

# HIGHLIGHTS

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 Education in Optics and Photonics

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 Leader in Photonics-based  
 industries

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## New Nanophotonics Faculty Member: **Kurt Busch**

We are pleased to welcome Dr. Kurt Busch to our growing faculty. Dr. Busch joined us on December 21, 2003, as an Associate Professor through a joint appointment with the UCF Dept. of Physics. Before coming to UCF, Kurt worked as a post-doctoral researcher at the University of Toronto with Sajeew John and as an Emmy-Noether Fellow (Assistant Professor) at the University of Karlsruhe, Germany; working on various aspects of the linear, nonlinear, and quantum optical properties of Photonic Crystals and disordered dielectric systems.

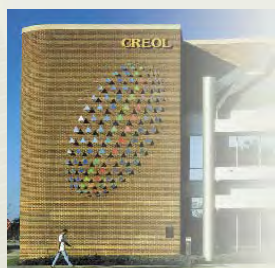
Kurt recently received the news that he and Sajeew John will be issued a patent later this year for their work at Toronto on "Electro-actively tunable

Please see **Busch**, 3



## UCF Becomes First Major University in U.S. to Designate Optics Program as College

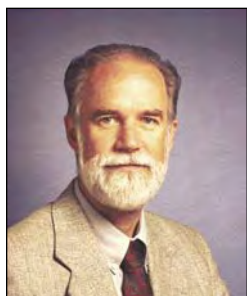
by Chad Binette, UCF News and Information



UCF Provost Terry Hickey announced on May 13, 2004, that the School of Optics is now the UCF College of Optics and Photonics. The school, which also houses the Center for Research and Education in Optics and Lasers (CREOL) and the Florida Photonics Center for Excellence (FPCE), became the first optics program at a major U.S. university to be designated as a free-standing college.

See **College**, 6

# Dean's Corner



*by Eric W. Van Stryland*

You may have noticed the change of name on the front cover! Yes – we have the distinction of being the first College concentrating on optics and photonics in the country. This is recognition by the UCF administration of the academic values we have instituted; and of the quality of our faculty, students, and research. This designation will help us in recruiting the best and brightest students and in recruiting faculty. See the front page article for more information.

I am extremely pleased to announce that Dr. James (Jim) Pearson has joined us as Associate Director. Dr. Pearson has been hired to help as a liaison to the optics and photonics industry, in particular to develop partnerships with and help grow the industry in Florida, and to help with administrative duties. He is a Fellow of OSA and SPIE, a Senior Member of IEEE; and is well-known to many in the optics and photonics field. Many in Florida know him as the former President & General Manager of United Technologies Optical Systems (UTOS) in West Palm Beach where he was also involved with the Florida High Technology & Industry Council (FHTIC) chairing the Lightwave Technology subcommittee. After leaving UTOS, he was Chief Scientist at United Technologies Research Center in East Hartford, CT. More recently he served as Executive Director of SPIE - The International Society for Optical Engineering, and as Executive Director of ISA - The Instrumentation, Systems, & Automation Society. Jim has been involved with CREOL since its formation, including serving on the CREOL external advisory committee. He now brings to the College of Optics & Photonics a wealth of experience from the industry and association sectors, as

well as many international connections and relationships. He will be an integral part of the Florida Photonics Center of Excellence (FPCE) activities, including developing partnerships with other Florida universities and Florida-based optics and photonics companies. Look for more information about Jim in our next addition of Highlights.

In this issue we highlight Kurt Busch (see front page article) who came to us from Karlsruhe University in Germany as an expert in the theory of photonic materials. His hiring is part of the UCF wide initiative in nano science and technology. He is a joint appointee between the Department of Physics and the College of Optics and Photonics.

And! I want to take this opportunity to tell you about a fourth hire in nanophotonics, Winston Schoenfeld, an expert in quantum dots and MBE growth, who has just joined us. He received his PhD from UC Santa Barbara and worked for Uniroyal Optoelectronics on LED development prior to joining us.

I'd like to direct your attention to the inside articles on this year's Industrial Affiliates' Day (and The Spring Thing) written by Jim Pearson. Both events continue to be roaring successes. We have set the date for next year's event for April 1, 2005. Mark your calendars!

Also, please take a look at student news. Our students really do a fantastic job of outreach. For example, on Optics Day, the students invited the entire campus to tour our facility. For more details visit <http://caos.creol.ucf.edu>.

#### **FPCE news:**

A major accomplishment of this quarter has been the completion of the proposal and award process for the FPCE Partnership Projects program. We received 28 proposals requesting \$4,662,777 in funding, offering \$3,595,127 of industry match, with 7 Florida universities participating in the competition. The FPCE Industrial Advisory Board (IAB) reviewed all the proposals, and 22 projects involving five universities were funded for a total of \$1,818,000 FPCE funding for the first year, with an additional \$2,691,224 of

industry match to the projects. A more detailed description of the FPCE can be found in a separate article in this issue.

#### **Other News:**

We were fortunate to have two distinguished visitors this Spring, Larry Coldren who is the Fred Kavli Professor of Optoelectronics and Sensors at the University of California, Santa Barbara and Tony Siegman who is the McMurtry Professor of Engineering Emeritus at Stanford. Each spent a week interacting with students and faculty. Both presented a public lecture and 2-3 technical seminars in their areas of expertise to overflow audiences consisting of the faculty and students of the School of Optics, UCF in general, and scientists from local industry.

Larry Coldren is an expert on the design, fabrication and testing of semiconductor-based devices for optical communications and signal processing. This year he was awarded the Tyndall prize of the Optical Society of America and IEEE for his pioneering work.

Over his distinguished career, Tony Siegman has made many seminal contributions to wave propagation and laser resonator design for which he has been awarded the Wood Prize and Ives Medal of the Optical Society of America, the Quantum Electronics Award of IEEE LEOS, and the Schawlow Medal of the Laser Institute of America.

We met up with some of our former students as well as current Affiliates at an Alumni reunion gathering during the CLEO 2004 conference in San Francisco. The venue was Jillian's next to the Moscone Center.

I again ask our Alumni and others associated with CREOL in the past to please go to our website and update your contact information online - see Alumni & Associates. We are working to make this database useful to you. Suggestions are solicited!



## FACULTY NEWS

It's hard to believe, since our organization is still so young, but College of Optics & Photonics faculty member **Glenn Boreman** just received his 20 year service medallion from UCF!

On May 4-5th, 2004, **Aristide Dogariu** organized an international workshop here that was co-sponsored by AFOSR, EOARD and AOARD. Leading experts from academia, government laboratories and the defense industry gathered to discuss current challenges in using coherence and polarization properties of light for various sensing applications. Professor Dogariu hopes to establish a tradition for such meetings which will generate future research directions related to the growing needs for improving the performance of optical sensors and sensing systems.

**Kathleen Richardson** is Conference Chair of the 14th International Symposium on Non-Oxide Glasses (ISNOG) to be held **November 7-12th 2004**, jointly with the Fall Glass and Optical Materials Meeting of the American Ceramic Society. As part of the conference, a reception and tour of the College of Optics & Photonics will be held on the 8th November.

**Jannick Rolland** has been awarded a UCF sabbatical, together with a travel Fellowship by the International Council of the OSA. During the sabbatical, she will continue to manage the research of the ODALab while making several trips to Europe. There, she will be collaborating with researchers in biophotonics at the *Institut d' Optique Theorique et Appliquee* in France in order to expand ODALab's current biophotonics imaging program into an international collaborative program. She has also been invited to give a talk on Wearable Displays at Photonics Asia in November and to meet with Dr. Yongtian Wang, who is leading a large government funded program on augmented reality for the restoration of cultural heritage in the city of Beijing.

## Busch, from cover

Photonic Bandgap Materials." At UCF, his research interests will be centered on developing a detailed theoretical understanding of light propagation and light-matter interactions in nanophotonic systems; in particular in strongly scattering media, Photonic Crystals and photonic metamaterials. In these systems, a judicious nanostructuring leads to optical properties such as Anderson localization of light, complete photonic band gaps, and negative indices of refraction that cannot be realized in other optical materials. A successful description of these systems in which memory and multiple scattering effects cannot be treated within simple perturbative frameworks, requires the development of novel analytic and computational tools that are often inspired by solid state theoretical methods. The predictive and interpretative power of these tools has in the past spawned a number of collaborations between Kurt's and several experimental groups.

At UCF, Kurt aims to engage in collaborations leading to nanophotonic devices with applications in telecommunication and sensing.

Kurt received his Diplom (M.Sc.) and Dr. rer. nat. (Ph.D.) in Physics from the University of Karlsruhe in 1993 and

1996, respectively, where he acquired a background in semiconductor and condensed matter physics. His thesis with Ralph von Baltz was on the theory of the photogalvanic effect in non-centrosymmetric semiconducting materials. While working for his PhD with Peter Wölflé (University of Karlsruhe) and Costas Soukoulis (Iowa State University), Kurt developed a new effective medium theory that describes light propagation in random dielectric media; a theory which is still

used to analyze experimental results.

Apart from his scientific interests, Kurt is a passionate master-level chess player who - time permitting - competes in tournaments and is always ready to

play a couple of relaxing Blitz-games during lunchtime.

Kurt and his wife Tamriko are the proud parents of a new baby girl named Nina. Since Tamriko's native land is the Republic of Georgia (not Georgia, USA), Kurt has become deeply interested in all aspects of the Georgian culture, from their ancient history and mythology to their exotic cuisine.

Again, welcome to our newest joint faculty member. Kurt can be contacted at his email address: [kbusch@physics.ucf.edu](mailto:kbusch@physics.ucf.edu).

At UCF, Kurt aims to engage in collaborations leading to nanophotonic devices

## Spring 2004 Graduates

Larry	Davis	Rolland	EE	PhD
Joel	Hales	Hagan/Van Stryland	Optics	PhD
Vinay	Jonnalagadda	NonThesis	Optics	MS
Patrick	Laycock	NonThesis	Optics	MS
Rich	Lepkowicz	Hagan/Van Stryland	Optics	PhD
Pao Tai	Lin	NonThesis	Optics	MS
Sayatan	Mitra	NonThesis	Optics	MS
Mircea	Mujat	Dogariu	Optics	PhD
Claudia	Mujat	Dogariu	Optics	PhD
Karthik	Narayan	NonThesis	Optics	MS
Jason	O'Daniel	NonThesis	Optics	MS

## Florida Photonics Center of Excellence (FPCE)

by James Pearson

In previous issues of *Highlights*, we mentioned the Florida Photonics Center of Excellence, but didn't really describe what this new Center is all about. The FPCE resulted from an initiative by the State of Florida, led by Governor Jeb Bush, to establish high-technology Centers of Excellence at several Florida State Universities that would accomplish the following objectives:

» Facilitate the identification of collaborative research opportunities between universities and Florida businesses.

» Facilitate the acquisition of public and private funding for collaborative research opportunities and maximize the leveraging of such funds.

» Create partnerships between industrial and governmental entities to advance knowledge and research and to move technologies from academic laboratories and research centers to commercial sectors.

» Assist in the enhancement of advanced academic curricula through improved communication between academia and businesses.

» Recruit and retain eminent scholars in advanced technology disciplines.

UCF's proposal to establish the Florida Photonics Center of Excellence (FPCE) emerged as the top candidate among those reviewed in early 2003 by the state's Emerging Technology Commission (ETC). As a result, in March 2003, Gov. Jeb Bush and the Florida Board of Education underscored the significance of photonics for Florida's economy -- and UCF's leadership role in this key area -- by allocating \$10 million to establish the FPCE at the College of Optics & Photonics. This action added an important new dimension to the College by establishing a second research center within the

College, joining the well-established Center for Research and Education in Optics and Lasers (CREOL). The focus of the FPCE work is on the growing areas of nanophotonics, biophotonics, advanced imaging and 3D displays, and ultra-high bandwidth communications.

**FPCE Vision:**  
Establish Florida as the national leader in photonics-based industries and industries enabled by photonics.

### FPCE Goals

» Advance excellence in research and graduate education chosen to serve existing and emerging industry clusters in the state (photonics, optics, lasers) such as the Florida Photonics Cluster

» Leverage state resources via partnerships with industry and government

» Work in partnership with local, state and regional economic development organizations to attract, retain and grow knowledge-based, wealth producing industry to Florida.

The \$10M state grant is being used for three purposes: (1) to develop infrastructure (new faculty, three new eminent chairs, new facilities); (2) to fund competitive Partnership Projects at Florida universities; and (3) to pursue commercialization and outreach with the help of the FPCE Industrial Advisory Board.

A search is currently underway for endowed chair Professorships in

Nanophotonics and Biophotonics; other endowed chairs are planned for the future. An essential element for FPCE success is to attract outstanding faculty. The previous two issues of *Highlights* introduced two new faculty in nanophotonics -- Dr. Pieter Kik and Dr. Stephen Kuebler. In this issue, we introduce Dr. Kurt Busch. Another key accomplishment has been the establishment of a new Nanophotonics Systems Fabrication Facility that has Class 100 and Class 1000 cleanroom areas and a Leica 5000+ e-beam lithography system, one of only 4 in the U.S. (see March 2004 *Highlights*)

Moving research out of the laboratories and into the marketplace has long been a priority and core competency of CREOL and UCF, and the FPCE will continue this emphasis. A key element of the FPCE operating plan is thus the establishment of Partnership Projects. These projects are led by one of the Florida universities, may involve multiple universities, and must have participation by one or more Florida-based companies. The company participation can be via cash funding to the university, donation of equipment, or in-kind match such as use of equipment or time of company technical personnel.

A Request for Proposals was issued in October, 2003 for 2-year projects. The response was 28 proposals from 7 different Florida universities. The FPCE Industrial Advisory Board (See March 2004 *Highlights*) reviewed all the proposals, and 22 projects involving five universities and 17 companies were funded for a total of \$1,818,000 from FPCE funds for the first year, with an additional \$2,691,224 of industry match to the projects. An additional \$1,282,000 of FPCE funds was set aside for second-year project funding based on progress, and for possible new projects. The table on the next page lists the funded projects. Further information is on the FPCE website (<http://www.fpce.ucf.edu>).

## Optics Day 2004

The third installment of Optics Day at the College was held in February. Every year, we welcome local high school students as well as undergraduate and graduate students for a day dedicated to Optics and its applications. The event is coordinated by the CREOL Association of Optics Students (CAOS), which is presided over by OSA Student Chapter member Brian Monacelli and

regroups the major professional organization student chapters. The UCF Student Government Association sponsored food and promotional gifts. Graduate students from the college presented optics display projects and



answered various questions about optics and graduate school. The goal is to stimulate interest in optics and science by showing its use in everyday life.

## Florida Photonics Center of Excellence    Currently Funded Partnership Projects

Principal Investigator	Universities	Project Title	Industry Partners
1. Peter Delfyett	UCF	Development of a Compact High Power Modelocked Optical Pulse Source Using Extreme Chirped Pulse Amplification (XCPA)	Ablation Industries, Inc.
2. Craig Siders	UCF	High Average Power, Compact Ultrashort Pulse Lasers for Applications in Nano-photonics and Laser Micromachining	Ablation Industries, Inc. & Quantum Technologies
3. Aravinda Kar	UCF	Laser-doped nanostructuring in silicon carbide for deep green light-emitting diodes	AppliCote Associates, LLC
4. Glenn Boreman	UCF	Test and Evaluation of Semiconductor Devices	AuthenTec, Inc.
5. Jannick Rolland & Olusegun Ilegbusi*	UCF	Intravascular Photonics Catheter Design	CORELAB
6. Kathleen Richardson & Eloy Hernandez*	UCF	Development of Improved Materials and Technologies for the Manufacture of Low Cost Optics for Infrared Systems	CoSci Technologies
7. Sam Kozaitis	FIT	Mobile Multispectral Sensor for Individual Use	DRS Optronics, Inc.
8. Glenn Boreman	UCF	Liquid Crystal on Silicon Infrared Scene Projector	Dynetics, Inc.
9. Ronald Phillips	UCF	Free Space Laser Communications and Field Laboratory	Harris Corp.
10. Guifang Li	UCF	Millimeter Wave Fiber-optic Transmission for Broadband Wireless Networks	Harris Corp., Govt. System Div.
11. Ryan Toomey & David Fries*	USF	Holographic Photolithography System as an Improvement to the Fabrication of Microstructured, Biofunctional Hydrogels	Intelligent Micropatterning, LLC
12. Jannick Rolland	UCF	3D Displays for Medical and Engineering Visualization	METI Corp; ADASTRA Labs Motion Analysis Corp.
13. Kunal Mitra	FIT	Optical Tomography System Using Short Pulse Laser for Early Lung Cancer Detection	MVM Electronics, Inc.
14. Kathleen Richardson	UCF	Laser Assisted Direct Metallization for Microelectronic Applications	Nkanea Technologies Inc. (NTI)
15. Aristide Dogariu	UCF	Polarimetry for Active Detection and Identification of Immersed Targets	Northrop Grumman AGS&BMS
16. Guifang Li	UCF	Coherent Optical Transmission: Phase Modulated Antenna Remoting for JTRS and Beyond	Northrop Grumman AGS&BMS
17. Glenn Boreman	UCF	Subsurface Millimeter Wave Imaging through Soil	Northrop Grumman AGS&BMS
18. Glenn Boreman	UCF	IR Antennas for Reduction of Pixel Size	Northrop Grumman Laser Systems
19. Aravinda Kar	UCF	Nanoscopic Optical Sensors	Nuonics, Inc.
20. Lewis Johnson	FAMU	Florida Consortium for LIBS Plasma Technology	Ocean Optics, Inc.
21. Pieter Kik & Aristide Dogariu*	UCF	Tunable Plasmon Optical Nanosensors for Biochemical Detection	Ocean Optics, Inc.
22. Alfred Ducharme	UCF	High-Power LED Fiber Optic Cable Illuminator	Super Vision International

\* indicates Co-Principal Investigators

## STUDENT NEWS

Congratulations to our own **Student of the Year for 2004: Ms. Janet Milliez**, a student of Professor Michael Bass. The two other finalists were **Ladislav Jankovic**, from Dr. Stegeman's group, and **Bojan Resan**, from Dr. Delfyett's group.

Dr. **Zahid Yaqoob**, who graduated this spring from Dr. Nabeel Riza' group, won the first annual UCF Outstanding Dissertation Award.

**Sarun Sumriddetchkajorn** (Ph.D.,2000) received news from the President of the Foundation for the Promotion of Science and Technology (under the Patronage of H. M. the King

of Thailand) that he is the recipient of Thailand's 2004 Young Scientist Award. The award ceremony will be held on Aug. 18, 2004 and members of the royal family, including the princess of Thailand will be in attendance.

**Nathan Carlie**, who works in Professor Kathleen Richardson's group, received first prize (\$2500) for his poster presentation on "New Germanium-Based Sulfide Glasses for Telecommunication Applications" at UCF's inaugural *Showcase of Undergraduate Research Excellence* (SURE) competition.

**Yi-Pai Huang**, along with other authors from Shin-Tson Wu's research group, recently won the Distinguished Student Paper Award at the meeting of

the Society of Information Display.

**Katherine Schafer** a PhD graduate student in Biomolecular Sciences working with Professor Kevin Belfield won the 2004 Inaugural Graduate Research Forum Best in Category Award for oral presentation in: engineering, computer science, optics, physical sciences, mathematics, simulation and modeling.

**Cali Fidopiastis** works for Professor Jannick Rolland and is a graduate student in the UCF Simulation and Modeling Program with an MS in psychology. She was recently selected for a prestigious LINK Fellowship Award for 2004-2005. This award carries \$25,000 for the academic year. (see **Student news** on 6)



## College, from cover

Nearly 150 graduate students are enrolled in the College of Optics and Photonics. Under the new structure, undergraduate degrees in optics could be offered within the next several years, said Eric Van Stryland, who was promoted to dean of the college. He had been director of the School of Optics and still directs both CREOL & the FPCE. He is also vice president, and future president, of the Optical Society of America (OSA); an 88-year-old society that counts 22 Nobel Prize winners and other top engineers, educators and scientists among its 15,000 members.

Dean Van Stryland said the college designation will make it easier for optics faculty to work closely with professors from other colleges at UCF. He also said the new structure should help with faculty and student recruiting. "It will be regarded nationally as a step up," Van Stryland said. "It's a rather distinctive honor; recognition by our administration of our worth to the university."

The college's professors have received about \$27 million in grants for research this year, up from \$9.3 million just three years ago. Among ongoing research efforts are projects designed to prevent soldiers and pilots from being blinded by lasers, and to mass produce optical chips to help manufacturers.

The College of Optics and

Photonics' 36 teaching and research professors have won many top honors in recent years. Fifteen of them are OSA fellows, and eight are SPIE-The International Society for Optical Engineering fellows. "The University of Central Florida and CREOL have always played a pivotal role in the education, research and development that propel the fields of optics and photonics forward," said Elizabeth A. Rogan, executive director of OSA. "The added distinction of being recognized as a college, an entity unto itself, further establishes the school's significant role within the community. We are looking forward to the future innovations UCF's College of Optics and Photonics is certain to bring."

Eugene Arthurs, executive director of SPIE, said the elevation of UCF's optics program to the college level is an encouraging move for the "nationwide recognition of optics and photonics as a workforce discipline."

"The progress made by CREOL in moving to an internationally recognized center for optics and photonics in such a relatively short period is truly impressive, and this transition is well-earned," Arthurs said. "The quality of the people working in optics and photonics at UCF and the work they do is outstanding, and the unique model for technology transfer stimulates local industry and benefits the Florida economy."

## Spring Thing 2004

Those who have attended previous Industrial Affiliates' Day events know that it is very important to stay one more day for the next-day's event: *The Spring Thing*, hosted by Dr. MJ Soileau, Founding Director of CREOL and now the Vice-President for Research at UCF. The festivities this year included great fellowship and great Cajun Cuisine, including: gator, pig, chicken (tastes just like gator), and other miscellaneous good (and some healthy) victuals. There was also Gator stalking on Lake Jessup led by Capt. Soileau in his cruising craft and live music provided by the Quantum Beats, whose members happen to include Peter Delfyett, Glenn Boreman and Jim Ross. For those who missed this, get Industrial Affiliates Day 2005 (April 1, 2005) and Spring Thing (April 2, 2005) on your calendar for next year!



MJ Soileau navigates the waters of Lake Jessup at this year's Spring Thing Picnic.

## Student News, from 6

**Jeremiah Brown**, Eric Johnson's graduate student, has received a coveted National Science Foundation (NSF) Graduate Fellowship Award. These awards offer recognition and three years of support at \$30,000 per year for three years and an annual cost-of-education allowance of \$10,500, paid to UCF in lieu of tuition and fees.

Finally, here is the news about SPIE's 2004 Educational Scholarships and Grants in Optical Science and Engineering. The mission of this SPIE program is to recognize, assist, and encourage SPIE student members

and academic organizations with outstanding potential for long-range contribution to the field of optics and photonics. There were 340 applicants this year and the breakdown by academic level was: 2% high school students, 14% undergraduates, 84% graduates. Eighty-one scholarships, totaling \$212,500 were approved for the 2004 distribution. The following College of Optics and Photonics students were selected by the SPIE Scholarship Committee and approved for scholarships by the SPIE Board of Directors' Executive Committee in April: **Vesselin I. Chaoulov** (Advisor: Rolland); **Adela M. Apostol** (Advisor:

Dogariu); **Muzamil Arain** (Adv: Riza); **Jeremiah D. Brown** (Adv: Johnson); **Yun-Hsing "Claire" Fan** (Adv: Wu); **Chiew-Seng Koay** (Adv: M. Richardson); **Daniel A. May-Arrijoja** (Adv: LiKamWa); **Joachim Meier** (Adv: Stegeman); **Brian Monacelli** (Adv: Boreman); **Bojan Resan** (Adv: Delfyett); **Erdem A. Ultanir** (Adv: Stegeman); and **Wei-yao Zou** (Adv: Rolland). Jannick Rolland's student **Vesselin Chaoulov** also received the 2004 William Price Scholarship from SPIE! We are proud that 15% of the 81 SPIE awards were given to our own students, with a total dollar amount of \$32,500. NOT TOO BAD!

# Industrial Affiliates' Day 2004

April 16, 2004

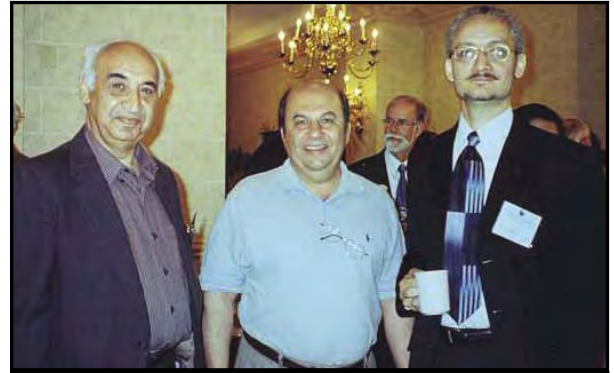
The 2004 gathering of the Industrial Affiliates of the College of Optics & Photonics was, in the opinion of all the attendees, a most enjoyable and informative event. There were over 200 participants, including representatives from Affiliate member companies, other companies, and special invited guests.

The morning program was a series of technical presentations focused on the primary topical areas of the new Florida Photonics Center of Excellence (FPCE) : Nanophotonics, Biophotonics, and Imaging & Displays. Professor Dennis Deppe from the Microelectronics Research Center at the University of Texas, Austin, spoke on the growth of self-organized III-V nanostructures and their application to quantum dot lasers and light emitters, including how these devices can impact ultrafast laser sources and enable new types of Terahertz sources. Professor Steve Brueck of the Center for High Technology Materials at the University of New Mexico talked about "Phat Photons and Nifty Nanoscience", explaining and illustrating his conclusion that there is no fundamental limit to the resolution of optical lithography, but there are limits set by process latitude and manufacturing costs. Dr. Daniel Farkas, Director of the Minimally Invasive Surgical Technologies Institute at Cedars-Sinai Medical Center, outlined recent advances in high-resolution non-invasive bioimaging, including hyperspectral and mesoscopic techniques for applications from neurobiology and surgery to cancer detection and regenerative medicine. Shin-Tson Wu, Provost Distinguished Professor of Optics at UCF, described the recent advances in liquid crystal displays, which are displacing CRTs in many applications, and enabling new applications such as full color cellular phone displays, large screen TVs, and foveated imaging devices for animating human vision. The morning plenary session concluded with an enlightening presentation by Dr. Anthony Siegman, McMurtry Professor of Engineering Emeritus from Stanford University, on

how "Light brings us news of the universe" (quote from Sir William Bragg). Tony illustrated how light brings us striking knowledge of our universe, ranging from astronomy's macro-view into the cosmos, to spectroscopy's insights into the micro-world of atoms and molecules

The afternoon program provided an opportunity to learn about the research activities at the College of Optics & Photonics and tour the facilities in the CREOL building. Eric Van Stryland provided an overview of all the research at the College, and Professor Eric Johnson described the newly-opened Nanophotonics Fabrication Facility, with its class 100 and 1000 clean rooms and Leica 5000+ e-beam lithography equipment. The afternoon was rounded out by graduate student research presentations by the three finalists for Student of the Year, 20+ student poster presentations, and tours of the laboratory facilities, expertly organized as usual by the CREOL Association of Optics Students – CAOS. The CREOL lobby was filled with tabletop exhibits from 11 of our Industrial Affiliates and the Florida Photonics Cluster. Siskiyou Design Instruments added a bit of spice to their exhibit by having a drawing for determining which CREOL lab would receive a donation of all the equipment they had on display.

The day concluded with a reception and the presentation of awards, including Student of the Year award going to Mike Bass' student Ms. Janet Milliez for her presentation on "Upconversion Processes in Rare Earth Co-Doped Emitters for Photonic Displays", and the Best Poster award going to Joachim Meier, a student



Hoss Izadpanah, Shahab Etemad and Peter Delfyett



Affiliates Day 2004 Speakers: Shin-Tson Wu, Eric Van Stryland, Steve Brueck, Dennis Deppe, Tony Siegman, MJ Soileau, Daniel Farkas and Jim Pearson.

of George Stegeman, for his poster on "Instabilities and Interactions in Discrete Nonlinear Wave-Propagation."

We would like to again thank all the participants and especially the event sponsors: Laser Institute of America; Metro Orlando Economic Development Commission; New Focus; Photonics Spectra; SPIE; Scionix; Siskiyou Design Instruments; Spiricon; Varian Vacuum Technologies; and Gary & Connie Washam.

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**College of Optics and Photonics**  
www.creol.ucf.edu

P.O. Box 162700  
Orlando, FL 32816-2700  
407-823-6986

**Address Service Requested**

## College of Optics and Photonics: Industrial Affiliates Program

### Life Members

Cobb Family Foundation  
Dr. Arthur H. Guenther  
Memoriam Member: Dr. William Schwartz

### Medallion Members

JDS Uniphase  
Northrop Grumman Laser Systems  
Ocean Optics  
Schott Glass Technologies, Inc.  
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Tektronix

### Senior Members

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Optical Research Associates  
OSI Laser Scan  
Photonics Spectra  
Rini Technologies  
Scionix  
Siskiyou Design Instruments  
Spiricon  
Technical Manufacturing Corp.  
TwinStar Optics Coating & Crystals

For additional information about joining the  
Industrial Affiliates Program visit [www.creol.ucf.edu/  
people/affiliates](http://www.creol.ucf.edu/people/affiliates).