

# JAMES C. WYANT

Professor Emeritus, College of Optical Sciences  
Founding Dean, College of Optical Sciences  
University of Arizona  
<http://wp.optics.arizona.edu/jcwyant/>  
[jcwyant@optics.arizona.edu](mailto:jcwyant@optics.arizona.edu)



---

## Educational Background

University of Rochester	PhD	Optics	1968
	MS	Optics	1967
Case Institute of Technology	BS	Physics	1965

## Employment History

### Academia

University of Arizona	Founding Dean	2005–2012
College of Optical Sciences	Director	1999–2005
Optical Sciences Center	Professor	1979–2013
	Associate Professor	1976–1979
	Assistant Professor	1974–1976
Electrical and Computer Engineering	Professor	1985–2013
Changchun University	Visiting Professor	2005–2010
University of Rochester	Visiting Professor	1983
Lowell Technological Institute	Instructor, Math, and Physics	1970–1974
	Lecturer, Physics	1969–1972

### Industry

WYKO Corporation	President	1984–1997
CSIRO	Visiting Scientist	1983
Itek Corporation	Manager, Optical Engineering Section	1974
	Optical Engineer	1968–1974
Libbey-Owens-Ford Glass Co.	Research Assistant	1964–1965 Summers

### Company Boards

4D Technology Corporation	Board Chairman	2002–2018
ILX Lightwave	Board Member	1988–2012
Optics 1	Board Member	1999–2008
DMetrix	Board Member	2001–2011

Veeco Instruments	Board Member	1997–1999
WYKO Corporation	Board Chairman	1984–1997
Wyant Measurement Systems	Board Chairman	1981–1984

### University Board of Trustees

University of Rochester	Life Trustee	2017–date
	Board of Trustees	2012–2017
Case Western Reserve University	Emeriti Trustee	2021–date
	Board Chair	2016–2020
	Board of Trustees	2010–2021

## Awards

### Technical Awards

Election to National Academy of Engineering, 2007.

Election to National Academy of Inventors, 2015.

Optica Frederic Ives Medal/Jarus W. Quinn Prize (Highest award given by Optica - formerly OSA), "For pioneering contributions in advancing the science and technology of quantitative interferometric metrology, his leadership as an educator and entrepreneur, and his visionary service to the global optics and photonics community," 2022.

SPIE Gold Medal (Highest award given by SPIE), "For significant contributions to the field of interferometry and optical testing," 2003.

SPIE Visionary Award, "For his role as founding dean of the College of Optical Sciences at the University of Arizona, for pioneering photonics at WYKO Corporation and 4D Technology, for deeply generous philanthropy to enable education in optics, and for thoughtful investment in the future of photonics," 2019.

SPIE Charles S. Vikram Award, "For pioneering contributions to the field of quantitative interferometric optical testing and for nurturing the invention of phase-measurement interferometer systems," 2010.

SPIE Technology Achievement Award (WYKO), "For development of software and instrumentation for optical quality metrology," 1988.

OSA Joseph Fraunhofer Award, "For pioneering work in the development of optical testing technology," 1992.

R&D 100 Award,

"For Model RST Rough Surface Tester," 1993. (WYKO)

"Phase-Cam 1000 – Fizeau Interferometer," 2004 (4D Technology)

"Phase-Cam 4010-MW – Dynamic multiple wavelength interferometer," 2005 (4D Technology)

"DX-40 Array Microscope," 2005 (DMetrix)

"SpeckleCam," 2006 (4D Technology)

Photonics Circle of Excellence Award,  
"Development of multiple-wavelength TOPO," 1988. (WYKO)  
"TOPO A/F noncontact surface profiler with autofocus," 1990. (WYKO)  
"MicroProbe 3D scanning probe microscope," 1992. (WYKO)  
"WYKO rough surface tester," 1993. (WYKO)  
"Phase-Cam 4000," 2004. (4D Technology)  
NASA Goddard Achievement in Excellence Award for its contribution to the James Webb Space Telescope (JWST) project, 2006.

Member of the International Order of the Knights of Holography, 2013.

Wolfram (*Mathematica*) Innovator Award, 2021.

### **Entrepreneurial Awards**

University of Arizona College of Business and Public Administration Entrepreneurial Fellow, 1989.

Arizona "Innovator of the Year" Product Award, 1993.

Tom Brown Excellence in Entrepreneurship Award, 2005.

University of Arizona Technology Innovation Award, 2005.

Arizona Technology Council William F. McWhortor Award, 2011.

The David N. Allen Award for Leadership and Vision, 2019.

AccountabilIT Lifetime Achievement Award – Governor's Celebration of Innovation Awards, 2019

### **Other Awards**

SPIE Governors' Award, 1979.

University of Rochester College of Engineering Distinguished Alumnus Award, 1994.

Doctorado Honoris Causa, Instituto Nacional de Astrofisica, Optica y Electronica, Puebla, Mexico, 2008.

Case Alumni Association Gold Medal Award, 2014.

Case Western Reserve University Athletic Hall of Fame, 2016.

The University of Arizona renamed the College of Optical Sciences the James C. Wyant College of Optical Sciences, 2019.

Case Western Reserve University's highest form of recognition, The University Medal, for exceptional leadership, dedication, and service to the university, to higher education and to society, 2020.

Honorary Doctor of Science Degree, University of Rochester, 2021.

SPIE Special Tribute to James C. Wyant - The Extraordinaire in Optical Metrology and Optical Education, 2021.

## Companies Founded or Co-Founded

Wyant Measurement Systems - 1981  
 WYKO Corporation - 1982  
 4D Technology - 2002

## Professional Society Affiliations

OSA – The Optical Society	
Presidential Advisory Committee	2012 - date
Immediate Past-President	2011
President	2010
President-Elect	2009
Vice President	2008
Executive Committee	1980–1981, 2008–2011
Board of Directors	1979–1981, 2008–2011
Fellow	1977–date
Member	1966–date
SPIE – International Society for Optics and Photonics	
President's Advisory Committee	1987–date
Immediate Past-President	1987
President	1986
President-Elect	1985
Board of Directors	1978–1987
Fellow	1980–date
Member	1972–date
Optical Society of Japan	
International Advisory Member	1999–2015
Optical Society of India	
Lifetime Fellow	2005–date
Distinguished Fellow	2021–date
Optical Society of Korea	
Honorary Member	2010–date

## Journal Editor

Optical Engineering, Sept.-Oct. 1975, "Applications of Holography."  
 Optical Engineering, July-Aug. 1977, "Metal Optics."  
 Optical Engineering, Sept.-Oct. 1980, "Holography,"  
 Associate Editor, Optical Engineering, 1976–1984  
 Advisory Editor, Optics Letters–1975  
 Associate Editor, JOSA, 1978–1983  
 Topical Editor, JOSA, 1983–1986  
 Associate Editor, Applied Optics, 1983, 1988–1992  
 Topical Editor, Applied Optics, 1989–1992  
 Topical Editor, Optics Letters, 1990–1992  
 Optical Technology Division Editor, Applied Optics, 1992–1997  
 Associate Editor, Optics Express, 1998–2004  
 Editor-in-Chief, Applied Optics, 2006–2008

## Book Series Editor

Applied Optics and Optical Engineering, **Vol. VII–Vol XI**, Academic Press, (1979–1992) (Co-edited with R. R. Shannon)

## Book Author

Field Guide to Interferometric Optical Testing, SPIE, 2006 (Co-authored with Eric Goodwin)

## Book Chapter Author

1. "Holographic and moiré techniques," Chap.12 in Optical Shop Testing, D. Malacara, Ed., Wiley-Interscience, New York, 1978.
2. "Adaptive Optics," Chap. 3 in Adaptive Optics and Short Wavelength Sources, S. F. Jacobs, M. Sargent III, and M. O. Scully, Eds., Addison-Wesley, Reading, Massachusetts, 1978.
3. "Diamond turned metal optics," Chap. 6 in Adaptive Optics and Short Wavelength Sources, S. F. Jacobs, M. Sargent III, and M. O. Scully, Eds., Addison-Wesley, Reading, Massachusetts, 1978. (Co-authored with Richard N. Shagam).
4. "Basic wavefront aberration theory for optical metrology," for Applied Optics and Optical Engineering, Vol 11<sub>1</sub>, edited by R. R. Shannon and J. C. Wyant (Academic Press, 1992). (Co-authored with K. Creath).
5. "Holographic and speckle tests," for Optical Shop Testing, 2nd Edition, edited by Daniel Malacara (John Wiley and Sons, 1992). (Co-authored with K. Creath).
6. "Tests using moiré and fringe projection techniques," for Optical Shop Testing, 2nd Edition, edited by Daniel Malacara (John Wiley and Sons, 1992). (Co-authored with K. Creath).
7. "Testing of aspheric wavefronts and surfaces," Chap.12 in Optical Shop Testing, D. Malacara, Ed., Wiley-Interscience, New York, 2007. (Co-authored with D. Malacara, K. Creath, and J. Schmit).
8. "Surface profilers, multiple wavelength, and white light interferometry," Chap.15 in Optical Shop Testing, D. Malacara, Ed., Wiley-Interscience, New York, 2007. (Co-authored with J. Schmit and K. Creath).
9. "Optical metrology of diffuse surfaces," Chap.16 in Optical Shop Testing, D. Malacara, Ed., Wiley-Interscience, New York, 2007. (Co-authored with K. Creath and J. Schmit).
10. "Wacko WYKO," Chap. 11 in Engineering a High-Tech Business, Jose Miguel Lopez-Higuera and Brian Culshaw, Ed., SPIE Press, Bellingham Washington, 2008.
11. "A wonderful world of holography, interferometry, and optical testing (honorary lecture)" in Fringe 2009, W. Osten and M. Kujawinska, Ed., Springer, New York, 2009.
12. "Use of Computer Generated Holograms in Optical Testing," Chapter 14 in OSA Handbook of Optics, Third Edition, Volume II, McGraw-Hill, 2010. (Co-authored with Katherine Creath).

13. "Thin Film Interference," Chapter 23 in College of Optical Sciences, Masud Mansuripur, Ed., 2014.

## Wolfram *Mathematica* Demonstrations

Wolfram (*Mathematica*) Innovator Award, 2021

1. James C. Wyant, "Moiré Pattern of Two Fresnel Zone Plates"  
<http://demonstrations.wolfram.com/MoirePatternOfTwoFresnelZonePlates/>  
Wolfram Demonstrations Project  
Published: June 2007
2. James C. Wyant, "Moiré Pattern of Two Equally Spaced Circular Ring Patterns"  
<http://demonstrations.wolfram.com/MoirePatternOfTwoEquallySpacedCircularRingPatterns/>  
Wolfram Demonstrations Project  
Published: August 2007
3. James C. Wyant, "Moiré Pattern of Two Straight Line Patterns"  
<http://demonstrations.wolfram.com/MoirePatternOfTwoStraightLinePatterns/>  
Wolfram Demonstrations Project  
Published: August 2007
4. James C. Wyant, "Wavefront Maps and Profiles of Seidel Aberrations"  
<http://demonstrations.wolfram.com/WavefrontMapsAndProfilesOfSeidelAberrations/>  
Wolfram Demonstrations Project  
Published: January 4, 2012
5. James C. Wyant, "Plots of Zernike Polynomials "  
<http://demonstrations.wolfram.com/PlotsOfZernikePolynomials/>  
Wolfram Demonstrations Project  
Published: January 15, 2013
6. James C. Wyant, "Point Spread and Modulation Transfer Functions of Zernike Wavefronts"  
<http://demonstrations.wolfram.com/PointSpreadAndModulationTransferFunctionsOfZernikeWavefronts/>  
Wolfram Demonstrations Project  
Published: January 25, 2013
7. James C. Wyant, "Point Spread and Modulation Transfer Functions for Seidel Aberrations"  
<http://demonstrations.wolfram.com/PointSpreadAndModulationTransferFunctionsForSeidelAberration/>  
Wolfram Demonstrations Project  
Published: February 13, 2013
8. James C. Wyant, "Using web*Mathematica* to Solve Optics Problems"  
<https://wp.optics.arizona.edu/jcwyant/mathematica/webmathematica/>

## Research and Development Accomplishments

1. First to use computer generated holograms (CGHs) to test aspheric surfaces (1969).  
CGHs are now commonly used to test aspheric optics and most high-quality optical systems now use aspheric optics.

2. Developed special shearing interferometer wavefront sensor for use in the correction of atmospheric turbulence (1970).  
Was a member of a team of 3 at the Itek Corporation who were the first to demonstrate what is now called adaptive optics for the correction of atmospheric turbulence. (The work quickly became classified.)
3. Early development of phase-shifting interferometry (1970)  
Essentially all interferometers made today for the measurement of wavefront or surface shape use phase-shifting interferometry.
4. First user-friendly, graphics intensive, software for analysis of interferograms using a personal computer (1982)  
Many copies of this were sold through Wyant Measurement Systems or through Zygo. The software later became the basis of the WYKO Corporation software.
5. First to develop and sell a computerized optical interferometric profilometer for measurement of smooth surfaces in the Angstrom range (1982).  
Thousands of these profilometers have been sold by WYKO and other companies for many different markets.
6. Development of computerized interferometer for measuring optical wavefronts (1983).  
This added user-friendly, graphics intensive, software to classical interferometers for improved optical testing.
7. Development of two-wavelength interferometric techniques for extending the dynamic range of interferometric measurements (1985).  
This increased the dynamic range of computerized optical interferometric profilometers and increased the number of applications for the profilometer.
8. First to develop a computerized interference microscope to measure magnetic read/write disks and heads (1989).  
For a few years, essentially any company in the world who made magnetic read/write heads for hard disk drives used our WYKO profilometer for measuring every single read/write head they manufactured to make sure it met the specifications. Being able to measure the shape of the heads was essential for producing higher capacity, faster, computer disk drives.
9. First to develop a computerized interferometric profiler using coherence peak sensing techniques to measure much rougher surfaces than could be previously measured (1993).  
Extended the dynamic range of the computerized interferometric profiler and greatly increased the applications for the profiler. Thousands of these profilometers have been sold by many different companies for many different markets.
10. Development of interferometric stitching techniques for giving high spatial resolution surface microstructure measurements over a large field-of-view (1996).  
Further increased the applications for the profiler.
11. First to develop practical interferometric metrology having reduced sensitivity to vibration (2000).  
Our reduced sensitivity techniques appear to be a paradigm shift in how large optics is tested. The techniques were used in the testing of the optics for the James Webb Space Telescope and are now being used in most, if not all, of the giant telescopes currently being fabricated. Besides applications in the optics industry, other applications have been found in the machine tool and semiconductor industries, as well as in biomedical engineering.

## Patents

1. U.S. Patent No. 3,829,219 "Shearing interferometer," 1974.
2. U.S. Patent No. 4,025,195 "Image subtraction, addition system," co-inventor: J. F. Ebersole, 1977.
3. U.S. Patent No. 4,639,139 "Optical Profiler using improved phase-shifting interferometry," co-inventor: K. Prettyjohns, 1987.
4. U.S. Patent No. 4,832,489 "Two-wavelength phase-shifting interferometer and method," co-inventor: K. Creath, 1989.
5. U.S. Patent No. 5,398,112 "Method for testing an optical window with a small wedge angle," co-inventor: Chiayu Ai, 1995.
6. U.S. Patent No. 5,502,566 "Method and apparatus for absolute optical measurement of entire surfaces of flats," co-inventors: Chiayu Ai, Lian-Zehn Shao, Robert E. Parks, 1996
7. U.S. Patent No. 7,057,737 "Common optical-path testing of high numerical aperture wavefronts," co-inventors: James Millerd, Neal Brock, John Hayes, 2006
8. U.S. Patent No. 7,057,738 "Simultaneous phase-shifting Fizeau interferometer," co-inventor: James Millerd, 2006
9. U.S. Patent No. 7,230,717 "Pixelated phase-mask interferometer," co-inventors: Neal Brock, James Millerd and John Hayes, 2007
10. U.S. Patent No. 7,230,718 "Simultaneous phase-shifting Fizeau interferometer," co-inventor: James Millerd, 2007

## Partial List of Courses Taught

- University of Arizona, College of Optical Sciences  
Taught graduate courses in diffraction, interferometry, holography, and optical testing for 40 years.
- Optical Testing and Testing Instrumentation  
Taught course in summer school at Institute of Optics, University of Rochester, for 32 years beginning in 1982.
- Interferometric Optical Testing  
Taught every year at Optical Society of America Annual Meeting - 1982 to 1994.
- Modern Optical Testing  
Taught annually at SPIE Annual Meeting - 1985 to present.  
Taught annually at SPIE Photonics West meeting - 1992 to present.  
Taught at SPIE Optifab meeting every other year – 1989 – 2014.  
Taught at many European and Asian SPIE meetings – 1990 – present.  
Taught every year in the UK for students from all around Europe - 1997 to 2009.
- Interference and Interferometry  
Taught at various SPIE meetings a couple of times each year - 1995 to 2000.



## Student Advisor

Adviser of 34 graduated Ph.D. students

Adviser of 25 graduated MS students

## Dissertations of Graduated Ph.D. Students

Year	Name and Title
1978	William H. Swantner Optical Design of Coherent Optical Processor
1978	Chungte W. "Bill" Chen Design and fabrication of holographic elements
1979	Nobuhiko "Pooshan" Tamura Feedback systems for image acquisition and processing
1980	Osuk Kwon Infrared interferometric systems
1980	John S. Loomis Applications of computer-generated holograms in optical testing
1980	Lawrence F. Rubin Scatterplate interferometry
1980	Richard N. Shagam Heterodyne interferometric and moiré test methods for surface measurements
1982	Elliott G. Eichen Speckle measurements with a CCD array: Applications to speckle reduction
1982	Cheol J. Kim Polynomial fit of interferograms
1982	Christ L. Koliopoulos Interferometric optical phase measurement techniques
1982	Ken Womack Traditional and synchronous convolution methods for processing fringe pattern images
1984	John B. Hayes Linear methods of computer controlled optical figuring
1984	Sin-Sang "Phil" Lam Real-time two-wavelength holographic interferometry with a Bi <sub>12</sub> SiO <sub>20</sub> crystal
1985	Yeou-Yen Cheng Multiple-wavelength phase-shifting interferometry

- 
- 1985 Katherine Creath  
Digital speckle-pattern interferometry
- 1987 Chiayu Ai  
Phase measurement accuracy limitation in phase-shifting interferometry
- 1987 Russell Chipman  
Polarization aberrations
- 1987 Donald K. Cohen  
Analysis of methods for detecting focus error in optical data storage systems
- 1988 Eugene R. Cochran III  
Extending the measurement range of an optical surface profiler
- 1988 Scott L. Devore  
Analysis and measurement of optical disk drive functions
- 1992 Walter G. Hahn  
Optical measurement of surface profiles of silicon dioxide films on silicon substrates and carbon coatings on magnetic disks
- 1994 Joseph G. Ambrose  
Deconvolution of lateral shear interferograms
- 1998 Erik L. Novak  
Measurement and analysis optimization of large aperture laser Fizeau interferometer
- 1999 Conrad Wells  
Phase-shifting interferometric imaging ellipsometer
- 2000 Akiko Harasaki  
Improved vertical scanning interferometry
- 2000 Michael North-Morris  
Phase-shifting birefringent scatterplate interferometer
- 2003 Mark Neal  
Polarization phase-shifting point-diffraction interferometer
- 2003 Jay Van Delden  
Principles and measurement of polarized light: A novel interferometric approach
- 2004 Babak Saif  
Simultaneous phase shifted digital speckle pattern interferometry
- 2005 Matt Novak  
Micropolarizer phase-shifting array for use in dynamic interferometry
- 2006 Bradley Kimbrough  
Path Matched Vibration Insensitive Fizeau Interferometer
- 2009 Peter H. Smith  
Water at the Phoenix Landing Site

- 2012 Joshua Thomas Wiersma  
Pixelated Mask Polarization Based Spatial Carrier Interference Microscopy
- 2013 Goldie Goldstein  
Smart Temporal Phase Unwrapping for Biological Objects

### Selected Publications

1. James C. Wyant and M. Parker Givens, "Effect of the photographic gamma on the luminance of hologram reconstructions," *J. Opt. Soc. Am.* **58**(3), 357–361, Mar. 1968.
2. James C. Wyant and M. Parker Givens, "Effects of photographic gamma on hologram reconstructions," *J. Opt. Soc. Am.* **59**(12), 1650–1658, Dec. 1969.
3. J. C. Wyant and M. P. Givens, "Undesired light in a reconstructed hologram image caused by the nonlinearity of the photographic process," *Appl. Opt.* **9**(4), 810–814, Apr. 1970.
4. J. C. Wyant and A. J. MacGovern, "Computer generated holograms for testing aspheric optical elements," in *Applications of Holography*, Laboratoire de Physique Generale et Optique, Universite de Besancon, Besancon, France, 1970.
5. A. J. MacGovern and J. C. Wyant, "Computer generated holograms for testing optical elements," *Appl. Opt.* **10**(3), 619–624, Mar. 1971.
6. J. C. Wyant, "Testing aspherics using two-wavelength holography," *Appl. Opt.* **10**(9), 2113–2118, Sept. 1971.
7. J. C. Wyant and V. P. Bennett, "Using computer generated holograms to test aspheric wavefronts," *Appl. Opt.* **11**(12):2833–2839, Dec. 1972.
8. J. C. Wyant, "Double frequency grating lateral shear interferometer," *Appl. Opt.* **12**(9), 2057–2060, Sept. 1973.
9. J. C. Wyant, "White Light Extended Source Shearing Interferometer," *Appl. Opt.* **13**(1), 200–202, Jan. 1974.
10. J. C. Wyant, P. K. O'Neill, and A. J. MacGovern, "Interferometric method of measuring plotter distortion," *Appl. Opt.* **11**(7), 1549–1551, July 1974.
11. P. Hariharan, W. H. Steel and J. C. Wyant, "Double grating interferometer with variable lateral shear," *Opt. Comm.* **11**(3), 317–320, July 1974.
12. John W. Hardy, Julius Feinleib, and James C. Wyant, "Real time phase correction of optical imaging systems," OSA Topical Meeting on Opt. Propagation through Turbulence, Boulder, Colorado, July 1974.
13. J. C. Wyant, "Holographic testing of aspheric optical elements," pp. 643-664 in *Proceedings of the Ninth Congress of the International Commission for Optics*, National Academy of Science, Washington, D.C., 1974.
14. J. F. Ebersole and J. C. Wyant, "Collimated light acousto-optic lateral shearing interferometer," *Appl. Opt.* **13**(5), 1004–1005, May 1974.

15. J. C. Wyant and P. K. O'Neill, "Computer generated hologram: null lens test of aspheric wavefronts," *Appl. Opt.* **13**(12), 2762–2765, Dec. 1974.
16. M. P. Rimmer and J. C. Wyant, "Evaluation of large aberrations using a lateral-shear interferometer having variable shear," *Appl. Opt.* **14**(1), 142–150, Jan. 1975.
17. J. C. Wyant, "Rotating diffraction grating laser beam scanner," *Appl. Opt.* **14**(5): 1057–1058, May 1975.
18. J. C. Wyant, "Optical gauging principles," Proceedings of the SPIE Meeting on Solving Quality Control and Reliability Problems with Optics, May 15–16, 1975.
19. J. C. Wyant, "Imaging in astronomy," *Optical Society of America Technical Digest*, June 18–21, 1975.
20. J. C. Wyant and F. D. Smith, "Interferometer for measuring power distribution of ophthalmic lenses," *Appl. Opt.* **14**(7), 1607–1612, July 1975.
21. J. C. Wyant, "OTF measurements with a white light source: an interferometric technique," *Appl. Opt.* **14**(7), 1613–1615, July 1975.
22. J. C. Wyant, "Holographic applications," Guest Editorial, *Opt. Eng.* **14**(5), 381–382, Sept.-Oct. 1975.
23. J. C. Wyant, "Imaging in astronomy," *Appl. Opt.* **14**(10), 2322, Oct. 1975.
24. J. C. Wyant, "Use of an ac heterodyne lateral shear interferometer with real-time wavefront corrections systems," *Appl. Opt.* **14**(11), 2622–2626, Nov. 1975.
25. Poohsan N. Tamura and James C. Wyant, "On-axis coherent optical feedback system for image processing," *Proc. SPIE* **74**: 57–61, 1976.
26. J. C. Wyant, book review of *Principles of Holography*, 2nd Ed. *J. Opt. Soc. Am.* **66**(4): 396, Apr. 1976.
27. J. F. Ebersole and J. C. Wyant, "Real-time optical subtraction of photographic imagery for difference detection," *Appl. Opt.* **15**(4):871–876, Apr. 1976.
28. J. C. Wyant, "Sensors for adaptive optics," *Laser Focus* **12**(9):35–40, Sept. 1976.
29. D. A. Thomas and J. C. Wyant, "High efficiency grating lateral shear interferometer" (short communication), *Opt. Eng.* **15**(5), 477–478, Sept.-Oct. 1976.
30. J. C. Wyant, "A simple interferometric MTF instrument," *Opt. Commun.* **19**(1):120–121, Oct. 1976.
31. J. C. Wyant, Ed., Proceedings of the SPIE National Seminars on Imaging Through the Atmosphere, **75** (meeting held March 22–23, 1976, Reston, Va.).
32. P. N. Tamura and J. C. Wyant, "Matrix multiplication using coherent optical techniques," *Proc. SPIE* **83**, 97–104 (1977).
33. D. A. Thomas and J. C. Wyant, "Determination of the dihedral angle errors of a corner cube from its Twyman-Green interferogram," *J. Opt. Soc. Am.* **67**(4), 467–472, April 1977.

34. R. Shagam, R. Sladky and J. C. Wyant, "Optical figure inspection of diamond turned metal mirrors," *Opt. Eng.* **16**(4): 375–380, July–Aug. 1977.
35. J. C. Wyant "Guest editorial: metal optics," *Opt. Eng.* **19**(4): 319, July–Aug. 1977.
36. J. C. Wyant "Image blur for rainbow holograms," *Optics Letters*, **1**(4): 130–132, October 1977.
37. J. C. Wyant, "Speckle," pp. 395-397 in McGraw Yearbook of Science and Technology, McGraw Hill, New York, 1977.
38. James C. Wyant, "Fringe localization," *Appl. Opt.* **19**(12), 1853, 15 June 1978.
39. C. Koliopoulos, O. Kwon, R. Shagam, J. C. Wyant and C. R. Hayslett, "Infrared point-diffraction interferometer," *Opt. Lett.* **3**(3), 118–120, Sept. 1978.
40. R. N. Shagam and J. C. Wyant, "Optical frequency shifter for heterodyne interferometers using multiple rotating polarization retarders," *Appl. Opt.* **17**(19): 3034–3035, Oct. 1978.
41. James C. Wyant and Richard N. Shagam, "Use of electronic phase measurement techniques in optical testing," *Proceedings of ICO-II Conference, Madrid, Spain*, pp. 659–662, 1978.
42. James C. Wyant, "Interferometric optical testing: past, present and future," *Proc. SPIE* **192**, 2–5, 1979.
43. Osuk Kwon, James C. Wyant and C. R. Hayslett, "Long-wavelength interferometer in the optical shop," *Proc. SPIE* **192**, 88–92, 1979.
44. K. H. Womack, J. A. Jonas, C. Koliopoulos, K. L. Underwood, James C. Wyant, John S. Loomis, and C. R. Hayslett, "A microprocessor-based instrument for analyzing video interferograms," *Proc. SPIE* **192**, 134–139, 1979.
45. Kang M. Leung, T. C. Lee, E. Bernal and James C. Wyant, "Two-wavelength contouring with the automated thermoplastic holographic camera," *Proc. SPIE* **192**, 184–189, 1979.
46. James C. Wyant, "Optical engineering," *Encyclopedia Britannica 1979 Yearbook of Science and the Future*, pp. 364–367, 1979.
47. Osuk Kwon, J. C. Wyant, and C. R. Hayslett, "10.6 micrometer interferometric testing of infrared optics and aspherics," *Proc. SPIE* **190**, 99–102, 1979.
48. James C. Wyant, "Recent investigations of interferometry and applications to optical testing," *Proc. SPIE* **190**, 507–511, 1979.
49. J. C. Wyant, review of *Handbook of Optics*, *Rev. Sci. Instr.* **50**(20), 266, Feb. 1979.
50. J. C. Wyant, review of *Holographic Interferometry*, *Appl. Opt.* **18**(18), 3155, Sept. 1979.
51. Lawrence F. Rubin and James C. Wyant, "Energy distribution in a scatter-plate interferometer," *J. Opt. Soc. Am.* **69**(9), 1305–1308, Sept. 1979.
52. James C. Wyant, "Precision optical testing," *Science* **206**(12), 168–172, Oct. 1979 (invited paper).

53. Osuk Kwon, J. C. Wyant and C. R. Hayslett, "Rough surface interferometry at 10.6 micron," *Appl. Opt.* 19(11):1862–1869, 1 June 1980.
54. J. C. Wyant, "Holography," in Encyclopedia of Physics, Addison-Wesley, Reading, Massachusetts, 1981.
55. J. C. Wyant, "Interferometry," McGraw-Hill Encyclopedia of Science, McGraw-Hill, New York, 1981.
56. J. C. Wyant, "Speckle," in McGraw-Hill Encyclopedia of Science, McGraw-Hill, New York, 1981.
57. John Hayes, K. L. Underwood, John L. Loomis, Robert E. Parks and James C. Wyant "Testing of nonlinear diamond-turned reflexicons," *Appl. Opt.* 20(2), 235–239, 15 Jan. 1981.
58. James C. Wyant, review of Applied Optics: A Guide to Optical Design, Vol. 2, *J. Opt. Soc. Am.* 71(2): 205–206, Feb. 1981.
59. James C. Wyant and Chris L. Koliopoulos, "Phase measurement system for adaptive optics," *Agard Conference Proceedings No. 300*, 1981 (invited paper).
60. James C. Wyant, "Use of symbolic math system to solve polarized light problems," *Appl. Opt.* 20(19), 3321–3326, 1 Oct. 1981.
61. Elliot Eichen and J. C. Wyant, "High-gain holographic screens," *Opt. Lett.* 6(11): 517–518, Nov. 1981.
62. James C. Wyant, review of Periodic Structures, Gratings and Moiré Patterns and Diffraction Phenomena, *Medical Physics* 9(2): March–April 1982.
63. James C. Wyant, "Interferometric optical metrology: basic principles and new systems," *Laser Focus* 18(5): 65–71, May 1982.
64. James C. Wyant, "3.8 micron Interferometry for testing coated optics," *Proc. SPIE* 325, 144–148, 1982.
65. K. Underwood, J. C. Wyant, C. L. Koliopoulos, "Self-referencing wavefront sensor," *Proc. SPIE* 351, 108–114, 1983.
66. K. Prettyjohns, S. DeVore, E. Dereniak, and J. C. Wyant, "Design and operation of a real time interferometer working at 3.8 micron," *Proc. SPIE* 429, 142–147, 1983.
67. J. C. Wyant, C. L. Koliopoulos, B. Bhushan, and O. E. George, "An optical profilometer for surface characterization of magnetic media," *ASLE Trans.* 27, 101–113 (1984).
68. P. Lam, J. D. Gaskill, and J. C. Wyant, "Two-wavelength holographic interferometer," *Appl. Opt.* 23(18), 3079–3881 (1984).
69. Akira Ono and James C. Wyant, "Plotting error measurement in CGH using an improved interferometric method," *Appl. Opt.* 23(21), 3905–3910 (1984).
70. J. C. Wyant, B. F. Oreb, and P. Hariharan, "Testing aspherics using two-wavelength holography: application of digital electronic techniques," *Appl. Opt.* 23(22) 4020–4023 (1984).

71. Yeou-Yen Cheng and J. C. Wyant, "Two-wavelength phase shifting interferometry," *Appl. Opt.* **23**(24), 4539–4543 (1984).
72. J. C. Wyant, Review of Interferometry, *Appl. Opt.* **23**(13): 2222, 15 July 1984.
73. James C. Wyant, "Microprocessor analysis of interferometric optical testing data," Optics in Modern Science and Technology, ICO-13 Conference Digest, Sapporo, Japan, August 1984, pp. 184–185.
74. Yeou-Yen Cheng and James C. Wyant, "Multiple-wavelength phase-shifting interferometry," *Appl. Opt.* **24**(6), 804–807 (1985).
75. James C. Wyant, "Optical profilers for surface roughness" *Proc. SPIE* **525**, 174–180, 1985.
76. Akira Ono and James C. Wyant, "Aspherical mirror testing using a CGH with small errors," *Appl. Opt.* **24**, 560–563 (1985).
77. Keith Prettyjohns, Eustace Dereniak, Scott DeVore, and James C. Wyant, "Direct phase measurement interferometer working at 3.8 mm" *Appl. Opt.* **24**, 2211–2216 (1985).
78. Y.-Y. Cheng and James C. Wyant, "Phase shifter calibration in phase-shifting interferometry," *Appl. Opt.* **24**, 3049–3052 (1985).
79. M. W. Chang, C. P. Hu, P. S. Lam, and James C. Wyant, "High precision deformation measurement by digital phase shifting holographic interferometry," *Appl. Opt.* **24**, 3780–3783 (1985).
80. B. Bhushan, J. C. Wyant, and C. L. Koliopoulos, "Measurement of surface topography of magnetic tapes by Mirau Interferometry" *Appl. Opt.* **24**, 1489–1497 (1985).
81. E. L. Church, T. V. Vorburger, and J. C. Wyant, "Direct comparison of mechanical and optical measurements of finish of precision machined optical surfaces," *Opt. Eng.* **24**(3) 388–395 (1985).
82. K. Creath, Y.-Y. Cheng, and J. C. Wyant, "Contouring aspheric surfaces using two-wavelength phase-shifting interferometry," *Optica Acta* **32**(12):1455–1464 (1985). (invited paper).
83. James C. Wyant and Katherine Creath, "Recent advances in interferometric optical testing," *Laser Focus/Electro Optics*, November 1985.
84. Ming Chang, Ching-Piao Hu, and James C. Wyant, "Phase shifting holographic interferometry," *Proc. SPIE* **599**, 149–153 (1985).
85. J. C. Wyant, C. L. Koliopoulos, B. Bhushan, and D. Basila, "Development of a three-dimensional noncontact digital profiler," *Trans. ASME J. Tribology* **108**(1), 1–8 (1986).
86. Gudmunn A. Slettemoen and James C. Wyant, "Maximal fraction of acceptable measurements in phase-shifting speckle interferometry: a theoretical study," *J. Opt. Soc. Am. A.* **3**(2), 210–214, Feb. 1986.
87. James C. Wyant, "Interferometry for three-dimensional sensing," *Test and Meas. World*: 66–71, April 1986.
88. James C. Wyant and Katherine Creath, review of Optical Holography, *Appl. Opt.* **25**, 225 (1986).

89. Katherine Creath and James C. Wyant, "Direct phase measurement of aspheric surface contours," Proc. SPIE **645**, 101–106 (1986).
90. James C. Wyant and Keith N. Prettyjohns, "Three-dimensional surface metrology using a computer controlled non-contact instrument," Proc. SPIE **661**, 29–295 (1986).
91. E. R. Cochran and J. C. Wyant, "Longscan surface profile measurements using a phase-modulated Mirau interferometer," Proc. SPIE **680**, 112–117 (1986).
92. K. Creath and J.C. Wyant, "From angstroms to microns: extending the measurement range of optical profilers," OSA Fabrication and Testing Technical Digest, 137–141 (Seattle, Washington, October 1986).
93. James C. Wyant, Katherine Creath, and Keith N. Prettyjohns, "Surface roughness measurements using a computer-controlled non-contact optical instrument," Proc. 2nd International Machine Tool Engineering Conf. (IMEC), Kobe, Japan, Nov. 1986. (invited paper).
94. James C. Wyant, "Interferometric testing of aspheric surfaces," Proc. SPIE **816**, 19–39 (1987).
95. K. Creath and J. C. Wyant, "Aspheric testing using phase-shifting interferometry", Proc. 14th Congress of the International Commission for Optics: 353–354, 1987. (Also listed as Proc. SPIE **813**, 1987).
96. T. Honda, J. Huang, J. Tsujiuchi, and J. C. Wyant, "Shape measurement of deep aspheric optical surfaces by radial shear interferometry," Proc. 14th Congress of the International Commission for Optics: 351–352, 1987. (Also listed as Proc. SPIE **813**, 1987).
97. K. Creath, S. L. DeVore, and J. C. Wyant, "Real-time phase-shifting holographic interferometry," OSA Optical Fabrication and Testing Digest **19**, 59–63, 1987.
98. Chiayu Ai and James C. Wyant, "Effect of piezoelectric transducer nonlinearity on phase shift interferometry," Appl. Opt. **26**, 1112–1116 (1987).
99. Chiayu Ai and James C. Wyant, "Effect of spurious reflection on phase shift interferometry," Appl. Opt. **27**, 3039–3045 (1988).
100. K. Creath and J. C. Wyant, "Measurement of ultraprecision components using non-contact interferometry based instrumentation, Ultraprecision in Manufacturing Engineering (Proc. of the International Congress on Ultraprecision Technology, Aachen, W. Germany, May, 1988), edited by M. Weck and R. Hartel (Springer-Verlag, Berlin, 1988), pp.287–302.
101. K. Creath and J. C. Wyant, "Comparison of interferometric contouring techniques," Proc. SPIE **954**: 174–182, 1988.
102. K. Creath and J. C. Wyant, "Interferometric measurement of the roughness of machined parts," Proc. SPIE **954**, 246–251, 1988.
103. Bhushan, B., Wyant, J. C. and Meiling, J., "A New Three-Dimensional Noncontact Digital Optical Profiler," *Wear*, **122**, 1988, pp. 301–312.
104. James C. Wyant, review of Optical Metrology, IEEE J. Quantum Electronics **24**, 586–586 (1988).



105. James C. Wyant, "Adaptive Optics," Interferometry," and "Speckle," in Optics Source Book, edited by Sybil P. Parker (McGraw-Hill, New York, 1988), pp. 102–106, 142–151, 279–283.
106. K. Creath and J. C. Wyant, "Three-dimensional contouring using phase-measuring interferometry," *Optical Sensing and Measurement, Proc. 7th Intern'l Congress on Appl. of Lasers and Electrooptics, ICALEO '88*, edited by Aaron Gara (Springer-Verlag, New York, 1989), pp 3–12.
107. K. Creath and J. C. Wyant, "Absolute measurement of surface roughness," *Appl. Opt.* **29**(26), (Sept. 10, 1990).
108. K. Creath and J. C. Wyant, "Absolute measurement of spherical surfaces," *Proc. SPIE* **1332**(01), (1991). [invited]
109. J. C. Wyant and K. Creath, "Absolute measurement of surface roughness," *Proc. 15th Congress of the ICO*, 568–569 (1990). (Also listed as *Proc. SPIE* **1319**, (1990))
110. James C. Wyant, "Optical testers refine interferometry," *Laser Focus World*, 139–147, (January 1991). [invited]
111. James C. Wyant, "Absolute optical testing: better accuracy than the reference," *Photonics Spectra*, 97–101, (March 1991). [invited]
112. C. Wyant and K. Creath, "Advances in interferometric optical profiling," *Proc. Metrology and Properties of Engineering Surfaces*, 1–4 (1991). [invited]
113. Chiayu Ai and James C. Wyant, "Measurement of the inhomogeneity of a window", *Opt. Eng.* **30**(9) 1399–1404 (Sept. 1991).
114. Chiayu Ai and James C. Wyant, "Testing stress birefringence of an optical window," *Proc. SPIE* 1531:165–172, (1992).
115. Jay Jahanmir and J. C. Wyant, "Comparison of surface roughness measured with an optical profiler and a scanning probe microscope," *Proc. SPIE* **1720**, 111–118, (1992). [invited]
116. Katherine Creath and James C. Wyant, "Testing spherical surfaces: a fast, quasi-absolute technique," *Appl. Opt.* **31**, 4350–4354 (1992).
117. C. Wyant and K. Creath, "Advances in interferometric optical profiling," *Int. J. Mach. Tools Manufact.* **32**, No.1/2, 5–10(1992). [invited]
118. Chiayu Ai and James C. Wyant, "Absolute testing of flats decomposed to even and odd functions," *Proc. SPIE* **1776**, 73–83, (1992).
119. James C. Wyant, review of Interferogram Analysis: Digital fringe pattern measurement techniques, *Opt. Eng.* **32**(11), 2987–2988 (Nov 1993).
120. Chiayu Ai and James C. Wyant, "Effect of retroreflection on a Fizeau phase-shifting interferometer," *Appl. Opt.* **32**, 3470–3478 (1993).
121. Chiayu Ai and James C. Wyant, "Absolute testing of flats by using even and odd functions," *Appl. Opt.* **32**, 4698–4705 (1993).

122. Chiayu Ai and James C. Wyant, "Testing an optical window of a small wedge angle: effect of multiple reflections," *Appl. Opt.* **32**, 4904–4912 (1993).
123. Chiayu Ai and James C. Wyant, "Testing an optical window of a small wedge angle," *Proc. SPIE* **1994**, 102–110 (1994).
124. James C. Wyant, "Computerized interferometric measurement of surface microstructure," *Proc. SPIE* **2576**, 122–130 (1995).
125. James C. Wyant and Joanna Schmit, "Computerized interferometric measurement of surface microstructure," *Proc. SPIE* **2782**, 26–37 (1996).
126. Erik Novak, Chiayu Ai, and James C. Wyant "Optical resolution of phase measurements of laser Fizeau interferometer," *Proc. SPIE* **2870**, 545–552 (1996).
127. Joseph Lamb, James C. Wyant, et al "Optical and mechanical design considerations in the construction of a 24-in. phase-shifting interferometer," *Proc. SPIE* **047**, 415–426 (1997).
128. Conrad Wells and James C. Wyant "A Phase-shifting interferometric imaging ellipsometer," *Proc. SPIE* **3121**, 13–18 (1997).
129. Erik Novak, Chiayu Ai, and James C. Wyant "Transfer function characterization of laser Fizeau interferometer for high-spatial-frequency phase measurements," *Proc. SPIE* **3134**, 114–121 (1997).
130. Erik Novak, Chiayu Ai, and James C. Wyant "Errors caused by nearly parallel optical elements in a laser Fizeau interferometer utilizing strictly coherent imaging," *Proc. SPIE* **3134**, 456–460 (1997).
131. Conrad Wells and James C. Wyant "Fringe modulation characterization for a phase-shifting imaging ellipsometer," *Proc. SPIE* **3134**, 466–474 (1997).
132. James C. Wyant and Joanna Schmit, "Large field of view, high spatial resolution, surface measurements", *Int. J. Mach Tools Manufact.*, **38**, 691–698 (1998). [invited]
133. Michael North-Morris, Jay van Deldon, and James C. Wyant, "Birefringent scatterplate phase-shifting interferometer," *Proc. SPIE* **3749**, 432–433 (1999).
134. Ritva A. M. Keski-Kuha, Pierre Y. Bely, Richard Burg, James H. Burge, Pamela S. Davila, Joseph M. Geary, John G. Hagopian, David N. Jacobson, Andrew E. Lowman, Steven A. Macenka, John D. Mangus, Charles M. Perrygo, David C. Redding, Babak N. Saif, W. Scott Smith, and James C. Wyant, "NGST OTA optical metrology instrumentation and conceptual approaches," *Proc. SPIE* **4013**, 826–835 (2000).
135. Michael North-Morris and James C. Wyant, "Phase-shifting scatterplate interferometer," *Proc. SPIE* **4231**, 59–66 (2000).
136. Akiko Harasaki and James C. Wyant, "Fringe modulation skewing effect in white-light vertical scanning interferometry," *Appl. Opt.* **39**, 2101–2106 (2000).
137. Akiko Harasaki, Joanna Schmit, and James C. Wyant, "Improved vertical-scanning interferometry," *Appl. Opt.* **39**, 2107–2115 (2000).
138. Akiko Harasaki, Joanna Schmit, and James C. Wyant, "Offset of coherent envelope position due to phase change on reflection," *Appl. Opt.* **40**, 2102–2106 (2001).

139. James C. Wyant, "White light interferometry," Proc. SPIE **4737**, 98–107 (2002).
140. James C. Wyant, "Advances in Interferometric Metrology," Proc. SPIE **4927**, 154–162 (2002)
141. Michael B. North-Morris, Jay VanDelden, and James C. Wyant, "Phase-shifting birefringent scatterplate interferometer," Appl. Opt. **41**, 668–677 (2002).
142. James C. Wyant, "Dynamic Interferometry," Optics and Photonics News **14**, 36–41 (April 2003).
143. James E. Millerd, Neal J. Brock, John B. Hayes, and James C. Wyant, "Instantaneous phase-shift point-diffraction interferometer," Proc. SPIE **5531**, 264–272 (2004).
144. James E. Millerd, Neal J. Brock, John B. Hayes, Michael B. North-Morris, Matt Novak, and James C. Wyant, "Pixelated phase-mask dynamic interferometer," Proc. SPIE **5531**, 304–314 (2004).
145. James E. Millerd, Stephen J. Martinek, Neal J. Brock, John B. Hayes, and James C. Wyant, "Instantaneous phase-shift point-diffraction interferometer," Proc. SPIE **5380**, 422–429 (2004).
146. Babak N. Saif, James Millerd, Ritva Keski-Kuha, Lee Feinberg, and James C. Wyant, "Instantaneous phase-shifted speckle interferometer for measurement of large optical structures," Proc. SPIE **5494**, 152–162 (2004).
147. James Millerd, Neal Brock, John Hayes, Brad Kimbrough, Matt Novak, Michael North-Morris, and James C. Wyant, "Modern approaches in phase measuring metrology," Proc. SPIE **5856**, 14–22 (2005).
148. Neal Brock, John Hayes, Brad Kimbrough, James Millerd, Michael North-Morris, Matt Novak, and James C. Wyant, "Dynamic interferometry," Proc. SPIE **5875**, 58750F-1–10 (2005).
149. Matt Novak, James Millerd, Neal Brock, Michael North-Morris, John Hayes and James Wyant, "Analysis of a micropolarizer array-based simultaneous phase-shifting interferometer," Appl. Opt. **44**, 6861–6868 (2005).
150. James C. Wyant, "Advances in interferometric surface measurement," Proc. SPIE **6024**, 602401-1–11 (2006).
151. Brad Kimbrough, James Millerd, James Wyant, and John Hayes, "Low-coherence vibration insensitive Fizeau interferometer," Proc. SPIE **6292**, 62920F (2006).
152. James Millerd, Neal Brock, John Hayes, Brad Kimbrough, Michael North-Morris, James C. Wyant, "Vibration insensitive interferometry, Proc. SPIE **10567**, 105671P (27-30 June 2006) · doi: 10.1117/12.2308094.
153. R. N. Neal and James C. Wyant, "Polarization phase-shifting point-diffraction interferometer," Appl. Opt. **45**, 3463–3476 (2006).
154. James C. Wyant, "How to start up a start-up," Nature Photonics **1**, 301–302 (2007) (Invited paper).

155. James C. Wyant, "Improved interferometric optical testing, OPN, 33–37 (July/August 2007) (Invited paper).
156. James C. Wyant, "Precision interferometry in less than ideal environments", Proc. SPIE **7790**, 77900J-1–2 (2010).
157. James C. Wyant, "Evolution of an Editor", Appl. Opt. **51**, ED11–ED12, (2012).
158. James C. Wyant, "Computerized Interferometric Surface Measurements [Invited]", Appl. Opt. **52**, 1–8 (2013).
159. Joshua T. Wiersma and James C. Wyant, "Vibration insensitive extended range interference microscopy," Appl. Opt. **52**, 5957–5961 (2013).
160. James C. Wyant, "Optical Sciences Center/College of Optical Sciences-50 years of excellence (Keynote Paper)," Proc. SPIE **9186**, 918602-1–26 (2014).
161. James C. Wyant, "The evolution of interferometry from metrology to biomedical applications," Proc. SPIE **9718**, Quantitative Phase Imaging II, 971802 (9 March 2016); doi: 10.1117/12.2218169.
162. Babak Saif, David Chaney, Perry Greenfield, Marcel Bluth, Kyle Van Gorkom, Koby Smith, Josh Bluth, Lee Feinberg, James C. Wyant, Michael North-Morris, and Ritva Keski-Kuha, "Measurement of picometer-scale mirror dynamics," Appl. Opt. **56**, 6457–6465 (2017).
163. James C. Wyant, "A wonderful life of holography, interferometry, and optical testing," Proc. SPIE **10749**, Interferometry XIX, 107490P (18 August 2018); doi: 10.1117/12.2324276.
164. Babak Saif, Ritva Keski-Kuha, Perry Greenfield, Michael North-Morris, Marcel Bluth, Lee Feinberg, J. C. Wyant, S. Park, "Picometer level spatial metrology for next generation telescopes," Proc. SPIE **11115**, UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts IX, 111150K (9 September 2019); doi: 10.1117/12.2543034.
165. Babak Saif, Perry Greenfield, Michael North-Morris, Marcel Bluth, Lee Feinberg, J. C. Wyant, and Ritva Keski-Kuha, "Sub-picometer dynamic measurements of a diffuse surface," Appl. Opt. **58**, 3156–3165 (2019). (Editors' Pick)
166. Babak Saif, Perry Greenfield, Marcel Bluth, Lee Feinberg, J. C. Wyant, and Ritva Keski-Kuha, "Tracking sub-nanometer thermal structural changes with speckle interferometry," Appl. Opt. **59**, 1559–1563 (2020).
167. James C. Wyant, "Amazing scatterplate interferometer," Proc. SPIE **11479**, Roland V. Shack Memorial Session: A Celebration of One of the Great Teachers of Optical Aberration Theory, 1147907 (21 August 2020); doi: 10.1117/12.2570914.