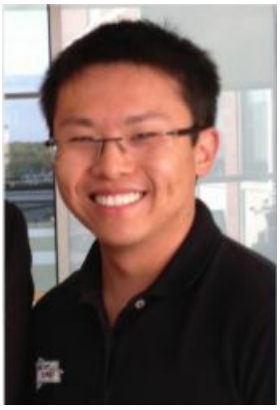
Date Sent December 4, 2019
From Donn M Silberman
Subject Subject: OSSC eNewsletter - December 2019

OSSC Optical Society of Southern California

IMAGES Newsletter

Newsletter Volume 26, Number 3 December 2019



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From the President:

Hello OSSC Members,

I want to first wish all of you a very Happy Thanksgiving, and from all of us at the OSSC encourage all of you to have a safe and meaningful holiday season. As we embark on this time of year, I hope that we can all take time to reflect on how lucky we all are when it comes to the great optics community we have here in Southern California. I have often heard that the optics and photonics industry is like a family, and many of the people that we have met through our professional connections have since grown into a fulfilling part of our personal lives as well. It makes me incredibly proud to see how our society has become such as integral part of people's lives, and I hope that as the years go on we will never lose sight of that as we push ahead into the 21st century.

I want to express my thanks to our speaker for this past November, Kevin Romeo of Northrop Grumman for his talk about Design and Innovation. Optics (like many other industries), at times can get formulaic. Pretty soon every lens design starts to look like all the others. Staying innovative in an ever-changing world is key to staying relevant, not just in a technological side, but also in the way that we run our businesses, and recruit people into our industry. I hope that we can all take something from Kevin's talk about how we can all take a different look at the way we approach problems, and incorporate them into making our industry stronger.

Looking into December, we have our annual **Corporate Appreciation Meeting** coming up at our next meeting on December 11th at Angelo's and Vinci's Ristoronte in Fullerton. Our corporate members play a key part of keeping our society strong, as it is through their support that allows the OSSC to continue to provide the offerings that our members enjoy! I want to express my deepest thanks to all of our corporate members for their generosity and support, and we look forward to seeing all of the great work that they have been mulling away on since our previous corporate appreciation meeting last year.

Finally, in addition to our corporate appreciating meeting, we will be hosting our first annual **OSSC Job Fair**. Our corporate members are encouraged to bring information about any job opening that they may have, and job seekers from at all levels are welcome to join us in a wonderful night of networking and to hear a great talk by Prof. V. Ara Apkarian from UC Irvine's Department of Chemistry on Imaging Molecular Vibrations for the First Time. I highly encourage all of our members to make their best effort to attend as we look to end the calendar year with a bang!
Once again I want to wish all of you a safe and meaningful holiday season, and I will see all of you at an OSSC meeting in the future!
Sincerely,
Bo Wang
President 2019 - 2020

Wednesday, December 11th, 2019

The Optical Society of Southern California invites its members and friends to our

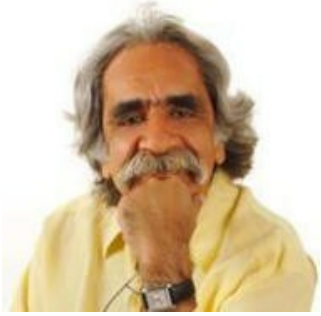
Annual Corporate Member Appreciation Event Featuring

a presentation on:

Molecular Vibrations Imaged for the First Time: Atomically Confined Light

Professor V. Ara Apkarian,

Director of UC Irvine's Center for Chemistry at the Space-Time Limit (CaSTL)

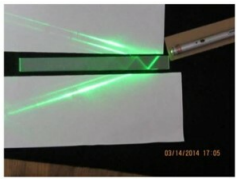


Wednesday, December 11th, 2019
Reception & Corporate Member exhibits: 6:00 pm
(no host bar)
Dinner: 7:00 pm; Talk: 8:00 pm
Meal: Pasta, Chicken or Meat Lasagna
Members: $35 by Dec. 7, $40 after
Non-Members: $40 by Dec. 7, $45 after
(OSSC Student Members $10 by Dec. 7, $20 after)
Attend the Talk for Free by Registering
Venue:Angelo's and Vinci's
550 N Harbor Blvd, Fullerton, CA, 92832
714-879-4022
On-line Registration:www.ossc.org
Or Contact: Sean Wilson
Events@ossc.org,(310) 933-2255
Corporate members can reserve exhibittables during online registration.
Contact Donn Silberman for information.

Abstract: The internal vibrations of molecules drive the structural transformations that underpin chemistry and cellular function. While vibrational frequencies are measured by spectroscopy, the normal modes of motion are inferred through theory because their visualization would require microscopy with ångström-scale spatial resolution—nearly three orders of magnitude smaller than the diffraction limit in optics. Using a metallic tip to focus light and taking advantage of the surface-enhanced Raman effect to amplify the signal from individual molecules, tip-enhanced Raman spectromicroscopy (TER-SM) reaches the requisite sub-molecular spatial resolution, confirming that light can be confined in picocavities and anticipating the direct visualization of molecular vibrations. Here, by using TER-SM at the precisely controllable junction of a cryogenic ultrahigh-vacuum scanning tunneling microscope, we show that ångström-scale resolution is attained at subatomic separation between the tip atom and a molecule in the quantum tunneling regime of plasmons. We record vibrational spectra within a single molecule, obtain images of normal modes and atomically parse the intramolecular charges and currents driven by vibrations. Our analysis provides a paradigm for optics in the atomistic near-field.

About our Speaker: V. Ara Apkarian is a Professor of Chemical Physics at UCI and Director of the NSF Center for Chemical Innovation on Chemistry at the Space-Time Limit (2007-present). He holds B.S. and Ph.D. degrees in Chemistry from USC and Northwestern, respectively. Following a postdoctoral fellowship in Cornell, he joined the Chemistry faculty at UCI in 1983. He has served as Department Chair (2004-2007) and as the founding co-Director of the Chemical and Materials Physics (ChaMP) program at UCI (1997-2000).

OSSC Corporate Members are invited to sign up for exhibit space!



Ventura OSA (CVOSA) Announcement for Tuesday **December 10, 2019**

(Please RSVP)

Our meeting is At Cal Lutheran University, Room 128
3293 Mountclef Blvd, Thousand Oaks, CA

Enter the parking lot from Montclef –lots of easy parking. Park at the X, meet at the arrow.

GPS 34.224432, -118.876235 **https://goo.gl/maps/7TWoMaUHRpM755x97**

6:00p Mixing and Stand Up Dinner
7:00p Speaker
$25 donation on site (it is a donation for food, insurance and venue. If you need a no-food, student, pre-school, old age or other discount please give yourself one).

SIDE ILLUMINATED OPTICAL FIBER SENSORS: FROM BASIC RESEARCH TO A TECHNOLOGY PLATFORM

Claudio Oliveria Egalon, Ph.D.

Abstract

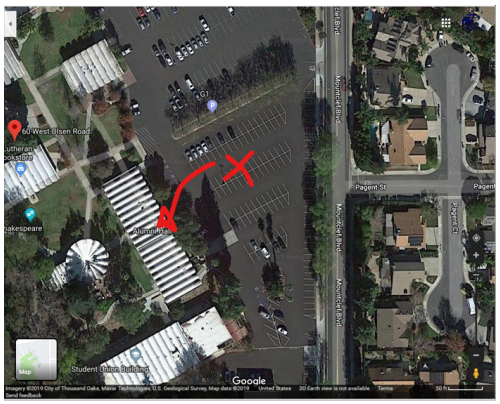
In 1989, a group of Bell Lab scientists, at Murray Hill, NJ, published a paper about the first side illuminated optical fiber sensor. At the time, this group recognized one of the advantages of this technology: a very high signal to noise ratio, SNR, if compared to its competing counterpart, axial illumination.

Despite this recognition, these early pioneers abandoned their own creation and dedicated their efforts to the more established technique of axial illumination. As a result, the task of championing this technology ended up in the hands of the presenter who may also be counted among its earlier pioneers.

Despite side illumination's simplicity, reliability, low cost and high SNR, it did not get much attention in its first 15 years of life. This is very puzzling for the following reasons:

- Even today, optical fiber sensors based on axial illumination are plagued with a low SNR and expensive instrumentation and
- The technology required to commercialize optical fiber devices based on side illumination was available even before 1989: something we were able to recognize only recently.

In this presentation, we will cover the evolution of this concept: from its earlier laboratory experiments at AT&T Bell Labs, NASA Langley and Old Dominion University, its later reduction to practice and the present-day devices based on this technology. We will also cover the missteps taken along the way, the surprising revelations that, sometimes, were brushed aside, the lack of support for the continuing development of this technology, which still prevails today, and much of the drama that comes along with a technology that, for many years, remained hidden in plain sight.



From the Editor:

Hello OSSC members and fellow readers,
With this edition of the OSSC eNewsletter, I want to thank our November contributors who made that issue very special. We used the OSSC website to take a survey of readers and had a few people make some very good comments. Please continue to provide feedback to this newsletter and we will endeavor to make it better as time goes on.
This month we are getting this newsletter out earlier than before to let you all know about the news and December OSSC Meeting activities.
Hope to see you at an OSSC event soon.
Sincerely,
Donn M. Silberman
OSSC Past President & Fellow
Current OSSC Newsletter Editor

Dr. Jon Arenberg of Northrop Grumman gave a fantastic talk about the James Webb Space Telescope for our October OSSC meeting. Here are a couple photos from that event. The first one is at the start of Jon's talk and the second one is OSSC President Bo Wang president Jon with our Appreciation Certificates, one year individual OSSC Membership and one year Corporate Membership for Northrop Grumman for hosting the tours. You can see more photos from this event and other OSSC events at: Photo Album List.

James E. Millerd:

The 2020 SPIE Chandra S. Vikram Award in Optical Metrology

The SPIE Chandra S. Vikram Award in Optical Metrology recognizes exceptional contributions to the field of optical metrology, whether for a specific achievement, development, or invention of significance, or for lifetime achievement.

James E. Millerd has improved optical metrology in multiple areas including holographic interferometry, speckle metrology, and vibration insensitive phase-shifting interferometry. At MetroLaser, he was a principal in the development of a laser vibrometer instrument that sold worldwide; he also led the development of a dynamic interferometer that led to 4D Vision, a startup that was sold to 4D Technology where Millerd was initially chief technology officer, then president. At 4D Technology, he co-invented the Pixelated Dynamic Phase Sensor at the core of 4D's commercial dynamic interferometers, including Interference Microscopes, Fringe Projection 3D Measurement systems, Electronic Speckle Pattern Interferometers, and Twyman-Green and Fizeau Interferometers.

While he has authored many papers on metrology — presenting more than 30 at SPIE conferences alone — and is the inventor or coinventor of 15 patents, even more importantly he has been key in commercializing many of these inventions: the products resulting from these inventions have transformed the way phase-shifting interferometry is performed, has reduced the need for vibration free environments, and has moved precision optical interferometry from the lab to manufacturing areas.

"Through his work and leadership as the President of 4D Technology Corporation, James is responsible for a paradigm shift in the quality and capabilities of commercially available interferometers over the past decade," says SPIE Senior Member and Arizona Optical Systems President Martin Valente. "As an end user of interferometers, I can think of no other individual in recent history who has impacted and pushed the state of the art in interferometry more than James: the many innovations that he has developed have enabled the advancement of other correlated fields including optical components and systems manufacturing and testing, modal response testing of opto-mechanical systems and dynamic structures, and ophthalmic-related diagnostics of the human eye and corrective lenses."

Read more about James E. Millerd and the SPIE Chandra S. Vikram Award in Optical Metrology.
James is 4th from the left in the back in the photo of the 4D Technology Team

Recently, we had an excellent workshop at OSSC Corporate Member Diverse Optics: Gaining Traction with EOS facilitated by Josh Holtzman. Josh brings 15 years as an entrepreneur (including 2 exits, Inc. Magazine Fastest Growing Company, Best Place to Work, Forbes Most Promising Company) and the power of the Entrepreneurial Operating System (EOS) to achieve real results. Erik Fleming, President/CEO and Letty Ortega-Treviño, Sales Engineer, at Diverse Optics Inc. posted this news on LinkedIn.

John R. Rogers:

The 2020 SPIE Rudolf and Hilda Kingslake Award in Optical Design

The SPIE Rudolf and Hilda Kingslake Award in Optical Design recognizes significant achievement in the field of optical design.
With more than 35 years contributing to the optics industry, SPIE Fellow John R. Rogers has worked with Leica, Kern, Optical Research Associates, and Synopsys as well as participating extensively in the academic optics community and with professional optics societies. His technical accomplishments include contributions to the theory of non-rotationally symmetric systems, optical tolerancing, and imaging systems. Many of his publications emphasize the important aspect of tolerancing in design, fabrication, and testing of optical systems, an approach which has proved of significant value to lens designers and optical fabricators across the globe.
Considered one of the foremost experts in the field of optical design, Rogers has acted as chair for the SPIE International Optical Design Conference, presenting his research there and at several other field-relevant SPIE conferences since 1999. Rogers has also impacted many next-generation optics students through his teaching appointments at the Institute of Optics at the University of Rochester, and the Wyant College of Optical Sciences at the University of Arizona.
"I am especially fond of John for his unique ability to gain insight into a design and for his ability to solve some of the hardest challenges," says Jannick Rolland, Brian J. Thompson Professor of Optical Engineering at the University of Rochester's Institute of Optics. "Some of his key contributions include the development of algorithms for the reduction of tolerance sensitivity and athermalization; these are particularly technologically advanced and John 'nailed it,' so to speak. I worked directly with him on DARPA's Manufacturable Gradient Index Optics (M-GRIN) at DARPA ten years ago: he was the designer on our team. His insight not only into design, but also into the metrology of the samples that we were leading with my team, were invaluable. I very much enjoyed having this exceptional thinker and rigorous scientist working side by side with us."
Read more about John R. Rogers and the SPIE Rudolf and Hilda Kingslake Award in Optical Design.

The Center for Laser and Fiber Optics Education, LASER-TEC, is a National Science Foundation Advanced Technological Education Center comprised of community and state colleges, universities, high schools and technical centers, trade associations, and laser and fiber optic (LFO) companies.

At LASER-TEC, we work closely with companies developing and selling laser, fiber optics, and photonics equipment to bring the most relevant hands-on experience to our students. If you would like to expand your laboratories, take advantage of the special pricing available exclusively to our college partners.

Last month, OSSC Corporate Member, eLas Americas, provided the letter in the next column to LASER-TEC to help their partner colleges purchase Laser Education Kits at a special discount. An arrangement similar to this had been in place with the former Op-Tec Center which has now been incorporated into LASER-TEC.

November 5, 2019

Chrysanthos Panayiotou
Executive Director, Principal Investigator
Laser-Tec
Indian River State College
3209 Virginia Avenue Fort Pierce, FL 34981
772-462-7621 cpanayio@irsc.edu

Subject: e-Las Educational Laser Kits for Laser-Tec Partner Colleges

Dear Chrys,

This letter is to inform you that effective immediately, all eLas Americas Educational Laser kits available through e-Las Americas, will be provided to Partner Colleges at a 15% discount from the published List Prices. Partner Colleges qualify by being listed on the Laser-Tech website at: www.laser-tec.org/opcn.html or http://www.laser-tec.org/our-partners.html

e-Las Americas has over 18 laser educational kits that can be incorporated into programs. eLas Americas also offers support of curriculum for laser and related courses, design of the laboratories and advice in equipment selection with concepts for complete training facilities. We are excited to be able to continue to support the laser educational requirements of the Laser-Tec Partner Colleges and look forward to working with you as you build your programs.

Please let me know if you have any questions or if you would like pricing or a formal quote for any of our Laser Educational Kits. Also, see out Outreach Materials too at the link below. https://www.e-las.net/e-las-theme-packets

Kind Regards,

Donn M. Silberman
President
Email: donn@e-las.net
Phone: 949-636-6170

PI
MOTION | POSITIONING

Photonics Media & PI (Physik Instrumente) will host a live webinar....

Advancements in Precision Motion Control for Electro-Optical Manufacturing and Laser Materials Processing
Wed, Jan 22, 2020 1:00P EST https://www.photonics.com/Webinars/Advancements_in_Precision_Motion_Control_for/w204

With a focus on high-throughput/high-yield positioning and microrobotic solutions for leading-edge manufacturing, Scott Jordan and Matt Price from Physik Instrumente (PI) will present the latest advancements in software, control algorithms, and motion systems hardware available to design engineers and scientists in the laser processing, optics, and photonics industries. Examples will include:

Laser processing of substrates with nonuniform

Scott Jordan is head of photonics for PI and a PI fellow. A physicist with an MBA in finance/new ventures, Jordan has made multiple contributions to photonics alignment automation and precision motion control and optimization technologies.

Matt Price is a technical manager for PI, working in precision automation technologies for microfabrication and metrology. A physicist with a background in laser materials processing and characterization, he has contributed to the development of motion technologies to advance capability in these fields.

topologies. The presenters will discuss hardware, software, algorithms, and system architecture to support the identification and integration of selectable process zones and methods to address defects in materials through both additive and subtractive processes.
New, autonomous microrobotic and precision-positioning solutions for fast optimization in the manufacture of silicon photonic, laser electro-optic, lidar, and imaging-optic assembly and test.

Many OSSC Members exhibited and participated in the OptiFab conference in October in Rochester. There is a concept around about..... Building an Optics Bridge between Rochester and So. Cal. with some on / off ramps along the way. What do you think abou that idea??

Review photos and more.... SPIE Optifab is held every 2 years, bringing people together to learn about the latest optical fabrication technologies. Check out photos and more to see what happened at the 2019 meeting. https://www.spie.org/conferences-and-exhibitions/optifab/highlights-photos-and-more

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Website Content	Charles Gaugh	(562) 986-5852

UCI Division of Continuing Education

Celebrating 10 Years of Course offerings in OPTICS

UCI Optical Engineering 10 yrs - Photonics Spectra
from Sept 2019 Photonics Spectra Magazine

The following courses are part of **Certificate Programs** in:
Optical Engineering and **Optical Instrument Design**
There was an Information Session - Monday 19 August
OSSC Fellow Donn Silberman was the guest speaker.

Recorded Session Here

Winter 2020 courses will begin in early January:
Advanced Lens Design
Optical Instrument Design
Optomechanical Systems Engineering
Past UCI Optical Engineering Webinars

UCI DCE Financial Aid for Optics Programs
Go to the links above to learn more about the courses and programs.
*15% discount for **OSSC** Members on courses Required for a Certificate.*
Email: **Jennifer Mortensen**
with confirmed **OSSC** Membership
to receive discount code.
Instructors Wanted to Teach:
Optical Engineering and Optical Instrument Design!

IRVINE VALLEY COLLEGE
PHOTONICS TECHNOLOGY

Laser and Photonics Technology instructors lead hands-on, laboratory-driven classes, utilizing state-of-the-art industrial equipment, based on the industry-guided photonics curricula written by industry professionals. In addition to laboratory skills, students are offered one-on-one support and career advice, including résumé and LinkedIn profile building.

Program Website
***IVC Laser Technology** is located on the*
IDEA at **ATEP** campus in Tustin, CA
For Information Contact:
Prof. Brian Monacelli, Ph.D.
949-824-2704
IVCphotonics@ivc.edu

WEBSITE SPONSORS

Website Sponsors are *Corporate Members* that make an additional donation to support the **OSSC.ORG** website. They enjoy all the benefits of *Corporate Membership* AND have their company logo and link prominently displayed along the left side of our website. Website Sponsorship dues are $200 per year.
New Members may select the Website Sponsor option when applying for membership using the link below.
Current Members may select the Website Sponsor option when renewing their membership during the April to June renewal period or at other times by contacting the Membership Chair.
All Website Sponsors may contact the Website Team to add or update their company link or logo or to resolve other website issues.
For general membership questions, please contact the Membership Chair.

Become a Corporate Member or Website Sponsor!

Corporate Members

OSSC Corporate Members display their products at the December 2012 Corporate Member Appreciation Meeting.

Corporate Members benefit the **Optical Society of Southern California** through their generous donations of time, talent and financial resources. Corporate Membership dues are $100 per year.

Aerotech
Alluxa
AMP Optics
Äpre Instruments
AVS Southern California Chapter
AWI Industries
Cambridge Technology
Cimarron Optical Consulting
Collins Optronics
Curt Deckert Associates
Diverse Optics
DMK Engineering
e-Las Americas
Facebook Connectivity
4D Technology
Guernsey Coating Laboratories
Hadland Imaging
Infinite Optics
Inrad Optics
Isuzu Glass
Laser Components
Mahr
Mark Optics
Mendez R & D Associates
Micro Laser Systems
Mindrum Precision
Newport Corporation
Newport Thin Film Laboratory
Ohara Corporation
Optic Systems Group
Optikos
OptiPro Systems
OptoSigma
Photonics Media
Physik Instrumente
Precision Glass & Optics
Raytheon ELCAN Optical Technologies
Raytheon Space and Airborne Systems
Reynard Corporation
Schott North America
Silicon Lightwave Technology
Spectrum Scientific
SPIE
Starrett Metrology
Supply Chain Optics
Synopsys
Trioptics
II-VI Optical Systems
UC Irvine Division of Continuing Education
Zemax
Zygo

CONFERENCES AND SEMINARS

SPIE. PHOTONICS WEST BIOS
1 - 2 February 2020
San Francisco, California
The Moscone Center
More Information

SPIE. PHOTONICS WEST
4 - 6 February 2020
San Francisco, California
The Moscone Center
More Information

OFC
The Optical Networking and Communication Conference & Exhibition
Technical Conference: 8 – 12 March 2020
Exhibition: 10 – 12 March 2020
San Diego Convention Center, San Diego, California, USA

SPIE. DEFENSE+ COMMERCIAL SENSING
Anaheim Convention Center
Anaheim, California, United States
26 - 30 April 2020

The Following list of OSA Student Chapters in California is a bit outdated.
The OSSC Board would like one volunteer to reach out one of these OSA / SPIE Student Chapters and become a contact person to that one college or university student chapter and optics community. Please contact Donn Silberman if you would like to volunteer.

- California Institute of Technology - OSA Student Chapter
- California State Polytechnic University, Pomona
- Irvine Valley College (IVC) Student Chapter
- San Francisco State University, OSA Student Chapter
- Stanford University, Stanford Optical Society
- University of California, Berkeley, "PhotoBears" (Joint OSA & SPIE Student Chapter)
- University of California, Davis, Optics Club
- University of California, Irvine, Photonics@UCS (Joint OSA & SPIE Student Chapter)
- University of California, Los Angeles (Joint OSA & SPIE Student Chapter)
- University of California, Merced
- University of California, San Diego, Photonics Society at UCSD

Outreach

Left: Dr. Murty Mantravadi demonstrates his Optricks! Right: Children play with home made telescopes.

The **OSSC** supports several outreach events each year. If you would like to **volunteer** to help on a project or event, please contact **OSSC** Outreach Chair - Nick Lambert, or any member of the Outreach Committee

The OSSC Optics Outreach Programs have had a long history of success over many years. At this time we are looking forward to bringing on a new outreach leader, Anthony E. Oceguera, from Cal Poly Pomona's Optics & Photonics Club, who will help us continue reaching many young people around Southern California. Please welcome Anthony and volunteer to help him create successful programs for the next year and beyond.

WELCOME NEW MEMBERS
Jonathan Arenberg
Tomas A Avilez
Yan Cheng
Denise Durance
Steven L Ernst
David Filgas
Andrew J Froning

Zainuddin Karriem
Eileen Klabunde
Nadhir B Kosa
Anise E Mansour
Shelly J Mechery
Cody Miller
Keith E Mitchell
Michael P Newell
Juan Rizo
Gopal Salvady
Nicholas A Schram
Nicholas Tallarida
Andrew Tomat
Gokce Toprak
Ally K Valainis
Julian E Vimont

OSSC*welcomes***Individual***and***Corporate***
Members who joined (or rejoined) in the last 60 days.

We value your membership
and appreciate your support!

You have received this message from the mailing list of Optical Society of Southern California. If you would prefer not to receive these emails in the future, go to the opt-out page and modify your privacy settings. You can also request to be removed from our database completely.

Done