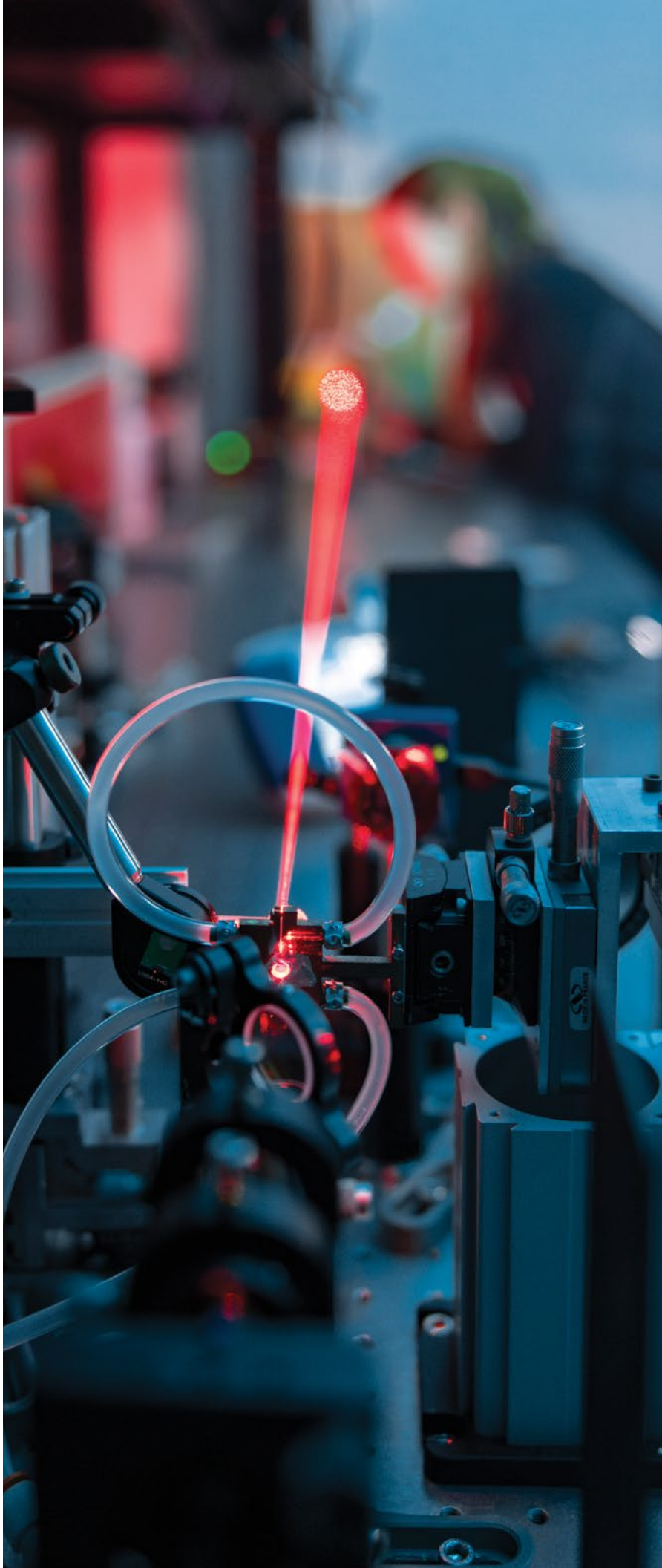
Optimax
PowerLight Technologies
PSI
Raytheon/RTX
Safran Optics 1
Situs Light
Synopsis
Thorlabs
TwinStar
Vescent Photonics
VIGO Photonics
Zemax



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