PTICAL SOCIETY
OF SOUTHERN CALIFORNIA

IMAGES

Newsletter volume 14, number 8 WWW.OSSC.ORG May 2008

From the President
Donn Silberman

April's OSSC meeting at UCLA's Engineering Building was well attended (standing room only – even though it was a small room!) Here we partnered up with the IEEE LEOS Los Angeles Chapter which is gaining momentum again with its new Co-Chair Keisuke Goda. We also had a few students from the Physics department including Adrian Cheng (pictured here), who is a customer of mine and is currently recruiting fellow students to see about starting an OSA student chapter. I think we even may have an OSSC member (or even a new Fellow) who lives near UCLA and may step up to help out!!

Another couple of interesting guests we had were two recruiters from Newport Corp., Lisa Cook (no relations to our own David Cook) and Lea Love. These two ladies are helping Newport fill some key positions and they thought they may get some good leads at our meeting. I think they did. Welcome!!

Our April speaker, Hamid Hemmita from JPL (shown below), did an excellent job of providing an overview of one of the most exciting communications programs. If you missed his talk you can download a copy of his Nov. 2007 OPN article for: http://oisc.net/Hamid.pdf

Expanding the OSSC Membership

Over the last few years, the OSSC has been growing at a pretty good pace and we now have well over 200 individual members, 60 corporate members and over 20 Fellows. As I may have mentioned, it is really an honor to serve this society, as I have been involved for over 16 years. My first involvement was when I was asked to give a presentation sometime back in 1992. I mention this now, because it is now the tradition of the OSSC to give each speaker and / or company (or university department) sponsors a free one year introductory membership. This has helped us to grow our chapter and serve a broader group of the local optics community.

As many of you know, it is another tradition of the OSSC that the Board of Directors meets to conduct the Society's business usually during the Social Hour of each meeting. Sometimes this takes place at a table in the restaurant and sometimes in an adjacent room. At our April meeting we had the honor of using a conference room at UCLA.

These meetings can actually be quite fun (you can see me smiling in this photo that Martin took) and I would like to encourage you volunteer some time as an appointed member of the Board or as a committee member. If you would like to sit in on our one of our meetings, just ask, I'm sure the answer will be yes!!

During May's meeting we will induct 5 members into the ranks of our Fellows. This will indeed be a special time. Hope to see you there.

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From the Board

From the Treasurer, Valentina Doushkina

ADAPTIVE OPTICS AND COMPUTERS, UNTWINKILING THE STARS AND BUILDING SUCCESS IN A RAPIDLY CHANGING COMPUTER BUSINESS

The twinkling stars have been the source of inspiration for artists and astronomers through the ages. Artist's inspiration resulted in paintings and poetry, while astronomer's inspiration to untwinkle twinkling stars resulted in a state of art Adaptive Optics (AO). A ground-based telescope using AO can generate images that are as sharp as those from NASA's Hubble Space Telescope. The AO has been one of the most revolutionary technical developments in astronomy since Galileo first used an astronomical telescope in 1609.

The concept of AO has been known since 1953 when Horace Babcock, an astronomer at the Mount Wilson Observatory published a paper on the principal of AO. However, the technology of the time was not up to the requirements and it took years before Babcock's ideas could take tangible form. A major investment in new technologies that could divide a light beam into many small elements and correct each element separately, hundreds of times per second, was required. These new techniques first became available in the 1970's, as a result of U.S. Department of Defense research into methods of keeping a laser beam sharply focused in the atmosphere. The rapid development of computing technology, and "computing power" which came about as a result of the development of fast high memory capacity computers made A O a reality. In recent years, the technology and practice of AO have become common in the astronomical community, in Vision Science and Optical Metrology, but these applications all work in closely similar fashions. All AO systems work by determining the shape of the distorted wavefront, and using an "adaptive" optical element -- usually a deformable mirror -- to restore the uniform wavefront by applying an exactly opposite canceling distortion. The most basic systems use a point source of light as a reference beacon, whose light is used to track the shape of the wavefronts. This may be a bright star, or in the case of Vision Research a laser spot focused on the retina; or laser beam utilized as an artificial guide star in any part of the sky (as used at the Keck Observatory). The process that makes A O systems a reality has resulted from the vastly increased data management abilities and sheer computing speed that current computer systems make available to scientific and business industries. That being said, I thought it would be appropriate to include a bit of insight into the computing world from a business expert in the field, the Chairman of Dynatem, Inc., Mr. Robert E. Anslow

Remember in the movie "*The Right Stuff*", actor Scott Glenn (portraying Astronaut Scott Carpenter), during a carrier landing, says "My name - Jose Jaimenes…may I have permission to land on the carrier"… I feel like the pilot going onto a carrier (OSSC) that isn't my own. My name is Bob Anslow, and I am not a glass, optics or optical specialist. Like you, I live and work in Southern, Calif (read Orange County). The business I'm in, like yours is centered around current and evolving technology, and the integration of that technology, and customer changes, that happen daily. The business I help run, (Dynatem, Inc.) is located in Mission Viejo and we design, have made, and sell real time/embedded computers. What is an embedded computer? It computes in real time…no keyboards or mice attached. Where are RTC (Real Time Computers) used? By the military, aerospace, medical, industrial and scientific markets that need precision, robust packaging, accessibility to a readily available operating system (such as Windows, Linux, QNX), and, most importantly, require close customer support in hardware and software. Our business is based on the Intel Pentium microprocessor progression. By progression, I mean we have moved from Pentium-II, to Pentium III, to Pentium-IV, to Pentium-M, to Core Duo to Core2Duo CPUs in 9 years. *Moore's Law* of doubling computer capacity each 2 years is still valid. It is this very same progression of computing speed and data management that has allowed scientific and industrial applications to make corresponding advances in both business applications and scientific advances such as the A O applications that Ms. Doushkina discussed above.

Each Pentium transition means new product designs, and it then means each of our new embedded boards requires 2000+ parts. Prototypes are built and we go into production. This happens 3 to 4 times a year in our business. We decided not to follow Motorola (now Freescale) and IBM's CPU developments, and our decision looks to be the right one for embedded computers at this point in time. Is the high tech portion of the optical industry moving that fast? Does it affect your business and what your lab is doing to take advantage of such advances?

Here are a few comments from an outsider to your industry and technology: 1)If you are a service company, and, for example, *Newport Industrial Glass* appears to fit that classification, you offer a broad range of glass products and services. and you are expanding geographically and in products, such as in diving goggles with built-in prescription lenses. My questions are: are you following all the technical glass developments (such as new suppliers, glass products coming to the market) and assuring your customers of the latest developments and applications of products. Can you produce the products you offer from the newest optical glass? Can you do it in a cost efficient manner and meet customer needs promptly. Do you need new equipment? 2) If you are an equipment company which has optics as it's core technology, are you close to the top level glass companies, such as *Schott & Corning*, who can help you tap into new technology before it reaches the market. Our company, Dynatem, has that closeness to its CPU provider, Intel, and uses that relationship and industrial lines of communication for product development continually. We are not HP or Dell, but the developments for the PC industry have great benefit for us if we can move fast enough. 3) If you are in research in a university or government lab, ask your optics suppliers about their new technology offerings. As an example, our company works with Ohio State University and the University in Australia assisting them with real time computer capabilities. The development work of those institutions often produce products that find a market - and Dynatem designs are the heart of those products. You optical design work may lead to products using the technology of your supplier. You both win. You get the best technology and/or support, and your supplier may participate in future business. Hopefully, some lessons we learned in the real-time computer business can help you and your company or laboratory.

PTICAL SOCIETY OF SOUTHERN CALIFORNIA

Meeting Announcement Wed. May 14, 2008

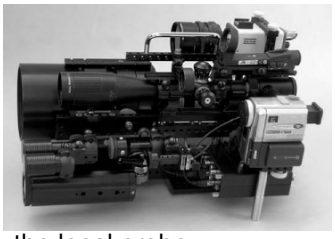
Optical remote sensing in a turbulent atmosphere

Dan Slater, Nearfield Systems, Inc.

Abstract:

Finding, identifying and characterizing distant terrestrial objects with ground based electro-optical sensors presents several difficult technical challenges. The entire optical path is fully immersed in a dense and turbulent atmosphere which results in a significant loss of scene contrast and resolution. Although there are strong similarities to the problems of high resolution astronomical and space object imaging, there are also significant differences.

The first part of the presentation discusses the problem of high resolution terrestrial imaging through a turbulent scattering atmosphere. Several ground based optical instruments specifically designed for long range remote sensing will be described including MIST (Miniature Integrated Speckle imaging Telescope) and TFIC (Terrestrial Fusion Imaging Camera). MIST supports a variety of imaging and non imaging experiments. TFIC is a portable high resolution camera that also includes wideband radiometric capabilities. The TFIC image processing workflow, using a combination of luminance processing, speckle imaging and image fusion is described. Representative high resolution urban and marine environment imagery with horizontal path distances up to 128 km (80 miles) is shown.



The second part of the presentation discusses long range optical sensing using non cooperative specular sensing probes. Solar illuminated glinting objects can serve as in situ sensor probes that are observable from very long distances. Retro reflective objects produce glints when illuminated by coaxial illumination sources such as lasers. These glints are modulated by illumination source variances, the local probe environment, the intervening propagation paths and the remote sensing system. The modulating signals can be recovered by using reflectivity detectors with temporal, spatial, wavelength, directivity or polarization sensitivity. Clustered and moving specular probes provide additional information through geometry extraction, beam forming and multi sensor noise reduction. Experimental instrumentation and results will be discussed.

About the Speaker:

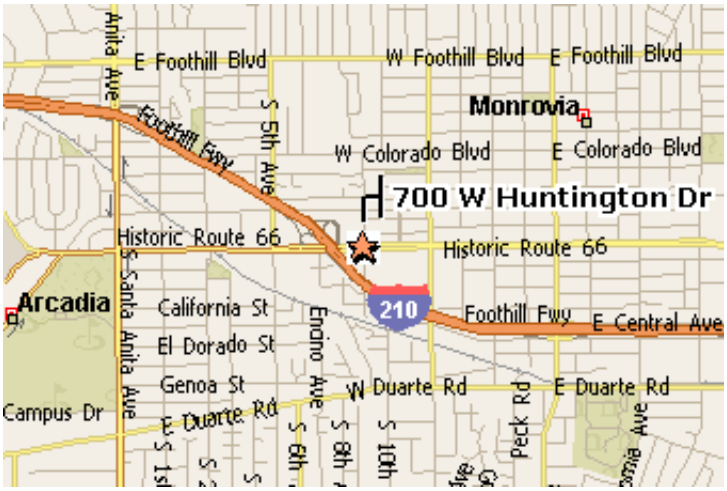
Dan Slater is vice president, co-founder and head of research and development for Nearfield Systems Inc (NSI). Previously he was a long term consultant to TRW (now Northrop Grumman), Paramount Pictures and others. He has consulted on a variety of projects including spacecraft antenna testing, launch vehicle avionics, flight simulation, imaging radar design, photo instrumentation and motion picture film effects. He has designed numerous aerospace, underwater and motion picture optical systems and lenses. He has received two Academy Awards for motion picture camera technology developments and holds 13 US patents. He is the author of the book "Nearfield Antenna Measurements" (Artech House 1991) and technical papers on a variety of topics including optical remote sensing, microwave receivers, radar imaging, robotics and microwave holography based antenna measurements. He is a senior member of the AIAA and IEEE.

Special OSSC Fellows Induction Ceremony

Meeting Details:

Date:	**Wed. May 14, 2008**
Times:	6:00 p.m. Social Hour
	7:00 p.m. Dinner
	7:30 p.m. Fellows Induction Ceremony
	8:00 p.m. Speaker Presentation
Location:	Courtyard Los Angeles Pasadena/Monrovia
	700 West Huntington Drive
	Monrovia, California 91016
	Phone: 1-626-357-5211
Cost:	$30 for Dinner
	Limited Corporate Sponsorships available
RSVP:	By May 9, on the OSSC Website, or
	Call Scott Rowe at 949-735-9927

Please visit www.ossc.org for directions & updates.



Please post and encourage your colleagues to attend. Friends and family of the new Fellows are also welcome.

PTICAL SOCIETY OF SOUTHERN CALIFORNIA

OSSC Corporate Profile

Hardin Optical is your source for high precision optics: from rapid prototype development and custom fabrication to mass production.

Established in 1976, Hardin Optical is located in the beautiful coastal community of Bandon, Oregon. For over three decades we have manufactured high quality optical components and systems. A strong emphasis on research and statistical process control keeps us at the industry forefront and sustains our technical versatility.

Our facility incorporates all the latest optical tools and equipment necessary for producing high precision optical products. In addition, our complete machine shop provides custom fabrication and in-house tool development for complete project support and maintenance.

Hardin Optical Company is a HUBZone Small Business, certified by the United States Small Business Administration.

News Announcement

Hardin Optical's proprietary dark coat process will headline our capabilities on display at our booth (#2511) in San Jose, California at the CLEO Exhibit, May 6 - 8. Visit with us and learn about this highly durable, widely applicable process.

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PTICAL SOCIETY OF SOUTHERN CALIFORNIA

OSSC Corporate Profile

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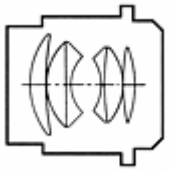
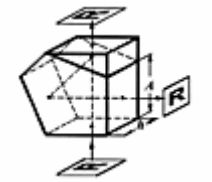
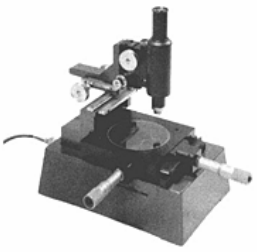
"Optics For Industry" REQUEST A QUOTE!

Rolyn Optics Company pioneered the distribution of quality optics to industry. Our experience in the business goes back to 1925 when we first began marketing optics to the photographic industry. During those years we represented several of the outstanding names in the world of optics and imported lenses from all over the European continent to supply the needs of American industry.

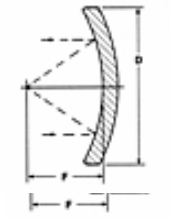
Our staff has experience in the design, fabrication and test of a diverse range of hardware such as studio motion picture cameras, spectrophotometers, tracking cameras, radiometers, star trackers, satellites and test equipment as well as expertise in the design, fabrication and use of the broad range of optical components which you will find in this Web Site. We sincerely hope you will feel free to call upon us for recommendations in your applications and assistance with your problems.



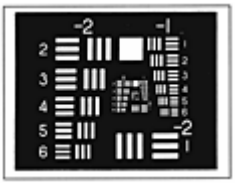




Rolyn Optics Company occupies a 25 000 square feet tilt-up concrete building located 2 miles south of the 210 Fwy; 5 miles north of the 10 Fwy; 3 miles west of the 57 Fwy and 5 miles east of the 605 Fwy.



Offices occupy 6 000 square feet. The balance of the facilities is devoted to manufacturing and warehouse.



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Looking Into Your Own Eye

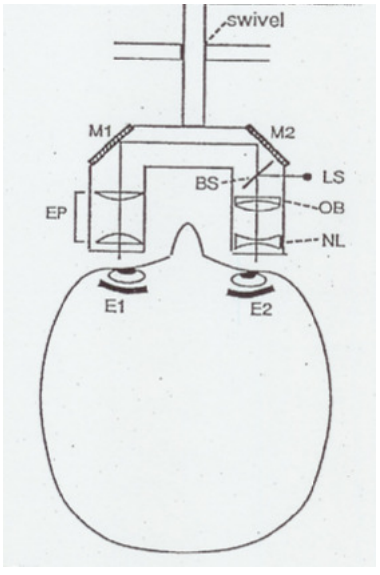
Forward by Susan Rico: *The idea presented here was originally conceived by Dr. Murty and submitted in 1990 by Dr. Murty and me to an OSA contest seeking ideas for optical demonstrations for science museums. It did not win the contest, but in 1992, we saw in an OPN article titled "Museum Competition Entry Goes on the Road". The article, by Michael Littman of Princeton, said that our idea had been refined and built for a traveling exhibit on the brain called "It's All in Your Head". The refinements included use of an ophthalmoscope, a CCD and a TV monitor.*

This highly interactive demonstration will allow museum visitors to look into their own eyes and see their own retinas. The basic idea is to use one eye to look into the other. The scheme is shown in the figure below.

The device is basically a low power microscope with the eyepiece EP close to the looking eye E1 and the objective OB close to the looked-into eye E2. Two plane mirrors M1 and M2 fold the path of the microscope. A beamsplitter BS just above the objective directs light from the source LS to illuminate E2. The separation of M1 and M2 can be adjustable to accommodate different inter-pupilary distances. Also, the whole display can be swiveled so that the viewer can look into the other eye.

Another possible method of looking into one's own eye is to use a CCTV with the low power microscope. In this case, the microscope path need not be folded and the
eyepiece is not needed. The image formed by the objective is directly imaged by the CCTV system and the image is displayed on a color or B&W video monitor.

If you are interested in designing or building such a device, please contact Donn Silberman.



KEY:
0B - Objective
EP - Eyepiece
BS - Beamspiitter
NL - Neutralizing negative lens
LS - Low-level light source
Ml & M2 - Plane mirrors
El - Looking eye
E2 - Looked into eye

PTICAL SOCIETY
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Around the OSSC

Aim and Purpose

It is the aim and purpose of this society to increase and disseminate the knowledge of Optics and closely allied sciences, to promote the mutual interests of investigators, teachers and students in these fields, and of designers, manufacturers and users of optical instruments and allied scientific apparatus as well as those who have optics as a hobby and to encourage cooperation and establish acquaintanceship among these persons.

OSSC members enjoying an intimate lecture in a UCLA Engineering classroom. Pizza, salads, lasagna & drinks as we support the possibility of a new student chapter. Read more about this in the Presidents Column on page 1.

ATEP
ADVANCED TECHNOLOGY & EDUCATION PARK

CACT

www.ATEP.us/CACT
New Summer Intro to Lasers Course
Meets Mons & Weds 07-02-08 through 08-06-08

DONATIONS ACCEPTED:

CACT@ATEP and the OISC have been accepting donations of instruments, materials, equipment, books and journals and of course volunteer time.

We would like to take this moment to thank:

- Don Wolpert for a collection of books.
- Opto-Sigma for a Gartner Autocollimator, Davidson Interferometer and lenses
- CVI Melles Griot for lots of optics blanks and raw glass.

Meetings of Related Societies

Orange County Astronomers – Monthly Meeting
May 9th. http://www.ocastronomers.org/

So Cal Science Café-
http://science.meetup.com/32/calendar/

Los Angeles Astronomical Society – General Meeting
May 12th , http://www.laas.org/Events.htm

UC Irvine OSA Student Chapter Meetings
Friday May 9th. Prof. Eric Van Stryland
(College of Optics and Photonics-UCF)
"Nonlinear Optical Spectroscopy"

Educational Outreach
UC Irvine Beall Center for Art + Technology
Sat. May 3rd – LIVE – Family Day Event with the OISC
http://www.beallcenter.uci.edu/

Up Coming Meetings

Date	Location	Speaker	Topic
17 May 2008 9:00a.m. (First Tee)*	Whispering Lakes Golf Club*	Golf Chair: Fred Houston	OSSC Annual Golf Tournament
11 June 2008*	Northrop Grumman Space Technology, Redondo Beach*	Kalin Spariosu	Industrial Applications of Nanotechnology
9 July 2008*	TBD*	2008-9 Board Planning Meeting	2008-9 Potential Programs, etc.

OSSC Corporate Members

These companies provide funding to the Optical Society of Southern California, enabling the OSSC to operate. We are grateful for their support.

A.W. I. Industries
Alson E. Hatheway, Inc.
Advanced Medical Optics
Britek Laser Optics
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Zygo Corp.

This OSSC Newsletter is sponsored by the Optics Institute of Southern California (OISC) and the Center for Applied Competitive Technologies (CACT) at the Advanced Technology & Education Park of the South Orange County Community College District.
A National Science Foundation Center of Excellence for Photonics Education.

MAY 2008 NEWSLETTER – TIME SENSITIVE

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