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## Robert G. Lindquist

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### Professional experience

**The University of Alabama in Huntsville**                      **Huntsville, AL**  
**2014 – Present**      **Associate Vice President for Research and Economic Development**  
**2010 – 2014**      **Department Chair in Electrical and Computer Engineering**  
**2005 – 2010**      **Director of the Center for Applied Optics**  
**2003 – Present**      **Professor in Electrical and Computer Engineering**

Accomplishments:

- Principal Investigator of > \$6.8M in contracts and awards over the past decade from NSF, NASA, Army and industry.
- > 12 patents and > 80 refereed journal and conference publications

**Corning Incorporated**    **Corning, NY**  
**2000 – 2003**      **Liquid Crystal Technology Manager**

Managed the technology and pilot line manufacturing groups for the LC component in Corning PurePath™ wavelength selective switch and dynamic spectral equalizer product line. At its peak, the group consisted of 3 scientists, 15 engineers, 30 process technicians, and 6 support professionals.

Accomplishments:

- Turned around an unstable pilot operation with yield <5% to a stable operation with yield >45%
- Developed and delivered a next generation design that enable the product launch of the PurePath Wave Blocker (WB) with significant performance improvement in PDL, insertion loss, flexible channel shapes, etc.
- Brought four fundamentally different LC products to pilot production and sale.

**1999 – 2000**      **Project Manager**

Managed a \$3 million research project within a matrix organization to design and prototype a planar liquid crystal optical cross connect. The cross functional team included efforts in inorganic (PECVD) waveguides, polymer waveguides, LC alignment layers, deep RIE, optical design, electronics and micro fabrication.

**1997 – 1999**      **Senior Research Scientist**

Individual contributor working in the thin film and surfaces core technology at Corning's Research Facility in Corning, NY. Key individual accomplishments: (11 patents)

**The University of Alabama in Huntsville**                      **Huntsville, AL**

**1996 –1997**      **Associate Professor in Electrical and Computer Engineering**  
**1992 - 1996**      **Assistant Professor in Electrical and Computer Engineering**

Research interests include liquid crystalline devices particularly high resolution 2-D and 3D displays, integration of liquid crystal component on silicon VLSI electronic, diffractive optical elements (DOEs), CMOS analog design of LC drivers and optical receivers, polymer dispersed liquid crystals, and optical interconnects.

## Education

1992 PhD in Electrical Engineering from the Pennsylvania State University.

1986 B.S. in Electrical Engineering with High Distinction from the Pennsylvania State University.

## Skills

### Technical Skills

- >15 years cleanroom microfabrication experience of photonic & display components (Photolith, etching, deposition, etc.,)
- >20 years liquid crystal design, modeling and fabrication experience
- Some ASIC design skills, familiar with Mentor Graphics CAD tools (design and tested 4 custom chips)
- >20 years experience with optics and laser systems, (CO<sub>2</sub>, argon, Nd:YAG, HeNe, semiconductor)

### Manufacturing Skills (Pilot stage)

- Experiment Planning & Process control and discipline concepts
- Configuration management & Documentation control
- Quality systems (APQP, Corrective Action, PFMEAs and DFMEAs)

### Management Skills

- Innovation Stages of New Product
- Defining roles, responsibilities and objectives
- Risk Management
- Managed Budgets from \$3-12 million per year

## Recent Publications

- "Tunable amplitude and phase modulation in terahertz regime using transverse stratified configuration," D. Lo Forti, R. G. Lindquist, and M. S. Heimbeck, *Progress In Electromagnetics Research*, Vol. 150, 59-71, 2015.
- "An enhanced LSPR fiber-optic nanoprobe for ultrasensitive detection of protein biomarkers," Mollye Sanders, Yongbin Lin, Jianjun Wei, Taylor Bono, Robert G. Lindquist, *Biosensors and Bioelectronics*, Volume 61, 15 November 2014, Pages 95-101, ISSN 0956-5663
- "Liquid Crystal Sensor Microchip," Hassanzadeh, A.; Lindquist, R.G., *Sensors Journal, IEEE*, vol.12, no.5, pp.1536,1544, May 2012
- "Design of an a-Si:H Interface Circuit for Liquid Crystal Chemical and Biological Sensor Array," Hassanzadeh, A.; Lindquist, R.G.; Dashen Shen, *Sensors Journal, IEEE*, vol.12, no.5, pp.1284,1288, May 2012
- "Influence of the bias voltage on surface-driven orientational transitions for liquid crystal based chemical and biological sensors," Y. Zou, J. Namkung, Y. Lin, D. Ke and R. G. Lindquist, *J. Phys. D: Appl. Phys.*, 44, p. 135103 (2011).
- "A reflection-based localized surface plasmon resonance fiber-optic probe for biochemical sensing," Y. Lin, Y. Zou and R. G. Lindquist, *Biomedical Optical Express*, 2, 478-484, (2011).
- "Interference colors of nematic liquid crystal films at different applied voltages and surface anchoring conditions," Y. Zou, J. Namkung, Y. Lin, D. Ke and R. G. Lindquist, *Optics Express* 19, 3297-3303, 2011

## Selected Funded Research Projects as PI for the Past 10 years

Externally funded contract and grants from NSF, NASA, Army, and industry has totaled to greater than \$6.8 million since I rejoined UAH in the Fall of 2003.

- “Enhancing Undergraduate Education in Signals and Signal Processing using Ultrawideband Radar,” NSF, \$199,220, 9/1/2013 thru 8/31/2016
- “Tunable Terahertz Filter Using Liquid Crystals,” Army, \$10,000, 9/21/2012 thru 9/30/2013.
- “Opto-MicroFluidic Sensors Using Liquid Crystals,” ACHE, \$50,000, 8/15/2012 thru 8/14/2014.
- “Enhancing Alabama's Research Capability in Natechnology, “ NSF EPSCoR, \$458,994, 9/27/2011 thru 8/31/2014.
- “Advanced Optical Fabrication and Testing,” NASA MSFC, \$500,000, 9/1/2009 thru 11/16/2010.
- “MRI: Acquisition of Deterministic Polishing Tool,” NSF, \$851,725, 9/1/2009 thru 8/31/2012. “
- “Integrated Mixed Signal Electronic for LC Sensor” Univ. of Alabama GRSP EPSCoR, \$25,000, 8/5/2009 thru 8/14/2010.
- “Integration of MEMs, Photonics and Micro-fluidics,” NASA Earmark, \$557,536, 9/17/2009 thru 8/9/2010.
- “Molecular Photonics Modeling (MORPH),” NASA, \$16,264, 9/17/2009 thru 8/9/2010.
- “Center for Optical Sensing and Spectroscopy,” NSF EPSCoR, \$100,000, 9/17/2008 thru 8/9/2013.
- “Center for Interdisciplinary Discovery Via Engineered Nanotechnology,” NSF EPSCoR, \$150,000, 9/17/2008 thru 8/31/2013.
- “Physics of Heterostructure and Nanostructures, etc.” Army/AMCOM, \$300,000, 9/21/2005 thru 12/31/2008
- “Bridging Nanotechnology to Device Realization,” GSFC/EPSCoR, \$673,478, 9/1/2007 thru 3/31/2011
- “Optical Materials,” NASA MSFC, \$300,000, 10/1/2006-11/31/2010.
- “Advanced Photonic Composites,”BYU, \$60,000, 3/1/2006 thru 9/27/2007
- “Chemical and Biological Sensors with Passive Telemetry,”NASA MSFC, \$550,000, 1/9/2006 thru 12/31/2007.
- “Alabama Center for Nanostructure Materials,” NSF, \$120,000, 5/1/2005 thru 10/31/2008
- “Laboratory for Advanced Photonics Composites” \$505,311, 9/27/2004 thru 11/30/2005
- “Capacitive Sensing for LC Chemical and Biological Sensors,” NSF, \$310,127, 8/15/2004 thru 7/31/2008.
- “Photonic MEMS Sensors,” sub-contract from NC State, \$236,100.00, 8/15/2004 thru 7/31/2006.

## Publications

### Journal Articles:

- 1- "Tunable amplitude and phase modulation in terahertz regime using transverse stratified configuration," D. Lo Forti, R. G. Lindquist, and M. S. Heimbeck, *Progress In Electromagnetics Research*, Vol. 150, 59-71, 2015.
- 2- "An enhanced LSPR fiber-optic nanoprobe for ultrasensitive detection of protein biomarkers," Mollye Sanders, Yongbin Lin, Jianjun Wei, Taylor Bono, Robert G. Lindquist, *Biosensors and Bioelectronics*, Volume 61, 15 November 2014, Pages 95-101, ISSN 0956-5663
- 3- "Liquid Crystal Sensor Microchip," Hassanzadeh, A.; Lindquist, R.G., *Sensors Journal, IEEE*, vol.12, no.5, pp.1536,1544, May 2012
- 4- "Design of an a-Si:H Interface Circuit for Liquid Crystal Chemical and Biological Sensor Array," Hassanzadeh, A.; Lindquist, R.G.; Dashen Shen, *Sensors Journal, IEEE*, vol.12, 2012.
- 5- "Influence of the bias voltage on surface-driven orientational transitions for liquid crystal based chemical and biological sensors," Y. Zou, J. Namkung, Y. Lin, D. Ke and R. G. Lindquist, *J. Phys. D: Appl. Phys.* 44, 2011
- 6- "A reflection-based localized surface plasmon resonance fiber-optic probe for biochemical sensing," Y. Lin, Y. Zou and R. Lindquist, *Biomedical Optical Express*, 2, 478-484, 2011
- 7- "Interference colors of nematic liquid crystal films at different applied voltages and surface anchoring conditions," Y. Zou, J. Namkung, Y. Lin, D. Ke and R. Lindquist, *Optics Express* 19, 3297-3303, 2011
- 8- "E-beam patterned gold nanodot arrays on optical fiber tips for localized surface plasmon resonance biochemical sensing," Y. Lin, Y. Zou, Y. Mo, J. Guo and R. Lindquist, *Sensors* 10, 9397-9406, 2010
- 9- "Gravitational field-induced orientational transition of aligned nematic liquid crystals," Y. Zou, Y. Lin, J. Namkung, D. Ke and R. Lindquist, *Liquid Crystals* 37, 1165-1169, 2010 (Shortlisted for the Luckhurst-Samulski Prize 2010)
- 10- "Optical monitoring of anchoring change in vertically aligned thin liquid crystal film for chemical and biological sensor," Y. Zou, J. Namkung, Y. Lin and R. G. Lindquist, *Applied Optics* 49, 1865-1869 (2010)
- 11- "Capacitive Techniques to Monitor of Anchoring Energy for Liquid Crystal Sensors." Jun Namkung, Yang Zou, Aladdin Abu-Abed, and Robert G. Lindquist, *IEEE Sensor Journal, IEEE Sensor Journal*, Vol. 10, No. 9, (2010).
- 12- "Surface plasmon resonance in nanostructure metal films under the Kretschmann configuration," H. Leong, J. Guo, R. Lindquist, and Q. Liu, *Journal of Applied Physics*, vol. 106, p. 124314, (2009).
- 13- "Demonstration of an ultra-wideband optical fiber inline polarizer with metal nano-grid on the fiber tip," Y. Lin, J. Guo and R. Lindquist, *Optics Express*, vol. 17, pp: 17206-18393, Sept. 28, (2009).
- 14- "Capacitive Techniques to Monitor Anchoring Energy in Liquid Crystal Based Sensors," J. Namkung, Y. Zou, A. Hassanzadeh, A. Abu-abad, and R. Lindquist, *IEEE Sensor and Application Symposium*, page(s): 114-117 (2009).

- 15- "Optical tracking of the director axis in liquid crystal Sensors," Abu-Abed, A.S.; Lindquist, R.G. *IEEE Sensor and Application Symposium*, page(s): 245-248 (2009).
- 16- Capacitive Transduction for Liquid Crystal – Based Sensors : Part II," Alaeddin Abu-Abed, Robert Lindquist, *IEEE Sensor Journal*, Vol. 8, No.9, pp 1557-1564, (2008).
- 17- Alaeddin Abu-Abed, Robert Lindquist, "Capacitive Interdigitated Sensor with Inhomogeneous Nematic Liquid Crystal Film," *Progress in Electromagnetic Research B*, Vol. 7, 75-87, (2008).
- 18- Shadi A. Alboon and Robert G. Lindquist , "Flat top liquid crystal tunable filter using coupled Fabry-Perot Cavities," *Optics Express*, Vol. 16, Issue 1, pp. 231-236 (2008).
- 19- Alaeddin Abu-Abed, Woo-Hyuck Choi, and Robert Lindquist , "Capacitive Transduction for Liquid Crystal – Based Sensors : Part I," *IEEE Sensor Journal*, Vol. 7, No.12, pp 1617-1624, 2007.
- 20- Abu-Abed, A.; Lindquist, R.G.; Jovanov, S.; Jovanov, E.; Jun Namkung; Abbott, N., "Capacitive Based Liquid Crystal Chemical and Biological Sensors," *IEEE Sensor 2007 Proceeding*, Atlanta Georgia, Page(s): 1040-1043(2007)
- 21- Alaeddin Abu-Abed and Robert Lindquist, "Capacitive Transduction in Partially Disordered Systems: Application to LC-Based Biosensors," *SAS 2007 Proceedings*, San Diego, CA, 2007.
- 22- Robert Lindquist, Alaeddin Abu-Abed, Woo-Hyuck Choi , "Liquid Crystal Sensors with Capacitive Transduction," *IEEE Sensor 2006 Proceeding*, Daegu, Korea, 2006.
- 23- D.J. Coe, J.M. English, T.J. Kaiser and R.G Lindquist, "Model of a MEMS sensor using a common gate MOSFET differential amplifier", *Journal of Physics D, Applied Physics*, Vol. 39, pp 4353-4358, 2006.
- 24- D.J. Coe, J.M. English, T.J. Kaiser and R.G Lindquist, "Design of a MEMS Accelerometer using an Integrated Common Gate Differential MOSFET Amplifier", *Sensor Letters*, Vol.4, 1-7, 2006.
- 25- "Stability of pre-tilt angle and polar anchoring strength and its impact on the performance of liquid crystal devices," R. Ma, R. G. Lindquist, and D. Acquard, *Opt. Express* **11**, 3649-3657 (2003),
- 26- "Three-Dimensional Display Utilizing a Diffractive Optical Element and an Active Matrix Liquid Crystal Display", G. Nordin, M. Jones, J. Kulick, R.G. Lindquist, and Stephen Kowel, *Optical Engineering*, vol. 35, no. 12, pp. 3404-12, (1996)
- 27- " An Optoelectronic Design of the Simultaneous Optical Multiprocessor Exchange Bus," R.G. Lindquist, J. Kulick, W. Cohen, R. Gaede, B. Wells, M. Abushagur, D. Shen, C. Katsinis, and S.T. Kowel, *SPIE Photonic West Symposium on Optoelectronic Interconnects*, *SPIE Proceedings Vol. 3005*, pp.303-313 (1997).
- 28- "Low-Coherence Reflectometry Based on DFWM in a Thin Liquid Layer," V. Fleurov, D. Brown, A. Dergachev, S. Mirov, and R.G. Lindquist, *Nonlinear Optical Liquids*, *SPIE Proceedings Vol. 2853*, pp.126-134 (1996).
- 29- "High-resolution liquid crystal diffractive optics," S.T. Kowel, R.G. Lindquist, G.P. Nordin, M. Friends, and J.H. Kulick, *IS&T/SPIE symposium on Electronic Imaging: Science & Technology*, San Jose, CA (1996) (invited Paper).

- 30- "Presentation and demonstration of a full-color ICVision holographic stereogram display," J.H. Kulick, M. Jones, G.P. Nordin, R.G. Lindquist, and S.T. Kowel, *IS&T/SPIE Symposium on Electronic Imaging: Science & Technology*, San Jose, CA (1996) (invited Paper).
- 31- "A Pixel-Scale Digital-to-Analog Converter for Liquid Crystal on VLSI Displays," A. Thomsen, R.G. Lindquist, J.H. Kulick, P.J. Nasiatka, G.P. Nordin, and S.T. Kowel, *IEEE Transaction on Circuits and Systems I*, 42(9), (1995).
- 32- "A Real-Time 3-D Display Based on the Partial Pixel Architecture," M. Jones, G. Nordin, J. Kulick, R.G. Lindquist, and S. Kowel, *Optics Letters*, 20 (12), (1995)
- 33- "Pulse-width modulation drive technique for high-resolution liquid-crystal gratings," R.G. Lindquist, G.P. Nordin, A. Thomsen, P.J. Nasiatka, J.H. Kulick, and S.T. Kowel, *Optics Letters*, 20 (5), (1995).
- 34- "All-Optical Switching of Infrared Optical Radiation Using Isotropic Liquid Crystal," P.G. LoPresti, P. Zhou, R.G. Lindquist, and I.C. Khoo, *IEEE Journal of Quantum Electronics*, 31 (4), (1995).
- 35- "A Liquid Crystal-on-Silicon Implementation of the Partial Pixel 3-D Display Architecture," G.P. Nordin, J.H. Kulick, R.G. Lindquist, P.J. Nasiatka, M.W. Jones, M. Friends, and S.T. Kowel, *Applied Optics*, 34 (19), (1995).
- 36- "Electrostatic and Diffraction Analysis of a Liquid Crystal Device Utilizing Fringing Fields: Applications to 3-D Displays," J. Kulick, J. Jarem, R.G. Lindquist, S. Kowel, M. Friends, and T. Leslie, *Applied Optics*, 34 (11), (1995).
- 37- "Partial Pixel: A 3-D Diffractive Display Architecture," J. Kuick, G.P. Nordin, A. Parker, S. Kowel, R.G. Lindquist, M. Jones, and P. Nasiatka, *Journal of Optical Society of America A*, 20 (1), (1995).
- 38- "Demonstration of a Novel 3-D Autostereoscopic Display," G.P. Nordin, J. Kulick, M. Jones, P. Nasiatka, R.G. Lindquist, and S. Kowel, *Optics Letters*, 19 (12), (1994).
- 39- "High Resolution Liquid Crystal Phase Grating Formed by Fringing Fields From Interdigitated Electrodes," R.G. Lindquist, J. Kulick, G. Nordin, J. Jarem, S.T. Kowel, M. Friends, and T.M. Leslie, *Optics Letters*, 19 (9), (1994).
- 40- "Isotropic Liquid Crystalline Film and Fiber Structures for Optical Limiting Application," I.C. Khoo, S. Lee, P.G. LoPresti, R.G. Lindquist, and H. Li, *Int. J. Nonl. Opt. Phys.*, 2 (4), (1993).
- 41- "Infrared and Visible Laser-Induced Thermal and Density Optical Nonlinearities in Nematic and Isotropic Liquid Crystals," R.G. Lindquist, P.G. LoPresti, and I.C. Khoo, *SPIE vol. 1692* (1992).
- 42- "Dynamics of Picosecond Laser Induced Density, Temperature, Flow and Reorientational Effects in the Mesophases of Liquid Crystals," I.C. Khoo, R.G. Lindquist, R.R. Michael, R.J. Mansfield, and P.G. LoPresti, *J of Applied Physics* 69 (7), 3853-3859 (1991).
- 43- "Experimental Studies of the Dynamics and Parametric Dependencies of Total-Internal-Reflection to Transmission Switching and Limiting Effects," I.C. Khoo, R.R. Michael, R.J. Mansfield, R.G. Lindquist, P. Zhou, C. Cipparone, and F. Simoni, *JOSA B* 8 (7), 1464-1470 (1991).
- 44- "Picosecond-Millisecond Optical Nonlinearities of Liquid Crystals for Limiting and Switching Applications," I.C. Khoo, R.G. Lindquist, R.R. Michael, R.J. Mansfield, P. Zhou, and P.G. LoPresti, *SPIE vol. 1307*, 336-349 (1990).

- 45- "Transient and Stationary Wavemixing and Interface Switching with Liquid Crystals," I.C. Khoo, R.R. Michael, R.G. Lindquist, P. Zhou, and R.J. Mansfield, *Mol. Cryst. Liq. Cryst.* 179, 163-172 (1990).
- 46- "Quantitative Analysis of Picosecond Transient Multiwave-Mixing-Mediated Beam Amplification Effect in Silicon," I.C. Khoo, P. Zhou, R.G. Lindquist, and P.G. LoPresti, *Phys. Rev. A* 41, 408-413 (1990).
- 47- "Degenerate Multiwave-Mixing and Phase Conjugation in Silicon," I.C. Khoo, R. Normandin, T.H. Liu, R.R. Michael, and R.G. Lindquist, *Phys.Rev. B*, 40, 7759-7765 (1989).
- 48- "Optical Switching by a Dielectric Cladded Film," I.C. Khoo, P. Zhou, R.R. Michael, R.G. Lindquist, and R.J. Mansfield, *IEEE J. Quantum Electron*, QE-25, 1755-1759 (1989).
- 49- "Infrared Nonlinear Optical Power Limiting with a Nematic Liquid Crystal Film," R.R. Michael, G.M. Finn, R.G. Lindquist, and I.C. Khoo, *SPIE vol. 971*, 157-163 (1988).

#### **Conference Papers:**

- 1- R. Lindquist, A. Tareki, D. L. Forti, "Stratified Liquid Crystal Structures to Enable Practical Electro-Optic Devices in Terahertz Regime," Liquid Crystals: Energy Materials Nanotechnology, Feb. 16-19, 2016, Orlando, Florida, USA. (Invited Talk)
- 2- R. Lindquist, D. L. Forti, A. Tareki, W. Kim and J. Guo, "Design Challenges for Electro-Optic Tuning of Amplitude and Phase in Terahertz Waves," PIERS Conference 2015, July 6-9, 2015, Prague, Czech Republic. (Invited Talk)
- 3- R. Lindquist, D. L. Forti, A. Tareki, and J. Guo, "Tunable metamaterial in the terahertz regime using liquid crystal," SPIE Optics and Photonics Annual Conference, August 25-29, 2013, San Diego, California, USA. (Invited Talk)
- 4- Yongbin Lin, Mollye Sanders, Taylor Bono, Krishnan Chittur, Robert Lindquist, "Improved nanofabrication for plasmonic nanostructures on optical-fiber tip for biosensors." SPIE Optics+Photonics, San Diego, CA, 27 - 29 August 2013. (Invited talk)
- 5- R.G. Lindquist, "Roles of Liquid Crystals in Optical Microsystems," International Symposium on Photonics and Optoelectronics 2013, Beijing, China, May 2013. (Invited Talk)
- 6- Mollye Sanders, Taylor Bono, Yongbin Lin, Krishnan Chittur, Robert Lindquist, "Optical fiber tip LSPR biological nanosensors." NanoBio Summit, 17-19 October 2013, Montgomery, Alabama.
- 7- Dan Ke and Robert Lindquist, "Opto-Microfluidic Sensors Based on Bias Voltage Driven Liquid Crystal Orientational Transitions at Aqueous Interface," NanoBio Summit, 17-19 October 2013, Montgomery, Alabama.
- 8- "Monitoring anchoring energy in LC-based sensors" by Robert G. Lindquist, Yang Zou, Jun Namkung and Dan Ke, at the 2012 SPIE Conference
- 9- Y. Zou, J. Namkung, Y. Lin, D. Ke and R. G. Lindquist, "Surface Driven Orientational Transitions of Liquid Crystals in a Confined Micro-Structure," in IEEE SoutheastCon Proceeding (Nashville, TN) 2011 (in press)
- 10- D. Ke, Y. Zou, Y. Lin and R. G. Lindquist, "Microfluidic Biosensor Using Liquid Crystals," in IEEE SoutheastCon Proceeding (Nashville, TN) 2011 (in press)

- 11- Y. Zou, J. Namkung, Y. Lin, D. Ke and R. G. Lindquist, "Enhanced chemical and biological sensor based on liquid crystal using a bias electric field," in Technical Digest of OSA/CLEO/IQEC(San Jose, CA), paper AWA6 2010
- 12- Y. Lin, Y. Zou, J. Namkung, D. Ke and R. G. Lindquist, "Enhanced Sensitivity Using Liquid Crystals for Optical Fiber Based Localized Surface Plasmon Resonance Sensor," in Technical Digest of OSA/CLEO/IQEC (San Jose, CA) , paper AWA4 2010
- 13- J. Namkung, Y. Zou, Y. Lin, D. Ke and R. G. Lindquist, "Sensing Characteristics of Chemical Agents by Using Liquid Crystal-Based Chemical and Biological Sensors," in Technical Digest of OSA/CLEO/IQEC (San Jose, CA), paper AWA5 2010
- 14- Jun Namkung, Yang Zou, Dan Ke, Yongbin Lin, and Robert G. Lindquist, "Sensing Characteristics of Chemical Agents by Using Liquid Crystal-Based Chemical and Biological Sensors." 2010 CLEO/QELS, San Jose, CA.
- 15- Yang Zou, Jun Namkung, Yongbin Lin, Dan Ke, Robert Lindquist, "Enhanced Chemical and Biological Sensor Based on Liquid Crystal Using a Bias Electric Field," 2010 CLEO/QELS, San Jose, CA.
- 16- Guo, H. S. Leong, R. Lindquist, Y. Lin, J. Wei, D. J. Brady, "Integrated chip-level surface plasmon resonance biochemical sensors using patterned metallic nanostructures," SPIE Photonic West, January 23-28, 2010, San Francisco, CA, USA.
- 17- H. S. Leong, J. Guo, R. Lindquist, and Qing H. Liu, "Surface plasmon resonance in effective nanostructured metal films," SPIE Photonic West, January 23-28, 2010, San Francisco, CA, USA.
- 18- H. S. Leong, Y. Lin, J. Guo, and R. Lindquist, "Surface plasmon resonance biosensor with nanostructured metal films" Alabama EPSCoR Conference, November 14, 2009, Tuskegee, AL, USA.
- 19- "Integration of Liquid Crystal with Interface Circuitry for Sensing Applications," A. Hassanzadeh and R. Lindquist, Alabama EPSCoR Annual Conference August 2008.
- 20- "The Polishing of a Concave Optic for the X-ray Mandrel Metrology," Fei Liu, Pat Reardon, Joe Geary, Chris Underwood, Ted Rogers, Tim Blackwell, Robert Lindquist, Alabama EPSCoR Annual Conference August 2008.
- 21- "Relative Humidity Measurement Using Capacitive Sensors," Alireza Hassanzadeh, Robert G. Lindquist and Abdollah Borghei, Proceedings of IEEE SoutheastCon 2008.
- 22- Neuro-Fuzzy System to Monitor Uniaxial Nematic Liquid Crystal Profile," Alaeddin S. Abu-Abed and Robert G. Lindquist, Proceedings of IEEE SoutheastCon 2008
- 23- Flat-Top / Distortionless Tunable Filters Based On Liquid Crystal Multi Cavities For DWDM Applications," Shadi A. Alboon and Robert G. Lindquist, Proceedings of IEEE SoutheastCon 2008.
- 24- Lindquist, Robert and Chen, Sheng-Wen, "Full Spectrum, Multi-cavity Tunable Liquid Crystal Filter," presented at the Optic in the Southeast, August 2006.
- 25- "Partial Pixel 3-D Display Architecture: Full-Color Display Design Considerations," R.G. Lindquist, G.P. Nordin, M. Jones, J.H. Kulick, and S.T. Kowel, IEEE/LEOS Summer Tropical Meeting on Flat Panel Display Technology, Keystone, CO, August 7-11, 1995.
- 26- "A Pixel-Scale Digital-to-Analog Converter For Liquid Crystal on VLSI Displays," A. Thomsen, R.G. Lindquist, J.H. Kulick, P.J. Nasiatka, G.P. Nordin, and S.T. Kowel, IEEE International Symposium on Circuits and Systems, Seattle, WA (1995).



- 27- "Demonstration of a Real-Time Implementation of the ICVision Holographic Stereogram Display," J. Kulick, M. Jones, G. Nordin, R.G. Lindquist, S. Kowel, and A. Thomsen, International Conference on Applications of Optical Holography, Toshio Honda, ed., Proc. SPIE 2577, p. 8-19, (1995) (Invited Paper).
- 28- "A Liquid Crystal Display-Based Implementation of a Real-Time ICVision Holographic Stereogram Display," M. Jones, J. Kulick, G. Nordin, R.G. Lindquist, P. Nasiatka, and S. Kowel, SPIE-Practical Holography IX, S. Benton, ed., Proc. SPIE, 2406 (1995).
- 29- "ICVision-Liquid Crystal Drive Electronic Design." J. Kulick, A. Thomsen, R.G. Lindquist, P. Nasiatka, G. Nordin, M. Jones, and S. Kowel, SPIE-International Conference on Display Holography, (July 1994).
- 30- "Electro-Optic Liquid Crystal Phase Gratings for Diffractive Display Applications," R.G. Lindquist, J. Kulick, G. Nordin, J. Jarem, S.T. Kowel, M. Friends, and T.M. Leslie, Proceedings of the Conference on Lasers and Electro-Optics (1994).
- 31- "Partial Pixel Diffractive Display Architecture," J. Kulick, G. Nordin, S. Kowel, A. Parker, R.G. Lindquist, M. Jones, M. Friends, and P. Nasiatka, CLEO (1994).
- 32- "ICVision- A Real-Time 3-D Display System Based on Liquid Crystal and VLSI Technologies," J. Kulick, S. Kowel, G. Nordin, R.G. Lindquist, A. Parker, M. Friends, and T. Leslie, Proc. of the Active Matrix LCD Symposium at Lehigh University, (1993).
- 33- "ICVision – A VLSI Based Diffractive Display System for Real-Time display of Holographic Stereograms," J. Kulick, S. Kowel, G. Nordin, A. Parker, R.G. Lindquist, P. Nasiatka, and M. Jones, SPIE-Practical Holography VIII, (1994).
- 34- "Theory and Experiments on Picosecond multiwave-mixing in GaAs," R.G. Lindquist, P.G. LoPresti, and I.C. Khoo, Proceedings of the Conference on Lasers and Electro-Optics (1993).
- 35- "Infrared nonlinear optical processes using liquid crystals," P.G. LoPresti, I.C. Khoo, and R.G. Lindquist, Proceedings of the 9th Interdisciplinary Laser Science Conference (1993).
- 36- "Unusual nonlinear optics near the nematic-isotropic phase transition point of the liquid crystals," I.C. Khoo, R.G. Lindquist, Hong Li, Yu Liang, P.G. LoPresti, and R. Normandin, Proceedings of the Annual Meeting of Optical Society of America 1991.
- 37- "Dynamic Theories and experiments of nonlinear interface switching," I.C. Khoo, P. Zhou, R.G. Lindquist, P.G. LoPresti, Proceedings of the Optical Society of America 1991.
- 38- "Nonlinear optical response of isotropic chiral nematic liquid crystal and optical limiting effect," I.C. Khoo, R.G. Lindquist, R.R. Michael, P.G. LoPresti, A. Mott, M. Miller, E. Sharp, and R. Normandin, presented at Conference on Lasers and Electro-Optics 1991.
- 39- "Experimental and theoretical study of transient multiwave-mixing effect in general nonlinear medium as well as experimental results with picosecond laser in silicon," R.G. Lindquist, P.G. LoPresti, P. Zhou, and I.C. Khoo, presented at Optical Society of America 1990.
- 40- "Picosecond laser-induced reorientation, density, temperature and flow effects in the mesophases of liquid crystals," I.C. Khoo, R.R. Michael, R.G. Lindquist, R.J. Mansfield, and P.G. LoPresti, presented at nonlinear Optics Conference, 1990.
- 41- "Experimental studies of the dynamics of total internal reflection to transmission," R.R. Michael, R.J. Mansfield, R.G. Lindquist, I.C. Khoo, G. Cipparone and F. Simoni, presented at Annual Meeting of Optical Society of America 1990.

- 42- "Effects of side diffractions, phase modulations and loss in optical phase conjugation," I.C. Khoo, P.Zhou, W. Wang, R.R. Michael, R.G. Lindquist and R.J. Mansfield, presented at Conference on Lasers and Electro-Optics 1989.
- 43- "Self-pumped multiwave mediated ring oscillation an phase conjugation with a Kerr-like media," I.C.Khoo, W. Wang, R.. Michael, R.G. Lindquist and P. Zhou, presented at Annual Meeting of Optical Society of America 1989.
- 44- "Stationary and transient multiwave mixing, theory and experimental observations," I.C.Khoo, P.Zhou, R.R. Michael, R.G. Lindquist, and P.G. LoPresti, presented at Annual Meeting of Optical Society of America 1989.
- 45- "Effects of side diffraction and phase modulation on optical multiwave mixing and phase conjugation," I.C. Khoo, P.Zhou, R.R. Michael, R.G. Lindquist, P.Y. Yan and T.H. Liu, presented at Annual Meeting of Optical Society of America 1989.

### **Patents/Patent Applications**

1. US 6,137,456 A1, "Electronic display device for simultaneously displaying 2D and 3D images," Corning Incorporated, Inventor(s): Bhagavatula, Venkata A. ; Carlson, Robert L. ; Lindquist, Robert G. Application No. 243328, Filed 1999, Issued 2000
2. US 6,388,730 B1, "Lateral field based liquid crystal electro-optic polarizer," Corning Incorporated, Inventor(s): Lindquist, Robert G., Application No. 09/443994, Filed 1999, Issued 2002
3. US 6,417,948 B1, "Variable delay device for an optical component such as a polarization mode dispersion compensator," Corning Incorporated, Inventor(s): Chowdhury, Dipakbin Q. ; Lindquist, Robert G. ; Rahman, Ashiqur, Application No. 09/663755, Filed 2000, Issued 2002
4. US 6,532,318 B1, "Symmetric wavelength selective switch for interconnecting two WDM rings Corning Incorporate, Inventor(s): Brophy, Christopher P. ; Lindquist, Robert G.. Application No. 09/691426, Filed 20001018, Issued 20030311
5. US 6,535,311 B1. "Wavelength selective cross-connect switch using a MEMS shutter array," Corning Incorporated, Inventor(s): Lindquist, Robert G., Application No. 09/458560, Filed 19991209, Issued 20030318
6. US 6,559,921 B1, " Liquid crystal planar non-blocking NxN cross-connect," Corning Incorporated, Inventor(s): Leslie, Thomas M ; Lindquist, Robert G, Application No. 09/431430, Filed 19991101, Issued 20030506.
7. US 6,563,973 B1, " Low-index waveguide liquid crystal cross-connect, Corning Incorporated, Inventor(s): Caracci, Stephen J. ; Leslie, Thomas M. ; Lindquist, Robert G. ; Ma, Rui-Qing ; Suggs, James V., Application No. 09/604039, Filed 20000627, Issued 20030513.

8. EP 1,181,620 A1, "Wavelength Compensation in a WSXC using Off-Voltage control," Corning Incorporated, Inventor(s): HARRIS, J., Michael; LINDQUIST, Robert, G., Application No. EP00919657 EP, Filed 2000, A1 Published 2002
9. WO2002084394 A1, "High Contrast Reflective LCD for Telecommunication applications," Corning Incorporated, Inventor(s):JI, Yimin ;KONDIS, John, Peter ;LINDQUIST, Robert, Glenn ;MA, Rui-Qing, Application No. US0211323 US, Filed 2002, A1 Published 2002
10. WO2002084379 A1, " Dynamic Spectral Equalizer and Wavelength Selective switch having extremely low polarization dependent loss and polarization mode dispersion," Corning Incorporated, Inventor(s):JI, Yimin ;KONDIS, John, Peter ;LINDQUIST, Robert, Glenn ;MA, Rui-Qing ;SCOTT, Bradley, Allen Application No. US0211306 US, Filed 2002, A1 Published 2002
11. WO20030128416 "Spatial light modulators with improved inter-pixel performanceLisa Caracci, John Kondis, Robert Lindquist, Rui-Qing Ma, Carina Reisin, Brad Scott, US6710758, Filed 2002 Published 2004
12. US 8,879,065 B1 "Systems and Methods for Localized Surface Plasmon Resonance Sensing," Lin, Yongbin; Lindquist, Robert; Zou, Yang, Filed 2011, Published 2014.