

Kevin P. (Rolland-)Thompson, Ph.D.

Professional Experience

2010-Present	Group Director, Research and Development/Optics, Synopsys, Inc.
2009-Present	Visiting Scientist, University of Rochester, The Institute of Optics
1998-2010	Vice President of Optical Engineering Services, Optical Research Associates
1996-1998	Director of Optical Engineering Services, Optical Research Associates
1994-1996	Acting Director of Optical Engineering Services, Optical Research Associates
1989-1994	Assistant Director of Optical Engineering Services, Optical Research Associates
1986-1989	Senior Staff Engineer/Optical Design, Optical Research Associates
1985-1986	Senior Optical Designer, Perkin-Elmer
1980-1985	Optical Designer, Perkin-Elmer
1978-1980	Optical Engineer, Talandic Research (part-time)
1978 (summer)	Optical Analyst, Perkin-Elmer
1976-1980	Research Associate, University of Arizona, College of Optical Sciences

Education

1980	Ph.D. Degree in Optical Sciences, University of Arizona, College of Optical Sciences
1979	M.S. Degree in Optical Sciences, University of Arizona, College of Optical Sciences
1976	B.S. Degree in Astrophysics, University of Minnesota, Institute of Technology
1976	B.S. Degree in Physics, University of Minnesota, Institute of Technology

Most recently Dr. Thompson has been leading breakthroughs in the understanding of the aberration fields of a new class of truly nonsymmetric optical systems using freeform optical surfaces working with Prof. Jannick Rolland and her graduate students; most recently Kyle Fuerschbach and Robert W. Gray. In 2012, the final part of the puzzle that is a general, unrestricted, aberration theory for optical systems including freeform surfaces with no symmetry constraints was identified by Dr. Thompson working with data developed by Kyle Fuerschbach. This has brought to a close over 35 years of research by Dr. Thompson on a problem that has been worked on for over 150 years. In addition, he has been working on advancing the technology associated specifically with optical design and the simulation of optical systems. His emphasis is on extending optical design tools to advance functionality in the design of optical systems based in advanced materials (gradient index) and most recently freeform optics. In his role as a visiting scientist, he has been contributing to a broad range of PhD topics with advice and guidance on optical design forms and solutions for optical systems including those used to generate Airy beams, those produced by optical systems with liquid lenses, and advances in spectrometers in support of state-of-the-art Optical Coherence Microscopy.

In his role at Synopsys, Inc., Dr. Thompson continues to lead a team of optical designers and optical engineers in both imaging and illumination optics providing state-of-the-art optical system development services throughout the world. Here, he contributes to all aspects of the optics engineering group including strategic direction, marketing, sales, customer development, and technical oversight. In this role, he typically works with over 100 companies a year across the spectrum of optics. He has initiated securing government funding for advancing the state of the art in optical design software where he has led successful proposals for over \$5M in government funding from DARPA, SBIR, and ATP in conformal optics, illumination optics for EUV lithography, advanced software for modeling photonic devices, the

incorporation of LEDs into Runway Lighting, and advanced developments in solar energy. Most recently, he has been leading primarily larger projects often based on government funding, including the optical design research for the application of a new Manufacturable Gradient Index (M-GRIN) developed at Case Western as part of a team led by SAIC, funded by DARPA.

Prior to entering management on a full-time basis in 1994, he performed as an integral member of small working teams formed to provide state-of-the-art optical hardware functioning in complex, demanding, customer-defined scenarios. In this role, responsibilities included: system engineering, i.e., transforming the scenario into an appropriate set of optical system specifications, conceptual and detailed optical design, in-depth computer modeling of the optical system to support performance prediction, error budget derivation, flow-down and piece part tolerance allocation, mount design for dynamic and environmental stability, assembly/test procedure development and implementation, vendor selection and monitoring for piece part manufacture, acceptance test plan development, acting as interface between design engineers and assembly technicians, and development and presentation of all optical information to the customer from proposal through final design review on through fabrication and alignment support. In addition to optical design, Dr. Thompson is particularly experienced and skilled in optical alignment and testing. His first assignment in optics was to provide the optical layout for Solar 1, the first large scale central tower solar collector ever built, at Sandia.

His initial work involved the optical design, tolerance analysis, and test plan development for state-of-the-art classified optical payloads. At the same time he concentrated in development of new applications for optical design software within a large custom optical design code developed in the 60s. Areas of expertise include: nonsymmetric design techniques, sensitivity analysis methods for one-of-a-kind optical systems, holographic optical design tools, and enhanced user environments for improving flexibility for state-of-the-art design problems.

Optical systems for which he has been the principle optical designer include: null lens designs for the highly successful Hubble 1st Servicing Mission, optical modeling and analysis for the first generation EUV illuminator for lithography (for the VNL alpha optics), developed one of earliest patents in EUV projection optics for ATT/Bell Labs, Gen III night vision systems; hybrid prototypes with binary optics; all reflective systems for normal incidence soft X-ray (e.g., EUV) lithography; machine vision systems for production quality control; null lenses for nonsymmetric mirrors; high frame rate acousto-optic IR scene generators; a thermally compensated high performance dual mode FLIR; two multiband active tracking radiometric imaging systems; a 3-bin real-time UV shearing interferometer; projection optics for dome simulators; far-field Gaussian beam shapers; multiband spectrometers; an ultra-wideband refractive imager; missile seeker heads; f-theta laser scan lenses; an acousto-optic laser projector for large format color displays; anamorphic beam expanders and projectors; and a proof of concept broad-band holographic imaging system. These projects have often led to field deployed hardware systems. He has also provided support to programs for a variety of systems (ALPHA, BSTS, SBL), the Advanced X-ray Astrophysical Facility (AXAF, now in-orbit as Chandra), the Solar Optical Telescope (SOT), the Space Telescope Fine Guidance System (ST-FGS), and the second generation Wide Field and Planetary Cameras (WFPC II), and COSTAR.

Awards

The Conrady Award for contributions to Optical Aberration Theory; SPIE (2013)

Patents

- U.S. 8,184,365 Optical instruments having dynamic focus – An optical system suitable for use in an optical instrument such as a handheld optical probe, the optical system including a scanning element and an objective, the objective including a variable focus lens that can be electronically controlled to change the focal length of the optical system.
- U.S. 5,315,629 Ringfield Lithography - A four mirror, unobscured, coaxial, scanning, reduction optical system for use in the extreme UV (~130 Angstroms) with normal incidence coatings.
- U.S. 4,650,321 Spatial/Spectral Real Time Imaging Systems - This patent combines electronic signal processing from a CCD array with a form of slitless spectrograph to provide simultaneous spatial imaging and spectral tagging for narrow band point sources; a precursor to hyperspectral imaging.

Peer Reviewed Publications

- Gray, R.W., K.P. Thompson, and J.P. Rolland, “Wavefront aberration function in terms of R. V. Shack’s vector product and Zernike polynomial vectors”, in manuscript revision, *Optics Express*, July (2013).
- Ma, B., K. Sharma, K.P. Thompson, and J.P. Rolland, “Mobile device camera with Q-type polynomials to achieve higher production yield”, *Optics Express* **21**(15), 17454-17463 (2013).
- Meemon, P., J. Yao, K-S Lee, K.P. Thompson, M. Pointing, E. Baer, and Jannick P. Rolland, “Optical Coherence Tomography Enabling Metrology of Layered Polymeric GRIN Material”, *Nature; Sci. Rep.* **3**, 1709 (2013).
- Thompson, K.P., “The Astigmatic Aberration Field in Active Primary Mirror Astronomical Telescopes”, invited, *Adv. Opt. Techn.* **2**(1) 89-95 (2013).
- Kaya, I., K.P. Thompson, and J.P. Rolland, “Comparative assessment of freeform polynomials as optical surfaces descriptors“, *Optics Express*, **20**(20), 22683-22691 (2012).
- Fuerschbach, K., J.P. Rolland, and K.P. Thompson, “Extending Nodal Aberration Theory to include mount-induced aberrations with application to freeform surfaces”, *Optics Express*, **20**(18), 20139-20154 (2012).
- Gray, R.W., C. Dunn, K.P. Thompson, and J.P. Rolland, “An analytic expression for the field dependence of Zernike polynomials in rotationally symmetric optical systems”, *Optics Express*, **20**(15), 16436-16449 (2012).
- Rolland, J.P., K.P. Thompson, K.S. Lee, J. Tamkin Jr., T. Schmid, and E. Wolf, “Observation of the Gouy phase anomaly in astigmatic beams”, *Applied Optics* **51**(17), 1-8 (2012).
- Sebag, J., W. Gressler, T. Schmid, J.P. Rolland, and K.P. Thompson, “LSST Telescope Alignment Plan Based on Nodal Aberration Theory”, *PASP* **124**, 380-390 (2012).
- Kaya, I., K.P. Thompson, and J.P. Rolland, “Edge clustered fitting grids for ϕ -polynomial characterization of freeform optical surfaces“, *Optics Express* **19**(27), 26962-26974 (2011).
- Fuerschbach, K., J.P. Rolland, and K.P. Thompson, “A new family of optical systems employing ϕ -polynomial surfaces”, *Optics Express* **19**(22), 21919-21928 (2011).
- Ma, B., L. Li, Kevin P. Thompson, and Jannick P. Rolland, “Applying Slope Constrained Q-polynomials to the Optical Design of Lithographic Lenses,” *Optics Express* **19**(22), 21174-21179 (2011).

Lee, K-S, K.P. Thompson, P. Meemon, and J.P. Rolland, "Cellular resolution optical coherence microscopy with high acquisition speed for *in vivo* human skin volumetric imaging", *Optics Letters*, **36**(12), 2221-2223 (2011).

Thompson, K.P., "The multi-nodal 5th order optical aberrations of optical systems without rotational symmetry (Part 3): The Astigmatic Aberrations," *JOSA A* **28**(5), 821 -836 (2011).

Vo, S., K. Fuerschbach, K.P. Thompson, M.A. Alonso, and J.P. Rolland, "Airy beams: a geometric optics perspective," *JOSA A* **27**, 2574-2582 (2010).

Lee, K-S., K.P. Thompson, and J.P. Rolland, "Broadband astigmatism-corrected Czerny-Turner spectrometer," *Optics Express* **18**(22), 23378-23384 (2010).

Schmid, T., J.P. Rolland, A. Rakich, and K.P. Thompson, "Separation of the effects of astigmatic figure error from misalignment using Nodal Aberration Theory (NAT)," *Optics Express* **18**(16), 17433-17447 (2010).

Schmid, T., K.P. Thompson, and J.P. Rolland, "The misalignment induced nodal aberration fields in two mirror astronomical telescopes," Special Issue on 400 Years of Optical Instrumentation, Editors: D. Malacara, J. Schmit, M. Kujawinska, and M. Takeda, *Applied Optics* **49**(16), D133-144 (2010).

Murali, S., P. Meemon, K.S. Lee, W.P. Kuhn, K.P. Thompson, and J.P. Rolland, "Assessment of a liquid lens enabled *in vivo* optical coherent microscope," Special Issue on 400 Years of Optical Instrumentation, Editors: D. Malacara, J. Schmit, M. Kujawinska, and M. Takeda, *Applied Optics*, **49**(16), D145-156 (2010).

Schmid, T., K.P. Thompson, and J.P. Rolland, "A unique astigmatic nodal property in misaligned Ritchey-Chretien telescopes with misalignment coma removed," *Optics Express*, **18**(5), 5282-5288 (2010).

Rolland, J.P., P. Meemon, S. Murali, K.P. Thompson, and K-S. Lee, "Gabor-based fusion technique for Optical Coherence Microscopy," *Optics Express* **18**(4), 3632-3642 (2010).

Thompson, K.P., "The multi-nodal 5th order optical aberrations of optical systems without rotational symmetry (Part 2): The Comatic Aberrations," *JOSA A* **27**(6), 1490-1504 (2010).

Thompson, K.P., T. Schmid, O. Cakmakci, and J.P. Rolland, "A real ray-based method for locating individual surface aberration field centers in imaging optical systems without symmetry," *JOSA A* **26**, 1503-1517 (2009).

Thompson, K.P., "The multi-nodal 5th order optical aberrations of optical systems without rotational symmetry (Part 1): Spherical Aberration," *JOSA A* **26**, 1090-1100 (2009).

Murali, S., K.P. Thompson, and J.P. Rolland, "Three-dimensional adaptive microscopy using embedded liquid lens," *Optics Letters*, **34**(2), 145-147 (2009).

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).

Cakmakci, O., S. Vo, K.P. Thompson, and J.P. Rolland, "Application of Radial Basis Functions (RBFs) to shape description in a dual-element, off-axis, eyewear display: field of view limit," *Journal of the Society for Information Display* **16**(11), 1089-1098 (2008).

Thompson, K.P., T. Schmid and J.P. Rolland, "The Misalignment induced aberrations of TMA telescopes," *Optics Express* **16** (25), pp 20345-20353 (2008).

Thompson, K.P., "Description of the third-order optical aberrations of near-circular pupil optical systems without symmetry," *JOSA A* **22**(7), 1389-1401 (2005).

Rodgers, J.M., K.P. Thompson, and T. Jewell "Reflective systems design study for soft X-ray projection lithography," *J. Vac. Sci. Technology B* **8** (6), 1519 (Nov/Dec 1990).

Book Chapters

Rolland, J.P. and K.P. Thompson, “See-Through Head Worn Displays (HWDs) for Mobile Augmented Reality (AR)”, Chapter, in English and Chinese, in Information Display (2012).

Rolland, J.P., K.P. Thompson, H. Urey, and M. Thomas, “See-Through Head Worn Display (HWD) Architectures”, Chapter 10.4.1, in Handbook of Visual Display Technology, Springer Reference Series (2012).

Webinars/Panels/Colloquia

Rolland, J.P. and K.P. Thompson, “The Impact of Freeform Optics”, invited, The Schott Glass Global Board of Directors Meeting, May (2013).

Thompson, K.P., “Freeform Optical Design”, **Invited Webinar**, hosted by Laser Focus World, September (2012).

Thompson, K.P., “Optical Design in the Infrared: The world has changed – new materials, methods, and solutions to address new challenges”, **Invited Webinar**, hosted by OSA, sponsored by Schott Glass, Duryea, December (2011).

Thompson, K.P., “Optical Design in the Infrared”, **Invited Webinar**, hosted by Laser Focus World, August (2011).

Thompson, K.P., “What did we really learn from the Hubble telescope experience?”, Panel Member, The Design Automation Conference (DAC), San Diego, CA (June, 2011).

Thompson, K.P., “The state of the art of astronomical telescope design”, Colloquium, Ilmenau, Germany (May, 2011).

Thompson, K.P., “The Forbes Polynomial Surface: The Road Forward; A Return to Manufacturable Aspheres”, Panel Moderator, SPIE OptiFab (May, 2011).

Thompson, K.P., “Quality is about knowing when to climb”, DVCON Panel, San Diego, CA (April, 2011).

Thompson, K.P., “Optical Design, Information and Insights,” **Invited**, Presented to: Committee on Optical Science and Engineering, National Academy of Sciences, (1996).

Short Courses

Thompson, K.P., “Methods in Freeform Optical Design”, a one-week seminar at CIOMP (Changchun, China), sponsored by OSA, (2013).

Thompson, K.P., “Nodal Aberration Theory”, A weekly seminar (12 weeks), presented to Zeiss worldwide, (2011)

Rolland, J.P. and K.P. Thompson, “Head Worn Displays: Perspectives and Perceptions,” **Invited** ISMAR Korea, (2010).

Thompson, K.P., “Optical design techniques for optical systems containing conformal surfaces,” OSA Annual Meeting, Long Beach, CA (1997).

Thompson, K.P., “Methods of optical design,” ORA Introductory 1-Day Course, Pasadena, CA (1996).

Other Publications/Invited & Plenary Talks

- Thompson, K.P., D. Shafer, and J.P. Rolland, "Some extremes in conventional lens design", at Computational Optics (COSI), OSA Topical Meeting, (2013).
- Rolland, J.P., K. Fuerschbach, and K.P. Thompson, "Freeform optics; enabling optical design in three dimensions", Computational Optics (COSI), OSA Topical Meeting (2013).
- Gray, R.W., C. Dunn, K.P. Thompson, and J.P. Rolland, "An analytic expression for the field dependence of Zernike polynomials in rotationally symmetric optical systems", at Frontiers in Optics, OSA Annual Meeting (2012).
- Fuerschbach, K., J.P. Rolland, and K.P. Thompson, "Aberration behavior of a classical two-mirror telescope in the presence of mount error using nodal aberration theory", at Frontiers in Optics, OSA Annual Meeting (2012).
- Ma B., K.P. Thompson, K. Sharma, and J.P. Rolland, "Applying slope constrained Q-type aspheres to reduce sensitivity of optical systems", at Frontiers in Optics, OSA Annual Meeting (2012).
- Thompson, K.P. and J.P. Rolland, "Freeform Optical Surfaces: Report from OSA's first incubator meeting", Optics and Photonics News, p33-37, **Invited** (September, 2012).
- Thompson, K.P., "A complete theory of the aberrations of astronomical telescopes (finally): Part 1: The misalignment aberration fields ", presented at The European Southern Observatory HQ, Garching Germany, **Invited** (July, 2012)
- Thompson, K.P., "A history of the optics that make wafers: 1975-2012 and beyond", presented at Zeiss, Oberkochen, Germany, **Invited** (July, 2012)
- Thompson, K.P. and J.P. Rolland, "Freeform Optical Surfaces: A revolution in Imaging optical design", Optics and Photonics News, p31-35, **Invited**, (June, 2012).
- Thompson, K.P., "Methods for managing aberration fields of freeform optical systems", at Journée thématique Calcul Optique, Palaiseau, France, **Invited** (May, 2012).
- Thompson, K.P. and J.P. Rolland, "Polynomial Optical Surfaces; stepping away from symmetry", I REUNIÓN ESPAÑOLA DE UN DÍA DE DISEÑADORES ÓPTICOS, Madrid Spain (October, 2011)
- Thompson, K.P., "Is This History in the Making?", at OSA Freeform Optics Incubator, **Invited** (October, 2011).
- Thompson, K.P., "Freeform Surfaces have aberrations too", at OSA Freeform Optics Incubator, **Invited** (October, 2011).
- Fuerschbach, K.H., J.P. Rolland, and K.P. Thompson, "Realizing an optical system with ϕ -polynomial freeform surfaces," at OSA Freeform Optics Incubator, **Invited** (October, 2011).
- Fuerschbach, K.H., J.P. Rolland, and K.P. Thompson, "Designing with ϕ -polynomial surfaces" in 2011 SPIE Optical System Design, Proc. SPIE **8167**, 81670Z (2011).
- Fuerschbach, K.H., J.P. Rolland, and K.P. Thompson, "Path to freeform optics," in NASA Mirror Tech Days 2011, **Invited** (June, 2011).
- Fuerschbach, K.H., K.P. Thompson, and J.P. Rolland, "A new generation of optical systems with ϕ -polynomial surfaces," in ASPE Spring Topical Meeting on Structured and Freeform Surfaces (April, 2011).
- Lee K-S, S.K. Mahalik, K.P. Thompson, and J.P. Rolland, "Micron-class axial resolution FD OCT with high acquisition speed using a broadband astigmatism-corrected spectrometer", Proc. SPIE Biomedical Technology IV; Proc. SPIE **7891**, 78910O (2011).
- Thompson, K.P., K. Fuerschbach, and J.P. Rolland, "An analytic expression for the field dependence of FRINGE Zernike coefficients in optical systems that are rotationally nonsymmetric," **Invited**, SPIE Photonics Asia, Proc. SPIE **7849**, 784906;1-11 (2010).

Thompson, K.P. "Evolution of the environment for optical computing," **Plenary**, SPIE Annual Meeting (2010).

Thompson, K.P. "Assumptions: Often traced to be the root cause of disaster," **Invited**, Proc. SPIE **7796-15** (2010).

Rolland, J.P., C. Dunn, and K.P. Thompson, "An analytic expression for the field dependence of FRINGE Zernike coefficients in optical systems that are rotationally symmetric," SPIE Interferometry XV, Proc. SPIE **7790**; 7790 0M (2010).

Schmid, T., K.P. Thompson, J.P. Rolland, D.R. Neill, J. Sebag, and W.J. Gressler, "Using Nodal Aberration Theory (NAT) of higher order field aberrations in the initial alignment of the Large Synoptic Survey Telescopes (LSST), Proc. SPIE; Astronomy and Astrophysics (2010)

Cakmakci, O., G. E. Fasshauer, K.P. Thompson, and J. P. Rolland, "Application of Radial Basis Functions to Represent Optical Freeform Surfaces," **Invited**, IODC 2010, Proc. SPIE **7652-0A** (2010).

Fuerschbach, K.H., K.P. Thompson, and J.P. Rolland, "A New Generation of Optical Systems with phi-Polynomial Surfaces," IODC 2010, Proc. SPIE **7652-0C** (2010).

Kaya, I., O. Cakmakci, K. P. Thompson, and J. P. Rolland, "The Assessment of a Stable Radial Basis Function Method to Describe Optical Free-form Surfaces," OF&T collocated with IODC 2010, (2010).

Rolland, J.P., S. Murali, P. Meemon, P. Glenn, K.P. Thompson, and K-S. Lee, "Liquid Lens Enabled Optical Coherence Microscope with Gabor Fusion," IODC 2010, Proc. SPIE **7652-2C**, (2010).

Rolland J.P., T. Schmid, J. Tamkin Jr., K-S. Lee, K. P. Thompson, and E. Wolf, "Gouy Phase Anomaly In Astigmatic Beams," IODC 2010, Proc. SPIE **7652-24**, (2010).

Schmid, T., J. P. Rolland, and K. P. Thompson, "Computation of misalignment and primary mirror figure error parameters of classical two-mirror telescopes," OF&T collocated with IODC 2010, (2010).

Thompson, K.P. Recent discoveries from nodal aberration theory," IODC 2010, Proc. SPIE **7652-2Q**, (2010),

Thompson, K.P., F. Fournier, J. P. Rolland, and G.W. Forbes, "The Forbes Polynomial: A more predictable surface for fabricators," **Invited**, OF&T collocated with IODC 2010, (2010).

Vo, S., K.H. Fuerschbach, C. Pachot, T. Schmid, K. P. Thompson, J. P. Rolland, "Airy Beams: Beyond Geometric Optics," IODC 2010, Proc. SPIE **7652-26**, (2010).

Rolland J.P., P. Meemon, S. Murali, K.P. Thompson, and K-S. Lee "Gabor domain optical coherence microscopy," Proc. SPIE **7556** (2010).

Cakmakci, Ozan, Jannick Rolland, Application of Radial Basis Functions to the Design of a Freeform Single Element See-through Head-Worn Display. **Invited** talk at the OSA Annual Meeting 2009, San Jose, California, USA.

Murali S., K.S. Lee, P. Meemon, W. Kuhn, K.P. Thompson, and J.P. Rolland, "Quantification of resolution for a dynamic focusing OCM microscope," Proc. SPIE **7170** (2009).

Thompson, K.P., T. Schmid, K. Fuerschbach, and J.P. Rolland, "Using nodal aberration theory to understand the aberration fields of multiple unobscured TMA telescopes," UK Optical Design Conference, September 16, Edinburgh UK (2009).

Thompson, K.P., T. Schmid, W. P. Kuhn, J. P. Rolland, "Development of an alignment insensitive 4-mirror coaxial telescope design using nodal aberration theory," OSA OptiFab Digest, Rochester, NY, paper TD06-26 (2009).

Thompson, K.P., and B. Stone, "Modeling interferometers with lens design software: beyond ray-based approaches," Proc. SPIE **7427** (2009).

Thompson, K.P., K. Fuerschbach, T. Schmid, and J.P. Rolland "Using nodal aberration theory to understand the aberrations of multiple unobscured three mirror anastigmatic (TMA) telescopes," Proc. SPIE **7433** (2009).

Rolland, J.P., P. Meemon, S. Murali, I. Kaya, N. Papp, K.P. Thompson, and K-S. Lee, "Gabor domain optical coherence microscopy," Proc. SPIE **7372** (2009).

Cakmakci, O., S. Vo, K. Thompson, and J. Rolland, "Application of radial basis functions to shape description in a dual-element off-axis eyewear display: Field-of-view limit," SID **16**, 1089-1098 (2008).

Schmid, T., K.P. Thompson, and J.P. Rolland, "Understanding the alignment of TMA telescopes with nodal aberration theory," **Plenary**, SPIE Photonics Europe, Glasgow, (2008).

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).

Cakmakci, O., J.P. Rolland, K.P. Thompson, and G. Fasshauer, "Mesh-free approximation methods for free-form surface representation in optical design with applications to head-worn displays," **Invited**, Proc. SPIE **7061** (2008).

Cakmakci, O., J.P. Rolland, K.P. Thompson, and J.R. Rogers, "Design efficiency of 3188 Lens Designs," Proc. SPIE **7061** (2008).

Murali, S., A. Jain, H. Foroosh, K.P. Thompson, and J.P. Rolland, "Super resolution imaging combining the design of an optical coherence microscope objective with liquid-lens based dynamic focusing capability and computational methods," Proc. SPIE **7061-46** (2008).

Schmid, T., K.P. Thompson, and J.P. Rolland, "Alignment induced aberration fields of next generation telescopes," **Invited**, Proc. SPIE **7068** (2008).

Schmid, T., K.P. Thompson, and J.P. Rolland, "The alignment of two-mirror astronomical telescopes; the astigmatic component," SPIE Astronomy and Astrophysics, Marseilles, Proc. SPIE **7017-11** (2008).

Thompson, K.P., T. Schmid, and J.P. Rolland, "Alignment induced aberration fields in next generation telescopes," **Invited**, SPIE Photonics Asia, Proc. SPIE **6834** (2007).

Thompson, K.P., "The earliest history of computer-aided optical design on large computers," Previously Classified Work by James G. Baker 1945-1954, **Invited**, Proc. SPIE Vol. **6668** (2007).

Chen, L., L. Foo, and K.P. Thompson, "Task-based evaluation of practical lens designs for lens-coupled digital mammography systems," Proc. SPIE **6515** (2007).

Thompson, K.P., "The 1st Optical Convention (in English); The 1905 Optical Convention in London England," **Invited**, International Optical Design Conference, Proc. SPIE **6342** (2006).

Eikenberry, S., S. Raines, N. Gruel, R. Elston, R. Guzman, J. Julian, G. Boreman, P. Glenn, G. Hull-Allen, K.P. Thompson, J. Hoffman, J. M. Rodgers, S. Flint, L. Comstock, B. Myrick, "FISICA: the Florida image slicer for infrared cosmology and astrophysics," Proc. SPIE **5492**, 1264-1273 (2006).

Thompson, K.P., "Early Books in Optics and Optical Design: A Complete System of Opticks & the Edinburgh Encyclopedia," Optics and Photonics News, 29-33 (2005).

Rodgers, J.M. and K.P. Thompson, "Benefits of Freeform Mirror Surfaces in Optical Design," **Invited**, American Society for Precision Engineering, (2004).

Thompson, K.P., "Reinterpreting Coddington: Correcting 150 Years of Confusion," **Invited**, Proc. SPIE: A Tribute to Robert Shannon and Roland Shack, (2004).

Eikenberry, S., P. Glenn, C. G. Hull Allen, J. Hoffman, J. Rodgers, K.P. Thompson, B. Myrick, L. Comstock, S. Flint, G. Boreman, R. Elston, R. Guzman, J. Julian, N. Raines, "Design, fabrication, assembly, and testing of the FISICA integral field unit," Proc. SPIE **5492**, 1254-1263 (2004).

Thompson, K.P. and L. Gardner, editors, "1998 International Optics Design Conference Proceedings," Proc. SPIE **3482** (1998).

Thompson, K.P. and J.M. Rodgers, "Conformal Optics: Key Issues in a Developing Technology," Optics & Photonics News, (1997).

Thompson, K.P. and D. Bajuk, "Incorporating Aspherics into your Technology," OSA Annual Meeting, Rochester, NY, (1996).

Thompson, K.P. "Practical Methods for the Optical Design of Systems without Symmetry," Proc. SPIE **2774**, 2 (1996).

Thompson, K.P., "Key to cost effective optical systems maximize the number of qualified fabricators," (with L Hoyle), OSA/SPIE, International Optics Design Conference Proc. **22**, 208 (1994).

Thompson, K.P. and J. Meckel, "Null Lens Designs and Testing of the Spherical Aberration Compensating Wide Field and Planetary Camera (WF/PC II) Secondaries for the Hubble Space Telescope (HST)," OSA/SPIE International Optics Design Conference Proc. **22**, 280 (1994).

Thompson, K.P., B. Kestner, and J.M. Rodgers, "Compensating Lens Designs and Testing of the COSTAR Optics," OSA/SPIE International Optics Design Conference Proc. **22**, 284 (1994).

Thompson, K.P., J. Kircher, R. Korniski, S. Marlow, and R. Richwine, "Design of a Multi-wavelength Scophony Infrared Scene Projector," Proc. SPIE **2000**, 76 (1993).

Thompson, K.P. and B. Irving, "Tolerancing the .065 NA Microscope Objective with CODE V," Presented at OPTCON, (1992).

Jewell, T., K.P. Thompson, and J.M. Rodgers, "Reflective Optical Designs for Soft X-ray Projection Lithography," Proc. SPIE 1527, 163 (1991).

Korniski, R. and K.P. Thompson, "The Importance of Dispersion Tolerances in Infrared Lens Design," Proc. SPIE 1354, 402 (1991).

Thompson, K.P., "Beyond Optical Design: Interaction between the Lens Designer and the Real World," **Invited**, Proc. SPIE 554, 426 (1985).

Thompson, K.P., "Techniques for characterizing optical system assembly," Presented at OSA Annual Meeting, October (1984). Abstract in JOSA A **1**, 12, 1227 (1984).

Thompson, K.P., "Techniques for characterizing optical system fabrication," Proc. SPIE **483**, 16 (1984).

Thompson, K.P., "Astigmatic Focal Surfaces in General Optical Systems: A New Look at an Old Aberration," Presented at OSA Annual Meeting (1980). Abstract in JOSA **72**, 1726 (1982).

Shack R.V. and K.P. Thompson, "Influence of alignment errors of a telescope system," Proc. SPIE **251**, 146-153 (1980).

Thompson, K.P., "A Graphic Approach to the Analysis of Perturbed Optical Systems," Proc. SPIE **237**, 127 (1980).

Thompson, K.P., "Aberration Fields in Tilted and Decentered Optical System," Ph.D. dissertation, University of Arizona, Tucson, AZ, (1980).

Thompson, K.P., "Aberration Fields in Unobscured Mirror Systems," Presented at OSA Annual Meeting, October (1980). Abstract in JOSA **70**, 2, 1603 (1980).

Thompson, K.P., "Image Degradation in Misaligned Optical Systems," Presented at the OSA Annual Meeting, October (1979). Abstract in JOSA **69**, 1428 (1979).

Professional Activities/Societies

Fellow, OSA Optical Society of America

2013 Cochairman, OSA Topical Meeting on Freeform Optics
2012- Committee Member, OSA Fellows Selection Committee
2011-2013 Committee Member, Board of Meetings
2011 Cochairman, OSA Freeform Optics Incubator
2003-2009 Topical Editor, JoSa A, Geometrical Optics
1995-1997 Chairman, Optical Design Technical Group
1998 Cochairman, 1998 International Optics Design Conference

Fellow, SPIE Lifetime Member, The International Society for Optical Engineering

Member, AAAS The American Association for the Advancement of Science
Member, IEEE The Institute of Electrical and Electronics Engineer
Member, SAE The Society of Automotive Engineers
Member, SID The Society for Information Display
Member, ASPE The American Society of Precision Engineering

Member, Development Board, University of Arizona, College of Optical Sciences