Clinical Application of Adaptive Optics Retinal Imaging Incubator Meeting
Meeting Attendees

Lloyd Paul Aiello, M.D., Ph.D.
Dr. Lloyd Paul Aiello is Professor of Ophthalmology at Harvard Medical School, Vice Chair for Centers of Excellence at Harvard Department of Ophthalmology, Associate Chief, Massachusetts Eye and Ear at Longwood, Director of the Beetham Eye Institute of the Joslin Diabetes Center (JDC), Medical Director of Ophthalmology and Brigham & Women's Hospital, Head of the Section of Eye Research JDC, Vice President of Ophthalmology JDC, and Founding Chair of the National Eye Institute Diabetic Retinopathy Clinical Research Network. He received his doctoral degree in Biochemistry and a medical degree from Boston University School of Medicine. He completed residency in ophthalmology at the Wilmer Ophthalmological Institute at Johns Hopkins University and Hospital where he completed both a clinical vitreoretinal, and a research fellowship. He joined the JDC staff in 1994. A third-generation ophthalmologist, Dr. Aiello is committed to eliminating visual loss resulting from diabetic retinopathy and other related retinopathies which account for the majority of blindness among working-age individuals in developed countries. Dr. Aiello's research aims to determine the biochemistry and molecular mechanisms underlying early diabetic retinopathy and other retinal vascular disorders, and then develop and test novel therapeutic interventions through rigorous translational and clinical trial research. He has served as Chair for the Lions Club International Sight First Diabetic Retinopathy Research Program Review Panel, the Complications Section, of the Juvenile Diabetes Research Foundation (JDRF) Medical Science Review Committee and the Clinical Investigation Section of the JDRF. He is recipient of over 40 national and international awards for his research including the Alcon Research Institute Award, ARVO/Pfizer Ophthalmics Translational Research Award, Award of Merit in Retina Research from the Retina Society, Senior Achievement Award from the American Academy of Ophthalmology, Dolly Green Scholar Award, the Special Research Scholar Award and Lew R. Wasserman Merit Award from the Research to Prevent Blindness Foundation, Rosenthal Foundation Award and the Paul Henkind Memorial Lecturship of the Macula Society, Charles Schepens Award in Research, Outstanding Foreign Investigator Award from the Japan Society of Diabetic Complications, ARVO Fellow Silver Medal and the Novartis Award in Diabetes. He has authored 218 publications including contributions to the New England Journal of Medicine, Nature Medicine, PNAS, Journal of Biological Chemistry, Journal of Clinical Investigation, Diabetes, Lancet and many others covering a wide range of topics in diabetic eye disease.

Ben Backus, Ph.D.
Dr. Ben Backus has training in mathematics (B.A., Swarthmore College), cognitive psychology (M.A., U Penn), secondary education, vision science (Ph.D., Berkeley), and neuroscience (postdoc, Stanford). He was an Assistant Professor of Psychology at the University of Pennsylvania until 2007. Since 2007 he has been an Associate Professor at the Graduate Center for Vision Research, SUNY College of Optometry. His scientific work to date has emphasized perceptual learning and visual perception, especially stereopsis, in normally sighted adults. His work has been funded by the NEI since 2003, and by grants from the NSF and the Human Frontier Science Program. He is interested in AO as a technology for delivering high contrast visual stimulation at high spatial frequencies, which could prove useful to correct the central developmental disorders of binocular vision that cause amblyopia and strabismus.

Meeting Attendees

Samuel Barone, M.D.
Dr. Samuel Barone is an ophthalmologist who joined FDA's Office of Cellular, Tissue, and Gene Therapies in October 2009. As a senior medical officer, he is a subject matter expert on the application of human cell and tissue regulation with particular experience in the review of ophthalmic, reproductive medicine, and adipose-derived products. He completed ophthalmology residency at The New York Eye & Ear Infirmary and retina fellowship at the University of California, San Diego. In addition to his FDA duties, Dr. Barone continues regular clinical patient care at a practice in the Washington suburbs.

Paul Bierden
Paul Bierden is the President and CEO of Boston Micromachines Corporation. Mr. Bierden received his B.S. and M.S. in Mechanical Engineering from Boston University in 1992 and 1994. He has spent over 15 years working with high technology small business. Since co-founding Boston Micromachines in 1999, he has led research efforts in optical MEMS fabrication, system integration, and compact Adaptive Optics. He has been the PI on over a federally funded research programs and has over 50 publications to his name. He has also led the commercialization efforts of the company's optical MEMS systems which have resulted in global sales of their award winning product. A current focus of Boston Micromachines is providing adaptive optics solutions for life science imaging, which Mr. Bierden is leading. Prior to joining Boston Micromachines, Mr. Bierden worked with Prism Corporation as Chief Engineer. While at Prism, he was responsible for the development of new equipment for optical disk manufacturing. Mr. Bierden is a member of the Optical Society of America, SPIE and the Association for Research in Vision and Ophthalmology.

David G. Birch, Ph.D.
Dr. David Birch heads the research effort of the Retina Foundation of the Southwest (RFSW), which is a non-profit research institute, affiliated with the UT Southwestern Medical Center in Dallas, Texas. The RFSW is one of four institutions comprising the Southwest Regional Center of the Foundation Fighting Blindness, which he co-directs with Dr. Robert Anderson. He is also director of the Rose-Silverthorne Retinal Degenerations Laboratory, where he coordinates efforts to translate basic research findings into treatments for retinitis pigmentosa, age-related macular degeneration (AMD) and allied retinal degenerations. Recent work, for example, has established methods for studying photoreceptor function in patients by recording electrical responses to high-intensity stimuli. Other studies have established sensitive techniques for monitoring the efficacy of therapy in patients with macular degeneration. He and his collaborators have conducted and/or participated in several recent therapeutic trials in retinitis pigmentosa and macular degeneration. Dr. Birch received his graduate training at the University of California, Santa Barbara. He completed a one year fellowship with Dr. Jay Enoch at the University of Florida and a three year fellowship with Dr. Eliot Berson at Harvard University before moving to Dallas. He has been a recipient of continuous support from the National Eye Institute since 1984 and has served as both special reviewer and regular member of NIH Study Sections. He serves on the editorial boards of several journals and is a Scientific Advisor for the Foundation Fighting Blindness, Dallas Services for Visually Impaired Children, and the Dallas Academy of Biomedical Professions.

Meeting Attendees

Barbara Blodi

Barbara Blodi is currently a co-principal investigator at the Fundus Photograph Reading Center, University of Wisconsin, for the Age Related Eye Disease Study 2 (AREDS2) an NEI funded trial of dry macular degeneration. This study includes over 4000 subjects to be followed for at least 5 years with retinal imaging (color fundus photographs, autofluorescence images and optical coherence tomograms). In the area of wet macular degeneration, she has served as reading center principal investigator of Phase 3 clinical trials testing anti-vascular endothelial growth factors including the ranibizumab (Lucentis) trials by Genentech. In the field of retinal vein occlusion, she developed the reading center protocols for evaluating retinal images in the SCORE trial, a NEI funded trial of the treatment of macular edema due to retinal vein occlusion. As a member of the Executive Committee of the SCORE study, she participated in the design, conduct and analysis of this trial. Barbara's work in the imaging of retinal vein occlusion has also included a new grading method for widefield fluorescein angiography. The grading method involves using a widefield grid in order to evaluate subfields of the angiographic images. In addition, she has started analyzing optical coherence angiograms in patients with retinal vein occlusion with segmentation software. This technique allows us to correlate visual loss with changes in individual layers of the neurosensory retina and retinal pigment epithelium.

Steve Burns, Ph.D.

Dr. Steve Burns received a B.S. in Engineering from Lehigh University and a Ph.D. in Biophysics from the Ohio State University. He is currently a Professor of Optometry at Indiana University. Dr. Burns is a fellow three societies, the Optical Society, The Association for Research in Vision and Ophthalmology, and the American Academy of Optometry and is the 2010 awardee of OSA's Tillyer Award. He was the Chairman of OSA's Medical Optics Division in 1991, is the past Editor in Chief of the Journal of the Optical Society of America. Dr. Burns has served on numerous panels including the NIH BDPE Study Section and the FDA's Panel on Ophthalmic Devices and is currently the Chairman of the Optical Society of America's Publication council and a member of the Board of Directors. His current research interests include retinal function and the use of adaptive optics to image the cellular changes in the retina with aging and retinal disease. Dr. Burns's research involves the effects of aging and disease on the human retina. To pursue these research interests Dr. Burns has developed state of the art retinal imaging technology using adaptive optics. He applies this technology for two major areas of research. First, he is interested in understanding how cone photoreceptors vary both across the retina and between individuals, and the implications these variations have for visual information processing capacity. As part of this research he has made systematic investigations of cone packing density across the retinal in both normal and diseased eyes. The second area of interest is centered on the vascular structure of the human retina. His lab has developed techniques to map the retinal vasculature and to make precise measurements of blood flow and vessel caliber based on adaptive optics imaging.

Melanie Campbell, Ph.D.

Dr. Melanie Campbell is currently a Professor of Physics and Astronomy and in the School of Optometry and Vision Science at the University of Waterloo. She earned a BSc in Chemical Physics, University of Toronto, an MSc in Physics, University of Waterloo and, from the Australian National University, a Ph.D. in Applied Mathematics and Physiology. Following a CSIRO Fellowship at the Institute of Mathematics and Statistics in Canberra, Campbell returned to Canada with an NSERC University Research Fellowship. She undertakes experimental and theoretical research in the optical quality of the eye and imaging of its structures. She studies eye development, eye disease and linear and nonlinear optics of the eye. Campbell is known for her work on the gradient index optics of the crystalline lens, its changes with ageing and effects of visual experience on its refractive index distribution. Recently she has discovered putative optical signals to eye growth which appear to follow a circadian rhythm. She has developed and patented improved scanning laser and polarization methods for imaging the retina and biological tissues. She collaborated in the first real-time images of cones, using adaptive optics. She is involved in the development of adaptive optics and improved retinal imaging. Applications of interest include understanding of the ocular effects of diabetes, highly localized light activated therapies for eye disease and the diagnosis of neural diseases, using the retina as a window on the brain. Campbell is a Fellow of the Optical Society of America, a Fellow of the Institute of Physics (UK), holds an honorary Professional Physicist designation from and is a former President of the Canadian Association of Physicists. Campbell was also a co-founder of Biomedical Photometrics Inc, now Huron Technologies. Campbell shared the 2004 Rank Prize in optoelectronics for her work cited as "an initial idea (that) has been carried through to practical applications that have, or will, demonstrably benefit mankind."

Nicolas Chateau, Ph.D.

Dr. Nicolas Chateau has built his career on bringing groundbreaking ophthalmic products to market. After earning his Ph.D. at France's prestigious Institut d'Optique, he began his professional journey at international leaders including Essilor and Ocular Sciences. During that period, he led the development of novel contact lenses for correcting presbyopia and astigmatism which later became market leading products. At the same time, he realized that the rapid progress of surgical and pharmaceutical treatments for ophthalmic disorders would generate increasing needs for advanced diagnostic instruments. He cofounded Imagine Eyes in 1993 to tackle the challenge. Since the company's inception, Nicolas has piloted its efforts to incorporate adaptive optics, a technology originally developed for astrophysics, into medical diagnostic devices. Under his direction, the company has marketed several breakthrough products. The irx3™ Wavefront Aberrometer is routinely used in hundreds of laser refractive surgery clinics around the world. The rtx1™ Adaptive Optics Retinal Camera recently received its first regulatory approvals. This revolutionary instrument enables clinicians to visualize individual retinal cells and microscopic vascular structures and therefore track the earliest signs of pathology. Nicolas has ensured Imagine Eyes' progress over the years by leveraging the team's core technology competence and applying a well-balanced mix of strategic marketing, partnership building and international business development. Under his management, Imagine Eyes has benefited from several years of double-digit growth and continues to build upon its unique know-how to maintain its leading edge.

Emily Y. Chew, M.D.
Dr. Emily Chew is the Deputy Director of the Division of Epidemiology and Clinical Applications (DECA), at the National Eye Institute, the National Institutes of Health in Bethesda, Maryland. She is also the Chief of the Clinical Trials Branch in the division. Emily received her medical degree and her ophthalmology training at the U. of Toronto, Canada. She completed her fellowship in medical retina at the Wilmer Eye Institute, the Johns Hopkins Medical Institutes and the U. of Nijmegen, the Netherlands. Her research interest includes phase I/II clinical trials and epidemiologic studies in retinovascular diseases such as age-related macular degeneration, diabetic retinopathy, and other ocular diseases. She has worked extensively in large multi-centered trials headed by the staff from her division, including the Early Treatment Diabetic Retinopathy Study (ETDRS), the Age-Related Eye Disease Study (AREDS) and the Age-Related Eye Disease Study 2 (AREDS2), which she chairs. She works on other clinical trials in collaboration with other institutes within NIH such as the Actions to Control Cardiovascular Risk in Diabetes (ACCORD) Trial and she chairs the ACCORD Eye Study. She directs the clinical portion of the international study, Macular Telangiectasia Project.

Judith E. Chiostri, B.S., M.S., CCRA
Judith Chiostri currently serves as the Foundation Fighting Blindness Clinical Research Institute's Director of Clinical Development to oversee clinical trials. Her key responsibilities are to ensure that clinical investigators are following protocols, completing critical documentation, and meeting FDA study requirements. She is also responsible for making sure that clinical trials run smoothly, appropriately, and expeditiously. Prior to joining FFB, Ms. Chiostri was employed more than 25 years in monitoring and coordinating all phases of the clinical trial process. Most recently, she was the Clinical Advisor to the Congressionally Directed Medical Research Programs at Ft. Detrick, where she assessed day-to-day operations procedures for a number of clinical trials. Prior to that role, she was the Research Evaluation Analyst for Social and Scientific Systems, Inc., providing performance evaluation of an NIH global research network of 78 clinical sites, the AIDS Clinical Trials Group (ACTG). Ms. Chiostri also has experience in clinical study monitoring with PPD, Inc., in clinical study management with GloboMax, LLC, clinical site study coordination with MedStar, Inc., and research support/health education at the Johns Hopkins University Lipid Research Center. Ms. Chiostri received a Master of Science degree in Nutrition and a Bachelor of Science degree in Dietetics from the University of Maryland, College Park. She has authored and co-authored a number of publications and books, has earned a Six Sigma Yellow Belt in Project Management, is a Certified Clinical Research Associate, and is a member of both the Association of Clinical Research Professionals and the Regulatory Affairs Professionals Society.

Mina Chung, M.D.
Dr. Mina Chung is an associate professor of ophthalmology at the Flaum Eye Institute and Center for Visual Science at the University of Rochester. She completed medical school at Yale University School of Medicine, ophthalmology residency training at the Doheny Eye Institute, University of Southern California, and vitreoretinal fellowship at the University of Iowa Hospitals and Clinics. She then served on the faculty of Doheny Eye Institute and Children's Hospital of Los Angeles for 2 years prior to joining the University of Rochester in 2002. Her clinical vitreoretinal practice includes a focus on inherited retinal degenerations. Her research interest is in the application of adaptive optics imaging to the study of macular and retinal degenerations.

Thomas B. Connor, Jr., M.D.
Dr. Thomas B. Connor, Jr. is an Associate Professor of Ophthalmology. After serving as Assistant Chief of Service and Director of the Eye Trauma Service at the Wilmer Eye Institute of Johns Hopkins Hospital, he joined the Medical College of Wisconsin Department of Ophthalmology in 1994. His clinical interests include macular degeneration, diabetic retinopathy, epiretinal membranes, macular holes, retinal vein occlusions and retinal detachment management. Research interests include clinical trials of novel treatments, particularly drug therapy for retinal disease as well as different imaging modalities of the retina. Patient Care Emphases: Age-Related Macular Degeneration, Retinopathy of Prematurity, Diabetic Retinopathy, Macular Holes and Epiretinal Membranes, Diseases and Surgery of the Retina and Vitreous, Eye Trauma. Education: Doctor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, 1988 Training: Residency, Wilmer Eye Institute, Johns Hopkins Hospital, Baltimore, MD, 1992; Fellowship, Vitreoretinal Surgery, Medical.

Robert F. Cooper
Robert F. Cooper received his Bachelor's Degree in Biomedical Engineering at Marquette University in 2009. He is currently pursuing a Ph.D. in Biomedical Engineering through Marquette University, under the tutelage of Dr. Joseph Carroll at the Medical College of Wisconsin. His research interests' center upon the development and analysis of structural and functional metrics derived from images of the human photoreceptor mosaic.

Steven Cornelissen
Steven Cornelissen is the Vice President of Engineering at Boston Micromachines Corporation of Cambridge, Massachusetts. Mr. Cornelissen received his M.S. degree in mechanical engineering from Boston University following a B.S. degree in mechanical Engineering from San Jose State University. He has spent the last 12 years doing research and development in the field of optical MEMS focusing on the design and fabrication of optical MEMS devices for wavefront control. His work has resulted in industry-leading commercial deformable mirror systems used for adaptive optics in astronomical imaging, free-space laser communication, microscopy, and pulse-shaping applications. He has been leading the R&D activities at Boston Micromachines Corporation since 2004. Prior to joining Boston Micromachines Corporation, Steven was a research engineer in the Advanced Space Mechanisms group at Space Systems/Loral in Palo Alto, CA.

Catherine Cukras, M.D., Ph.D.
Dr. Catherine Cukras is a Staff Clinician at the National Eye Institute, NIH. She received her undergraduate degree at Princeton University, her combined M.D./Ph.D. at Washington University and completed a residency in Ophthalmology at the Scheie Eye Institute at the University of Pennsylvania. She joined the NEI as a staff member after completing a medical retina fellowship there. Her research efforts are focused on clinical research and in the design, implementation and analysis of clinical trials of medical retinal diseases including genetically inherited retinal diseases. She is particularly interested in using imaging modalities to understand disease pathogenesis as well as to investigate potential trial outcome measures. She is currently the principal investigator on a number of NEI clinical trials on a range of retinal diseases including age related macular degeneration, diabetic macular edema, vein occlusions and plaquenil toxicity. She also sees patients with a range of inherited eye diseases including X-linked Retinoschisis, Stargardt disease, and Retinitis Pigmentosa among others.

Bruce Drum, Ph.D.
Dr. Bruce Drum is a Physicist and Vision Scientist in the Division of Ophthalmic, Neurological, and ENT Devices at the Center for Devices and Radiological Health (CDRH), Food and Drug Administration (FDA). He received a B. Sc. in Physics in 1969 and a Ph. D. in Biophysics in 1973, both from the Ohio State University. After completing a postdoctoral fellowship in Physiological Optics at the Wilmer Eye Institute, Johns Hopkins University, he joined the Ophthalmology Department of the George Washington University where he conducted psychophysical research in normal vision and glaucoma, with special interests in color vision and peripheral vision. In 1984 he moved back to the Wilmer Institute, where he continued his basic and clinical research in visual psychophysics. In addition to his academic research, Dr. Drum has extensive experience as a consultant in the development of clinical vision tests and testing equipment. In collaboration with two academic colleagues and LKC Technologies, Inc., he helped to develop the first computerized visual electrodiagnostic system, as well as new methods and devices for evaluating color vision deficiency and visual field loss. In 1994, Dr. Drum joined the FDA as a reviewer of ophthalmic devices, where he is now the CDRH expert in vision and physiological optics. He has extensive experience in the review of diagnostic and surgical ophthalmic lasers and other ophthalmic imaging devices, as well as new technology intraocular lenses (IOLs) and other refractive surgery devices. He is also involved in the development of national and international standards and FDA guidance documents for refractive lasers, multifocal and accommodative IOLs, and a variety of diagnostic ophthalmic instruments including retinal imaging devices.

Adam M. Dubis, Ph.D.
Dr. Adam M. Dubis is a postdoctoral fellow in the Department of Ophthalmology at Duke University, working under the mentorship of Dr. Cynthia Toth. He received his B.A. degree from Carthage College in 2006 and completed his Ph.D. at the Medical College of Wisconsin in 2012, working under the guidance of Dr. Joseph Carroll. During his graduate studies he also served as a Marie Curie Fellow, working on projects involving adaptive optics under the guidance of Dr. Chris Dainty. He has published over 20 peer-reviewed publications. His primary interests are structure-function relationships in the developing human retina. This is accomplished using high-resolution tools to study the fine structure of the human macula and psychophysical techniques to assess function.

Meeting Attendees

Alfredo Dubra, Ph.D.
Dr. Alfredo Dubra is an Assistant Professor at the Ophthalmology Department of the Medical College of Wisconsin. He pursued a BSc and a research MSc in physics at the Universidad de la República in Montevideo, Uruguay. This was followed by Ph.D. studies and a postdoctoral fellowship in optics at Imperial College London in London, UK, under the supervision of Chris Dainty and Carl Paterson. Postdoctoral training continued with David Williams' mentorship at the Center for Visual Sciences of the University of Rochester, in Rochester, NY, where he joined the faculty in 2009. Dr. Dubra leads an interdisciplinary research group centered on the translation, development and dissemination of engineering, optical and mathematical tools for they study of eye disease.

David Eveleth, Ph.D.
Dr. David Eveleth is currently Entrepreneur in Residence at CONNECT in San Diego and works with small biotechnology and pharmaceutical companies in the areas of ophthalmology, neuroscience, and regenerative medicine. Dr. Eveleth was the head of the Ophthalmology Medicines Development Group at Pfizer and has extensive experience in the development of ophthalmic therapeutics and devices. He has also worked at a variety of large and small companies performing and managing discovery research, licensing and business development, and portfolio management and decision support across a wide range of therapeutic areas.

Sina Farsiu, Ph.D.
Dr. Sina Farsiu received his Ph.D. in electrical engineering from the University of California, Santa Cruz, where he was a Center for Adaptive Optics graduate student fellow. He is currently an Assistant Professor in the Departments of Ophthalmology and Biomedical Engineering, and Fitzpatrick Institute for Photonics at Duke University, where he is the director of the Vision and Image Processing (VIP) laboratory. Dr. Farsiu is also an Associate Editor for the IEEE Transactions on Image Processing. He is a recipient of NIH R01 and R21 funding and private foundation awards for projects related to photonic imaging and analysis of ocular diseases. His technical interests include automatic segmentation and quantification of the imaging biomarkers of ocular diseases on SD-OCT and adaptive optics systems and development of efficient signal processing based methods to overcome the theoretical and practical limitations that constrain achievable resolution of ocular imaging devices.

R. Daniel Ferguson
R. Daniel Ferguson is a Principal Research Scientist in the Biomedical Imaging Group at Physical Sciences Inc. where he has pursued invention, design and development of novel ophthalmic imaging systems for nearly two decades. Dan is the inventor of the line-scanning ophthalmoscope (LSO) used in commercial retinal imaging systems. He and his PSI colleagues have recently developed and deployed advanced multimodal AO imaging platforms for research now being tested in labs and clinics in the U.S. and Canada. PSI is continuing the development of a new compact AO-LSO system for rapid imaging and mapping of cone photoreceptors.

Yale Fisher, M.D.
Dr. Yale Fisher is a clinical ophthalmologist specializing in vitreoretinal diseases. Dr. Fisher's career is noteworthy in the areas of patient care, teaching, and research. He is the author of several textbooks in the field of vitreoretinal diseases and ultrasonography. Dr. Fisher has published more than fifty scientific articles and numerous scientific exhibits and posters. He was a course director for the American Academy of Ophthalmology for over 22 years and a review editor for many prestigious ophthalmic journals. He has received numerous awards for national and international professorships and lectureships. He has also been awarded the coveted Senior Award from the American Academy of Ophthalmology. He has lectured throughout the US and abroad in the areas of ultrasonography and vitreoretinal surgery, developing new techniques and instruments in his field as well as pioneering developments in ocular endoscopy. He was selected by departmental chairmen and sections chiefs at major centers nationwide as one of the 400 best doctors in America. Dr. Fisher has developed numerous intraocular surgical instruments which have advanced the field of vitreoretinal surgery. These instruments include electromagnets as well as endoscopic techniques for situations where microscopic visualization is limited or impossible, all innovative contributions to the field of ophthalmology and the goals of preservation and restoration of vision. Most recently, Dr. Fisher launched an extensive instructional website for educational purposes. The site, www.ophthalmicedge.org, contains lectures, animations and an extensive, interactive video library of real-time contact B-Scan ultrasonograms.

Anne Fulton, M.D.
Dr. Anne Fulton is Senior Associate in Ophthalmology, Boston Children's Hospital, and Professor in Ophthalmology, Harvard Medical School. Education was at Radcliffe College and Tufts University School of Medicine, followed by internship at Grady Memorial Hospital, Atlanta, Georgia, and residency in ophthalmology at Yale. Introduction to vision research was at the Institute for Molecular Biophysics, the Florida State University, in the laboratory of William A. H. Rushton and Mat Alpern. She serves on the editorial boards of *Investigative Ophthalmology and Visual Science, Documenta Ophthalmologica,* and *Translational Vision Science & Technology* and has published over 150 peer reviewed articles. Her clinical work focuses on retinal disorders in pediatric patients, and research is on retinal and visual development, normal and abnormal. Currently funded projects include an NEI supported investigation of the photoreceptors and post-receptor retinal circuitry in retinopathy of prematurity using psychophysical and electroretinographic procedures and AO imaging.

Kiyoko Gocho-Nakashima
Nippon Medical School Chiba Hokusoh Hospital

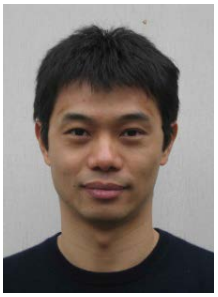
Jane Gwiazda, Ph.D.
Dr. Jane Gwiazda joined the faculty of The New England College of Optometry in 1995, where she is presently the Director of Research and a Professor of Vision Science. After obtaining her Ph.D. from Northeastern University, she was a research scientist at MIT and conducted studies of infant vision development focused on astigmatism and meridional amblyopia. Her current research interests include risk factors for myopia in children (e.g., parental myopia, lack of outdoor activity, corneal and whole eye aberrations) and treatments for myopia. Dr. Gwiazda chairs the Correction of Myopia Evaluation Trial (COMET), a multi-site, randomized clinical trial funded by the NEI/NIH that evaluated two types of lenses in slowing the progression of juvenile myopia. COMET is now a longitudinal investigation of the progression and stabilization of myopia including measurements of the optic disc, macular thickness, and choroidal thickness. Dr. Gwiazda is an editorial board member of *Investigative Ophthalmology & Vision Science* and the *Journal of Optometry*, and a fellow of the Association for Research in Vision and Ophthalmology and the American Academy of Optometry.

Daniel X. Hammer, M.S., Ph.D.
Dr. Daniel X. Hammer received a B.S in Electrical Engineering from Rensselaer Polytechnic Institute in 1991 and a M.S. and Ph.D. from University of Texas at Austin in 1998 and 2001. He has nearly 20 years experience in the invention, design, development, and application of biomedical optics and instrumentation to a broad range of interdisciplinary research programs. Dr. Hammer worked for Physical Sciences Inc. in Andover MA from 2001 to 2012, where he led the Biomedical Imaging Area in the development of line of clinical and research adaptive optics (AO) instruments. This work included development of several AO-SLO devices integrated with active retinal trackers, a multimodal AO platform with simultaneous AO-SLO/OCT imaging, and a compact, line-scanning AO imager. Clinical prototype AO devices developed under Dr. Hammer's guidance are operational in 8 clinics and research laboratories across the U.S. and Canada. He is co-editor of Advances in Optical Imaging for Clinical Medicine, has 13 patents and disclosures, over 50 peer-reviewed publications, and over 150 other papers and publications. He has been recognized at international conferences for his work in the development of AO instrumentation. Dr. Hammer is currently the Deputy Director of the Division of Physics in the Office of Science and Engineering Laboratories, Center of Devices and Radiological Health, Food and Drug Administration. He is a member of OSA, SPIE, and ARVO.

Masaaki Hanebuchi
Masaaki Hanebuchi has been working for NIDEK Ophthalmic Optics as the Senior Manager Advanced Technology Development, R&D Division Medical & Optical Operations since 1994 taking charge of optics especially of Auto Refractor, Aberrometer, OCT and AO-SLO. Since 2007, he has had the opportunity to be involved in the research and development project of AO-SLO which is the collaborative work with Kyoto University and supported in part by a grant from the New Energy and Industrial Technology Development Organization, Kawasaki, Japan. Masaaki has his BA and ME from Nagoya University.

Jennifer Hunter, Ph.D.
Dr. Jennifer Hunter is an Assistant Professor of Ophthalmology at the University of Rochester. She holds secondary appointments with the Center for Visual Science and Biomedical Engineering. She received her Ph.D. in Physics and Vision Science (2007) from the University of Waterloo. Dr. Hunter is an active member of the ANSI Z136 Safe Use of Lasers standards subcommittee (SSC-1) and the Laser Bioeffects & Medical Surveillance subcommittee (TSC-1). Her research interests include mechanisms of light-induced retinal damage and development of non-invasive fluorescence imaging techniques to study retinal function in healthy and diseased eyes.

Takeshi Kitamura
Takeshi Kitamura is a Director of Healthcare Solutions Division at Canon U.S.A., Inc. Takeshi has his Master Degree in Engineering from Sophia University. Takeshi has been working for Canon since 1984. He was in charge of developing ophthalmic equipment and new technologies for retinal imaging, ex. Fundus Camera, OCT and AOSLO. In 2012 he moved to Canon U.S.A. and is in charge of AOSLO Research in the U.S.A now.



Hyungsik Lim, Ph.D.
Dr. Hyungsik Lim is an Assistant Professor in Physics at Hunter College of the City University of New York. Dr. Lim received his Ph.D. in Applied Physics from Cornell University in 2005 on a subject of nonlinear fiber optics. Dr. Lim began to work on biomedical optics after moving to the Wellman Center for Photomedicine at the Massachusetts General Hospital. At the Wellman Center, Dr. Lim developed swept-source optical coherence tomography and demonstrated the highest speed for imaging the human retina in vivo. In the period of 2006-2009, Dr. Lim did a postdoctoral training in the Webb laboratory at Cornell University. His research was focused on the biophysics and instrumentation of multiphoton microscopy aimed for human disease diagnostics. Dr. Lim joined the CUNY in 2009. Currently in his lab at the CUNY, Dr. Lim studies novel label-free microscopy methods for visualizing the nervous systems, including the retinal nerve fibers.

Giuseppe Lombardo, MEng, Ph.D.
Dr. Giuseppe Lombardo graduated in Electronic Engineering in 1998 (summa cum laude). He earned his Ph.D. in Electronics in 2002 and a master's degree in Biomedical Engineering in 2004. His main investigations are devoted to optical, electro-optical and nano-mechanical properties of anisotropic materials, including liquid crystals and soft biological tissues, such as the cornea. He has been working as technologist at National Research Council (CNR) since November 2004. He is scientific coordinator for several assorted projects related to the development of new application in the renewable energy, security and biomedical sector. In particular he is the Lead of a granted national project PON01_00110, which aims to develop new nanotechnological platforms drug delivery in Ophthalmology. In the framework of the aforementioned project, there is a transfer technological seed activity for the development of an adaptive optics system for ophthalmic applications. He is also expert at the technological transfer and intellectual property fields. He is scientific responsible of CNR activities of the TECHNEST incubator, which it is located in the University of Calabria (Rende, Italy). In the last years, he was project manager of the technological activities of a start-up company (Innova Solar Energy SpA). He is also consultant for several Italian spin-off companies for the intellectual property protection. He is author of more than 45 scientific paper on peer reviewed international journals; he has presented, as author, more than n. 60 lectures in national and international congresses and he is inventor of n. 6 patents. He has been awarded an innovation prize for the development of innovative simulator of ocular aberration induced by refractive surgery.

Marco Lombardo, M.D., Ph.D.
Dr. Marco Lombardo graduated in Medicine and Surgery in 1999 (summa cum laude) at the University of Rome "La Sapienza". He specialized in Ophthalmology in 2003 (summa cum laude) at the Catholic University of Rome and earned his Ph.D. in Biomedical and Computer Engineering in 2007. His research fields of interest are adaptive optics retinal imaging, nanotechnology, corneal biomechanics, laser-corneal tissue interaction and corneal stem cells. He published more than 30 papers in peer-reviewed scientific journals and co-authored six books in the field of corneal laser surgery. He serves, on a regular basis, as reviewer for 12 scientific journals in the field of applied optics, microscopy and vision science. He has been working as researcher at the IRCCS Fondazione G.B. Bietti since January 2010. He is responsible for several assorted projects related to the development of new treatment modalities for keratoconus and limbal stem cell deficiency. Dr. Lombardo is working as principal investigator of the first and actually unique clinical trial on adaptive optics retinal imaging in Italy.

Michel Michaelides

Michel Michaelides is a Consultant Ophthalmologist at Moorfields Eye Hospital in the departments of Medical Retina, Inherited Eye Disease and Paediatric Ophthalmology; and is a Department of Health funded Clinical Senior Lecturer at the UCL Institute of Ophthalmology. He is a recipient of a career development award from the Foundation Fighting Blindness. He has undertaken a medical retina and genetics clinical fellowship at Moorfields Eye Hospital, and a combined ophthalmic genetics and paediatric ophthalmology clinical and research fellowship at the Casey Eye Institute, Oregon Health and Science University. He undertook a period of dedicated research (2002-2004), with his doctoral thesis entitled: 'Cone and Central Receptor Dystrophies – A Clinical and Molecular Genetic Investigation'. His clinical and research interests include diabetic eye disease and inherited eye disease in adults and children; with over 80 peer-reviewed publications and 12 co-authored book chapters. He collaborates closely with Professors Joe Carroll and Richard Weleber, culminating in multiple publications and presentations relating to both acquired and inherited retinal disease. He is actively involved in retinal clinical trials, being a principal investigator or principal investigator designee in 4 on-going clinical trials.

Toshifumi Mihashi, Ph.D.

Dr. Toshifumi Mihashi completed his physics undergraduate study at the University of Electro Communications in 1981 and obtained his Ph.D. in medicine from Osaka University in 2006. Dr. Mihashi worked for Topcon from 1981 to 2012. During his first 10 years at Topcon, he designed optics of civil engineering instruments and inspection systems for the semiconductor industry, and wrote a lens design program. From 1991 to 1993, he went to York University in Toronto and worked with David Regan studying psychophysics. Since then he has been interested in research and development related to the eye, including wavefront sensors. Recently, Dr. Mihashi moved to the Tokyo Institute of Technology as a research professor and is focusing on developing adaptive optics systems and Hyperspectral cameras and displays, and on research on electrophysiology and color vision.

Donald Miller, Ph.D.

Dr. Donald Miller earned a B.S. in applied physics from Xavier University and Ph.D. in optics from University of Rochester, with much of his doctoral work conducted in the Center for Visual Science. His research over the last 20 years has focused on the development and use of high-resolution optical systems for probing structure and function of the living human retina at the cellular scale. His early work resulted in the first images of cone photoreceptors in the living human retina and led to the first adaptive optics (AO) retina camera. At Indiana, his laboratory has pioneered the development of high-resolution optical systems based on the combined technologies of AO and optical coherence tomography, technologies with complementary strengths in lateral and axial resolution. His laboratory has used AO–OCT to capture volume images of retinal microstructures previously only visible with histology, enabling quantitative studies of individual cone photoreceptors, retinal capillaries, and retinal nerve fiber bundles.

Jessica I. W. Morgan, Ph.D.
Dr. Jessica I. W. Morgan is a Research Associate at the Scheie Eye Institute at the University of Pennsylvania. Dr. Morgan earned her bachelor's degree in physics and mathematics from Wake Forest University and her masters and doctorate degree in optical engineering from the University of Rochester. She did two postdoctoral fellowships with Dr. Edward N. Pugh, Jr. and Dr. Jean Bennett at the University of Pennsylvania. Currently, Dr. Morgan researches high-resolution imaging of retinal structure and function in patients with retinal degeneration.

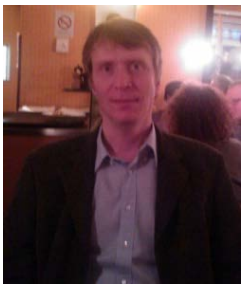
Matt Muller
Matt Muller is the Chief Operating Officer of Aeon Imaging, LLC, a medical devices company spun-off in 2005 from the Indiana University School of Optometry. He is the inventor of Aeon's patented DLP-Cam technology, which uses a digital light projector and rolling shutter CMOS sensor to perform cost-effective and flexible confocal imaging. Matt leads the development of Aeon's retinal camera for diabetic retinopathy screening, serving as PI of two Small Business Innovation Research grants (in Phase I and II), as well as for wide-field image guidance in adaptive optics systems.

Lisa A. Neuhold, Ph.D.
Dr. Lisa A. Neuhold, is currently a Program Director at the National Eye Institute (NEI) in the Division of Extramural Research and serves as Group Leader of the Fundamental Retinal Processes Program. She manages a portfolio of grants in photoreceptors, phototransduction, retinal pigment epithelium, retinal neuroscience, vitreous disorders and detachment, and cancer. She comes to the NEI from the National Institute on Alcoholism and Alcohol Abuse where she served as the Program Director of the Neurogenetics program. Dr. Neuhold received her Ph.D. from the University of Maryland and did her postdoctoral research at the California Institute of Technology. Before being recruited to the NIH, she worked for a pharmaceutical company, Wyeth-Ayerst Research as a Senior Research Scientist in the Molecular Genetics Division, where she supervised the production of transgenic and gene-targeted mice for use in drug development.

Sotaro Ooto, M.D., Ph.D.
Dr. Sotaro Ooto joined the Faculty of Medicine of Kyoto University and completed a medical course. He completed his residency in ophthalmology in 2001, after which he joined Kyoto University Graduate School of Medicine, where he worked on stem cell research. He became an assistant professor of Kyoto University Graduate School of Medicine in 2008, and he has been working as a member of the Macular Service and conducting studies on retinal imaging.

Richard Ornberg, Ph.D.

Dr. Richard Ornberg received a B.S. degree in chemistry and physics from Concordia College in Moorhead MN and a Ph.D. in Biophysics from Penn State University. Dr Ornberg began his professional as a Science Fellow in Neurology, Communicative Disease and Stroke and the Digestive, Diabetes and Kidney Diseases Institutes in Bethesda. MD. He went on to positions at Baxter Healthcare in Round Lake IL as a leader in pathology and the development of vascular grafts and cardiovascular devices and Monsanto as the director of the Microscopy Laboratory in the Analytical Sciences Center. During this tenure, Dr Ornberg established a preclinical pathology laboratory that supported the approval and expanded use of key drugs such as Celebrex for arthritis and cancer. Following the sale of Monsanto/Pharmacia to Pfizer, Dr Ornberg joined the Quantum Dot Corp, a nanotech-biotech start-up in Hayward CA for two years. In 2005, after Invitrogen purchased Quantum Dot, Dr. Ornberg joined Alcon Laboratories, Inc. and established the Research Imaging Laboratory in Pharmaceutical Product Research as a core facility for preclinical drug studies. His current position is with the Novartis Institute for Biomedical Research in Fort Worth. During his career, Dick has written over 60 scientific publications and 5 patents and served on numerous advisory boards for image related programs.



Michel Paques, M.D., Ph.D.

Dr. Michel Paques is an ophtalmologist involved in clinical applications of adaptive optics retinal imaging, in particular for vascular diseases. He is currently a Professor at the Quinze-Vingts hospital in Paris, France and also serves as an associated researcher at the Vision Institute. He published 19 peer-reviewed papers in the last 5 years.

Sung Pyo Park, M.D., Ph.D.

Dr. Sung Pyo Park graduated with honors (Second top) and received his M.D. from the Hallym Medical University, Seoul, Korea in 1996. After 5 years internship and residency in KangDong Sacred Heart Hospital, Hallym University Medical Center, Park worked in the Military Manpower Administration as a military doctor, the supreme office of central physical examination for 3 years. During this time, he received his Ph.D. from the Hallym University, Seoul, Korea in 2004. Park was a clinical fellow at Seoul National University Hospital, known as the one of the best hospitals in Korea, from 2004 to 2006 focusing on Retina and Vitreous. He is currently Associate Professor of Hallym University Medical Center. Since 2007 Park has served as Chairman of Department of Ophthalmology in KangDong Sacred Heart Hospital. As a clinical retinal specialist, his main work in Korea is correcting the pathologic state especially in vitreoretinal disease and cataract as well as research associated with his clinical performance. In 2011, recognized for his academic achievements and brilliant performances in research field, he was chosen to work as a research fellow in Columbia University Medical Center, New York. Since then, he has worked at the Edward S. Harkness Eye Institute with Prof. Stanley Chang, Dr. Steve Tsang and other brilliant researchers and had charge of Adaptive Optics Scanning Laser Ophthalmoscopy (Canon Inc.) in Columbia University Medical Center. His research with AO-SLO provides a measure of cone structure in patients with diseased retina at a sensitivity level that cannot be attained with conventional clinical instruments, especially in early stages of various vitreoretinal diseases. From 2008 to 2010, he served as council member and chairman of the Korean Ophthalmological Society and currently is a member of Korean Retinal Society, KSCEV, ASRS and Retina Society. He received a Rhett Buckler Award in 14th annual ASRS film festival in 2012.

Mark Pennesi, M.D.
Dr. Mark Pennesi studied in bioengineering at the University of Pennsylvania and graduated Summa Cum Laude. He earned a combined M.D./Ph.D. from Baylor College of Medicine in Houston, TX. His Ph.D. degree focused on retinal electrophysiology and animal models of retinal degeneration in the laboratory of Dr. Samuel Wu. He spent his internship at Scripps Mercy Hospital in San Diego and subsequently received his residency training in Ophthalmology at the University of California-San Francisco. Under the mentorship of Dr. Richard Weleber, he earned a fellowship in Ophthalmic Genetics, Electrophysiology, and Medical Retina. He is currently an Assistant Professor in the Department of Ophthalmology at Casey Eye Institute. His clinical and research interests include understanding inherited diseases of retinal degeneration as well as developing novel therapies for these diseases. His interests include retinal imaging using adaptive optics and hand-held spectral domain OCT.

Michael Pircher, Ph.D.
Dr. Michael Pircher graduated from the Experimental Physics Department of the University of Technology of Graz, Austria in 2000. In 2003 he finished his Ph.D. at the University of Technology of Vienna. From 2003 to 2006 he worked as a Postdoc at the Center for Biomedical Engineering and Physics of the Medical University of Vienna. From 2006 to 2012 he was working as an Assistant Professor at the Center for Medical Physics and Biomedical Engineering of the Medical University of Vienna where he gained his Habilitation in 2008 and where he became Associate Professor in 2012. He is currently faculty member of the same department. His scientific interests lay in retinal imaging, adaptive optics, new contrast techniques in optical coherence tomography and coherence microscopy. He has published more than 60 papers in the field in peer reviewed journals.

Jason Porter, Ph.D.
Dr. Jason Porter earned his B.S., M.S., and Ph.D. degrees in Optics from the University of Rochester's Institute of Optics. As a graduate student under the advisement of Dr. David Williams, he investigated the sources of optical aberrations induced in conventional and customized LASIK (laser in-situ keratomileusis) procedures. Jason then conducted his postdoctoral work with David Williams at the Center for Visual Science (University of Rochester) in the area of high-resolution retinal imaging using adaptive optics. As an Associate Professor at the University of Houston's College of Optometry (UHCO), Jason develops and uses high-resolution *in vivo* imaging technologies (such as adaptive optics scanning laser ophthalmoscopes) to better understand the mechanisms responsible for the development and progression of retinal and optic nerve head-related diseases (such as glaucoma and photoreceptor-based degenerations). These experiments are complimented with the use of other clinical imaging techniques (e.g., spectral domain optical coherence tomography) and visual function examinations (e.g., perimetry and electroretinography) to investigate structure-function relationships. Jason has received grants from the NIH, Optoelectronics Industry Development Association, and Texas Higher Education Coordinating Board.

Hope Queener

Hope Queener is an Application Developer at the University of Houston, College of Optometry. She has served as the Principal of the Research Computer Programming Module for the college's NIH Core Center Grant since 1994, providing software development and project management for various vision science applications, including psychophysics, neurophysiology, image analysis, wavefront sensing, and adaptive optics imaging systems. Her education includes a B.S. in bioengineering from Texas A&M University and an M.S. in optical sciences from the University of Arizona. Prior to her work in vision science, she worked with nuclear imaging and MRI software (U of AZ, University of Texas Health Science Center at San Antonio) and signal processing hardware (Texas Memory Systems, Inc.).

Austin Roorda, Ph.D.

Dr. Austin Roorda received his Ph.D. in Vision Science & Physics from the University of Waterloo, Canada in 1996. In his postdoctoral appointment at the University of Rochester, he used the world's first adaptive optics ophthalmoscope to measure the properties of human photoreceptors, which included generating the first-ever maps of the trichromatic cone mosaic. From 1998 to 2004, he was at the University of Houston College of Optometry, where he designed and built the first Adaptive Optics Scanning Laser Ophthalmoscope (AOSLO). His research is supported by the NIH, Foundation Fighting Blindness, and other foundation and industrial support. Since January 2005, he's been at the UC Berkeley School of Optometry where he is the current chair of the Vision Science Graduate Program. In 2009, he was elected as a Fellow of the Optical Society of America and received the Glenn A. Fry award, the highest research honor from the American Academy of Optometry. His current research involves the use of adaptive optics and other advanced technology for clinical (understanding and monitoring eye disease, including the evaluation of treatments) and basic (studying the limits of human vision on a cellular scale) applications.

Stephen M. Rose, Ph.D.

Dr. Stephen Rose joined the Foundation Fighting Blindness as the Chief Research Officer in December 2004 and is responsible for the leadership and direction of the Foundation's research efforts. He manages the day-to-day operations of the Science Department, works with the Foundation's Scientific Advisory Board and Science Liaison Committee, and provides overall leadership to its grants and awards program. Dr. Rose also works with Chief Drug Development Officer of the Foundation Fighting Blindness Clinical Research Institute (FFB-CRI), the clinical arm of the Foundation. The FFB-CRI's mission is to facilitate the translation of laboratory-based research into clinical programs for "back of the eye" therapy. Prior to joining the Foundation, Dr. Rose served Director, Division of Clinical Recombinant DNA Research, Office of Biotechnology Activities (OBA), NIH Office of Science Policy. In this position, he served as the Executive Secretary for the Recombinant DNA Advisory Committee and provided oversight and coordination for the recombinant DNA program, working with OBA staff and NIH Institute and Center staff to address issues regarding recombinant DNA, including human gene transfer clinical protocols. He also provided scientific input to the Secretary's Advisory Committee on Xenotransplantation. Before joining OBA, Dr. Rose was Director of the Office of Clinical Applications in the Division of Allergy, Immunology and Transplantation at the National Institute of

Allergy and Infectious Diseases. He supervised a staff of Medical Officers, nurses and regulatory experts to support the Division's clinical trials programs, including the adult and pediatric kidney transplantation cooperative studies, the Inner City Asthma cooperative study, the Autoimmunity Centers of Excellence and clinical trials conducted under individual investigator grants. Before accepting that position, Dr. Rose was the Chief of the Transplantation Immunobiology Branch in the same NIAID Division and established the kidney transplant clinical trial program. Dr. Rose has received several awards throughout his career, including the American Society of Transplantation-Roche Distinguished Service Award for Transplantation, the North American Pediatric Renal Transplant Cooperative Study Group Distinguished Service Award, the U.S. Secretary of Health's Distinguished Service Award, the NIH Director's Award, and the NIH Merit Award. Dr. Rose is currently a member of the Board of Directors and the Finance Committee of the Health Research Alliance and the Consumer Representative on the FDA's Center for Biologics Evaluation and Research Cellular, Tissue and Gene Therapies Advisory Committee. Dr. Rose received his B.S. in Biology with Honors from American University and his Ph.D. from the University of Virginia. Upon completion of his doctorate, he was a NIH postdoctoral fellow at Washington University in St. Louis. He also held academic positions at the University of Texas Southwestern Medical School and the University of New Mexico Cancer Research Center.

Richard B. Rosen, M.D., FACS, FASRS, CRA

Richard Rosen is a vitreoretinal surgeon and consultant at the New York Eye and Ear Infirmary where he serves as Vice Chairman and Director of Ophthalmic Research, as well as Surgeon Director and Chief of Retinal Services. Dr. Rosen's academic appointments include Professor of Ophthalmology at the New York Medical College and Visiting Professor in Applied Optics at the University of Kent in Canterbury, UK. He received his bachelor's degree in psychology and MD from the University of Miami School of Medicine. In addition he did graduate work in psychophysics in the Laboratory of Neuromagnetism at New York University, and worked for several years as a professional photographer in New York City, with an interest in scientific and ophthalmic photography. He serves on the Executive Board of the American Society of Ocular Trauma and the editorial boards of Retinal Physician and Ophthalmic Lasers, Surgery and Imaging. His research interests include new treatments for age-related macular degeneration, diabetic retinopathy, and macular edema, along with innovations in diagnostic retinal imaging and vitreoretinal surgical instrumentation. Through his collaboration with Professor Adrian Podoleanu at the University of Kent and Rishard Weitz, of Ophthalmic Technologies, Inc. he helped develop the first combined OCT/SLO instruments including versions that feature ultrahigh resolution, combined OCT/SLO with integrated ICG Angiography, and OCT/SLO with integrated Microperimetry. His Advanced Retinal Imaging Laboratory at the New York Eye and Ear Infirmary is dedicated to translation and implementation of novel technologies to address clinical problems, including High Frequency and 3-D Ultrasound, Macular Pigment Densitometry, Retinal and Choroidal Blood Flow Monitoring, Retinal Oximetry and Metabolic Imaging, as well as the extremes of Anatomic Imaging. Collaborating with Joe Carroll, Alf Dubra, and Rishard Weitz, he has recently built an AOSLO facility in the Infirmary's Einhorn Clinical Research Center, designed to provide easy access for patients in the Metropolitan Tristate area to Single Cell Retinal Imaging.

Ethan A. Rossi, Ph.D.

Dr. Ethan A. Rossi received his Ph.D. from the University of California, Berkeley in 2009. His dissertation work, performed in the laboratory of Austin Roorda, focused on the limits of human visual resolution. Rossi was recognized as an outstanding graduate student instructor at Berkeley in 2007 and received the Young Investigator Award at the OSA Fall Vision meeting in 2008. Dr. Rossi joined the laboratory of David Williams at the Center for Visual Science at the University of Rochester as a postdoctoral fellow in 2010. His postdoctoral work is focused on tracking disease progression in age related macular degeneration using adaptive optics imaging methods. Dr. Rossi's postdoctoral work has been supported through a postdoctoral award from Fight for Sight and a National Research Service Award from the National Eye Institute.

Hendrik P.N. Scholl, M.D., M.A

Dr. Hendrik P.N. Scholl is the Dr. Frieda Derdeyn Bambas Professorship in Ophthalmology at the Wilmer Eye Institute, Johns Hopkins University and Head of the Visual Neurophysiology Service. He received his M.D. from the Eberhard Karls University of Tuebingen, Germany, and did his residency at the Centre for Ophthalmology, University of Tuebingen. He did a clinical research fellowship at Moorfields Eye Hospital, London, UK. In 2004, he was awarded a Heisenberg-Fellowship of the German Research Foundation for his achievements in the field of macular degeneration and subsequently joined the faculty at the Dept. of Ophthalmology, University of Bonn for 5 years until he was recruited to the Wilmer Eye Institute in 2010. Dr. Scholl specializes in medical and surgical management of retinal diseases such as age-related macular degeneration and diabetic retinopathy. He has a specific expertise in inherited retinal and macular degenerations. He has has published more than 100 peer-reviewed original and review articles, inside and outside the eye literature in such journals as *Nature*, *Journal of Immunology*, *American Journal of Human Genetics*, *Human Molecular Genetics* and *PLoS ONE*. Dr. Scholl has been funded in the past by the European Commission and the German Research Foundation. In 2008, he received the European Vision Award and in 2010 the Wynn-Gund Translational Research Award by the Foundation Fighting Blindness and the Macular Degeneration Research Award by the American Health Assistance Foundation.

Ronald A. Schuchard, Ph.D.

Dr. Ronald A. Schuchard is a Research Career Scientist in the VA Rehabilitation R&D Service at the VA Palo Alto Health Care System. He holds a Clinical Associate Professor appointment at Stanford University School of Medicine in the Department of Neurosurgery and is a member of the Stanford Institute for Neuro-Innovation & Translational Neurosciences (SINTN). Dr. Schuchard earned a M.S. in Physics from DePaul University and a Ph.D. in Medical Physics from the University of Chicago. He completed a vision research fellowship at the Wilmer Institute of the Johns Hopkins University. The focus of his research is the functional vision assessment of innovative biomedical technologies for the treatment and rehabilitation of vision loss. Specific research activities at this time include: 1) studies of vision loss due to retinal degenerative diseases; 2) studies in the functional vision consequences of vision loss due to TBI; 3) evaluation of interventions for visual field loss especially as it relates to wayfinding; 4) retinotopic reorganization

(neural-plasticity) in people with central scotomas; and 5) effects of medical therapies (9-cis retinol, etc.) on functional vision for inherited retinal diseases and nyctalopia. Dr. Schuchard is an ARVO Fellow (Association for Research in Vision and Ophthalmology) and serves on many national boards including the Visual Impairment Advisory Board (VHA Executive Board) and the editorial board of the Journal of Rehabilitation Research & Development.

Drew Scoles
Drew received a bachelor's degree in biomedical engineering from the University of Rochester in 2008. He is currently enrolled in an M.D./Ph.D. program at the University of Rochester, under the direction of Alfredo Dubra. His research interests include the application of AO to the study of human retinal disease, and improving the resolution of AO instruments.

Paul Sieving, M.D., Ph.D.
Paul A. Sieving, M.D., Ph.D. is Director of the National Eye Institute at the National Institutes of Health. Beyond his administrative duties at the NIH, he also maintains a portfolio of clinical care and laboratory research. His long-term investigation seeks to define the pathophysiology of X-linked retinoschisis, using clinical studies and cell biology of a gene-knockout XLRS mouse model created in his laboratory. The Sieving laboratory has successfully treated this mouse using AAV-vector delivery of the Rs1 gene and is completing pre-clinical investigations towards obtaining an FDA IND to initiate a human clinical trial. Prior to his appointment at the NIH, Dr. Sieving served on the faculty at the University of Michigan (1985–2001), where he was the Paul Lichter Professor of Ophthalmic Genetics and was the founding Director of the Center for Retinal and Macular Degeneration, Department of Ophthalmology and Visual Sciences.

Hongxin Song, Ph.D.
Dr. Hongxin Song currently is a research associate in Center for Visual Science, University of Rochester. He received his Ph.D. from School of Optometry, Indiana University, under the supervision of Stephen Burns. He developed the first Polarization-sensitive AOSLO system and successfully extracted different polarization components of the light returning from individual cells from the retina. He also studied cone photoreceptors in younger subjects and older subjects and compared the cone packing density difference in these two groups and discovered that people lose photoreceptors in the central retina with aging. His current research is applying the latest advanced retinal imaging techniques (adaptive optics) in studying patients with different retinal diseases.

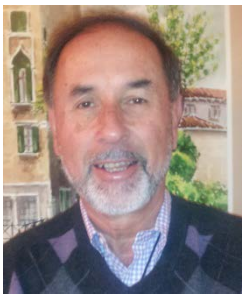
Kimberly Stepien, M.D.
Dr. Kimberly Stepien is Asst. Professor of Ophthalmology specializing in medical retina at the Medical College of WI. She joined the faculty after completing a retina fellowship at the Bascom Palmer Eye Institute. She is one of the founding co-directors of the Advanced Ocular Imaging Program at the Medical College of WI. Her research interests include applying novel, high-resolution retinal imaging tools to better understand clinical retinal pathology. Current emphasizes include detecting disease at an earlier, pre-clinical state and developing a better understanding degenerative conditions on a cellular level.

Yusufu Sulai
Yusufu Sulai received his Bachelor's degree in physics from Allegheny College in 2008. He is currently pursuing a Ph.D. in optics from the Institute of Optics, University of Rochester. His research interests, developed under the guidance of Dr. Alfredo Dubra, are primarily centered on the optical design of ophthalmic adaptive optics systems.

Jennifer Sun, M.D.
Dr. Jennifer Sun, an assistant professor in the Harvard Department of Ophthalmology, graduated from Harvard College and Harvard Medical School, and completed ophthalmology residency and vitreoretinal fellowship at the Massachusetts Eye and Ear Infirmary. She was the first participant in the NIH-sponsored Vision Clinical Scientist K12 program at Harvard. She received a Masters in Public Health in 2007 at the Harvard School of Public Health. Since 2005, Dr. Sun has served as Chief of the Center for Clinical Eye Research and Trials of the Beetham Eye Institute, Joslin Diabetes Center. She has served as the nationwide Protocol Working Investigator for the Diabetic Retinopathy Clinical Research Network (DRCR.net) since 2010, and as such is instrumental in the initial proposal, multi-level review and implementation of all new DRCR.net protocols. In 2012, she was also selected as one of three Vice Chairs for the Network, helping to oversee management of one-third of the DRCR.net sites. She is also a member of the DRCR.net's Operations Group and Executive Committee. Dr. Sun is the Section Editor for the Microvascular Complications: Retinopathy section for the journal, Current Diabetes Reports. In 2008, she received the ARVO/Alcon Early Career Clinician-Scientist Research Award for her work with the Joslin 50-Year Medalist Study. She has also served as the nationwide Protocol Chair for the DRCR.net study "Evaluation of Visual Acuity Measurements in Eyes with Diabetic Macular Edema", site Principal Investigator (PI), co-PI, or subproject PI for 14 additional clinical trials, and as a co-investigator on 18 other studies. She has been first author of 5 peer-reviewed publications and co-authored an additional 14. Her research includes the search for protective factors against retinal vascular complications in diabetes as well as an assessment of early biomarkers of diabetic retinopathy progression, including changes in retinal blood flow and the photoreceptor mosaic.

Johnny Tam, Ph.D.
Dr. Johnny Tam received his Ph.D. in Bioengineering from the UCSF / UC Berkeley Joint Graduate Program in Bioengineering, under the supervision of Austin Roorda. He developed a motion-contrast enhancement technique to noninvasively image human retinal capillaries using an adaptive optics scanning laser ophthalmoscope, and used the technique to investigate capillaries in patients with diabetes. He received a Whitaker International Postdoctoral Fellowship to pursue research at the Institute of Photonic Sciences in Barcelona, Spain. His current project combines microfluidics with super resolution STORM microscopy to investigate dynamic cellular processes.

Hiroko Terasaki, M.D., Ph.D.
Dr. Hiroko Terasaki graduated with a medical degree in 1980 at Kanazawa University, School of Medicine. She got a Ph.D. in 1984 at Nagoya University, Graduate School of Medicine. She was an Assistant Professor from 1991 to 1998 and an Associate Professor from 1998 to 1999 in Department of Ophthalmology, Nagoya University Hospital. She was a Visiting assistant professor at Harvard Medical School in 1997. She became a Professor in Protective Care for Sensory Disorders, Nagoya University, School of Medicine from 1999 to 2005. Now she is the chairman and the professor of the Department of Ophthalmology Nagoya University, Graduate School of Medicine since 2005. Dr. Terasaki is a vitreoretinal surgeon. She is a specialist in electrophysiological and psychophysics, and a member of Club Jules Gonin, ARVO, AAO, etc. Dr. Terasaki has published many articles on macular ERG as well as on other vitreoretinal diseases. Dr. Terasaki also now has started research about adaptive optics.



John Todhunter, Ph.D.
Dr. John Todhunter is Sr. VP for Science and Regulatory Affairs at SRS International Corp. SRS provides a variety of development support services to the pharmaceutical and medical device industry and is located in the metropolitan Washington, DC area with additional offices in Venice, FL. He received his B.S. degree from UCLA in 1973 and completed his Ph.D. at UCSB in 1976. He did a postdoctoral fellowship at the Roche Institute of Molecular Biology in Nutley, NJ after which he became an Assistant Professor of Biology at the Catholic University of America (CUA) in Washington, DC. While at CUA Dr. Todhunter was appointed Chairman of the Biochemistry Program and was also appointed by the Governor of MD as a scientific representative on the MD Hazardous Waste Facilities Siting Board. In 1981 he was appointed by the President to serve as Assistant Administrator for Pesticides and Toxic Substances at the Environmental Protection Agency, a position which he assumed after being so confirmed by the U.S. Senate. After leaving the EPA in 1983 Dr. Todhunter founded SRS International. Dr. Todhunter is a Fellow of the American Institute of Chemists, a Member of the American College of Clinical Pharmacology, a Diplomate of the American Board of Forensic Examiners, is Regulatory Affairs Certified, and has been a Diplomate of the American Board of Toxicology. He has published over 50 peer-reviewed publications and has written or contributed to a large number of FDA INDs, NDAs, BLAa, PMAs and 510k's for SRS clients over the years as well as similar work submitted to international regulatory authorities. Current interests and activities are clinical trials design and oversight, regulatory strategy, and development of novel therapeutic approaches and products.

Chinatsu Tosha Short, Ph.D.
Dr. Chinatsu Tosha Short graduated from a Ph.D. program in Department of Psychology, Claremont Graduate University (CA), with a specialization of vision science. Following a completion of my doctoral program, I joined Jules Stein Eye Institute, UCLA, as a post-doctoral fellow. I am currently working at a pharmaceutical company; Allergan, Inc., (Irvine, CA) as a scientist in Ocular Pharmacology team, Department of Biological Science. My primary research interests include functional and structural evaluation of retinal degenerative diseases in clinical settings as well as animal model development of ocular diseases. I have mainly been involved in electrophysiological diagnosis of ocular diseases in clinical settings, focusing on developing novel and more sensitive measures of retinal function. In addition, I have been conducting a research of correlational analyses in functional and structural changes throughout the progression of retinal degenerative diseases, especially in Stargardt's disease and age-related macular degeneration.

Norihiko Utsunomiya
Norihiko Utsunomiya is a Senior Engineer of Medical Imaging Project at Canon Inc. He graduated from the Department of Mechanical Engineering of Waseda University. He has been working for Canon since 1992. He spent first 10 years in Canon as software engineer for semiconducter production equipment. In the last 10 years he has been developing medical equipment and building business strategies for ophthalmic equipment.

Rishard Weitz
Rishard Weitz is currently the Senior Technical Advisor Retinal Imaging, The New York Eye & Ear Infirmary. He is also the technical, cooperate advisor to early stage medical device, biomedical and private equity companies. From 2008 to 2011 Rishard was the Executive Vice president, Opko Instrumentation. OPKO Health, Inc. is a publicly traded healthcare company involved in the discovery, development, and commercialization of proprietary pharmaceutical products, medical devices, vaccines, diagnostic technologies and imaging systems. In 1993, Rishard founded Ophthalmic Technologies Inc. (OTI) and served as president from 1993 – 2007. OTI was the first company to develop 3D Ultrasound as well as the first computerized Ultrasound including B & A-Scan, compact UBM and 3D. The company also developed the first ENT and Ophthalmic Micro-endoscope with laser delivery. The company also developed with the University of Kent (UK) the first combined Optical Coherence Tomography and Scanning Laser Ophthalmoscopy (OCT/SLO) as well as a Spectral OCT/SLO and Microperimetry system. During the 80's to 1993, Rishard was involve in the development of surgical lasers including: CO2 and CW:Yag lasers as well as Argon, Argon/Krypton, Q-switched Yag, Dye and solid state Diode and KTP Green lasers for ophthalmic applications. From 1982 until 2007 he was involved in development of ophthalmic ultrasound system including the first 3D ultrasound which was commercialized in 1995. Prior to that he work in research at a number of academic institutes.

Carol Westall, Ph.D.
In Dr. Carol Westall's lab, clinical-research guides research directions. New discoveries from research are translated into diagnostic techniques and advanced clinical management that. Dr. Westall obtained her Ph.D. from the University of California (Berkeley); she is an Optometrist, Director of the Visual Electrophysiology Unit at and Senior Associate Scientist at SickKids. Under her direction, the Visual Electrophysiology Unit has become a world leader in clinical paediatric visual electrophysiology. Dr. Westall is member of the Board of the International Society for Clinical Visual Electrophysiology and Vision and is on the editorial board of the Society's journal (Documenta Ophthalmologica). The major focus of the Westall lab is the investigation of neuro-visual markers of visual dysfunction when the developing visual system has been compromised. Dr. Westall uses neurophysiological recordings to identify sites of neuro-retinal dysfunction in adolescents with early diabetes and in children with cone dystrophy. Multi-model adaptive optics structural imaging (PSI) is targeted on sites with normal and abnormal function to investigate the association between structure and function.

Wai Wong, M.D., Ph.D.
Dr. Wai Wong heads the Unit on Neuron-Glia Interactions in Retinal Disease at the National Eye Institute, NIH that focuses on cellular mechanisms in the retina related to disease pathogenesis. He is currently the principal investigator on a number of retinal clinical trials conducted at the NEI. He received his degrees at MIT and Washington University in St Louis, and completed his postdoctoral scientific and clinical training at University of Pennsylvania and the NIH. His research focuses on translational approaches to understanding and targeting cellular mechanisms in diseases such as age-related macular degeneration and diabetic retinopathy. He is board certified by the American Board of Ophthalmology and a member of the Macula Society. Dr. Wong is also a member of PXE International's Professional Advisory Board.

Tom Wright, Ph.D.
Dr. Tom Wright received his Ph.D. in the Neurophysiology from the University of Gothenburg, Sweden in 2012. Working with Dr. Carol Westall at the Hospital For Sick Children he is interested in improving the sensitivity and specificity of clinical visual electrophysiological testing by applying advanced signal analysis techniques. He is using adaptive-optics enhanced retinal imaging to describe structural changes of the retina occurring in patients with Type 1 diabetes and to associate these changes with observed changes in retinal function. In addition he is using AO imaging to provide phenotypic descriptions of disease in populations with genotypically well described retinal disorders.

Nagahisa Yoshimura, M.D., Ph.D.
Dr. Nagahisa Yoshimura is Professor and Chairman, Department of Ophthalmology and Visual Sciences, Kyoto University Graduate School of Medicine, Kyoto, Japan. One of his main interests is retinal imaging and he has been collaborating with a couple of companies including Canon, Nidek and Topcon to develop new diagnostic instruments and also to apply retinal imaging technologies to retinal diseases and glaucoma. In his Department, there are several prototype AO-SLO machines and Imagine Eyes AO camera. He has eight publications on AO-SLO in Ophthalmology, Arch Ophthalmology, AJO and IOVS.

Robert Zawadzki, Ph.D.
Dr. Robert J. Zawadzki was born in Torun, Poland. He graduated from the Nicolaus Copernicus University with MSc in Medical Physics (Prof. Kowalczyk). He received his Ph.D. at the Technical University of Vienna, Austria (Prof. Fercher). In 2004 he begins working in Prof. John S. Werner's Vision Science and Advanced Retinal Imaging (VSRI) Laboratory at Department of Ophthalmology & Vision Science, University of California Davis where he is staying until now as Assistant Research Professor. Recently he started collaborating with Prof. Edward N. Pugh, Jr. and become Managing Director for UC Davis Eye-Pod laboratory in the Department of Cell Biology and Human Anatomy. Dr. Zawadzki's research interests focus on development and application of instruments that allow "optical biopsy", namely in-vivo high-resolution imaging of human subjects in clinical settings and small animal models of human diseases. Over last several years, he was focusing on developing multimodal systems for imaging of the retina and retinal diseases. Use of the high resolution imaging modalities allows visualization of individual cellular structures within the retina in living eyes. Therefore, it provides a unique opportunity to advance our understanding of blinding diseases and has the potential to significantly alter clinical diagnoses as well as to allow monitoring of cellular level changes during disease progression and treatment.

Yuhua Zhang, Ph.D., Assistant Professor
Dr. Yuhua Zhang received a B.S. and a Ph.D in precision instruments engineering from Tianjin University, China. He had post-doctoral training in adaptive optics in Beijing Institute of Technology and Auckland University, New Zealand. He did research on optical coherence tomography in the University of West Australia, Australia. In August 2003, he joined the lab of Austin Roorda, Ph.D., Professor of Vision Science at University of California at Berkeley. For 5 years in Roorda Lab, Dr. Zhang' research has focused on developing advanced adaptive optics assisted laser scanning ophthalmoscopy and in-vivo study of the retinal diseases with high resolution retinal imaging. He was appointed as an Assistant Professor in the Department of Ophthalmology at University of Alabama at Birmingham (UAB) in August 2008. His research has been funded by the NIH, EyeSight Foundation of Alabama, International Retina Research Foundation, Buck Trust of Alabama. He has developed advanced high-resolution adaptive optics assisted scanning laser ophthalmoscope and optical coherence tomography (AO-SLO-OCT) in the UAB. He is applying the advanced imaging technology to study age-related macular degeneration and macular degeneration caused by pathologic myopia.