

CURRICULUM VITAE

Jannick P. Rolland, Ph.D.

Last updated: **Sept. 2014**

Brian J. Thompson (endowed chair) Professor of Optical Engineering

www.optics.rochester.edu

Director, NSF I/UCRC Center for Freeform Optics

www.CenterFreeformOptics.org

Director, Robert E. Hopkins Center for Optical Design and Engineering

www.hopkinscenter.rochester.edu

Joint Appointment in the Department of Biomedical Engineering

Joint Appointment in the Center for Visual Science

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www.odalab-spectrum.org

FIELDS OF MAJOR CURRENT RESEARCH

Freeform Optics; Optical Design and Metrology; 3D Optical Imaging/Sensing; Biophotonics Instrumentation; Physics-based Modeling for Medical Imaging; 3D Display Systems; 3D Visualization.

EDUCATION

Ph.D., Optical Science, University of Arizona, Tucson, May 1990

Title: Factors Influencing Lesion Detection in Medical Imaging,

Advisor: Harry H. Barrett, Professor of Optical Science and Medical Imaging.

Master, Optical Science, University of Arizona, Tucson, May 1987

Diplôme Grandes Ecoles, Ecole Supérieure d'Optique* (Orsay, France), Optical Engineering, July 1984.

Baccalaureate (High School) in Math and Physics** (Versailles, France), June 1978.

* The Ecole Supérieure D'Optique was renamed *Institut d'Optique – Graduate School*; This School combines Master and Bachelor of Science unlike the US that may combine Master with PhD.

** The Bachelor is the equivalent of a High School Degree in the United States.

SHORT BIO SKETCH

Jannick Rolland joined the University of Rochester in 2009 and was established as the Brian J. Thompson Professor of Optical Engineering in spring 2009. She serves as director (2013-present) of the NSF I/UCRC Center for Freeform Optics, and director (2012-present) of the R.E. Hopkins Center for Optical Design and Engineering. She holds joint appointments in the department of Biomedical Engineering as well as in the Center for Visual Science. Professor Rolland also serves as an invited Professor at the Institute of Optics in Paris, France where she is helping with the development of a satellite optics institute in Bordeaux with a focus area on Optics and Numeric (2011-present). Rolland served as Faculty member at the University of Central Florida (UCF) where she served as Assistant Professor from (1996-2001), Associate Professor (2001-2008), and full Professor (2008).

Jannick Rolland received a Diplome Grandes Ecole equivalent to a Master Degree from l'*Institut d'Optique – Graduate School* in France in 1984. As part of her French Graduate School program, she worked at REOSC Corporation in France (a leading lens design, fabrication, and testing corporation for large mirror telescopes – now known as SAGEM-REOSC) and designed the optics for SPOT4 (Satellite

for Observation of the Earth working in the Visible-IR region of the spectrum). Following the completion of her Master degree, while visiting the University of Arizona for an abroad experience, she was invited to join the PhD program in 1985. Prior to joining the PhD program at the Optical Sciences Center, she taught a laboratory course for Roland Shack, worked one semester in the optical fabrication shop with Robert Parks, conducted research in optical testing during two semesters with Chris Koliopoulos, and worked two semesters for Robert Shannon on a lens design project related to optical tracking for “Star Wars”. During the summers 1985 and 1986 she had an opportunity to work at Perkin-Elmer in the optical design groups in CT (under the leadership of late Raul Casas) and in CA (under the leadership of late Juan Rayces), respectively. She joined Harry Barrett’s research group in the fall of 2007 to pursue research in medical imaging and received her Ph.D. in Optical Science from the University of Arizona in May 1990.

From there Dr. Rolland joined the Department of Computer Science at the University of North Carolina at Chapel Hill (UNC-CH) as a Postdoctoral Fellow to conduct research in optical design for 3D medical visualization. She was appointed to the Research Faculty at UNC in 1992 and invited to lead the Vision Research Group, which she led from 1992 to 1996. In this period, she supervised a small team of four people working on human perception. In this role, responsibilities have included system engineering, such as the design of head-worn displays for investigating perception issues, design of psychophysical experiments, and computer graphics C++ programming. In 1996, she accepted an invitation to join the CREOL faculty where she formed the Optical Diagnostics and Applications Laboratory (ODALab) and has gone on to become the first women Full Professor at CREOL.

Professor Rolland holds 25 patents, has written 12 book chapters, and has over 120 peer reviewed publications related to optical design with a focus on head-worn displays, vision, augmented reality and 3D visualization, biophotonics technology innovation and development related to Optical Coherence Tomography, and image quality assessment for medical and biomedical imaging. She has authored and co-authored over 200 other publications related to the same topics. She has been on the Editorial Board of Presence (MIT Press) 1996-2006, and was Associated Editor of Optical Engineering 1999-2004. She was a Guest Editor of the Journal of Display Technology for a 2007 special issue on Medical Displays. She was on the Editorial Board of the Handbook for Visual Display Technology published in 2012. She is a Fellow of the Optical Society of America (OSA), a Fellow of SPIE, a senior member of IEEE, and a member of SID. She was a member of ARVO 1994-1997 & 2013-present.

Professor Rolland’s experience has been concentrated in three areas, Conception and Design of Optical Systems, Biophotonics - Optical Coherence Microscopy Imaging combined with Image Quality Assessment, and Physics-based Modeling of Medical Datasets combined with 3D Visualization and Perception Assessment. Most recently, she has been leading a team of graduate and post-graduate students in the fields of Optics, Physics, and Computer Science. She has full responsibility for all aspects of the research activities at the ODALab including strategic directions, securing intellectual property, theoretical developments and reduction to practice, technical oversight, and technology transfer. In addition, she initiated and continues to participate in securing commercial and government funding for advancing the state of the art in her areas of research. Here she has either led or been a main contributor on proposals that were awarded to the ODALab for \$700K/year (on average) in government funding from NSF, NIH, ONR, US ARMY, NASA, DARPA, and Industry. She was an Awardee of the NYSTAR Foundation (2009-2012) that funded her research in Biophotonics. Several of her students have been supported under various Industry Fellowships.

Professor Rolland served on the Board of Directors at Large of the Optical Society of America (2011-2013) and developed in 2011 a new type of OSA meetings called incubator meetings. The first incubator meeting on Freeform Optics led to the creation of the NSF I/UCRC Center on Freeform Optics that she established with a team of collaborators at the university and is directing (CenterFreeformOptics.org).

EMPLOYMENT

2009-present Brian J. Thompson Professor of Optical Engineering
2013-present Director of the NSF I/UCRC Center for Freeform Optics
2012-present Director of the R.E. Hopkins Center for Optical Design and Engineering
2009-2012 Associate Director of the R.E. Hopkins Center for Optical Design and Engineering, Institute of Optics, University of Rochester, NY.
Joint Appointment in Biomedical Engineering, University of Rochester, NY
Joint Appointment in the Center for Visual Science, University of Rochester, NY
2011-present Professor Invitee, Institut d'Optique Théorique et Appliquée, Palaiseau France
2007-2008 Professor of Optics, CREOL, the College of Optics and Photonics, University of Central Florida (UCF), Orlando FL
Summer 2007 Visiting Professor at the National University of Ireland, Galway
(NUI – Applied Optics Laboratory, Professor Chris Dainty's Laboratory)
Summer 2006 Visiting Professor at the Ecole Nationale Supérieure des Télécommunications
(ENST) – Medical Imaging Team (June-July 2006) Paris, France.
2004-2005 Visiting Professor, Institut D'Optique Théorique et Appliquée (IOTA),
(UCF Sabbatical on Biophotonics – August 1st 2004-July 1st 2005) Orsay, France.
2001-2006 Associate Professor, College of Optics and Photonics, University of Central Florida
(UCF) Orlando. Joint Appointment in the School of EE-CS since 1996.
Joint Appointment in the Modeling and Simulation Program since 2003.
1996-2000 Assistant Professor, School of Optics/CREOL University of Central Florida
(UCF), Orlando. Joint Appointment in School of EE-CS.
Summer 1998 Visiting Professor at El Centro de Investigaciones in Optica, Leon, Mexico.
Summer 1999 Visiting Professor at El Centro de Investigaciones in Optica, Leon, Mexico.
1992-1996 Research Assistant Professor, Head of the Vision Group 94-96, Computer Science,
University of North Carolina at Chapel Hill (UNC-CH).
1990-1992 Postdoctoral Student, Computer Science, UNC-Chapel Hill.
1985-1990 Research Associate, Optical Science, University of Arizona.
Summer 1986 Optical Designer, Internship, Perkin Elmer Corp., LA-California.
Summer 1985 Optical Designer, Internship, Perkin Elmer Corp., Danbury-Connecticut.
1984 Teaching Assistant for Geometrical Optics, Optical Science, University of Arizona.
Spring 1984 Optical Designer, REOSC Corporation, Paris, France.
Summer 1983 Optical Engineer, Internship, El CISESE, Ensenada, Mexico.
Summer 1980 Optical Engineer, Internship, Institut D'Optique Théorique et Appliquée, Orsay,
France.

TEACHING

Awards/Honor

In this section, Jannick Rolland's awards related to teaching as well as awards to students either in her research team or in her class are reported, as well as TA award in her classes.

- 2014 **Optical Research Associates Lens Design Competition Award** to Aaron Bauer for his design of a freeform optics head worn display.
- 2011 **Teaching Assistant Award to Aaron Bauer (TA)** in OPT442 (taught by Dr. Rolland)
- 2010 **Optical Research Associates Lens Design Competition Award** to Kyle Fuerschbach, for his design of a lithographic lens. The base design was conducted as part of a class project (OPT444) taught by Dr. Julie Bentley and an expansion to this design was done as a research project to test the use of Forbes polynomials implemented in our lab under matlab as opposed to conventional power series to describe aspherical surfaces.
- 2010 **Teaching Assistant Award to Kyle Fuerschbach (TA)** in OPT442 (taught by Dr. Rolland)
- 2009 **Associate Director of the R.E. Hopkins Center for Optical Engineering** – University of Rochester
- 2007 **Grand Marshal** for the December 2007 UCF University Graduation.
- 2007 **Optical Research Associates Lens Design Competition Award** to Tobias Schmid. Based on Optical System Design (OSE 6265) Class Project conducted on Illumination Optics with Prof. Jannick Rolland who taught the class and Prof. Martin Richardson who provided the research context of Lithography for this work.
- 2006 **UCF Teaching Incentive Program (TIP) Award for Excellence in Teaching 2001-2006.**
- 2005 **Optical Research Associates in Optical System Design European Competition Award** to Olivier Jacques-Sermet for his design of a hybrid glass-diffractive optical element. Project conducted as part of a course developed and taught on 3D vision in Europe in spring 2005.
- 2004 **College of Optics and Photonics Excellence in Graduate Teaching Award.**
- 2004 **Meritorious Service Award from Lake Highland High School Prep.** "For outstanding contributions and many years of dedication to Science Education".
- 2003 **Distinguished Service Award** from Lake Highland High School Prep. "For your outstanding contribution and years of dedication to our ASPIRE Science Education Program".
- 2001 **Award of Optical Research Associates Lens Design Competition Award** to Ed and Charlene Sarver. Optical System Design (OSE 6265) Class Project related to Research conducted in Dr. Rolland's Laboratory.
- 1998 **Distinguished Service Award** from Lake Highland High School Prep. "For your outstanding dedication to science education".

Academic Courses Taught

University of Rochester

Instrumental Optics (OPT 442 - spring) 2009-2014

Optics Labs (OPT 256) fall 2010

Senior Design (OPT 310/311) fall 2010 and spring 2011, Faculty team leader for a group of four students working on a QED Corporation project related to mid spatial frequencies in optical fabrication with the MRF process.

Senior Design (BME 295/296) fall 2012 and spring 2013, Faculty in the role of the customer, working closely with a team of four students on a high-speed dual-axis MEMs scanning OCT probe.

Senior Design (ME 205) spring 2014, Faculty in the role of the customer, working on a mount for a hexapod to hold the secondary mirror of a Ritchey Chretien Telescope to study the aberration fields of misaligned optics.

Aberrations and Optical Testing (OPT242 –fall) 2011-2014

University of Central Florida

Foundation of Bio-Imaging Science (IDS 5937), fall 2006, (IDS 5127) spring 2008 (New course co-taught with Dr. Steven Ebert, Associate Professor of the Biomedical Science Center).

Optics (PHY4424), University of Central Florida, fall 2005. (Senior undergraduate course)

Optical System Design (OSE 6562), University of Central Florida, spring 2002, 2004, 2006, 2007

Optical System Design (EEL6446), University of Central Florida, spring 1997, 1998, 2000, 2001.

Fundamentals of Applied Optics (OSE 5203), spring 2003, fall 2003, spring 2008

Geometrical Optics (EEL5453), University of Central Florida, fall 1997, 1998, 1999 and 2000.

Lecture on Optics and Perception Issues in Virtual Environments, Comp 239, Virtual Worlds, UNC, 1995.

Topics in Computer Science: Medical Image Display: Lecture on Mathematical Observers for Assessing Image Quality in Greyscale Images, Comp 290-6, UNC, 1994.

Picture and Pattern Recognition: Lectures on Image Quality for Greyscale Images, Comp 254, UNC, 1992 and 1994.

Basics of Geometrical Optics, Lab Course Assistant, University of Arizona, fall 1984 (Instructor was Professor Roland Shack).

New Courses Developed

UR-OPT442 This course was redesigned in fall/spring 2009

UR-OPT242 This course was redesigned in fall 2011

UCF-IDS5937/IDS5127 Foundation of Bio Imaging Science. This new course was conceived fall 2005, and was developed summer 2006. Jannick Rolland is co-director of the course with Steven Ebert, Associate Professor of the Biomolecular Science Center. Also Manuel Perez, Assistant Professor from the Nanoscience Center has joined in co-teaching this class. It was first offered fall 2006. A second offering was spring 2008 as **IDS 5127**

UCF-OSE5203 Fundamentals of Applied Optics - Helped with defining course and prepared an appropriate set of notes that built in part on EEL5453.

UCF-EEL5453 Geometrical Optics: This course was redesigned in 1997 to provide students with an in-depth knowledge of the fundamentals of geometrical optics.

UCF-EEL6446 Optical System Design: This course was developed in 1996 to provide graduate students with an introductory course in lens design; Over the years it evolved to include 60% time with hands-on the computer performing design in the classroom to have full access to the professor while solving problems. Furthermore, it includes key guest speakers from industry.

Short Courses Developed and Taught

Freeform Optics:

- Full day short course for SPIE 2014 on Applying Freeform Optical Surfaces in Imaging Optics - January 2014

Virtual Reality at Institut d'optique Theorique et Appliquee:

- Project Realite Virtuelle – October 22-26 2012; January 7-11 2013 (with Xavier Granier)
- Conception Optique – January 15-18 and May 20-24

Virtual/Augmented Reality:

- 3-day course, October 22,23&26 2012 at the Institute d'Optique in Bordeaux, France (with Xavier Granier, Pascal Guitton, Florent Berthaud).

Nodal Aberration Theory:

- ½ day Short Course at Galway Summer School 2010 organized by Professor Chris Dainty

Non-imaging Optics:

- 2½ day Short Course at UofR Summer School 2010 and 2011 on Non-Imaging Optics. Instructors: William Cassarly, Florian Fournier and I, Michael Morris, and Duncan Moore.

Head-worn Displays (HWD) Fundamentals and Applications:

- 4hr Short Course at ISMAR 2006. (International Symposium on Mixed and Augmented reality), Lead Instructor with Professor Robert Patterson, Andrei State, and Ozan Cakmakci
- 3hr Short Course at ISMAR 2009 (with Dr. Hong Hua)
- Full day Short Course at ISMAR 2010 (with Dr. Kevin Thompson).

Optics in Simulation and Training, Short Course at ITSEC 2006. Co-teaching with Cali Fidopiastis (my former student) as Lead Instructor (Total 4 instructors).

Systems of 3D Vision. Institut d'Optique Théorique et Appliquée. 15hrs, March-April, 2005.

3hr Module on 3D Visualization for Biophotonics. February 2005.

1hr Module on Image Formation, University of Louisville, Kentucky, April 2005.

Modeling and Applications for Medical Visualization: Augmented Reality: Aims and Challenges, Short Course Given at CASA03 (4hrs total, one of 5 Speakers) <http://dimacs.rutgers.edu/casa03/>, May 7 2003.

UCF WISE (women in science and engineering) Orlando Science Center Workshop February 2003, 2004 (All Day Event for K-12 Students)

What Can You See? Fundamentals and Emerging Visual System Technologies, Short Course (2hrs) at ITSEC2002, Orlando Florida December 2nd, 2002.

Fundamentals of Geometrical Optics and Optical System Design taught for 4 days at Allied Signal (Kansas City, Missouri): Summer Short Course 1998.

Fundamentals of Optics for Head-Mounted Displays, ½ day Tutorial at the Virtual Reality Annual International Symposium (VRAIS), 1995-1997, also at the 5th *Conference Internationale en Informatique* at Montpellier96 France, May 21-24, 1996; Course updated for Short Course for Annual Conference of Beckman Institute, spring 2000.

Optical System Design Workshop (10hours), El Centro de Investigaciones in Optica, Leon, Mexico, 1999.

Independent Study Courses Taught

UCF (1996-2008): >70 covering multidisciplinary topics from optical instrumentation, simulation of optical phenomena, image processing, medical image analysis, tracking, and internet2 high speed networking.

Also participated in mentoring graduate students through class projects: e.g. Software Engineering I Class (EEL5881); Supervised 2 groups of students spring 2003; 4 groups of students fall 2003.

UofR (2009-present):

BME (Cheng Bin Zhang; fall 2010)(Jerome Barczykowski; spring 2012)(Nicole Tocha; fall 2012); (Lucy Ying-Ju Chu, spring 2014-2015);

Optics (Dennis Fantone; fall 2011);

Master Essays Supervisor (or Secondary Reader as specified)**Spring 2009**

1. Stephen Goodridge, Stress birefringence and how it is modeled in CODE V
2. Katie Hasman - Polarization sensitive optical coherence tomography
3. Sophie Vo - Review of distortion mapping for symmetric and asymmetric maps
4. Bin Yang – The development of light microscopes in the nineteenth century

5. Xuefeng Zhang – Review on fluorescence, Raman and diffuse reflectance spectroscopy

Spring 2010

6. Keija Fang – Freeform optics

Spring 2011

7. Robert Gray – A survey of geometric algebra in optics geometrical algebra

Spring 2012

8. Dennis Fantone – Nodal aberration theory
9. Fanny Keller-Lussier – Properties and engineering of Airy beam patterns
10. Shuyuan Han - Image formation in confocal laser scanning microscopy

Spring 2014

11. Brett Sternfield – The modulation transfer function: An objective characterization and diagnostic tool for imaging optical systems
12. Jonas Ogien – Optical Coherence Tomography Elastography
13. Di Xu – Nodal aberration theory: properties and applications
14. Teddy Lambropoulos – Eyepiece design

International Undergraduate/Master Internships Supervised

1. Summer 1998, Design of a novel projective head-mounted display, David Poizat (**Exchange student from Ecole Supérieure De Physique de Marseilles, France**).
2. Summer 1998, Eyetracking in head-mounted displays, Laurent Vaissie (**Exchange student from Ecole Supérieure De Physique de Marseilles, France**). (As of year 2005, he completed his PhD in Optics).
3. 1998-1999, Statistical analysis of texture, Alexei Goon (**Exchange student from Moscow University Russia**). (As of year 2006, he completed his PhD in Physics).
4. Summer 1998, Modeling imaging in interferometry, Emmanuel Maillart (**Exchange student from Ecole Supérieure D’Optique, France**). (As of year 2004, he completed his PhD in Biophotonics).
5. Summer 1999, Assembly and investigation of a projective head-mounted display, Axelle Girardot (exchange student from France – 3 months internship – also selected for the **REU program**).
6. Summer 1999, Development of a method for 7maging motion capture, Valerie Outters (**Exchange student from Ecole Supérieure De Physique de Marseilles, France**).
7. Summer 1999, Calibration methods for augmented reality head-mounted displays, Brahim Gharib. (**Exchange student from L’Institut des Sciences de L’ingénieur in Clermond Ferrand, France**).
8. Summer 2000, Image processing methods for eyetracking in head-mounted displays, Alexandre Szasz (**Exchange student from Ecole Supérieure De Physique de Marseilles, France**).
9. Summer 2000, Investigation of information handling in projective head-mounted displays, Olivier Fedkiw (**Exchange student from Institut du Petrol, France**).
10. Summer 2002, Investigation of noise sources in OCT, Laurent La Fenetre (**REU program – France**).
11. Summer 2003, Broadband source polarization-based spectral measurements, Maryam Chopra (**Exchange student from Ecole Supérieure D’Optique, France**).
12. Summer 2003, Charaterization of optical materials, Stephanie Catdevielle (**REU program – France**).
13. Summer 2003, Modeling of 7maging 7maging7e 7maging, Tony Delemos (**Exchange student from Ecole Supérieure De Physique de Marseilles, France**).
14. Spring 2004, Mathematical modeling of image quality in medical imaging, Aurelie Cartier (**Exchange student from from Ecole Supérieure D’Optique, France**).
15. Spring 2006, Lung modeling, Antonio Moreno (**Exchange student from Ecole Nationale Supérieure des Télécommunications (ENST) in Paris, France**).

16. Summer 2006, Lung modeling, Alexis Motir (**Exchange student from Ecole Spéciale des Travaux Publics, du Batiment, et de l'Industrie (ESTP) in Paris, France**).
17. Summer 2007, Modeling of alveolar gas exchange, Lisa Fluck (**Exchange student from Esil/Biomedical, Marseilles, France**).
18. Summer 2007, Optical coherence microscopy, Mayank Jain (**Exchange student from India Institute of Technology, Bangalore, India**).
19. Fall 2007-Spring 2008, Design of head-worn displays, Sophie Vo (**Exchange student from Institut d'Optique, Paris, France**).
20. Fall 2007-Spring 2008, Segmentation of clinical lung data, Charline Motir (**Study abroad after completion of her high school degree; Exchange student from Paris X University Nanterre, Paris, France**).
21. Summer 2008, Optical design of a dynamic focus lens, Sandrine Ricaud (**Exchange student from Institut d'Optique, Paris, France**).
22. Summer 2009, Pierre-Olivier Grau, MTF Measurements (University of Poitiers, France)
23. Summer 2009, Beam Propagation with BSP module in CodeV, Charlotte Pachot (**Exchange student from Institut d'Optique, Paris, France**).
24. Summer 2009, Holographic display. Pimrapat I-lean Thanusutiyaporn (**Exchange student from Chulalongkorn University, Bangkok, Thailand**).
25. Summer 2010, Extended Depth of Focus and Full Field Optical Coherence Tomography, Kang Liu (**Exchange student from Institut d'Optique, Paris France**).
26. Summer 2010, Saroj Kumar Mahalik, Design of a Baker Telescope and Ultra-high Resolution Optical Coherence Tomography (**Exchange student from Cochin University Of Science and Technology" (CUSAT), Kerala, India**).
27. Summer 2010, Aurelie Besse, Ipad & Augmented Reality (**Exchange student from l'Institut des Sciences et Techniques d'Ingénieur d'Angers (ISTIA), Angers, France**).
28. Fall 2010-spring 2011, Patricio Fluxa, Lens design of an IR camera (**Visiting student from the Universidad Nacional de la Plata, Argentina**).
29. Spring 2011, Saroj Kumar Mahalik, Optical Design for OCT (**Exchange student from Cochin University Of Science and Technology" (CUSAT), Kerala, India**).
30. Fall 2010-Fall2011, Bin Ma, Lens design with Forbes polynomial (**Visiting student from Beijing Institute of Technology (BIT), Beijing, China**).
31. Summer 2010, Pierre-Marie Le Gloahec, working on the ARstructure Project, (**Exchange student from l'Institut des Sciences et Techniques d'Ingénieur d'Angers (ISTIA), Angers, France**).
32. Fall 2011-Fall 2012, Johan Thivollet, Assembly of the Hilbert Telescope (**Intern Institut d'Optique, France**).
33. Summer 2012-Fall2012, Fanny Keller-Lussier, "Computer-aided and experimental validation of a new family of optical beams: Abruptly autofocusing Airy beams" **Intern Institut d'Optique, France**
34. Summer 2013, Clement Apelian, "Optimization of the controls for a 2D MEMs scanner" **Exchange student Institut d'Optique, France**
35. **Summer 2013**, Solene Demay, "Shadowing and pilot research in optical metrology and biomedical imaging" (**Exchange student from Ecole Preparatoire Hoche, Versailles, France**)
36. **Summer 2014**, Pornthep Pongchalee (Racha), "Broadband interferometry" OSA Foundation Fellow from Suranaree University of Technology in Thailand.
37. **Summer 2014**, Eric Dongmo, "Hands-on metrology in the RE Hopkins Center" OSA Foundation Fellow from Yaounde University in Cameroon.

US Undergraduate Internships Supervised

1. 1995-1996, Visual search in angiograms – methodology, Chris Helvig (**UNC, Computer Science**).
2. 1998, Quantification of depth perception in virtual environments, Alexander Quinn (**UCF Honor Student, Psychology Major**).

3. 1999-2002, Internet2 Technology Assessment, Ben Del Vento (**UCF, Computer Science**).
4. Summer 2002, Monte Carlo Simulation of light propagation in skin tissues, Harshal Deshmukh (**Exchange student from University of Memphis, Tennessee**).
5. 1999-2000, Internet2 Technology Assessment, Ami Sun (**UCF, Graphic Arts and Computer Animation**).
6. Summer 2000, Programming of eyetracking algorithm for eyetracking head-mounted display, Jeff Rice, (**REU summer program**).
7. Summer 2002, Optical Digitization & 3D Modeling, Angela Tygerson, (**REU**).
(Angela Tygerson received her Master degree in 2005).
8. 2001-2004, Bioinformatics 3D Visualization, Christopher Fuhman (**UCF Honor Student**)
(Chris received his Master Degree in 2006).
9. Summer 2003, Optical motion tracking, Jason Carpentier (**REU**).
10. Summer 2003, Modeling of deformable models, Amir Tal (**REU**).
(Amir Tal received his Master in Optics in 2006).
11. Fall 2005-fall 2007, technical writing experience, Claire Bagelman, (**UCF Lab Intern**).
12. Fall 2005-spring 2006, biomedical imaging, Erin Thompson, (**UCF Lab Intern**).
13. Summer 2006-spring 2008, skin and lung cancer diagnosis, Nicolene Papp (**UCF Lab Intern**).
14. Summer 2009 Philip Vanderwall, 2-photon microscopy (**University of Michigan**)
15. Summer 2009-2010, Pai-Fong Kao, Nodal Aberration in MathLab (**Optics, University of Rochester**)
16. Summer 2010, Dennis Fantone, Optical system design (**MIT**)
17. Summer and Fall 2010, Tom Karo, Distortion mapping for augmented reality (**UofR**)
18. Fall 2010 & spring 2011, Katelynn Sharma, designing a cell phone camera with Forbes aspherics shapes (**UofR**)
19. Summer 2011, Sarah Carlus, Creation of Airy Beams Using Aberration Theory and Propagation for Imaging Applications (**REU**)
20. Summer 2011, Rebecca Stabile, “Nondestructive Subsurface Analysis with Optical Coherence Imaging”, (**REU**).
21. Summer 2011, Mallory Smith, “Testing Optics Towards Assembling the Hilbert Telescope” (**REU**).
22. Summer 2012, Krysta Boccuzzi, “1st Controlled Results to Illustrate Nodal Aberration Theory” (**REU**)
23. Summer 2012, Joyce Wu, “Testing Optics Towards Assembling the Hilbert Telescope” (**REU**)
24. May2012-May2013, Nicole Tjota, “Gabor Domain Optical Coherence Microscopy of Skin” (**BME, UofR**)
25. May2012-2014, Vasanthi Balaji “Gabor Domain Optical Coherence Microscopy of Skin” (**BME, UofR**)
26. May 2012-2013, Joseph Tocha, “OCT Elastography” (**BME, UofR**)
27. May 2012-2013, Tianyu Li, “3D Rendering and Programming” (**Optics, UofR**)
28. May 2012-2014, David Oles, “Nonimaging Optics” (**Optics, UofR**)
29. May 2012-2014, Ke Xu, “Optical Metrology” (**Optics, UofR**)
30. Fall 2012-2015, Isaac Trumper, “MRF Fab. and Metrology of freeform optics” (**Optics, UofR**)
31. Jan. 2013-2015, Jungeun Won, “Optical Metrology for Biomedical Res.” (**BME/Optics, UofR**)
32. Summer 2013, Taryn Kittel, “Testing Optics Towards Assembling the Hilbert Telescope (**REU**)
33. Spring 2014, Fall 2014, Trevor Ivanov, “Metrology of freeform optics” (**Optics, UofR**)
34. Jan. 2014 - 2015, Nick Cirucci, “Metrology of freeform optics” (**Optics, UofR**)
35. Summer 2014-Spring 2015, Rebecca Pettenski, “Metrology of freeform optics,” (**Optics, UofR**)
36. Fall 2014, Zirui Zang, “Metrology in the Hopkins Center” (**Optics, UofR**)
37. Fall 2014, Mara Lanis, “Optical coherence microscopy of skin”, (**BME, UofR**)
38. Spring 2015, Brandon Dube, “Design and Metrology in the Hopkins Center”, (**Optics, UofR**)

Also from 1997-1998 I participated in the following undergraduates programs: the LEAD Scholars Program; 1996-2003; the UCF/CREOL REU summer-program through sponsoring students and offering

seminars to the students; the UCF Women Research Center for the promotion of women in research. From 2010-present, I participated in the Xerox Undergraduate Program at Rochester. From 2013-present, I volunteer as a mentor for WISTEE-connect a group led by Dr. Jie Qiao to promote entrepreneurship for women in science and engineering.

High-School Student Internships Supervised

1. 2001, Optical Imaging Fundamentals, Masha Shikari, University High School, Orlando, FL.
2. 2002-2006 Scaling of Medical Models for Augmented Reality, Alexa Sider and Neha Hippalgaonkar, Lake Highland Preparatory School, FL
 - Won 3rd place at the County Science Fair 2003.
 - Won 1st place at the County and State Science Fairs 2004.
 - Won 2nd place at the County and State Science Fairs 2005 + Price from Yale University for the most creative project, Price from Kodak for best use of pictures, and Price from the US Armed Forces.

Going International.

- Won 4th place as teams at the International Science Fair in Phoenix Arizona (+\$500 prize); \$2,000 IBM Scholarship to split between Neha and Alexa spring 05.
- IEEE Computer Society – 2nd place Award - \$400.00 prize for each team member. Spring 05.
- One of 4 finalists in their category in Siemens Westinghouse Writing Essay Competition. Fall 2005.

Alexa and Neha have now joined the University of Virginia and the University of California at Berkeley, respectively.

- John Tamkin, Gouy Phase, Junior at San Marino High School, CA
- Yvan Scher, Building 3D models using photographs with GPS co-registration, summer 2010, Junior at Pittsford-Mendon High School, NY
- Reid Ferguson, Alignment of a Telescope, spring 2013, New Jersey High School

Mentoring of Ph.D. and M.S. Students: Currently supervising 8 PhD Graduate Students (1 woman) (underlined), and 2 Master students (1 woman) (1 BME student, 1 Optics student). The ODALab is inclusive of students from different countries, gender, and spanning levels of high school to PhD. Four undergraduates (*3 women – 2 BME, 2 Optics*) are currently part of the ODALab research team (not including visiting students and summer interns)

<i>Student, Degree, Department Dissertation/Thesis Title</i>	<i>Degree Status</i>	<i>Job Status</i>
University of North Carolina at Chapel Hill		
Anantha Kancherla, M.S., CS Non-thesis Option Project: Calibration of Augmented Reality Head-Mounted Display	Graduated spring 1995	Computer Programmer Microsoft Corporation Seattle95-present
Norbou Buchler Undergraduate Student 1994-1996	Graduated spring 1996	US Army Research Laboratory (Aberdeen Proving Ground, MD) Cognitive PhD Scientist 2009-present

University of Central Florida		
Yohan Baillot, M.S., CS MS Thesis Option: First implementation of the Virtual Reality Dynamic Anatomy (VRDA) Tool)	Graduated spring 1999	Naval Research Lab / ITT Corp. Washington DC 99-2010 2011-2012 AR Startup
Charmaine Harris, M.S., Optics Thesis Option: Normalized Second-order Statistics for Texture Characterization	Graduated spring 1999	Technical Staff Life Touch Detroit 99-present
Ricardo Martins, M.S., Optics Project: Wearable Outdoors Displays	Graduated spring 2003 (MS) fall 2010 (PhD)	Optical Engineer, Orlando 03-08 Clear Align 2008-2012
1. Larry Davis, Ph.D., ECE PhD Thesis: Conformal Tracking for Virtual Environments	Graduated spring 2004	Research Scientist Staff Scientist Institute for Simulation and Training 04-09 Founder of Tirrion LLC. 04-present
2. Felix Hamza-Lup, Ph.D., CS PhD Thesis: Dynamic Shared State Maintenance in Distributed Virtual Environments	Graduated summer 2004 (Co-advised with Dr. Charles Hughes, CS)	Assistant (05-11) Professor Associate (11-present) Professor AASU, Savannah, GA

3. Vesselin Shaoulov, Ph.D., Optics PhD Thesis: Design and Assessment of Compact Optical Systems towards Special Effects Imaging	Graduated fall 2004	Director of Research ADASTRA Labs LLC, Orlando FL 04-present
4. Ceyhun A. Akcay, Ph.D., Optics PhD Thesis: System Design and Optimization of Optical Coherence Tomography	Graduated summer 2005	Senior Research Scientist ALCON Labs, Houston, Texas 05-present
Supraja Murali, M.S., Optics MS Thesis-option: Design of a Dynamic Focusing Microscope Objective for OCT Imaging	Graduated fall 2005	Ph.D. Candidate at UCF 05-09
5. Anand Santhanam, Ph.D., CS PhD Thesis: Modeling, Simulation, and Visualization of 3D Lung Dynamics	Graduated summer 2006 (Co-advised with Dr. Sumant Pattanaik,	Joint Postdoc at MD Anderson Cancer Center Orlando and the ODALab at the University of Central Florida, Orlando, FL [2006-2007] Research Faculty, CREOL 2008-2010 Research Assistant Professor, UCLA Medical Center 2010-present
6. Cali Fidopiastis, Ph.D., IEMS PhD Thesis: User-Centered Virtual Environment Assessment and Design for Cognitive Rehabilitation Applications	Graduated summer 2006 (Co-advised with Dr. Peter Kincaid, IST)	Postdoctoral Fellow at the Institute of Simulation and Training 06-07 Research Faculty, IST 08-09 Assistant Professor, University of Alabama at Birmingham 09-present
7. Weiyao Zou, Ph.D., Optics PhD Thesis: Curvature Sensing and Wavefront Estimation via Zonal Reconstruction	Graduated spring 2007	Postdoctoral Student with Stephen Burns Indiana University 07-spring11 ASML (spring11-present)
8. Mohamed Salem, Ph.D., Optics PhD Thesis: Effects of Polarization and Coherence on the Propagation and Detection of Stochastic Electromagnetic Beams	Graduated fall 2007 (Co-advised with Prof. Emil Wolf, Univ. of Rochester)	Joined Professor Emil Wolf at the University of Rochester, Physics Department, as a Postdoctoral Fellow. 07-2010 2011- present Optical Consultant

9. Kit-Iu Cheong, Ph.D., Optics PhD Thesis: Analysis of an Optical Coherence Imaging Modality on the Detection of an Abnormality in Biological Tissue with a Nanoparticle Contrast Agent	Graduated fall 2007 (Co-directed) (Dr. Eric Clarkson, Univ. of AZ, primary advisor)	BRO Research Corp., Tucson AZ Research Scientist 08-present
10. Jeff Covelli, Ph.D, IEMS PhD Thesis: Field Of View Effects On Reflexive Motor Response In Flight Simulation	Graduated spring, 2008 (Co-advised with Dr. Peter Kincaid, IST)	Human Factor Engineer Northrop Grumman (08-11) Computer Science Corporation (CSC) (11-present)
11. Ozan Cakmakci, Ph.D., Optics PhD Thesis: Meshfree Approximation methods for free-form optical surfaces with applications to head-worn displays	Graduated fall 2008	Optical Engineer Optical Research Associate 09-11 Synopsys/ORA 11-present
12. Kye-Sung Lee, Ph.D., Optics PhD Thesis: Optical Coherence Endoscopy	Graduated fall 2008	Postdoctoral Student 08-10 Research Associate 10-present University of Rochester Institute of Optics and Medical Center.
13. Supraja Murali, Ph.D., Optics PhD Thesis: Optical Coherence Microscopy	Graduated summer 2009	Optical Scientist General Optics Asia, Pondicherry, India 09-2012 Aptina Imaging 2013-present
14. Florian Fournier, Ph.D., Optics PhD Thesis: Freeform Reflector Design With Extended Sources	Graduated summer 2010	Software Developer Optical Research Associates 2010-present
15. Tobias Schmid, PhD., Optics PhD Thesis: Development of Nodal Aberration Theory and Application to the Alignment of Optical Systems	Graduated summer 2010	Optical Engineer OSRAM Corp., Germany 10-11 OSRAM Corp. Detroit 11-present
16. Panomsak Meemon, Ph.D. Optics PhD Thesis: Development of Optical Coherence Tomography For Tissue Diagnostics	Graduated fall 2010	Postdoctoral Student 10-11 University of Rochester Institute of Optics and Medical Center. Adjunct Prof. 11-present School of Laser Technology and Photonics, Institute of Science, Suranaree University of Technol., Thailand

17. Ilhan Kaya, Ph.D., CS PhD Thesis: Mathematical and computational methods for freeform optical shape description	Graduated fall 2013	Consultant, Turkey
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University of Rochester		
Sophie Vo, M.S., Optics	Graduated spring 2009	Engineer, Europe 2009-present
Robert Gray, M.S., Optics	Graduated spring 2011	Accepted in PhD program, UofR - Optics
Chen Bin Zhang, M.S., BME	Graduated summer 2011	Project Engineer, VA Boston Healthcare System
18. Cristina Canavesi, Ph.D., Optics Subaperture Conics and Geometric Concepts Applied to Freeform Reflector Design for Illumination	Graduated fall 2013	Project Coord. CeFO & LighTopTech Corp. President
19. Kyle Fuerschbach, Ph.D., Optics Freeform, ϕ -polynomial Optical Surfaces: Optical Design, Fabrication, and Assembly	Graduated spring 2014	Optical Engineer Sandia National Labs
20. <u>Jianing Yao</u> , Ph.D., Optics Metrology of GRIN Materials	Plans to graduate fall 2015	TBD
21. <u>Jinxin Huang</u> , Ph.D., Physics Task-based Assessment of OCT for Measuring the Tear Film Dynamic	Plans to graduate summer 2015	TBD
22. <u>Robert Gray</u> , Ph.D., Optics Zernike Field Dependence	Plans to graduate summer 2015	TBD
23. <u>Aaron Bauer</u> , Ph.D., Optics RBF-Freeform Optics Design	Plans to graduate spring 2016	TBD

23. <u>Eric Schiesser, PhD, Optics</u> Freeform Optics in Imaging and Non-Imaging Systems	Plans to graduate spring 2018	TBD
24. <u>Jacob Reimers, PhD, Optics</u> Freeform Optics in Spectrometers	Plans to graduate spring 2018	TBD
25. <u>Lucy Ying-Iu Chu, Master, BME</u>	Plans to graduate spring 2015	TBD
26. <u>Daniel Nikolov, PhD, Optics</u> Freeform Optics	Plans to graduate spring 2019	TBD
27. <u>Di Xu, PhD, Optics</u>	Plans to graduate spring 2019	TBD

Other Graduate Students Supervised with Significant Publications

- Emily Edwards, 1992-1993 (Physics Major).
Project: *Miniature video camera design for virtual environments.*
- Richard Holloway, 1993-1995 (in part) (Advisor: Dr. Brooks).
Title of Ph.D. Dissertation: *Registration errors in augmented reality systems.*
- Chunyu Gao, 1999-2000 Mechanical Engineering / Optics,
Project: *Optomechanical design of a projective head-mounted display.*

Postdoctoral Fellows

- Liyun Yu, *Texture based image synthesis* 1996-1997 (ECE/CS)
- Hong Hua, *Optical instrumentation for virtual environments* (1998-1999) (ECE/Optics)
- Haocheng Zheng, *Optical coherence tomography instrumentation* (1999-2001) (ECE/Optics)
- Yonggang Ha, *Optical instrumentation for virtual environments* (2000-2002) (Optics/ECE)
- Pascale Parrein, *Optical coherence instrumentation and microscopy* (2001-2003) (Optics)
- Felix Hamza-Lup, *Networked augmented reality environments* (2004-2005) (CS)
- Cali Fidopiastis, *User-centered virtual environment assessment and design for cognitive rehabilitation*, (2006-2007)(Industrial Engineering)
- Anand Santhanam, *Lung dynamics for radiation oncology*, (2006-2008) (CS)
- Kye-Sung Lee, *Optical Coherence Microscopy*, (2009-2010) (Optics)
- Panomsak Meemon, *Optical Coherence Microscopy* (2010-2011)(Optics)
- Natthani Meemon, *Clinical Imaging, Optical Coherence Microscopy* (2011)(Public Health)
- Bin Ma, *1D Q-Forbes polynomials* (2012-2013)(Optics).
- Patrice Tankam, *Vision Science, Optical Coherence Microscopy* (2012-present)(Optics)
- Cristina Canavesi, *Freeform Optics* (2014-present)(Optics)

Research Associates/Senior Scientists

- 1 Catherine Meyer, Ed.D., *Education and human factors* (1996-2003)
- 2 Yonggang Ha, Ph.D., *Optical design for virtual environments* (2002-2005)
- 3 Anand Santhanam, Ph.D., *Modeling and visualization of lung dynamics* (2008-present)
- 4 Christina Dunn, Ph.D., *Optical fabrication* (2009-2010)
- 5 Robert Gray, M.S., M.A., *Physics* (2009-2010)
- 6 Virgil Duma, Ph.D., *Optomechanics* (2009-2010)
- 7 Yong Song, Ph.D., *Optoelectronics* (2009-2010)
- 8 Kye-Sung Lee, Ph.D., *Optical Coherence Microscopy*, (2011-2013)
- 9 Martin Huarte-Espinosa, Ph.D., *Computational Physics* (2013-2015)

Active Member / Mentor on other Students Dissertation Committees / Chair

Graduate Students

University of Rochester

Blair Unger, PhD Dissertation, *Dimpled Planar Light Guides* (spring 2009)

(Advisor: Duncan Moore)

Ying (Melissa) Geng PhD Dissertation, *Optimizing the quality of retinal images in the living mouse eye* (fall 2011) (Advisor: David Williams)

John Harker, PhD Dissertation (Chair), *Measuring and Altering Ferroelectric Domain Structures in Lead Perovskite Single-Crystals* (fall 2011) (Advisor: David Quesnel)

Abbie Tippie, PhD Dissertation, *Aberration Correction in Digital Holography* (spring 2012)

(Advisor: Jim Fienup)

Xinye Lou, PhD Dissertation, *Spatial coherence interferometry* (fall 2012)

(Advisor: Duncan Moore)

University of Arizona

Kit-Iu-Cheong, Ph.D. Dissertation, *Analysis of an optical coherence imaging modality on the detection of an abnormality in biological tissue with a nanoparticule contract agent.*(fall 07)(Advisor: Eric Clarkson, Mathematics, Univ. of Az)(I provided the topic and co-advised her throughout her dissertation)

John M. Tamkin Sr., Ph.D. Dissertation, *A study of image artifacts caused by structured mid-spatial frequency fabrication errors on optical surfaces* (spring 2010) (Advisor: Tom Milster, Optics, Univ. of Az)

University of Central Florida

Andrey Krywonos, Ph.D. Dissertation, *Predicting surface scatter using a linear systems formulation of non-paraxial scalar diffraction* (fall 06) (Advisor: Jim Harvey, Optics, UCF).

Antonio Moreno, Ph.D. Dissertation, *Registration of PET and SPECT* (fall 06)

(Advisor: Isabelle Bloch, ENST-Paris).

Pierre Lecaruyer de Lainsecq, Ph.D. Dissertation, IOTA-France, *Biochips design* (fall 06)

(Advisor: Michael Canva, IOTA-France).

Janet Milliez, Ph.D., *Up-conversion in rare earth doped micro-particles applied to 2D displays* (spring 06) (Advisor: Michael Bass, College of Optics and Photonics: CREOL & FPCE).

Jiangjian Xiao, Ph.D. Dissertation, *Image based view synthesis* (fall 04)

(Advisor: Murabak Shah, CS, UCF).

Chandran Reddy, Master Thesis, *A non-obtrusive head mounted face capture system* (summer 03) (Advisor: George Stockman, CS, Michigan State University).

Glenn Stellar, Ph.D. Dissertation, *High efficiency hyperspectral imaging (HEHSI)*, (spring 03)

(Advisor: Glenn Boreman).

- Dijana Bugonovic, Master Thesis, *A non-paraxial scalar treatment of diffraction grating behavior* (summer 2002) (Advisor: James Harvey).
- Patrick Thompson, Ph.D. Dissertation, *Optical performance of grazing incidence X-ray/EUV telescopes for space science applications* (spring 2000) (Advisor: Dr. Harvey).
- Ola Harrysson, Ph.D. Dissertation, *Development of a knee-joint prosthesis* (spring 2000) (Advisor: Yasner Hosni).
- Dimitrios Charalampidis, Ph.D. Dissertation, *Analysis of images based on wavelets and multifractals with application to remote sensing* (spring 2000) (Advisor: Takis Kasparis).
- Jui Lin Chen, Ph.D. Dissertation, *Development of a means of measuring and responding to the navigational complexity of a virtual environment.* (fall 99) (Advisor: Kay Stanney).
- Jason Schaeffer, Master Thesis, *Design of an infrared antenna characterization system* (spring 99) (Advisor: Glenn Boreman).
- Anita Kotha-Thompson, Ph.D. Dissertation, *Scattering effects of machined optical surfaces* (spring 98) (Advisor: James Harvey).
- Curtis Lisle, Ph.D. Dissertation, *A framework for distributed computation of recursive, physically-based models* (spring 98) (Advisor: Rebecca Parsons).

Undergraduate Students (Honor Thesis)

- Nattorn Pongratananukul, Honors' Thesis, *Texture segmentation using fractal features*, (Honors B.S. in ECE, spring 2000) (Advisor: Dr. Takis Kasparis).
- Chris Ingrassia, Honors' Thesis, *Segmentation and tracking of the coronary arteries*, (Honors B.S. in CS, spring 99) (Advisor: Dr. Shah).
- Irene Snyder, Honors's Thesis, *The role of temporal proximity in grouping and object formation*, (Honors, B.A. in Cognitive Psy, spring 94) (Advisor: Dr. C. Burbeck).

International Academic Partnerships for Teaching

- 2010-present *L'Ecole Supérieure D'Optique in Bordeaux* (France). On the committee creating a new satellite institute in Bordeaux.
- 1998-present *L'Ecole Supérieure D'Optique in Orsay* (France). I offered second and third year students one position for a 3-6 month internship in my laboratory.
- 1998-2008 *L'Ecole Supérieure Nationale de Physique in Marseilles* (France). I offered third year students one position for a 6 month internship in my laboratory.
- 1998-2000 *L'Institut des Sciences de L'ingénieur in Clermond Ferrand* (France). Dr. Peuchot, Head of the Computer Vision Lab, and I collaborated on methods for augmented reality.
- 1998-2000 *El Centro de Investigaciones in Optica (CIO)*, Leon, Mexico. Taught a short course in Lens Design at CIO in April-May 99.

Mentoring of Graduate Students Towards Fellowships/AWARDS reported under Teaching or Research Awards.

RESEARCH (more information may be found under www.odalab-spectrum.org)

RECOGNITION AWARDS

- 2014 David Richardson Medal – **Awarded October 2014**
- 2013 **Director of the NSF-I/UCRC Center for Freeform Optics –Awarded August 1st 2013**
- 2012 **Director of the R.E. Hopkins Center for Optical Design and Engineering**

- 2012 **Recognized at “The Book” event**, University of Rochester, for role as **Associate Editor of Handbook of Visual Displays** (2012)
- 2009 Endowed as the **Brian J. Thompson Professor of Optical Engineering** – Univ. of Rochester.
- 2009 **Fellow of the NYSTAR Foundation** (Award 2009-2012).
- 2008 Recognized at **Women Making History Celebration 2008 – Faculty Women of Prominence.**
- 2008 **Joint Appointment in the College of Medicine** at UCF.
- 2008 **Fellow of the SPIE.**
- 2007 **Promotion to Full Professor of Optics with joint appointments in CS, ECE, and Modeling and Simulation** (all part of the College of Engineering).
- 2007 **Won 1st place** with student Ozan Cakmakci for the “EyeGlass Display” in the Technology and Fashion Show at CTIA Wireless 2007.
- 2005 **Honoree Women’s Research V “Honoring the Women of Physics” October 20, UCF.**
- 2004 **Fellow of the Optical Society of America.**
- 2001 **Distinguished Researcher Award for the UCF Centers and Institutes**, spring 2001.
- 2001 **Research Incentive Award**, UCF for Academic Year 2001.
- 2000 At the 2000 Photo Marketing Association (PMA) show in Las Vegas, Sm**ART**lens™ won the Digital Imaging Marketing Association (**DIMA**)’s **prestigious “Most Innovative Product Line” award**. As head of optics research for Sm**ART**lens Corporation, our contribution to the Award was the conceptual design of a compact relay lens for imaging texture in camera lenses, the associated optical texture phase plates, and the software “Voila!” for modeling of painterly effects in photographs. Other companies honored for their innovative digital products were Canon U.S.A. Inc., Fuji Photo Film U.S.A. Inc., Eastman Kodak Co., Astron Systems Inc., Sony Electronics Inc.
- 1998 **Research selected as Meritorious Application for Internet2 Research at UCF which contributed to UCF** receiving in Spring 99 a High Performance Connection grant (ANI-9729623) from the National Science Foundation’s Advanced Networking Infrastructure and Research (ANIR) program to support a connection to the vBNS (very-high-speed Backbone Network Service), a high-performance network that interconnects NSF supercomputing centers and research institutions that are selected under NSF’s High-Performance Connections program.
- 1997 **NIH First Award (Career/R29) (5 years).**

RECOGNITION AWARDS TO GRADUATE STUDENTS UNDER MY MENTORING

- 2014 **Aaron Bauer**, Hilbert Travel Award (**\$1,000**)
- 2014 **Aaron Bauer**, SPIE Fellowship in optical science and engineering (**\$2,000**)
- 2013 **Cristina Canavesi won 1st place** in the Simon Games business simulation and received a full-tuition scholarship (2013-2015) for the Executive MBA program at Simon School.
- 2013 Cristina Canavesi won **CYC student prize for Excellence** at the Institute of Optics
- 2012 **Best paper award at Optical Fabrication and Testing, OFT 2012, 1st place** - Kyle Fuerschbach
- 2012 **McAIN Business Competition** – Cristina Canavesi wins 1st place
- 2012 **William H. Price SPIE Scholarship** to Cristina Canavesi (**\$5,000**)
- 2011 **Kidger Memorial Scholarship Award 2011** to Kyle bach (**\$5,000**)
- 2011 **Award of Synopsys in Optical System Design USA Competition** to Bin Ma (**\$2,000**)
- 2011-14 **Carl Zeiss Fellowship** to Aaron Bauer and Robery Gray (**\$120,000**)
- 2010-13 **Synopsys Fellowship** to Cristina Canavesi (**\$130,000**)

2010-13 **NASA GSRP Fellowship** to Robert Gray (**\$90,000**)
2010 **Best paper award on Non-imaging Optics, 1st place**, IODC 2010, Florian Fournier
2010 **Best paper award on Alignment of Optical Systems, 2nd place**, OFT 2010, Tobias Schmid
2010 **SPIE Fellowships in Optical Science and Engineering** to Florian Fournier (**\$4,000**)
2010 **SPIE Fellowships in Optical Science and Engineering** to Sophie Vo (**\$2,000**)
2009-14 **LLE Fellowship** to Kyle Fuerschbach (**\$125,000/yr**)
2008 **Kidger Memorial Scholarship Award 2008** to Tobias Schmid (**\$5,000**)
2008 **William H. Price SPIE Scholarship** to Ozan Cakmakci (**\$3,000**)
2008 **LINK Foundation Fellowship** to Ilhan Kaya (**\$25,000**)
2008 **SPIE Fellowships in Optical Science and Engineering** to Florian Fournier (**\$2,500**), Kye Sung Lee (**\$2,500**), Supraja Murali (**\$2,000**).
2007 **Incubic/Milton Chang Travel Award** to Panomsak Meemon (**\$1,000**)
2007-09 **NASA Fellowship** to Jon Harben (**\$30,000/yr**)
2007-10 **Optical Research Associates Fellowship** to Florian Fournier (**\$30,000/yr**)
2007 **Best Paper Award in Optical System Design** to Florian Fournier at the Annual Meeting of the Optical Society of America. (2007).
2007 **Kidger Memorial Scholarship Award 2007** to Florian Fournier (**\$5,000**)
(1 award/yr from the Memorial Kidger Fund, International Award for Optical System Design).
2007 **UCF I²Lab 2007 Fellowship** for Interdisciplinary Research to Panomsak Meemon (**\$25,000**)
2007 **Won 2nd place in the UCF I²Lab Poster Competition 2007** for Supraja Murali.
2007 **LINK Foundation Fellowship** to Ozan Cakmakci (**\$25,000**)
2007 **Won 1st place** for the “EyeGlass Display” in the Technology and Fashion Show at CTIA Wireless 2007. (**Scholarship to Ozan Cakmakci of 10K**)
2006 **William H. Price Scholarship** to Costin Curatu (1 award per year – International Award) (**\$3,000**)
2006 **UCF I²Lab Fellowship** to Supraja Murali for Interdisciplinary Research (**\$25,000**)
2005 **UCF Graduate Research Forum, Best presentation in category winners** Engineering, Computer Science, Optics, Physical Sciences, Mathematics, Simulation and Modeling to Anand Santhanam.
2005 **Kidger Memorial Scholarship Award 2005** to Ozan Cakmakci (**\$5,000**)
(1 award/yr from the Memorial Kidger Fund, International Award for Optical System Design).
2005 **Award of Optical Research Associates in Optical System Design USA Competition** to Supraja Murali, regarding her dynamic focusing microscope objective design done for her Master Degree.
2005 **LINK Foundation Fellowship** to Anand Santhanam (**\$25,000**)
2005 **NSF Fellowship K-12 Program** to Cali Fidopiastis (**\$30,000**)
2005 **SPIE Fellowship** to Kye-Sung Lee (**\$1,200**)
2004 **LINK Foundation Fellowship** to Cali Fidopiastis (**\$25,000**)
2004 **SPIE Fellowships** to Weiyao Zou (**\$1,700**).
2004 **William H. Price Scholarship** to Vesselin Shaoulov (1 award per year International Award).(**\$3,000**)
2003 **LINK Foundation Fellowship** to Felix Hamza-Lup (**\$25,000**)
2003 **SPIE Fellowship** to Ceyhun A. Akcay (**\$2,000**).

FUNDING AWARDS As Principal Investigator (PI if not specified) or Co-PI

Current Support (Active Students Fellowships Reported p16)

2010-2015 NSF-GOALI: Enabling Freeform Optics, (**\$358,052**); **REU SUPP (\$54,000)**;
2013-2018 NSF I/IUCRC and UR match Center for Freeform Optics (**\$4M equivalent**)

2013-2015 II-VI Foundation, Metrology of Freeform Optics (**\$195,000**)
 2013-2015 DOE, Launching the Next Generation of Optical Systems (**\$350,000**)
 2013-2014 Intel Corporation (**\$204,975**)
 2014 DARPA (**\$100,000**)
 2014-2015 Perkin Elmer (**\$92,483**)
 2014 LighTopTech Corp. /CEIS (**\$94,630**)

Completed AWARDS

2013 UMASS (**\$11,000**)
 2012-13 NSF/-IUCRC, Planned Center for Freeform Optics (**\$14,500**)
 2012-2013 NSF/I-Corps, Optics for Photodynamic Therapy, (**\$50,000**)
 2011-2012 DSO National Labs, Far-Field Visual Imaging Using Lenslet Array (**\$55,952**)
 2010-2013 II-VI Foundation, Optical Design, Fab. and Testing of Polynomial Surfaces (**\$299,843**)
 2011-2012 RevisionEyewear, assessment of freeform technology in design (**\$85,000**)
 2009-2012 NYSTAR/UR Career Development Award, Biotechnology. (**\$949,883**)
 2010-2013 DARPA, development of metrology for GRIN optics (**\$622,000**) (**Phase I**)
 2010-2011 Multidisciplinary Provost grant, Augmented Reality for the Structural Conservation of Archaeological Monuments (**\$27,100**)
 2010 UMASS Amherst (**\$8,000**)
 2009-2010 Optical Research Associates, Support for Interns (**\$25,000**)
 2008-2010 Optical Research Associates, Light Tools Optical Test Cases (**\$15,000**).
 2009-2010 NOAO, LSST Telescope Alignment (**\$25,518**)
 2009-2010 ZCorp., Computational Methods for Testing (**\$122,578**)
 2009-2010 ONR/ORO – STTR: Development of Low-Cost Augmented Reality Head-Mounted Display (**\$28,000**)
 2008-2010 HEDZOPT Eyeglass Display. HEDZOPT. (**\$143,216**).
 2008-2010 I4 Corridor in relation to the James and Esther King Biomedical Research Program (**Anand Santhanam, PI; Rolland Co-PI \$320,000**) [Remains with UCF Lab]
 2008-2010 James and Esther King Biomedical Research Program (**\$949,717 Patrick Kupelian-Project Director; \$662,358 to UCF Rolland, UCF-PI**).[Remains with UCF Lab]
 2008 Distortion mapping. Phase I. Anhui Huadong Photoelectron Research Institute (**\$14,210**).
 2008-09 Center of Excellence for Imaging (**\$5.45M**) (**PI: Murabak Shah**)(**Rolland one of 15 Co-PIs**)(Recommended for Funding)
 2008-09 I4 Corridor in relation to MD Anderson Cancer Center Orlando (**\$76,338**).
 2007-08 ASRC/NASA Kennedy Space Center. Design of a Lunar Soil Instrument: II (**\$45,000**).
 2007-09 US Army Medical Research and Materiel Command. Human in Vitro Lung Model for Infectious Disease (**\$999,969/yr with \$225,000 to Rolland**, one of 4 Co-PIs; Pappachan Kolattukudy, PI).
 2007-08 Disney Imagineering. Design of eyeglass displays (**\$39,957**).
 2007-08 REI Optronics. Design of eyeglass display Phase I (**\$46,000**).
 2007-09 I4 Corridor matching funds in relation to VDC contract (**\$68,000**).
 2006-08 VDC Display Systems. LED Illumination System. (**\$137,528**).
 2006-09 MD Anderson Cancer Center. Dynamic Medical Imaging Analysis: Application to Radiotherapy. (**\$172,214**).
 2006 Royalty from Tech Transfer (After all UCF cost deductions). (**\$18,962**).
 2005-08 Optical Research Associates, Test Macro Development, (**\$40,000**).
 2003-08 National Science Foundation “IIS/HCI: Collaborative Research: Development and assessment of head-mounted fovea-contingent display technology” (**\$375,000**).

2006-07 LINZ University (Vienna). Institute für Pervasive Computing. Eyeglass Display. (**\$76,194**).

2004-07 Florida Photonics Center of Excellence Award on 3D Displays (**\$175,000**).

2004-07 Florida Photonics Center of Excellence Award on Biophotonics Imaging (**\$200,000**).

2004-07 SHANDs Hospital, University of Florida, Biophotonics Imaging (**\$100,000**).

2006-07 ASRC/NASA Kennedy Space Center. Design of a Lunar Soil Instrument. (**\$73,000**)

2006-07 Army RDE Command, Virtual Technologies and Environments (VIRTE) for Advanced Research on Agents and Teams, (PIs: D. Nicholson, S. Burke, S. Fiore, C. E. Hughes, G. Martin, **J. Rolland**, E. Salas, E. Smith, C. B. Stapleton) – **\$2,137,500**, 2006-2007. (Credit: 5% = **\$106,875**).

2004-06 METI, 3D Display for Medical and Engineering Visualization, (**\$100,000**).

2005-06 US ARMY SBIR phase 1 through Nvis Corporation, “Wide angle HMD” (**\$17,000**).

2004-06 NASA/Adastralabs SBIR phase 1 “Teleportal face-to-face collaboration,” (**\$10,000**).

2004 UCF Foundation/Motion Analysis. Donation (**\$10,000**).

2003-05 ONR, “Research in Augmented and Virtual Environment Systems(RAVES): HMDs” (**\$400,000**).

2002-05 US ARMY SBIR phase 1 & 2 through Nvis Corporation, “Head Mounted Display for Cockpit” (**Phase 1: \$20,000**); (**Phase 2: \$200,000 to UCF**).

2002-05 ONR STTR phase 1&2 through Nvis Corporation, “Improved Head Mounted Display for Close Quarter Battle Training,” (**Phase 1: \$22,000**); (**Phase 2: \$148K to UCF**).

2000-04 National Science Foundation, ITR/HCI: “Development of Head-Mounted Displays for Distance Collaboration,” (**\$204,984**).

2002-03 ONR, “Immersion Center: Achieving Excellence in Multimodal Interactive Systems Design,” (**PI: Brian Godiez; Co-PIs: Jannick Rolland and Kay Stanney**) (**\$966,000**).

2002-03 Army-Stricom, “Organic-based See-Through HMD for Outdoor Augmented Reality,” (**\$68,002**).

2002-03 Army-Stricom, “Deployable 3D Trauma Training Center: Modules One and Two,” (**\$200,000**).

2001-03 Army-Stricom (NAWCTSD), “Development of a Projection Head-Mounted Display for Integration with the Mannequin for the Military Medics ,” (**\$415,000**).

2001-03 Office of Naval Research (ONR), “VIRTE: Analysis and Development of a Full Immersion Projective Head-mounted Display for Dismounted Infantry Training,” (**\$145,000**).

2001 ELF Exploration Production “An interferometer for curvature measurement,”(**\$34,914**).

2000-01 In-House Research Award, UCF (**\$7,500/year**).

2001 UCF Research Grant, “ Investigation of Non-Invasive Diagnosis of Cervical Cancer Using Optical Coherence Tomography,” (**\$7,500**).

1997-02 National Institutes of Health First Award, “3D Dynamic Anatomy: a Virtual Reality Prototype,” (**\$500,000**).

1999-03 National Science Foundation,“ Interactive Distributed Physical Modeling and Augmented Virtual Reality,” (**\$176,928**) (Co-principal investigators: Charles E. Hughes).

1999-01 SmARTlens Corp./ I4-Corridor “Redefining Photography: Simulating Painterly Effects in Images,” (**\$254,000**).

2000 ELF Exploration Production “Development of Optical Coherence Tomography for 3D Imaging,” (**\$34,914**).

1999-00 Michigan State University, “Design of an Ultra-Light Weight Projective Head-Mounted Display,” (**\$37,000**) (+ **\$8,000 in kind donation**).

1999 ELF-France-Aquitaine, “Research Support Grant - Phase 1: Design of a Light-Weight Projective Head-Mounted Display,” (**\$33,304**).

1999 Lockheed-Martin, “Augmented Reality Research and Instrumentation Grant,” (**\$31,125**).

1997-99 Artificial Reality Corporation, “Design of a High-Speed Optical Tracker,” (**\$15,000**).

- 1997-98 Tacom US Army Research Laboratory, “Stereoscopic and HMD System Test Development,” **(\$47,416).**
- 1998 Florida Hospital, “Optical Colposcopy,” **(\$16,000).**
- 1998 I4-Corridor, “Investigation of Vection in a Rotating Drum,” **(\$40,000).**
- 1997-98 UCF Research Grant, “Texture Based Segmentation,” **(\$7,500).**
- 1994-98 Office of Naval Research Grant Award, “Psychophysical Investigations of See-Through Head-Mounted Displays for 3D Visualization,” **(\$459,626).**

FUNDING AWARDS as Investigator

- 2013 Postdoctoral CVS Fellowship Awarded to Patrice Tankam and Jannick Rolland (PI).
- 2010-present part of NIH core grant in Center for Visual Science at URMC, Rochester
- 2010-present part of NIH core grant in Center for Dermatology at URMC. Rochester
- 2006-09 ONR, Virtual Technologies and Environments (VIRTE) for Advanced Research on Agents and Teams. (\$1,000,000 - **\$50,000 to Rolland**, one of multiple investigators).
- 2003-04 ONR,” research in Augmented and Virtual Environment Systems(RAVES): Rendering” **(\$3,876).**
- 2002-03 Army-Stricom, “Development of a Holographic Single Element Head Mounted Display,” **(\$62,000).**
- 2000 CONACYT, “Investigations on Physical Optics and Geometrical Optics,” PI: Oreste Stavroudis **(\$15,000).**
- 1998 NSF/UCF InternetII at UCF, Rolland’s Research was Selected as One of Two Meritorious Applications from UCF, Total Award Amount to UCF **(\$2,220,800).** **(free Internet2 connection to ODALab and University Support for Internet2).**
- 1996-97 UCF grant, “A Research Center Proposal to the University of Central Florida: Phase I,” PI: Michael Moshell (CS and IST) **(\$50,000).**
- 1995 *Junior Faculty Development Award*, “A Novel Virtual Reality Tool for Teaching Dynamic 3D Anatomy,” PI: Donna Lee Wright **(\$3,000).**

U.S. Academic Partnerships Focused on Research

- 2011-present **Newhouse School of Communication at Syracuse University.** Dr. Biocca, Endowed Chair Professor of Telecommunication Technologies and Information Services, also Director of the Media Interface & Network Design (M.I.N.D.) laboratory, and I collaborate on virtual environment technology design and assessment.
- 2010-present **UCLA, CA,** Dr. Anand Santhanam, collaborating on 3D Medical technologies
- 2009-present **Armstrong Atlantic University,** Dr. Felix Hamza-Lup, collaborating on Virtual Reality technologies.
- 2003-2008 **University of Florida,** Electrical Engineering Department, Dr. Xie, Ph.D., collaborating on MEMS for optical coherence imaging.
- 2003-2006 **University of Florida,** Shands Hospital Core (Cardiac) Lab, Dr. Marco Costa (MD/PhD) and Paul Guilmore (MD) collaborating on coronary optical imaging.
- 2001-Present **Columbia University,** Medical School, Dr. Celina Imielinska, Ph.D., collaborating of 3D medical models rendering.
- 2002-05 **University of Pittsburgh,** Cancer Institute, Dr. Robert Ferris, PhD/MD, collaborating on OCT and skin cancer diagnosis.
- 1998-present **Optical Sciences Center and Radiology Department at the University of Arizona.** Dr. E. Clarkson and I have been collaborating on mathematical methods for imaging.

- 1993-2010 **Communication Department at Michigan State University.** Dr. Biocca, Ameritech Professor of Telecommunication Technologies and Information Services, also Director of the Media Interface & Network Design (M.I.N.D.) laboratory, and I collaborate on virtual environment technology design and assessment.
- 1993-00 **Radiology Department at the University of North Carolina at Chapel Hill.** Dr. Wright, Assistant Professor and Dr. Renner, M.D., both in the Radiology Department at the University of North Carolina at Chapel Hill, are current medical partners on developing the Virtual Reality Dynamic Anatomy (VRDA) tool for visualization and teaching of dynamic anatomy.

International Academic Partnerships for Research

- 2011-present **Institute d'Optique - LP2N and INRIA,** Bordeaux France
- 2007-2008 **Nationale University of Ireland, Galway.** Professor Chris Dainty, Collaborating on optical instrumentation applied to astronomy and biophotonics
- 2006-2008 **University of LINZ, Austria,** Simon Vogt and Loi Ferscha, Collaborating on the design of eyeglass displays
- 2005-2008 **Institut d'Optique et Théorique et Appliquée.** Michael Canva, Head of the Biophotonics team. Collaboration on methods for biochips design and measurements.
- 2006-2008 **Ecole Nationale Supérieure des Télécommunications.** Isabelle Bloch, Head of the Medical Imaging team. Collaboration on application of 3D Lung Dynamics to Registration of PET and SPECT images for Radiation Oncology.
- 1997-99 **L'institut des Sciences de L'ingénieur at Clermond Ferrand (France).** Dr. Peuchot, Head of the Computer Vision Lab. Collaboration on methods for augmented reality.
- 1996 **Centro de Investigaciones in Optica (CIO),** Leon, Mexico. Collaboration with Dr. Stavroudis on differential geometry.

Industrial Partnerships

- 2013-present **CeFO** members (Freeform Optics)
- 2011-present **Carl Zeiss,** Germany (Nodal Aberration Theory and Freeform Optics)
- 2011-present **Revision Military,** Quebec Canada (Freeform Optics)
- 2010-present **Optipro Corporation,** Webster NY (Freeform Optics)
- 2010-present **QED Corporation,** Rochester NY (Aspherics and Freeform Optics)
- 2009-present **II-VI Corporation,** Saxonburg Pennsylvania (Freeform Optics)
- 2009-2010 **Rochester Photonics Optics,** Rochester NY (Development of a catheter for OCT)
- 2007-2008 **Disney Imagineering,** Glendale, CA (development of displays)
- 2007-present **Revision Eyewear/Hedzopt,** Montreal, Quebec, Canada
Development of head-worn displays
- 2006-2007 **Silhouette,** LINZ, Austria (development of displays)
- 2006-2009 **VDC Displays,** Orlando FL
Collaboration on the development of LED-based illumination for projector systems
- 2005-present **Optical Research Associates,** Pasadena CA
Collaboration on macro development for software related to optical simulation
- 2004-present **Optimax Corporation,** Webster NY
Collaboration on optical fabrication
- 2004-06 **METI Corporation,** Sarasota FL
Collaboration on the development of a biomathematical model of breathing
- 2003-04 **ADASTRA LABs LLC,** Orlando FL

- 2003-04 Collaboration on the design of head-mounted displays
Uni-pixel Displays, Inc., Georgetown, Texas
 Collaborating on the design of microdisplays for head-mounted displays
- 2002-06 **Nvis. Inc.**, Washington DC
 Development of head-mounted displays
- 2001-02 **Microvision Corporation**, Seattle WA
 Development of retinal scanning displays
- 2000 **SmARTlens Corporation**, Tampa, FL
 Developing innovative technology for special effects in photography/movies
- 2000 **RSK Assessments Inc.**, Orlando FL
 Investigation of vection via texture patterns presentation in virtual environments
- 1998-99 **Air Instruments and Measurements Inc.**, Baldwin Park, CA
 Design of a telescope for pollution monitoring working in the IR and UV
- 1998-99 **Naval Warfare Center**, Orlando, FL
 Review of phase II SBIR Award to Laser Power Corp. (CA) and design of assessment of experiments
- 1997-99 **Supervision International**, Orlando FL
 Supervised design of a fiber optics illumination system
- 1996-06 **RSK Assessments, Inc**, Orlando FL
 Research advisor on assessment technology for virtual environments
- 1997-98 **Artificial Reality Corporation**, Vernon, CT
 Design of an anamorphic lens for optical tracking
- 1997-98 **TACOM US ARMY Research Lab**, Detroit, MI
 Investigation of eyepoint location in head-mounted displays
- 1995 **Design Magic**, Rayleigh, NC
 Optics for virtual reality theater
- 1991-93 **Ocutech**, Chapel Hill, NC
 Design of a miniature telescope for low-vision aids
- 1992 **Boeing**, Seattle, Washington State
 Research advisor on head-mounted display design

PUBLICATIONS

Articles in Refereed Journals

(This list is built from earliest to most recent)

1. Myers, K.J., J.P. Rolland, H.H. Barrett, and R.F. Wagner, "Aperture optimization for emission imaging: effect of a spatially varying background," *J. Opt. Soc. Am. A*, 7(7), 1279–1293 (1990).
2. Rolland, J.P. and H.H. Barrett, "Ideal versus human observer for long-tailed point-spread functions: Does deconvolution help?" *Phys. Med. Bio.*, 36(8), 1091–1109 (1991).
3. Robinett, W. and J.P. Rolland, "A computational model for the stereoscopic optics of a head-mounted display," *Presence: Teleoperators and Virtual Environments* (MIT Press), 1(1), 45-62 (1992).
4. Barrett, H.H., T. Gooley, K. Girodias, J.P. Rolland, T. White, and J. Yao, "Linear discriminates and image quality," *Image and Vision Computing*, 10(6), 458-473 (1992).
5. Rolland, J.P. and H.H. Barrett, "Effect of random background inhomogeneity on observer detection performance," *J. Opt. Soc. Am. A*, 9(5), 649-658 (1992).
6. Barrett, H.H., J. Yao, J.P. Rolland, and K. J. Myers, "Model observers for assessment of image quality," *Proc. Natl. Acad. Sci.*, 90(21), 9758–9765 (1993).

7. Rolland, J.P., D. Ariely, and W. Gibson, "Towards quantifying depth and size perception in virtual environments," *Presence: Teleoperators and Virtual Environments* (MIT Press), 4(1), 24-49 (1995).
8. Hemminger, B.H., R.E. Johnston, J.P. Rolland, and K.E. Muller, "Introduction to perceptual linearization of video display systems for medical image presentation," *Journal of Digital Imaging*, 8(1), 21-34 (1995).
9. Wright, D.L., J.P. Rolland, and A.R. Kancherla, "Using virtual reality to teach radiographic positioning," *Radiologic Technology*, 66(4), 167-172 (1995).
10. Burbeck, C.A., S.M. Pizer, B.S. Morse, D. Ariely, G.S. Zauberman, and J.P. Rolland, "Linking object boundaries at scale: a common mechanism for size and shape judgments," *Vision Research*, 36(3), 361-372 (1996).
11. Marshall, J.A., C.A. Burbeck, D. Ariely, J.P. Rolland, and K.E. Martin, "Occlusion edge blur: A cue to relative visual depth," *J. Opt. Soc. Am. A*, 13(4), 681-688 (1996).
12. Rolland, J.P. and R. Strickland, "An approach to the synthesis of biological tissue," *Optics Express*, 1(13), 414-423 (1997).
13. Rolland, J.P., A. Goon, and L. Yu, "Synthesis of textured complex backgrounds," *Optical Engineering*, 37(7), 2055-2063 (1998).
14. Rolland, J.P., A. Yoshida, L. Davis, and J.H. Reif, "High resolution inset head-mounted display," *Applied Optics*, 37(19), 4183-4193 (1998).
15. Schachar, R.A., D.P. Cudmore, T.D. Black, J.C. Wyant, V.W. Shung, T. Huang, R.T. McKinney, and J.P. Rolland, "Paradoxical optical power increase of a deformable lens by equatorial stretching," *Annals of Ophthalmology*, 30(1), 10-18 (1998).
16. Biocca, F. and J.P. Rolland, "Virtual eyes can rearrange your body: adaptation to virtual eye location in see-thru head-mounted displays," *Presence: Teleoperators and Virtual Environments* (MIT Press), 7(3), 262-277 (1998).
17. Goon, A. and J.P. Rolland, "Texture classification based on comparison of second-order statistics I: Two-point probability density function estimation and distance measure," *J. Opt. Soc. Am. A*, 16(7), 1566-1574 (1999).
18. Rolland, J.P., V. Vo, B. Bloss, and C.K. Abbey, "Fast algorithms for histogram matching: application to texture synthesis," *Journal of Electronic Imaging*, 9(1), 39-45 (2000).
19. Rolland, J.P., "Wide angle, off-axis, see-through head-mounted display," *Optical Engineering - Special Issue on Pushing the Envelope in Optical Design Software*, 39 (7), 1760-1767 (2000).
20. Baillot, Y., J.P. Rolland, K. Lin, and D.L. Wright, "Automatic modeling of knee-joint motion for the virtual reality dynamic anatomy (VRDA) tool," *Presence: Teleoperators and Virtual Environments* (MIT Press), 9(3), 223-235 (2000).
21. Rolland, J.P. and H. Fuchs, "Optical versus video see-through head-mounted displays in medical visualization," *Presence: Teleoperators and Virtual Environments* (MIT Press), 9(3), 287-309 (2000).
22. Rolland, J.P., M. Krueger, and A. Goon, "Multi-focal planes in head-mounted displays," *Applied Optics*, 39(19), 3209-3215 (2000).
23. Hua, H., A. Girardot, C. Gao, and J.P. Rolland, "Engineering of head-mounted projective displays," *Applied Optics*, 39(22), 3814-3824 (2000).
24. Kasparis, T., D. Charalampidis, M. Georgiopoulos, and J.P. Rolland, "Segmentation of textured images based on fractals and image filtering," *Pattern Recognition*, 34(10), 1963-1973, (2001).
25. Rolland, J.P., V. Shaoulov, and F.J. Gonzalez, "The art of back-of-the-envelope paraxial raytracing," *IEEE Transactions in Education*, 44(4), 365-372 (November 2001).
26. Zou, W. and J.P. Rolland, "Generalized figure Control Algorithm for large segmented Telescope Mirrors," *J. Opt. Soc. Am. A.*, 8(3), 638-649 (March 2001).
27. Rolland, J.P., L. Davis, Y. Ha, C. Meyer, V. Shaoulov, A. Akcay, H. Zheng, R. Banks, and B. DelVento, "3D Visualization and Imaging in Distributed Collaborative Environments," *IEEE Computer Graphics and Applications*, January-February 22(1), 11-13 (2002).

28. Rolland, J.P., C. Meyer, K. Arthur, and E. Rinalducci, "Methods of adjustments versus method of constant stimuli in the quantification of accuracy and precision of rendered depth in head-mounted displays," *Presence: Teleoperators and Virtual Environments*, 11(6), 610-625 (2002).
29. Argotti, Y., L. Davis, V. Outters, and J.P. Rolland, "Dynamic superimposition of synthetic objects on rigid and simple-deformable objects," *Computers and Graphics*, 26(6), 919-930 (2002).
30. Akcay, C.A, P. Parrein, and J.P. Rolland, "Estimation of longitudinal resolution in optical coherence imaging," *Applied Optics*, 41(25), 5256-5261 (2002).
31. Ha, Y. and J.P. Rolland, "Optical Assessment of Head-Mounted Displays in Visual Space" *Applied Optics*, 41(25), 5282-5289 (2002).
32. Hua, H., Y. Ha, and J.P. Rolland, "Design of an ultra-light and compact projection lens," *Applied Optics*, 42(1), 97-107 (2003).
33. Hamza-Lup, F., L. Davis, C. Hughes, and J.P. Rolland, "Where Digital meets Physical - Distributed Augmented Reality Environments," *ACM / Crossroads / Xrds9-3 / Where Digital Meets Physical: Computer-based Distributed Collaborative Environments* (2003) [online]. <http://www.acm.org/crossroads/xrds9-3/dare.html>
34. Davis, L., J.P. Rolland, F. Hamza-Lup, Y. Ha, J. Norfleet, B. Pettitt, and C. Imielinska, "Enabling a Continuum of Virtual Environment Experiences," *IEEE Computer Graphics and Applications*, 23(2), 10-12 (February 2003).
35. Akcay, C.A., J.P. Rolland, and J. Eichenholz, "Spectral Shaping to Improve the Point Spread Function in Optical Coherence Tomography," *Optics Letters*, 28(20), 1921-1923 (October 2003).
36. Shaoulov, V. and J.P. Rolland, "Design and assessment of Microlenslet array relay Optics," *Applied Optics*, 42(34), 6838-6845 (December 2003).
37. Shaoulov, V., R. Martins, and J.P. Rolland, "Compact microlenslet array-based magnifier," *Optics Letters*, 29(7), 709-711 (April 2004).
38. Hamza-Lup, F.G. and J.P. Rolland "Scene Synchronization for Real-Time Interaction in Distributed Mixed Reality and Virtual Reality Environments," *Special issue on Collaborative Virtual Environments, Presence: Teleoperators and Virtual Environments* (MIT Press), 13(3), 315-327 (June 2004).
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40. Shaoulov, V. and J.P. Rolland, "Model of Wide-angle Optical Field Propagation using Scalar Diffraction Theory," *Special Issue of Optical Engineering on Illumination Engineering*, 43(7), 1561-1567 (July 2004).
41. Hamza-Lup F., J.P. Rolland, and C. Hughes, "A Distributed Augmented Reality System for Medical Training and Simulation," *Energy, Simulation-Training, Ocean Engineering and Instrumentation: Research Papers of the Link Foundation Fellows*, 4, 213-235, Rochester Press (2004).
42. Rolland, J.P., J. O'Daniel, T. Delemos, A. Akcay, K. Lee, K. Cheong, E. Clarkson, R. Chakrabarti, and R. Ferris, "Task-based optimization and performance assessment in optical coherence imaging," *J. Opt. Soc. Am. A*, 22(6), 1132-1142 (2005).
43. Rolland, J.P., F. Biocca, F. Hamza-Lup, Y. Ha, and R. Martins, "Development of Head-Mounted Projection Displays for Distributed, Collaborative Augmented Reality Applications," *Presence: SI Immersive Projection Technology*, 14(5), 528-549 (2005).
44. Fidopiastis, C.M., C. Fuhrman, C. Meyer, and J.P. Rolland, "Methodology for iterative evaluation of prototype head-mounted displays in virtual environments: visual metrics," *Presence: SI Immersive Projection Technology*, 14(5), 550-562 (2005).

45. Lee, K.S, A.C. Akcay, T. Delemos, E. Clarkson, and J.P. Rolland, "Dispersion control with Fourier-domain optical delay line in a fiber optic imaging interferometer," *Applied Optics*, 44, 4009-4022 (July 2005).
46. Akcay, A.C. and J.P. Rolland, "Effect of source spectral shape on task-based assessment of detection and resolution in Optical Coherence Tomography" *Applied Optics*, 44(35), 7573-7580 (2005).
47. Zou, W. and J.P. Rolland, "Iterative zonal wavefront estimation algorithm for optical testing with general-shaped pupils," *J. Opt. Soc. Am. A*, 22(5), 938-951 (2005).
48. Curatu, C., G. Curatu, and J.P. Rolland, "Tolerance analysis method for Shack-Hartmann sensors using a variable phase surface," *Opt. Express*, 14, 138-147 (2006).
49. Hua H., P. Krishnaswamy, and J.P. Rolland, "Video-based eyetracking methods and algorithms in head-mounted displays," *Optics Express* 14(10), 4328-4350 (May 2006).
50. Fidopiastis, C.M., C.B. Stapleton, J.D. Whiteside, C.E. Hughes, S.M. Fiore, G.A. Martin, J.P. Rolland, and E.M. Smith, "Human experience modeler: Context-driven cognitive retraining to facilitate transfer of learning," *CyberPsychology & Behavior*, 9(2), 183-187 (2006).
51. Akcay, A.C., K.S. Lee, L.R. Furenlid, M.A. Costa, and J.P. Rolland, "Compact low-cost detection electronics for optical coherence imaging," *Optical Engineering Letters* 45 (7) 070504:1-3 (July 2006).
52. Zou, W. and J.P. Rolland, "Quantification of error propagation in slope-based wavefront estimations" *J. Opt. Soc. Am. A* , 23 (10), 2629-2630 (October 2006).
53. Cakmakci O. and J.P. Rolland, "Head-worn displays: A review," *IEEE/OSA Journal of Display Technology*, 2(3) 199-216 (September 2006). **(Invited)**
54. Lecaruyer, P., E. Maillart, M. Canva, and J.P. Rolland "Generalization of the Rouard Method to an Absorbing Thin-film Stack and Application to Surface Plasmon Resonance," *Applied Optics* 45(33), 8419-8423 November (2006).
55. Hamza-Lup, F.G., A. Santhanam, C. Imielinska, S. Meeks, and J.P. Rolland, "Distributed augmented reality with 3D lung dynamics – A planning tool concept," *IEEE Transactions on Information Technology in Biomedicine*, 11(1) 40-46 (2007).
56. Rolland, J.P., O. Cakmakci, J. Covelli, C. Fidopiastis, F. Fournier, R. Martins, F. Hamza-Lup, and D. Nicholson. "Beyond the Desktop: Emerging Technologies for Supporting 3D Collaborative Teams." *International Journal on Interactive Design and Manufacturing* 4(1) (2007). **(Invited)**
57. Lecaruyer, P., M. Canva, and J.P. Rolland, "Metallic film optimization in a surface plasmon resonance biosensor by the extended Rouard method," *Applied Optics* 46 (12), 2361-2369 April (2007).
58. Santhanam, A.P., F. Hamza-Lup, and J.P. Rolland "Simulating 3D lung dynamics using a programmable graphics processing unit," *IEEE Transactions on Information Technology in Biomedicine* 11 (5), 497-506 (2007).
59. Cakmakci, O. and J.P. Rolland, "Design and Fabrication of a Dual-Element Off-Axis Near-Eye Optical Magnifier" *Optics Letters*, (32)11, 1363-1365 (June 1, 2007).
60. Martins, R., V. Shaoulov, Y. Ha, and J.P. Rolland, "A mobile head-worn projection display," *Optics Express* 15, 14530-14538 (2007).
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64. Zou, W., K.P. Thompson, and J.P. Rolland, "Differential Shack-Hartmann curvature sensor: local principal curvature measurements," *JOSA A* 25, 9, 2331-2337 (2008).
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126. Fuerschbach, K., J. P. Rolland, and K. P. Thompson, "Interferometric measurement of a concave, ϕ -polynomial, Zernike mirror", Optics Letters 39(1), 18-21 (2014). doi: 10.1364/OL.39.000018
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129. Bauer, A., and J.P. Rolland, "Visual space assessment of two all-reflective, freeform, optical see-through head-worn displays", Optics Express 22(11), 13155-13163 (2014). doi:10.1364/OE.22.013155 http://vjbo.osa.org/virtual_issue.cfm
130. Fuerschbach, K., J. P. Rolland, and K. P. Thompson, "Theory of Aberration Fields for General Optical Systems with Freeform Surfaces" Optics Express 22(22) 26585-26606 (2014). doi: 10.1364/OE.22.026585
131. Huang, J., Q. Yuan, B. Zhang, K. Xu, P. Tankam, E. Clarkson, M.A. Kupinski, H.B. Hindman, J.V. Aquavella, T.J. Suleski, and J.P. Rolland, "Measurement of a multi-layered tear film phantom using optical coherence tomography and statistical decision theory", Biomedical Optics Express 5(12), 4374-4386 (2014). doi:10.1364/BOE.5.004374

Plenary / Keynote Presentations

(This list is built from earliest to most recent)

1. Rolland, J.P., O. Cakmakci, and S. Vo, "A Perspective on the Design of Head-Worn Displays," SPIE Europe Optical System Design (September 2008).
2. Thompson K., T. Schmid, and J.P. Rolland, "Understanding the Alignment of TMA Telescopes with Nodal Aberration Theory," SPIE Europe Optical System Design (September 2008).
3. Rolland, J.P., "Seeing beyond skin in three dimensions: The Optics and Optical Design of a Gabor Domain Optical Coherence Microscope with Imbedded Liquid Lens", UK Optical Designers Meeting (Abington UK, September 16, 2010).
4. Rolland, J.P., "Beyond Aspherics" Annual Meeting of the SPIE, San Diego CA (2011).
5. Rolland, J.P., "Towards quantitative imaging of the tear film dynamics and understanding its clinical relevance" 7th International Conference on the Tear Film & Ocular Surface: Basic Science and Clinical Relevance Taormina, Sept. 18-21 (2013) (Keynote)
6. Rolland, J.P., "Freeform Optics" OSA Topical Meeting on Freeform Optics, Tucson AZ (2013)
7. Thompson, K, and J.P. Rolland, "Will Computational Imaging Change Lens Design?", International Optical Design Conference, June 22-26, Hawaii Kona Island (2014)
8. Rolland, J.P., "Applications and Challenges with Freeform Optics" ASPE, (Hawaii, Big Island, 22-26 June 2014)

Invited Talks/Papers

(This list is built from earliest to most recent)

1. Rolland, J.P., "Synthetic experience in virtual worlds," Imagina, Monte-Carlo, France, (January, 1991).
2. Rolland, J.P., "Insight into optical properties of wide-angle see-through head-mounted displays," Virtual Worlds Conference, SRI, Seattle, WA, (June, 1991).
3. Rolland, J.P., "Towards blending real and virtual environments," ACM-SIGGRAPH New York, NY, (May, 1992).
4. Rolland, J.P., "Depth and size perception in virtual environments," Optical Society of America General Meeting, Albuquerque, NM, (September, 1992). (Abstract).
5. Barrett, H.H., J. Yao, and J.P. Rolland, "Applications of the Hotelling observer in medical imaging," Optical Society of America General Meeting, Albuquerque, NM, (September, 1992) (Abstract).
6. Rolland, J.P., "Depth perception in see-through head-mounted displays," Virtual Reality International Symposium, Seattle, WA, (1993).
7. Rolland, J.P., "Head-mounted displays for virtual environments: The optical interface," International Lens Design Conference, Proceedings of the Optical Society of America 22, 329-333, (1994).
8. Rolland, J.P., "Development of a virtual reality dynamic anatomy (VRDA) tool," Symposium on High Tech Education for the Third Millennium," Oregon Institute of Technology, Klamath Falls, OR, (April, 1997).
9. Rolland, J.P., "Depth and size perception in virtual environments," MIT Media Lab, (September, 1995).
10. Rolland, J.P., "Role of synthetic backgrounds in image quality assessment," National Institutes of Health, Workshop on Image perception in Radiology, Washington, DC, (October 21, 1997).
11. Rolland, J.P., "Depth perception in virtual environments," American Psychological Association Annual Convention, Chicago, IL, (1997).
12. Rolland, J.P., Y. Baillot, L. Davis, L. Vaissie, and D.L. Wright, "Role of optics in virtual environments," Proceedings of the International Lens Design Conference, Hawaii, (1998).

13. Rolland, J.P., "Building the future of biology and medicine," Bioengineering and Clinical Medicine Symposium, National Institutes of Health, Bethesda, MD, (February 27, 1998).
14. Rolland, J.P., "Optical texture in images," Third International Conference on Optical Signal Processing Conference, Moscow, Russia, (May 28–31, 1999).
15. Rolland, J.P., "Advances in texture synthesis, analysis, and imaging," SIAM/SEAS, Knoxville, TN, (March 19, 1999).
16. Rolland, J.P., "Augmented reality with innovative displays," Augmented Reality Workshop, Navy Research Lab (NRL), Washington, DC, (December 7, 2000). (Invited talk).
17. Kennedy, R.S., K.M. Stanney, J.P. Rolland, and A. Mead, "Optokinetic studies of the relationship between ego-motion and cybersickness," Aerospace Medical Association Meeting, Reno, NV, (May, 2001).
18. Rolland, J.P., V. Outters, and Y. Argotti, "Recent developments of augmented reality technology for the virtual reality and dynamic anatomy (VRDA) tool," Medicine Meets Virtual Reality (MMVR), 2000, Eds. J.D. Westwood, H.M. Hoffman, R.A. Robb, and D. Stredney, (IOS Press) (January, 2000). (Presentation Selected for Reporting in MD Computing – see Public Relations).
19. Hua, H. and J.P. Rolland, "Design of a compact lens using diffractive optics for a projected head-mounted display," Optical Society of America Annual Meeting, Providence, RI, (October 22-26, 2000). (Abstract and Oral Presentation).
20. Hua, H. and J.P. Rolland, "Technologies of head-mounted displays for 3D visualization and wearable applications," Computer Graphics Seminar at the Computer Science Department at the University of Illinois at Urbana-Champaign, IL, (November 29, 2000). (Abstract and Oral Presentation).
21. Hua, H. and J.P. Rolland, "Technologies of head-mounted displays for 3D visualization and wearable applications," Human interaction with Complex Systems (HICS) at the Beckman Institute, University of Illinois at Urbana-Champaign, IL, (May, 2000) (Workshop).
22. Rolland, J.P., H. Hua, C. Gao, and F. Biocca, "Innovative displays for augmented reality applications and remote collaborations," Medicine Meets Virtual Reality (MMVR), Newport Beach, CA, (January 27, 2001). (Abstract and Oral presentation).
23. Hua, H., L.D. Brown, C. Gao, N. Ahuja, and J.P. Rolland, "A head-mounted projective display and its applications in interactive augmented environments," SIGGRAPH 2001 Sketches & Application, Los Angeles, CA, (August 12-17, 2001).
24. Rolland, J.P., "Augmented reality with potential use in the fields of orthopedics and rehabilitation," Department of Mechanical Engineering, at the Louisiana State University, Baton Rouge, New Orleans, LA, (September 7, 2001).
25. Rolland, J.P. and F. Biocca, "New paradigm for head-mounted display technology and its application to medical visualization and remote collaborations," The International Society for Optical Engineering (SPIE) Annual Meeting, San Diego, CA, (June, 2001).
26. Rolland, J.P., "Innovation in head-mounted displays: a demonstration of augmented reality," Optical Society of America Annual Meeting, Long Beach, CA, (October 14-18, 2001). (Abstract).
27. Rolland, J.P., L. Davis, Y. Argotti, Y. Ha, B. DeVento, A. Akcay, H. Zheng, V. Shaoulov, and C. Meyer, "3D visualization and imaging in distributed collaborative environments," Computer Graphic Applications (January, 2002).
28. Rolland, J.P., "Wearable displays: Demonstration of the 3D ARC Display," (Special Event – Optical Society of America Annual Meeting) Orlando, FL, (2002).
29. Rolland, J.P., "Emerging Visual Technologies: The developments in visual displays," SMI'03 (January, 2003 & March, 2003).
30. Rolland, J.P., "Surgical displays," Photon Forum, Tucson, AZ, (April 6, 2004).
31. Rolland, J.P., "Past, present, and future of wearable displays," Keynote Invitation at the CITSA'04, Orlando, FL, (July 23, 2004).
32. Rolland, J.P., and O. Cakmakci, "Past, present, and future of wearable displays," Photonics Asia Beijing, China, (November 8-12, 2004).
33. Hamza-Lup, F. and J.P. Rolland. "Augmented reality and Internet 2 for advanced collaborative

- environments,” Internet 2 Fall Members Meeting, Austin, TX, (September, 2004).
34. Pansing, C., H. Hua, and J.P. Rolland, “Optimization of illumination schemes in a head-mounted-display integrated with eye tracking capabilities,” Novel Optical Systems Design and Optimization VIII. SPIE Symposium on Optics and Photonics, Proceedings of SPIE 5875, San Diego, CA, (July 31 – August 4, 2005).
 35. Rolland, J.P., “Visualisation 3D avec la réalité augmentée,” Institut d’Optique Théorique et Appliquée, Université Paris Sud, France, (February 11, 2005).
 36. Rolland, J.P., “Imagerie a basse cohérence optique,” Institut d’Optique Théorique et Appliquée, Université Paris Sud, France, (April 14, 2005).
 37. Rolland, J.P., “Vers L’imagerie a basse cohérence optique quantitative,” Ecole Supérieure de Physique et de Chimie Industrielle, Paris, France, (June, 2005).
 38. Rolland, J.P., “Visualisation 3D avec la réalité augmentée,” Ecole Nationale Supérieure des Télécommunications, Paris, France, (March 18, 2005).
 39. Santhanam, A. and J.P. Rolland, “Visualization of 3D lung dynamics,” Mayo Clinic, College of Medicine, (July, 2005).
 40. Rolland, J.P., “Head-mounted Displays,” SID Student Chapter Meeting Kickoff, (October 2005)
 41. Rolland, J.P., “Overview of head-mounted display (HMD) research and development,” AFRL/HEAE, Mesa, AZ, (December, 2005).
 42. Rolland, J.P., A.C. Akcay, K.S. Lee, and L. Furenlid, “Utilization of broadband fiber couplers in optical coherence imaging,” NSF and DARPA workshop for the PTAP program, Hawaii, (July 2005).
 43. Rolland, J.P., “In situ 3D visualization with deployable and head-worn displays,” Affiliates Day, College of Optics and Photonics (April 21, 2006).
 44. Rolland, J.P., “Design of head-worn displays,” University of LINZ, Austria, (June 2006).
 45. Cakmakci O. and J.P. Rolland, “Head-worn displays,” IEEE/OSA Journal of Display Technology, 2(3) (September, 2006). (Co-listed under peer review publications).
 46. Curatu, C. , G. Curatu, and J.P. Rolland, “Fundamental and specific steps in Shack-Hartmann wavefront sensor design,” Annual Meeting of the SPIE (August, 2006).
 47. Rolland, J.P., “Beyond the Desktop: Emerging technologies for supporting 3D collaborative teams,” Virtual Concept 2006, Cancun, Mexico, (2006).
 48. Rolland, J.P., K.S. Lee, C. Akcay, L. Furenlid, and H. Xie, “Fiberoptic-based optical coherence imaging with broadband couplers: Robustness and deployability,” PTAP Annual Meeting. Maui, Hawaii, (2007).
 49. Rolland, J.P., “Visualization with deployable and head-worn displays,” University of Galway. Ireland, (July, 2007)
 50. Rolland, J.P., “Mountain tops and wilderness: A new vision,” (Invited Tutorial Talk). Optical Society of America Annual Meeting, San Jose, CA, (September, 2007).
 51. Fournier, F. and J.P. Rolland, “Freeform components for projection displays,” UK Optical Designers’ Meeting, Oxfordshire, United Kingdom, (2007) (Abstract)
 52. Rolland, J.P., O. Cakmakci, K.S. Lee, C. Fidopiastis, F. Hamza-Lup, and A. Santhanam, “Beyond the desktop: Emerging technologies for supporting collaborative teams in virtual environments,” Proceedings of SPIE Photonics Asia. Beijing, China 68340B (November 12, 2007).
 53. Thompson, K., T. Schmid, and J.P. Rolland, “Alignment induced aberration fields of next generation telescopes,” Proceedings of SPIE Photonics Asia, paper 68340B, Beijing, China, (November 12, 2007).
 54. Thompson, K., T. Schmid, and J.P. Rolland, “Important new concepts for aligning TMA-based telescopes and astronomical instrumentation,” 7017-11, SPIE Symposium on Astronomical Telescopes and Instrumentation: Synergies Between Ground and Space, Marseilles, France, (June 23-28, 2008).

55. Cakmakci, O., G.E. Fasshauer, H. Foroosh, K.P. Thompson, and J.P. Rolland, "Meshfree approximation methods for free-form surface representation in optical design with applications to head-worn displays," Annual Meeting Proc. SPIE 7061 (2008).
56. Schmid T., K. Thompson, and J.P. Rolland, "Alignment induced aberration fields of next generation telescopes," Proc. SPIE 7068, 70680E (2008) SPIE Annual Meeting (2008).
57. Rolland, J.P., P. Meemon, S. Murali, A. Jain, N. Papp, K. Thompson, and K.S. Lee, "Gabor domain optical coherence microscopy," 1st Canterbury Workshop on Optical Coherence Tomography and Adaptive Optics, September 8-10, edited by Adrian Podoleanu, Proceedings of the SPIE Vol. 7139, 71390F (2008).
58. Hsu, K. and J.P. Rolland, "Ultra broadband Fourier-domain mode-locked lasers," invited paper to the 1st Asia-Pacific Optical Fiber Sensors Conference (APOS), Chengdu, China, (2008).
59. Santhanam, P., J.P. Rolland, T. Willoughby, and P. Kupelian, "Image-based dynamic lung models for model-guided real-time lung radiotherapy," Biomedical Applications in Molecular, Structural, and Functional Imaging, SPIE Paper Number 7262-13 (2009).
60. Thompson, K.P., T. Schmid, W.P. Kuhn, and J.P. Rolland, "Development of an alignment insensitive 4-mirror coaxial telescope design using nodal aberration theory," Optifab, paper TD06-26, Rochester, NY, (2009).
61. Schmid, T., K. Thompson, and J.P. Rolland, "Aberrations in optical systems without symmetry, Theory and Application," seminar given at Corning Tropol Corporation, Fairport, NY, (2009).
62. Thompson, K.P., T. Schmid, K. Fuerschbach, and J.P. Rolland, "Using nodal aberration theory to understand the aberration fields of multiple unobscured Three Mirror Anastigmatic (TMA) telescopes," UK Optical Design Conference, Edinburgh, United Kingdom, (September 16, 2009).
63. Thompson, K., J.P. McGuire, O. Cakmakci, and J.P. Rolland, "The coming generation of head-worn displays (HWDs): Will the future come to us through new eyes?" Optical Society of America Annual Meeting, San Jose, CA, (October 10-16, 2009).
64. Cakmakci, O. and J.P. Rolland, "Application of radial basis functions to the design of a freeform single element see-through head-worn display," **Invited** talk at the Optical Society of America Annual Meeting, San Jose, CA, (October 10-16, 2009).
65. Fournier, F., W. J. Cassarly, and J. P. Rolland. "A review of lightpipe design for projection displays," ODF '10 Yokohama (7th International Conference on Optics-photonics Design & Fabrication), 19 - 21 April 2010.
66. Jannick P. Rolland, Ilhan Kaya, Kevin P. Thompson, and Ozan Cakmakci "Head-worn Displays – Lens Design," Proceedings of SID2010 (57.3)(Seattle, WA) (2010).
67. Thompson, K.P., T. Schmid, and J.P. Rolland, "Misalignment-induced Aberrations of JWST", NASA Mirror Technology, Boulder CO., June 7-9 (2010).
68. Cakmakci, O., J.P. McGuire, K.P. Thompson, G.E. Fasshauer, and J.P. Rolland, "Application of radial basis functions to represent optical free-form surfaces," International Optical Design Conference 2010, Wyoming.
69. Thompson, K., F. Fournier, J.P. Rolland, and G. Forbes, "The Forbes polynomials: a more predictable surface for fabricators," Topical Meeting of the OSA, Optical Fabrication and Testing, Jackson Hole, WY, (2010).
70. Rolland, J.P., "Gabor Domain Optical Coherence Microscopy", GE Research, Albany NY July 22 (2010)
71. Rolland, J.P., "Evolving methods for specifying freeform optical surfaces for optimization and fabrication", SBIR Review Program, July 13 (Rochester, NY, 2010)
72. Thompson, K.P., K. Fuerschbach, and J.P. Rolland, "An analytic expression for the field dependence of FRINGE Zernike polynomial coefficients in optical systems that are rotationally nonsymmetric", Photonics Asia, Proc. SPIE 7849, 784906;1-11 (2010).
73. Lee, K.S., S. Vo, and J. P. Rolland, "Optical Coherence Microscopy Using Bessel Beam," in Frontiers in Optics, OSA Technical Digest (CD) (Optical Society of America, 2010), paper FMI1.

74. Lee, K.S., S. Vo, and J. P. Rolland, "Optical Coherence Microscopy Using Bessel Beam," in Proceedings of SPIE Photonics West Paper, 7891-34 78910M (2011).
75. Rolland, J.P., "Tomography for Depth Imaging of Biological Systems at Micron Resolution", In AAAS Annual Meeting, Washington DC (Feb 17-21 2011).
76. Rolland, J.P., "Head-Worn Displays; Will the Future come to us through New Eyes?" Local Chapter of the OSA, Ilmenau Germany 26-27 May (2011).
77. Rolland, J.P., "Augmented Reality Displays: A Playground for Freeform Surfaces" in Freeform Optics Incubator, (OSA, Washington, D.C., USA, OCT31-NOV1- 2011)
78. Bauer, A, I. Kaya, and J.P. Rolland, "Moving from Phi-Polynomial to Multicentric Radial Basis Functions", in Freeform Optics Incubator, (OSA, Washington, D.C., USA, 31 Oct.-1 Nov. 2011)
79. Canavesi, C., W. Cassarly, and J.P. Rolland, "A Starting Point Approach for Nonimaging Reflector Design" in Freeform Optics Incubator, (OSA, Washington, D.C., USA, 2011)
80. Fuerschbach, K.H., J.P. Rolland, and K.P. Thompson, "Realizing an optical system with ϕ -polynomial freeform surfaces," in Freeform Optics Incubator, (OSA, Washington, D.C., USA, 2011)
81. Fuerschbach, K.H, J.P. Rolland, and K.P. Thompson, "Path to Freeform Optics," in NASA Mirror Tech Days 2011, (NASA, Greenbelt, M.D., USA, June 2011)
82. Thompson K.P., and J.P. Rolland, "Polynomial Optical Surfaces – Stepping Away from Symmetry" One-Day Spanish Optical Designer's Meeting (Madrid, 6th October 2011)
83. Rolland, J.P., P. Meemon and K.S Lee "Optical Coherence Tomography In the Investigation of Manufacturable-GRIN (M-GRIN) Material" Workshop in Non-Imaging Optics (San Diego, August 20, 2011)
84. Rolland, J.P., "Freeform Optics - Will it be in your future?" Rochester Local Chapter of the Optical Society of America (2012, March 6 Rochester NY)
85. Rolland, J.P., K.S. Lee, P. Meemon, N. Meemon, H. Zhao, and S. F. Ibrahim "Optical Skin Biopsy with Gabor Domain Optical Coherence Microscopy", PPP2012: "Advances in Dermatological Science" (2012, April 13 La Grande Motte, France)
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Technology transfer brought \$14,000 to UCF in technology evaluation

Technology transfer on Gabor Domain Optical Coherence Tomography to LightTopTech Corp.

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2. Vaissie, L., and J.P. Rolland, "Double acousto-optic in-line shearing interferometer (DAISI) for measurement of wavefront slope and curvature," Technical Report TR02-001, University of Central Florida (2002).
3. Rolland, J.P., and L. Vaissie, "Albertian errors in head-mounted displays: choice of eyepoint location," *Technical Report* TR01-001 University of Central Florida (2001).
4. Argotti, Y., L. Davis, A. Sun, and J.P. Rolland, "Technologies for augmented reality: real-time Superimposition of synthetic objects on dynamic rigid and simple deformable real objects," *Technical Report* TR01-002, University of Central Florida (2001).
5. Gao, C., H. Hua, and J.P. Rolland, "Optomechanical design and integration of a light-weight head-mounted projection display," *Technical Report* TR00-001, University of Central Florida (2000).

6. Rolland, J.P., C. Meyer, and K. Arthur, and E. Rinalducci “Accuracy of rendered depth in head-mounted displays: Comparison of two assessment technologies,” *Technical Report* TR00-002, University of Central Florida (2000).
7. Gao, C., H. Hua, and J.P. Rolland, “Design and Integration of a light-weight head-mounted projection display,” *Technical Report* TR00-003 University of Central Florida (2000).
8. Vaissie L., and J.P. Rolland, “Albertian errors in head-mounted displays: choice of eyepoints location,” *Technical Report* TR00-001, University of Central Florida (2000).
9. Guest, M., and J.P. Rolland, “Search strategies when masses are missed in mammography,” *Technical Report* TR99-007, University of Central Florida (1999).
10. Outters, V., Y. Argotti, and J.P. Rolland, “Knee motion capture and representation in augmented reality,” *Technical Report* TR99-006, University of Central Florida (1999).
11. Gharib, B., Y. Argotti, B. Peuchot, and J.P. Rolland, “Calibration of a see-through head-mounted display – application to augmented reality,” *Technical Report* TR99-005, University of Central Florida (1999).
12. Girardot, A., and J.P. Rolland, “Assembly and investigation of a projective head-mounted display,” *Technical Report* TR99-003, University of Central Florida (1999).
13. Hua H., Y. Argotti, and J.P. Rolland "Documentation of the 3D bench prototype see-through HMD" *Technical Report* TR99-002, University of Central Florida (1999).
14. Rolland , J.P., V. Vo, L.Yu, B. Bloss, and C.K. Abbey, “An optimal histogram matching algorithm,” *Technical Report* TR99-001, University of Central Florida (1999).
15. Poizat D., and J.P. Rolland, “Use of retro-reflective sheets in optical system design,” *Technical Report* TR98-006, University of Central Florida (1998).
16. Vaissie L., and J.P. Rolland, “Eyetracking in head-mounted displays: analysis and design,” *Technical Report* TR98-007, University of Central Florida (1998).
17. Baillot, Y., and J.P. Rolland, “Fundamental principles of tracking technology for virtual environments,” *Technical Report* TR96-004, University of Central Florida (1996).
18. Rolland, J.P., and K. Arthur, “Study of form and depth perception in virtual environments,” *Technical Report* TR96-003, University of Central Florida (1996).
19. Rolland, J.P., D.L. Wright, and A.R. Kancherla, “Towards a novel augmented-reality tool to visualize dynamic 3D anatomy,” *Technical Report* TR96-002, University of Central Florida (1996).
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24. Rolland, J.P., and T. Hopkins, “A method of computational correction for optical distortion in head-mounted displays,” *Technical Report* TR93–045, University of North Carolina at Chapel Hill (1993).
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26. Rolland, J.P., “Off-axis telescope design,” *Optical Sciences Center of the University of Arizona* (1987) (proprietary).
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28. Rolland, J.P., “Design of a camera for observation of mars,” *Perkin Elmer Corporation* (1986) (in house report).

29. Rolland, J.P., “Rapport sur le telescope HRV et MIR du programme spot,” REOSC Corporation (France, 1984) (in house report).
30. Rolland, J.P., “Etude des propriétés optiques de répliques de surfaces,” Institut D’Optique Théorique et Appliquée (France, 1980) (end of study report).

PROFESSIONAL AFFILIATIONS and SERVICES

Societies Affiliations

Optical Society of America (**OSA**), **Fellow since 2004**, Member since 1990
 International Society for Optical Engineering (**SPIE**), **Fellow since 2008**, Member since 1990
IEEE, Member 1996-2007; **Senior Member** since 2008.
 Image Society, Member, 1993-2000
 Association for Research in Vision and Ophthalmology (**ARVO**), Member 1994-1997; 2012-present
 Society for Information Display (**SID**) Member, 2006-present

Boards of Directors

Optical Society of America (**OSA**), Director at Large 2011-2013

Editorial Positions

On Editorial Board, Associate Editor of the Handbook of Visual Display Technology Vol 1-4, Springer (2012)

Lead Guest Editor for IEEE Journal of Display Technology for a special issue on Medical Displays 2007-2008

Optical Engineering, Associate Editor 1999-2004

Presence (MIT Press), Editorial Board, 1996-2006

A Journal Specialized in the Technology and Assessment of Virtual Reality Systems

Selected Conference/Session Leadership and Chair Position

- 2014 Signal Recovery and Synthesis (SRS) 2014. This topical meeting will be held in Seattle July 13-17
- 2104 Optical Fabrication and Testing – OSA – Conference General Co-Chair with Stephen Jacobs, Jessica deGroot Nelson, Ted Mooney, and Kim
- 2012 SPIE Annual Meeting, Interferometry XVI: Techniques and Analysis, Session Chair on Optical Coherence Tomography (August 13, 2012)
- 2012 OSA Local Chapter Women in Engineering Outreach Breakfast (May 16)
- 2012 MMVR’19, on Program Committee, also Session Chair
- 2012 Optical Fabrication and Testing – OSA – Conference General Co-Chair with Stephen Jacobs, Jessica deGroot Nelson, Ted Mooney, and Shai Shafrir
- 2010 Optical Fabrication and Testing – OSA – Conference General Co-Chair with Stephen Jacobs, Jessica deGroot Nelson, and Shai Shafrir
- 2009 Member of the Council of the Optical Society of America
- 2009 ISMAR09 General Chair (Co-Chair - Chris Stapleton). Orlando FL.
- 2008 SPIE BIOS08, sub-conference on quantitative assessment, Program committee
- 2008 Optical Fabrication and Testing – OSA – Conference General Co-Chair with Stephen Jacobs & Ulf Griesmann
- 2008 Optics-photonics Design and Fabrication (OFD.08) – Member of Advisory Board
- 2007 SPIE Photonics Asia, Program Co-Chair with Professor Yongtian Wang, Theo Tschudi and Kimio Tatsuno. Also Chair of Session on astronomical and space optics.
- 2007 SPIE Symposium on Novel Optical System Design, on Program Committee, & Chair of Session on optical design

2006 MMVR'06, on Program committee, also Session Chair on registration and navigation
 2004-13 ISMAR 2004, Program Chair and Member of the Executive Committee
 2004 CITSA04, Organizer and Chair of Session on augmented reality and human performance
 2004 IEEE-VR 2004, Chair of Session on 3D displays
 2004 SPIE AEROSENSE 2004, Chair of Session on head-mounted displays
 2004 SPIE Medical Imaging 2004, Chair of Session on human observer performance
 2003 SPIE AEROSENSE 2003, Chair of Session on head-mounted displays
 2002 ISMAR2002, Chair of Session on demos-teaser, Darmstadt Germany
 2002 International Optical Design Conference (IODC'02) Chair of Session on conformal optics.
 2002 SPIE AEROSENSE 2002, Chair of Session on head-mounted displays
 2002 MMVR 2002, Chair of Session on modeling in virtual environments
 1996-02 Member of the Technical Council of the Optical Society of America, `
 1997-98 Vice Chair of the Optical Design Technical Group of the Optical Society Of America
 1998-99 Chair of the Optical Design Technical Group of the Optical Society of America
 1999 Optical Society of America, Chair of Session on head-mounted displays and wearable computers
 1998 Optical Society of America, Chair of Session on optical technology for 3D visualization
 1998 Tutorial Chair for the IEEE Virtual Reality Annual International Symposium
 1995 Local Arrangements Chair for the IEEE Virtual Reality Annual International Symposium

Awards Committees

Ad Hoc Committee tasked with examining the scopes of three OSA awards in Optical Engineering 2011
Land Medal Award Committee of the Optical Society of America, Member 2009, 2010, 2013
Conrady Award Committee of the SPIE, Member 2008
Paul Forman Engineering Award Committee of the Optical Society of America, Member 2007, Chair 2008
Joseph Fraunhofer Award Committee of the Optical Society of America, Committee Chair 2002, Committee Member 2001
New Focus Award Committee of the Optical Society of America, Committee Member 1998 and 1999

Review Research/Papers Services

October 1996 **National Institutes of Health (NIH/NCI)**, Special Study Session and Grant Review
 October 1997 **National Institutes of Health (NIH/NCI)**, External Reviewer
 October 1997 **National Institutes of Health (NIH) BECON INITIATIVE:** Expert Panel on Building the Future of Biology and Medicine - Panel on "Bioengineering and Clinical Medicine"
 March 2000 **American Institute of Biological Sciences (AIBS)** Peer Review to USAMRMC Vision and Visual Performance Research Program U.S. Army Aeromedical Research Laboratory (Fort-Rucker, Alabama).
 July 2000 **National Institute of Health (NIH)** Special Study Sessions and Grant Review for the Biomedical Program.
 July 2000 **American Institute of Biological Sciences (AIBS)** Peer Review to USAMRMC-WRAIR Laser Bioeffects and Treatment Program (San Antonio, Texas).
 May 2003 **American Institute of Biological Sciences (AIBS)** Peer Review to USAMRMC Vision and Visual Performance Research Program U.S. Army Aeromedical Research Laboratory (Fort-Rucker, Alabama).
 June 2003 **National Institutes of Health (NIH/NCI)**, Special Study Session and Grant Review
 February 2003 **National Institutes of Health (NIH/NCI)**, Special Study Session and Grant Review
 May 2005 **European Commission**, Study Section and Audit Panel for Initiative Presence II
 October 2006 **National Institutes of Health (NIH/NCI)**, Special Study Session and Grant Review
 May 2009 **National Science Foundation (NSF)**, review panel

June 2009 **National Institutes of Health (NIH)**, R21 Study Session and Grant Review
 June 2009 **National Institutes of Health (NIH)**, Equipment Grants Study Session
 June 6 2012 **NSF Review Panel**, Photonics Devices
 July 11, 2013 **National Institutes of Health (NIH)**, **SPECIAL EMPHASIS PANEL ZRG1 F15-X**

Leadership / Centers / Commercialization

January 2014 STTR Grant subcontract from LighTopTech Corp.- \$68k (+ \$30k CEIS)
 November 2013 Meeting of the IAB – Tucson Az. (NOV. 7-8 2013)
 April 2013 LighTopTech Corp. Spin off
 March 2013 Full Proposal to the NSF for I/UCRC Center for Freeform Optics
 January 2012 Visit to UNC-Charlotte to Plan the NSF Center CeFO Teaming
 January 2012 NSF Annual Meeting of IUCRC Centers; Bootcamp for new Center CeFO
 February 2012 Attended OSA Leadership Meeting and Board Meeting in Washington DC
 September 2012 Interviewed for OSA Video that was prepared for the OSA FIO Meeting
 September 2012 Planned NSF/IUCRC CeFO Meeting held at Eastman House in Rochester
 March 23-25, 2012 Course at Stanford on Technology Commercialization as part of NSF I-Corps.
 March 26, 2012 Attend an ARPA-E workshop on optics in renewable energy - Washington DC
 May 5th, 2012 Attended OSA Board Meeting during CLEO
 May 2013 co-Founded LighTopTech Corporation
 August 2013 NSF I/UCRC Center for Freeform Optics (CeFO) Awarded

Reviewer for Journal Articles: JOSA A, Applied Optics, Optical Engineering, Optics Letters, Optics Express, Journal of Display Technology (JDT), Journal of Digital Imaging, Presence (MIT Press), IEEE Transactions on Medical Imaging, other IEEE Transactions 2000-Present.

Program and Technical Committee Member

FiO1 (applied optics) subcommittee for FiO 2013
 SPIE Conference, Optical Systems Design Symposium, 5-8 September (Marseilles, France) 2011.
 International Optical Design Conference (IODC'02, 06, 10)
 EOS Symposium on Optical Design and Engineering (France Fall 2003)
 International Symposium on instrumentation and Control Technology (ISICT'03) (August China)
 International Symposium on Photonics China, 2002, 2003, 2004
 OSA/SPIE International Lens Design Conference (IODC), 1994, 1998, 2002, 2006, 2010, 2014
 International Workshop in Augmented Reality, October 1998 and 1999
 SPIE Symposium on Novel Optical System Design, 1995-1999, 2003, 2004, 2005, 2006, 2007
 IEEE/SPIE Virtual Reality Annual International Symposium, 1993-2000
 IEEE-VR International Symposium 2000-present (former IEEE-VRAIS above)
 Medicine Meets Virtual Reality, 1997-present
 International Workshop on Augmented Reality, (October) 1998-1999
 Information Processing in Medical Imaging, 1993
 VRIC (Virtual Reality International Conference) 2000-2007
 ISMAR International Symposium 2001-2008
 Frontier in Optics 2013, FiO1 subcommittee on applied optics

University Committees

3D Visualization Project Meeting 2013-present
 Steering Committee for Dean Lennie 2012-2013
 CVS Makous Prize committee 2011-present
 Middle State Assessment, University of Rochester 2010-2012
 ABET Accreditation for the Institute of Optics 2009-2012

University of Rochester Faculty Council Meeting 2009-2012
University of Rochester Hopkins Center 2009-2012 (Associate Director); (2012-present Director)
CREOL Hiring Committee for Biophotonics and Integrated Optics 2006-2008
UCF Roundtable Committee to discuss “The Role of the Research University in the Citistate” 2008
UCF Search for a new Dean for the College of Optics and Photonics 2007
UCF Research Week Committee 2006-2007
UCF Senate Committee 2006-2007
UCF information and technology resources 2006-2008
UCF I²Labs Fellowship Selection Committee, Member, 2005-2008
BMS committee for setting up guidelines for promotion and tenure 2005-2006
CREOL committee to work on improving the MS and PhD degrees 2006-2008
CREOL curriculum committee 2006-2008
CREOL space utilization committee 2006-2008
CREOL sabbatical committee 2006-2008
CREOL IT committee 2001-2008
UCF Internet2 Appointed Committee Chair 2002-2006; Committee Member, 1997-2001
UCF Senate Committee 2001-2004 – Member, Graduate Council and Appeal Committees 2002-2004
CREOL Member Committee on alternative education vehicles 2001-2008
UCF/Lockheed Martin Synthetic Environment Learning Lab (SELL) Member 1999-2005
CREOL Student Recruiting Committee Member, 1999-2005
CREOL Academic Affairs Committee Member, 1998-1999
CREOL Graduate Committee Member, 1997-1998
CREOL Computer Room Committee Chair, 1996-1997
CREOL Industrial Affiliates Committee Member, 1998-2004
Human Factors in HCI Group, Research Triangle Park, Co-Chair with Dr. F. Biocca, 1993-1996
Faculty Search Committee, UNC-CH, 1994
Teaching Tune-up Committee, UNC-CH, 1994-1996

Optical imaging is a technique for non-invasively looking inside the body, as is done with x-rays. But, unlike x-rays, which use ionizing radiation, optical imaging uses visible light and the special properties of photons to obtain detailed images of organs and tissues as well as smaller structures including cells and even molecules. These images are used by scientists for research and by clinicians for disease diagnosis and treatment. What are the advantages of optical imaging? Optical imaging offers a number of advantages over other radiological imaging techniques. What are NIBIB-funded researchers developing in the area of optical imaging to improve biomedical research and medical care? Source: Hari Shroff, NIBIB. He is interested in medical image processing, machine learning and pattern recognition. He has published more than 100 papers in the international journals and conferences. Dr. Wu is actively in the development of medical image processing software to facilitate the scientific research on neuroscience and radiology therapy. Affiliations and Expertise. Dinggang Shen is a Professor of Radiology, Biomedical Research Imaging Center (BRIC), Computer Science, and Biomedical Engineering in the University of North Carolina at Chapel Hill (UNC-CH). He is currently directing the Center for Image Informatics and Analysis, the Image Display, Enhancement, and Analysis (IDEA) Lab in the Department of Radiology, and also the medical image analysis core in the BRIC. Optical Coherence Imaging Techniques and Imaging in Scattering Media (Bouma, Wojtkowski) . . . 15-34. Medical Laser Applications and Laser-Tissue Interactions VII (Lilge, Sroka). Wien (Austria) Lise Randeberg, Norwegian Univ. of Science and Technology (Norway) Daniel Razansky, Helmholtz Zentrum Mnchen GmbH (Germany) Darren Roblyer, Boston Univ. (USA) Amir Rosenthal, Helmholtz Zentrum Mnchen GmbH (Germany) Sava Sakadzic, Massachusetts General Hospital (USA). David Sampson, The Univ. of Western Australia (Australia) Peter T. C. So, Massachusetts Institute of Technology (USA) Shy Shoham, Technion-Israel Institute of Technology (Israel) Yaron Silberberg, Weizmann Institute of Science (Israel) Melissa Skala, Vanderbilt Univ.