

Digital Conference

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Photonics for Ophthalmology

Photonics for Ophthalmology

FREE Digital Conference

Join us for a Webinar on Thu, Jun 9, 2016 12:00 PM - 3:15 PM EDT

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Photonics Media invites you to join us for our FREE upcoming digital conference, "Photonics for Ophthalmology," covering the latest in ophthalmologic therapies and technologies. Presentations from physicians, researchers and consultants will cover a range of topics, including photo-mediated ultrasound therapy, ophthalmological lasers, intraocular lenses, photobiomodulation and optical coherence tomography. The event will feature several 15-minute online presentations. Brief question-and-answer sessions will follow each presentation.

Conference Schedule

Noon-12:05 p.m. EDT: Introduction

12:05 p.m.-12:25 p.m. EDT: Femtosecond Laser Technology Driving Innovation in Ophthalmology Matthias Schulze, Coherent Inc.

In the past five years femtosecond (fs) laser technology, the tool of choice for LASIK surgery, has successfully entered the cataract market. The use of a fs laser improves surgical precision and allows the surgeon to use an Intraocular Lens Implant (IOL) customized for the specific patient. The path to wider adoption of Laser Refractive Cataract Surgery (LRCS) is to bring awareness of the benefits of combining the mandatory cataract lens replacement with the vision correction equivalent to LASIK and potentially even offsetting the effects of presbyopia, all in one procedure. The goal for the next decade is thus to make LRCS a lifestyle surgery with a cash-basis component, along a similar adoption path to that previously followed by LASIK. Matthias Schulze is Director of Marketing, OEM Components & Instrumentation for Coherent Inc.

12:25 p.m.-12:45 p.m. EDT: Photo-Mediated Ultrasound Therapy as a Novel Method to Selectively Treat Small Blood Vessels Dr. Yannis Paulus, University of Michigan

Retinal and choroidal neovascularization play a pivotal role in the leading causes of blindness, including macular degeneration and diabetic retinopathy, but conventional laser damages surrounding tissue. Using low intensity laser concurrently with relatively low intensity ultrasound, Dr. Paulus discusses a novel method he developed to treat small vessels without damaging surrounding tissue, known as photo-mediated ultrasound therapy (PUT), concluding that PUT may have a role in treating blood vessels without damaging surrounding tissue. Dr. Yannis Paulus is an academic vitreoretinal surgeon who investigates novel retinal imaging and treatment systems. Yannis M. Paulus, Xinmai Yang, and Xueding Wang have applied for a patent on PUT "Method and Apparatus for Removing Microvessels".

12:45 p.m.-1:05 p.m. EDT: Photobiomodulation Protects Mitochondrial and Retinal Function in a Rodent Model of Retinitis Pigmentosa Janis T. Eells, University of Wisconsin-Milwaukee

Ms. Eells has shown that photobiomodulation (PBM) by far-red to near-infrared light restores the function of damaged mitochondria, up-regulates the production of cytoprotective factors, and prevents cell death. Investigations by her research team have demonstrated improved outcomes in experimental models of retinal disease and in clinical retinal disease. She presents the method, results and conclusions of her study to test the hypothesis that a brief course of 830-nm PBM would preserve mitochondrial function and protect against photoreceptor loss in a rodent model of retinitis pigmentosa.

1:05 p.m.-1:25 p.m. EDT: Optical Coherence Tomography Angiography (OCTA) vs. Adaptive Optics Scanning Light Ophthalmoscope Fluorescein Angiography (AOSLOFA) – A Quantitative and Qualitative Comparison Study Dr. Richard Rosen, New York Eye & Ear Infirmary at Mount Sinai

Optical Coherence Tomography Angiography (OCTA) is a high resolution imaging technique for noninvasive quantitative visualization of retinal microvasculature. Dr. Rosen discusses a side-by-side comparison that was performed using higher resolution Ophthalmoscope Fluorescein Angiography (AOSLOFA) in healthy and diseased eyes to evaluate quantitative and qualitative similarities and differences. He discusses methods, results and conclusion, demonstrating that OCTA shows excellent agreement with AOSLOFA around the fovea of healthy and diseased eyes with minor differences. Dr. Richard B. Rosen is professor and vice chairman, surgeon director, retina service chief and director of research for the ophthalmology department at the New York Eye and Ear Infirmary of Mount Sinai and the Icahn School of Medicine at Mount Sinai in New York City.

1:25 p.m.-1:45 p.m. EDT: Visible-Light Optical Coherence Tomography for Functional Retinal Imaging Hao F. Zhang, Northwestern University

Visible-light Optical Coherence Tomography (Vis-OCT) represents a cutting-edge FOCT imaging technique that aims to dramatically improve the diagnostic capabilities and clinical benefit of OCT in ophthalmology. VisOCT is currently the only FOCT imaging modality capable of combining both high resolution structural imaging of blood vessels with precise measurements of metabolic activity, such as in the retina. Using dual band scanning with visible light and NIR light wavelengths, Vis-OCT represents a next-generation FOCT tool with the potential to fundamentally change how ophthalmologists use OCT in the diagnosis, treatment and monitoring of numerous major ocular disorders. Hao F. Zhang is an associate professor of biomedical engineering at Northwestern University.

1:45 p.m.-2:05 p.m. EDT: 4D Microscope-Integrated Optical Coherence Tomography for Image-Guided Human Ocular Surgery Oscar Carrasco-Zevallos, Duke University

OCT has revolutionized ophthalmic imaging and is now the gold standard for preoperative and postoperative evaluation of most retinal and many corneal procedures. Carrasco-Zevallos and others have developed initial microscope-integrated OCT (MIOCT) systems to image live human ocular surgery, but these were limited to 2D real-time imaging and required offline post-processing for 3D rendering and visualization. Carrasco-Zevallos presents a novel 4D MIOCT system that can record and display the 3D surgical field stereoscopically through the microscope oculars using a dual-channel heads-up display (HUD) at up to 10 micron-scale volumes per second. Oscar Carrasco-Zevallos is a Ph.D. graduate student at Duke University, working under the supervision of Joseph Izatt.

2:05 p.m.-2:25 p.m. EDT: Advances in Model Eyes and Tissue Phantoms for Optical Coherence Tomography Scott Rowe, Rowe Technical Design Inc.

Rowe documents his latest work in developing a new eye model with a solid-state cornea and liquid filled anterior and posterior chambers designed for demonstrating, validating and comparing ophthalmic OCT instruments. Scott Rowe is an inventor, entrepreneur, optical engineer and instructor with a passion for bringing disruptive products and technologies to successful market introductions. Currently he is developing Rowe Technical Design Inc., focused on manufacturing tissue phantoms for testing diagnostic devices, and consulting on the development of a variety of therapeutic and diagnostic instruments for ophthalmologists.

2:25 p.m.-2:45 p.m. EDT: Optical Concepts Used for Multifocal and Other Advanced Intraocular Lenses Michael Simpson, Simpson Optics LLC

Multifocal IOLs have been used for over 25 years following cataract surgery. Modest unwanted visual phenomena and limitations in the range of focus have been the greatest potential drawbacks of IOLs. The increased use of handheld devices has coincided with the evaluation of additional designs, with lower add powers used to adjust focus location. Recent refractive multifocal designs also address pupil limitations. Interest in "extended depth of focus" IOLs is leading toward a continuum of designs from monofocal to multifocal. Michael Simpson worked for many years in the research and development of multifocal IOLs at Alcon Co. He is now an independent consultant, specializing in technical issues relating to the design, fabrication, testing and performance of ophthalmic lenses.

2:45 p.m.-3:05 p.m. EDT: Cataract vs. Lens Replacement Surgery, Roger Reiss, SPIE President Award 2000 Recipient

Despite its designation "cataract surgery," what is achieved through this procedure is a lens replacement with a man-made lens. Reiss' cataract surgery led him to consider the following: 1. The eyeball and the eye lens are both optical transmission quality fluid material, not found anywhere in nature; and 2. The eye lens focal length is determined by many variables and a careful and complex calculation that requires adjustment according to the age of the individual to determine the proper eye lens curvature. Roger Reiss has been involved with the design, development, fabrication, assembly and testing, including alignment, of various precision instruments and instrument projects throughout his career. He was a columnist and contributing editor for the SPIE technical newspaper, OE Reports (1989-2000), and is a fellow of SPIE.

3:05 p.m.-3:10 p.m. EDT: Concluding remarks

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Date: June 9, 2016

Time: 12:00-3:15 pm EDT

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