

Kelvin H. Wagner

Optoelectronic Computing Systems Center
Department of Electrical and Computer Engineering
University of Colorado
Boulder, Colorado 80309-0425

(303) 492-4661
FAX 303-492-5810
kelvin@boulder.colorado.edu
<http://optics.colorado.edu/~kelvin>

Education

Ph.D. in Electrical Engineering June 87, California Institute of Technology, Pasadena, CA.

Thesis: *Time and Space Integrating Acousto-Optic Signal Processing*

MS in Electrical Engineering June 82, California Institute of Technology, Pasadena, CA.

BS in Applied Physics June 81, California Institute of Technology, Pasadena, CA.

Thesis: *Multichannel Optical CCD Correlator Array.*

Honors

2006 Joseph Negler Endowed Chair in Engineering
2005- Senior member of the IEEE
2003- Fellow of the Optical Society of America
1992-1997 National Science Foundation Young Investigator
1983-1986 Army Research Office Graduate Research Fellowship
1977-1979 Caltech Prize Scholarship

Work Experience

2001- **Professor:** *Electrical and Computer Engineering, University of Colorado, Boulder*
Optics, optical computing, spectral holography, and RF signal processing are the concentration of my courses and research. My research in optical information processing focuses on utilizing the unique computational properties of optical systems to produce special purpose signal processing systems with significant computational advantages over conventional microelectronic digital approaches. Currently, I am pursuing 4 avenues of research towards this goal: imaging, target recognition, squint-free adaptive beamforming and jammer nulling using optical processing of advanced radar systems; applications of stabilized tunable lasers and spectral hole burning materials in spatial-spectral holography for multidimensional signal processing; ultrafast lasers for nonlinear optics and multiwavelength processing systems; and acousto-optic devices and systems.

6/95 - 2001 **Associate Professor:** *ECE, CU Boulder*

9/88 - 5/95 **Assistant Professor:** *ECE, CU Boulder*

During the period of the OCS center at CU (1987-1998) I pursued 5 avenues of research. Adaptive optical neural networks using dynamic volume holograms; imaging, target recognition, and adaptive beamforming using optical processing of advanced radar systems; development of photorefractive and organic holographic materials and VLSI-liquid crystal devices for incorporation in these systems; advanced acousto-optic crossbars and routing systems for ultrawideband optical interconnection networks using both bulk and surface wave devices, and interactions between optical spatial solitons and 3-dimensional light bullets for ultrafast and massively parallel digital optical computing.

⁰Jan 31, 2006

- 7/88 - 8/88 **Visiting Professor:** *Ecole Nationale Supérieure Telecommunications, Paris, France.* Analysis of incoherent polarization holography using anisotropic propagation through crystals. Development of a taxonomy for optical neural network architectures.
- 6/87 - 9/88 **Research Assistant Professor:** *Optical Sciences Center, University of Arizona, Tucson, AZ.* Research in the use of photorefractive volume holograms as adaptive optical interconnections for optical learning networks. Demonstration of neuron like operation of nonlinear GaAs multiple-quantum-well bistable Fabry-Perot etalons.
- 1985 - 1986 **Consultant:** *Research and Development Labs, Culver City, CA.* Design of brassboard acoustooptic signal processing system for real-time synthetic aperture radar imaging.
- 1981 - 1987 **Graduate Research Assistant:** *California Institute of Technology, Pasadena, CA.* Investigation of time-and-space integrating acoustooptic signal processing for real-time synthetic aperture radar imaging, and folded spectrum analysis.
- 1982-1985 **Consultant:** *Applied Technology Division, Litton Industries, Sunnyvale, CA.* Analysis of acoustooptic signal processing systems for spread spectrum processing, ambiguity function processing, and phased array processing.

Teaching Experience at University of Colorado and University of Arizona

New Courses Developed

Fundamentals of Photonics, developed with R. Piestun

Applications of Photonics, developed with R. Piestun

Nonlinear and Crystal Optics

Graduate Optics Lab, Developed 14 new labs and completely new lab facility.

Optical Computing

Quantum Electronics

Optoelectronic Computing Systems, co-taught with Kris Johnson, John Neff, Vince Heuring

ing

Acoustooptic Devices, with Jieping Xu

Additional Courses Taught

Linear Systems

Optoelectronic Systems Design

Physical Optics

Fourier Optics

Optical Electronics

Brains, Minds, and Computers co-taught with H. Wachtel, M. Lutges, and R. Su

Fourier Optics, co-taught with A. Gmitro and R. Kostuk at University of Arizona

Dissertations and Thesis Directed

Masters Completed

1. Richard Eric Feinleib, Adaptive Optical Learning Network with a Photorefractive Crystal, University of Arizona, Optical Sciences Center, 1988. (Co-supervised with Prof. Hyatt Gibbs)

2. Jose Luis Contreras-Vidal, An Optical-Connectionist Model for Image Pattern Recognition, University of Colorado, Boulder, 1989.
3. Dave Finamore, A Wide Band, Large Area, Wide Dynamic Range, Photodetector Amplifier, University of Colorado, Boulder, 1991.
4. Arnaud Brignon, Polarization State Evolution in Photorefractive BSO, Thesis submitted to Institut d'Optique, Orsay France, 1992.
5. Joseph Dimasi, 1999.
6. Alan Hoskins, 2004.

Doctor of Philosophy

PhD Completed

1. George William Gigioli, Jr., Optimization and Tolerancing of Nonlinear Fabry-Perot Etalons for Optical Computing Systems, University of Arizona, Optical Sciences Center, 1988.
2. Huang Tizhi, Physics and Applications of Photoanisotropic Organic Volume Holograms, May 22, 1993.
3. Kuang-Yi Wu, Acousto-optic fiber crossbar switches, 1995.
4. Robert M. Mcleod, Spectral domain analysis and design of three-dimensional optical switching and computing systems, 1995.
5. Charles Garvin, Experimental demonstration of a cascaded optical system for temporal signal classification using error driven optical learning, 1996.
6. Anthony W. Sarto, Adaptive Phase-array processing using photorefractive volume holograms, 1996.
7. Timothy Slagle, A smart pixel holographic competitive learning network, 1998.
8. Steve Blair, Optical soliton based logic gates, 1998.
9. Ken Anderson, Multidimensional optical signal processing using optical coherent transient spatial-spectral holography, 2001
10. Paulo Silveira, Optoelectronic Signal Processing using finite impulse response neural networks, Feb 19, 2001.
11. Greg Kriehn, Coherent optical signal processing for broadband adaptive phased-array antennas using the BEAMTAP algorithm, 2003.
12. Alex Romariz, Optoelectronic technology for implementation of pulsed neural networks, 2003.
13. Kishore Yellampalle, Optical soliton controlled inverters in quadratic media and inhomogeneous waveguides, 2004.
14. Friso Schlottau, Multidimensional Signal Processing in Spatial-Spectral Holographic Media, 2005.
15. Robert Ted Weverka, Coherent optical processing for phased arrays, 2006.
16. Max Colice, Spectral Hole Burning Spectrum Analyzer, 2007.

PhDs In Progress

1. Jingyi Xiong, Doppler array generation for optical ambiguity processing in spatial-spectral holograms
2. Sangtaek Kim, multiwavelength AO deflectors
3. Lu Gao, multiwavelength optical processing using femtosecond lasers
4. Ben Braker, Self Cohered optical array processors.
5. Dan Feldhkun, Fourier Scanning Optical Microscope.

Conference and Professional Society Activities

1. Guest Editor, Applied Optics special issue on the Lake Tahoe Optical Computing Meeting, May 1, 1988.
2. Session Chairman, Optical Image Processing, OSA Annual Meeting, October 1987, Rochester, NY.
3. Session Chairman, Optical Neural Networks, IEEE Parallel Processing, Fullerton CA, March 29 1989.
4. Organizer and Program Chair, Workshop on Optical Neural Networks, Jackson WY, Feb 7-10 1990.
5. Organizer and Program Chair, Workshop on Fundamental Limits in Optical Computing, Boston MA, Nov 4 1990.
6. Program Committee, OSA meeting on Optical Computing, Salt Lake City UT, March 4-6 1991.
7. Program Committee, International Joint Conference on Neural Networks, Seattle WA, July 8-12 1991.
8. Program Committee, SPIE Annual Meeting, Devices for Optical Processing, San Diego CA, July 21-26.
9. Organizer and Program Committee, workshop on neural network hardware, Banff, Can, Mar 3-7, 1992.
10. Organizer, 1992 OSA annual meeting symposium on Photorefractive Storage, Albuquerque NM, Sept 1992.
11. Program Committee, OSA meeting on Optical Computing, Palm Springs CA, March 13-17 1993.
12. Program Committee, CLEO '93, Baltimore MD.
13. Guest Editor, Applied Optics special issue on Optical Neural Networks, March 10, 1993.
14. Program Committee, CLEO '94.
15. Organizer, 1994 OSA annual meeting symposium on Optical Neural Networks, Dallas TX, Oct 1994.
16. Program Chair, OSA topical meeting on Optical Computing, 1995.
17. Guest Editor, Applied Optics special issue on Optical Computing, March 10, 1996.
18. General Chair, OSA topical meeting on Optical Computing, 1997.
19. Topical Editor, Applied Optics Information Processing, 1996-1998.
20. OSA/ICO Optical Computing steering committee chair, 1998-2000.
21. Member OSA Technical Council 1998-2000

22. Program Committee, SPIE meeting on Photonic Devices and Algorithms for Computing 1999, Denver, CO.
23. Program Committee, Optics in Computing, 2000, Quebec City CA.
24. Program Committee, SPIE meeting on Photonic Devices and Algorithms for Computing 2000, San Diego, CA.
25. Program Committee, CLEO Pacific Rim 2001
26. Program Committee, SPIE meeting on Photonic Devices and Algorithms for Computing 2001, San Diego, CA.
27. CLEO 2002 program committee – subcommittee #5 Holography, Wavemixing, Photorefractives, and Storage.
28. Member of SPIE program committee, Photonic Devices and Algorithms for Computing, SPIE annual meeting July 2002, Seattle, WA.
29. Member of SPIE program committee, Photonic Devices and Algorithms for Computing, SPIE annual meeting July 2003, San Diego, CA.
30. CLEO 2003 (Conference on Lasers and Electro-Optics) program committee, subcommittee “Holography, Wavemixing, Photorefractives, and Storage.”
31. HBSM03 (Hole Burning and Single Molecule Spectroscopies) program committee member, 2003.
32. CLEO 2004 (Conference on Lasers and Electro-Optics) program committee, subcommittee “Holography, Wavemixing, Photorefractives, and Storage.”
33. Member of SPIE program committee, Photonic Devices and Algorithms for Computing, SPIE annual meeting July 2004, Denver CO.
34. CLEO 2005 (Conference on Lasers and Electro-Optics) program committee, subcommittee “Holography, Wavemixing, Photorefractives, and Storage.”
35. Program Committee 1st topical meeting on Information Photonics, June 2005. Committee formed with Invited speaker selection in 2004.
36. Member of SPIE program committee, Photonic Devices and Algorithms for Computing, SPIE annual meeting August 2005, San Diego, CA.
37. HBSM06 (Hole Burning and Single Molecule Spectroscopies) program committee member, 2006, France.
38. OSA COTA (Coherent Optical Technologies and Applications) Topical Meeting, July 2006, Whistler, BC.
39. Member of SPIE program committee, Photonic Devices and Algorithms for Computing, SPIE annual meeting August 2006, San Diego, CA.

Publications

Summary of publications: 3 book chapter, 58 journal papers, and 155 conference publications.

Book Chapters

1. Robert T. Weverka, Kelvin Wagner, Robert Mcleod, Kuang-Yi Wu, Charles Garvin, Low-loss acousto-optic photonic switch, in *Acousto-optic signal processing*, 2nd Edition, Norm Berg and John Pelligrino Editors, Marcel Decker 1995.
2. Steve Blair and Kelvin Wagner, Gated Logic with Optical Solitons, in “Collision-Based Computing”, ed by Andrew Adamatzky, Springer-Verlag, UK, 2002.
3. G. R. Kriehn and K. Wagner, True-time-delay adaptive array processing using photorefractive crystals, *Photorefractive Materials Effects and Devices 3* volume book series, to be published by Springer-Verlag, 2006.

Journal Publications

1. D. Psaltis and K. Wagner, Real-time optical synthetic aperture radar (SAR) processor, *Optical Engineering*, Vol. 21(5), p. 288 (1982).
2. P. Tong, D. Neikirk, D. Psaltis, D. Rutledge, K. Wagner, and P. Young, Tracking antenna arrays for near-millimeter waves, *IEEE Trans. AP-31*(3), p. 512 (1983).
3. K. Wagner and D. Psaltis, Space integrating acousto-optic matrix multiplier, *Optics Comm.*, Vol. 54, p. 173 (1984).
4. K. Wagner and D. Psaltis, Time and space integrating acoustooptic folded spectrum processing for SETI, *The Telecommunications and Data Acquisition Progress Report*, p. 229, February 15, (1986).
5. K. Wagner and D. Psaltis, Multilayer optical learning networks, *Applied Optics*, Vol. 26(23), p. 5061 (1987).
6. L Wang, V. Esch, R. Feinleib, L. Zhang, R. Jin, H. Chou, R. Sprague, A. Macleod, G. Khitrova, H. Gibbs, K. Wagner, and D. Psaltis, Interference filters as nonlinear decision-making elements for three-spot pattern recognition and associative memories, *Applied Optics*, Vol. 27(9), p. 1715 (1988).
7. D. Psaltis, D. Brady and K. Wagner, Adaptive optical networks using photorefractive crystals, *Applied Optics*, Vol 27(9), p. 1752 (1988).
8. R. Athale, D. Psaltis, and K. Wagner, Optical computing: introduction by the guest editors to the feature in the 1 May 1988 issue, *Applied Optics*, Vol. 27(9), p. 1641 (1988).
9. W T. Cathey, K. Wagner, and W. J. Miceli, Digital computing with optics, *IEEE Proceedings* vol. 77(10), p. 1558 (1989).
10. J. Pankove, C. Radehaus, K. Wagner, Winner-take-all neural net with memory, *Electronic Letters*, vol 26(6), p.349 (1990).
11. Robert T. Weverka, Mark Saffman, and Kelvin Wagner, Fully interconnected, two-dimensional neural arrays using wavelength-multiplexed volume holograms, *Optics Letters*, Vol. 16(11), June 1 (1991).
12. E. Maniloff, K. Johnson, and K. Wagner, Dynamic energy transfer and transient fringe dislocations in photorefractive lithium niobate, *Journal of the optical society of america. B*, vol 9(9), p. 1673 September 1992.

13. Tim Slagle and Kelvin Wagner, A winner-take-all spatial light modulator, *Optics Letters*, Vol. 17(16), p 1164 (1992).
14. Tizhi Huang and K. Wagner, Holographic diffraction in photoanisotropic organic materials, *J. Opt. Soc. Am. A*, vol. 10(2), pp. 306-315, February 1993.
15. Tizhi Huang and K. Wagner, Photoanisotropic incoherent-to-coherent optical converter, *Applied Optics*, vol. 32(11), p 1188-1900, April 10 1993.
16. K. Wagner and T. Slagle, Optical competitive learning with VLSI/Liquid Crystal winner-take-all modulators, *Applied Optics*, vol. 32(8), pp. 1408-1436, March 10 1993.
17. K. Wagner and D. Psaltis, Optical Neural Networks: An introduction by the feature editors, *Applied Optics*, vol. 32(8), pp. 1261-1263, March 10 1993.
18. A. Brignon, and K. Wagner, Polarization state evolution and eigenmode switching in photorefractive BSO, *Optics Communications*, vol 101, p 239-246 (1993).
19. Kenneth Purchase, David Brady and Kelvin Wagner, Time of flight cross-correlation on a detector array for ultrafast packet detection, *Optics Letters*, vol. 18(24), pp 2129-2131, Dec 15 1993.
20. Huang Tizhi and Kelvin Wagner, Dynamic polarization volume holograms, *IEEE Journal of Quantum Electronics*, vol. 31(2), pp 372-390, Feb 1995.
21. Huang Tizhi and Kelvin Wagner, Real-time joint transform correlation using photoanisotropic dye-polymer films, *Applied Optics*, vol. 33(32), pp 7634-7645, Nov 10, 1994.
22. Steve Blair, Kelvin Wagner, and Robert Mcleod, Asymmetric Spatial Soliton Dragging, *Optics Letters*, vol. 19(23), pp. 1943-5, Dec 1, 1994.
23. Sam Weaver and Kelvin Wagner Nonlinear Techniques in Optical SAR Image Generation and Recognition, *Applied Optics*, vol. 34(20) pp 3981-96, July 10 1995.
24. Huang Tizhi and Kelvin Wagner, Diffraction analysis of photoanisotropic holography: An anisotropic saturation model, *JOSA B*, vol 13(12), pp 282-299, 1996.
25. Robert Mcleod, Kelvin Wagner and Steve Blair, 3+1 dimensional optical soliton dragging logic, *Phys Rev A*, vol. 52(4), pp3254-78, Oct 1995.
26. Yao Li, Jun Tanida, Frank Tooley, and Kelvin Wagner, Optical Computing: introduction by the feature editors, *Applied Optics*, vol 35(8), 1177-1179, March 10 1996.
27. R. T. Weverka, K. Wagner, and A. Sarto, Photorefractive processing for large adaptive phased-arrays, *Applied Optics*, vol 35(8), pp 1344-1366, Mar 10 1996.
28. A. W. Sarto, K. H. Wagner, R. T. Weverka, S. Weaver, and E. K. Walge, Wide Angular Aperture Holograms in Photorefractive Crystals using orthogonally polarized write and read beams, *Applied Optics*, vol 35(29), pp 5765-5775, Oct 10 1996.
29. Charles Garvin and Kelvin Wagner, Real-time signal classification using an acousto-optic triple product processor cascaded into a volume holographic classifier, *Applied Optics*, vol.35(20), pp 3937-3944, July 10 1996.
30. Robert Mcleod, Kuang-yi-Wu, Kelvin Wagner and R. T. Weverka, Acoustooptic Photonic Crossbar Switch: Part 1 - Design, *Applied Optics*, vol 35(32), pp 6331- 6353, Nov 10 1996.
31. Steve Blair, Kelvin Wagner, and Robert Mcleod, Material figures of merit for spatial soliton interactions in the presence of absorption, *JOSA B*, vol 13(10), 2141-2153, October 1996.
32. T. M. Slagle and K. H. Wagner, Optical Smart-Pixel-Based Clos Crossbar Switch, *Applied Optics*, p. 8336-8351, v. 36, 1997

33. S. Blair, and K. Wagner, Propagation of (2+1)-D spatio-temporal solitary waves including higher-order corrections, *Optical and Quantum Electronics special issue on spatial solitons*, vol 30, pp 697-737, 1998.
34. B. Yellampalle and Kelvin H. Wagner, Redundant interconnections for fault-tolerant digital optical computing, *Optical Engineering*, vol 38(3), March 1999.
35. R. Mcleod, K. Wagner, and S. Blair, Variational approach to orthogonally-polarized optical soliton interaction with cubic and quintic nonlinearities, *Physica Scripta*, vol. 59(5), pp 365-373, May 1999.
36. Ali Adibi, Jose Mumburu, Kelvin Wagner, and Demetri Psaltis, Secondary grating formation by read-out at Bragg-null incidence, *Applied Optics*, vol 38(20), July 10 1999.
37. K.D. Merkel, W.R. Babbitt, K.E. Anderson, K.H. Wagner, Variable-time-delay optical coherent transient signal processing, *Optics Letters*, vol. 24(20), Oct 15 1999.
38. Steve Blair and Kelvin Wagner, Spatial Soliton Angular Deflection Logic Gates, *Applied Optics*, vol 38(32), pp 6749-6772, Nov 10 1999.
39. Gregory Kriehn, Andrew Kiruluta, Paulo E. X. Silveira, Sam Weaver, Shawn Kraut, Kelvin Wagner, R. Ted Weverka, and Lloyd Griffiths, Optical BEAMTAP Beamforming and Jammer Nulling System for Phased Array Antennas, *Applied Optics*, vol. 39(2), pp 212-230, Jan 10 2000.
40. Steve Blair and Kelvin Wagner, Cascadable Spatial Soliton Logic , *Applied Optics*, vol. 39, p. 6006-6018, Nov 10 2000.
41. A. V. Kir'yanov, Igor V. Mel'nikov, and Kelvin Wagner, Two-color generation in a rare-earth-doped quasiphase-matched structure, *Applied Physics Letters*, vol. 76(20), pp. 2829-2831, MAY 15 2000.
42. Paulo E.X. Silveira, G. S. Pati, and Kelvin H. Wagner, Optical Finite Impulse Response Neural Networks, *Applied Optics*, Vol 41(20), pp 4162-4180, July 10 2002.
43. J. Shamir and K. Wagner, Generalized Bragg selectivity in volume holography *Applied Optics*, v. 41 (32), 6773-6785, Nov 10 2002.
44. Andrew Kiruluta, G.S. Pati, Gregory Kriehn, Paulo E. X. Silveira, Anthony W. Sarto, and Kelvin Wagner, Spatio-Temporal Operator Formalism for Holographic Recording and Diffraction in a Photorefractive Based True-Time-Delay Phased Array Processor, *Applied Optics*, 42 (26): 5334-5350 SEP 10 2003.
45. F. Schlottau and K. Wagner, Demonstration of a continuous scanner and time-integrating correlator using spatial-spectral holography *Journal of Luminescence*, Vol 107, no 1-4, pp 90-102, 2004.
46. Paulo E. X. Silveira, G. S. Pati and Kelvin H. Wagner, Optoelectronic implementation of a 256-channel sonar adaptive array processor, *Applied Optics* 43 (35): 6421-6439 DEC 10 2004
47. F. Schlottau, M. Piket-May, and K. Wagner, Modeling of femtosecond pulse interaction within homogeneously broadened media using an iterative predictor corrector FDTD method, *Optics Express*, v 13(1): 182-194 Jan 10 2005.
48. Max Colice, Ted Weverka, Gregory Kriehn, Friso Schlottau, and Kelvin Wagner, Holographic Method of Cohering Fiber Tapped-Delay-Lines, *Applied Optics*, v 44(25), 5257-5272, Sept 1 2005.
49. Sangtaek Kim, Kelvin Wagner, Ram M. Narayanan and Wei Zhou, Broadband Polarization Interferometric Time-integrating Acousto-optic correlator for random noise radar, *Optical Engineering*, v. 44(11), 108202 (2005).

50. F. Schlottau, M. Colice, and K. H. Wagner, Spectral linearization of high-bandwidth spectral holograms, *Optics Letters*, v 30, p 3003 (2005).
51. F. Schlottau, M. Colice, and K. H. Wagner, Spectral hole burning for wideband, high-resolution radio-frequency spectrum analysis, December 2005 issue of *Virtual Journal of Ultrafast Science*, <http://www.vjultrafast.org/> .
52. Lu Gao, Sandrine I. Herriot, and Kelvin H. Wagner, A Novel Approach to RF Photonic Signal Processing Using an Ultrafast Laser Comb Modulated by Traveling-Wave Tunable Filters submitted to *IEEE Journal of Quantum Electronics*, 2005.
53. Max Colice, Friso Schlottau, and Kelvin Wagner, Broadband RF spectrum analysis in spectral-hole-burning media, submitted to *Applied Optics*, 2005.
54. Youzhi Li, Alan Hoskins, Friso Schlottau and Kelvin H. Wagner, Carl Embry, and Wm. Randall Babbitt, Ultra-Wide Band Coherent Noise LIDAR Range-Doppler Imaging and Signal Processing by use of Spatial-Spectral Holography in Inhomogeneously Broadened Absorbers, submitted to *Applied Optics*, 2005.
55. Lu Gao, Sandrine I. Herriot, and Kelvin H. Wagner, A Novel Approach to RF Photonic Signal Processing Using an Ultrafast Laser Comb Modulated by Traveling-Wave Tunable Filters *IEEE Selected Topics in Quantum Electronics*, v 12(2), pp. 315-329, 2006
56. Youzhi Li, A. Hoskins, F. Schlottau, K.H. Wagner, C. Embry, and W.R. Babbitt, Ultrawideband coherent noise lidar range-Doppler imaging and signal processing by use of spatial-spectral holography in inhomogeneously broadened absorbers, *Applied Optics*, 45 (25): 6409-6420 SEP 1 2006
57. iM. Colice, F. Schlottau, K.H. Wagner, Broadband radio-frequency spectrum analysis in spectral-hole-burning media *Applied Optics*, 45 (25): 6393-6408 SEP 1 2006
58. L. Gao, S.I. Herriot, K.H. Wagner, Sluggish light for radio-frequency true-time-delay applications with a large time-bandwidth product *Optics Letters*, 31 (22): 3360-3362 NOV 15 2006

Conference Publications

1. D. Psaltis and K. Wagner, Generation of synthetic aperture radar images using acousto-optics, *Proc. SPIE*, Vol. 271-13, 1981.
2. K. Wagner and D. Psaltis, Real-time computation of moments with acousto-optics using time and space integration, *Proc. SPIE*, Vol. 352-19, 1982.
3. D. Psaltis, K. Wagner, and M. Haney, Synthetic aperture radar imaging using acousto-optics and charge coupled devices, *Proc. SPIE*, Vol. 352-16,.1982.
4. M. Haney, K. Wagner, and D. Psaltis, Programmable real-time synthetic aperture radar processing, *Proc. NASA Conf. on Optical Information Processing*, 1983.
5. M. Haney, K. Wagner, and D. Psaltis, Programmable real-time acousto-optic/CCD SAR Processor, *Proc. SPIE*, Vol. 495-25,.1984.
6. K. Wagner and R. Weverka, Space integrating acousto-optic matrix-matrix multipliers. *Proc. OSA topical meeting on Optical Computing*, Lake Tahoe, March, 1985.
7. D. Psaltis, M. Haney, and K. Wagner, Point simulator for synthetic aperture radar, *NASA Tech Briefs*, Vol. 9(2), p. 72, summer 1985.
8. K. Wagner and D. Psaltis, Time and space integrating acousto-optic folded spectrum processing for SETI, *Proc. SPIE*, Vol. 564-31, 1985.

9. K. Wagner, R. Weverka, and D. Psaltis, Threshold device tolerance requirements in digital optical computers, Proc. OSA Topical Meeting on Optical Bistability 2, Nov. 1985.
10. R.T. Weverka, K. Wagner, P. Katzka, I.C. Chang, and F. Sabatpeyman, Photorefractive tunable optic filter, Abstract, IEEE-Ultrasonics, vol 33(6), p. 799, (1986).
11. K. Wagner and D. Psaltis, Multilayer optical learning networks, Proc. SPIE, Vol. 752-16, Los Angeles, January, 1987.
12. K. Wagner and D. Psaltis, Multilayer optical learning networks, Proc. OSA Topical Meeting on Optical Computing, Lake Tahoe, March, 1987.
13. D. Psaltis, D. Brady and K. Wagner, Adaptive optical neural computers, Proceedings ICNN, San Diego, June, 1987.
14. K. Wagner and D. Psaltis, Nonlinear etalons in competitive optical learning networks, Proceedings ICNN, San Diego, June, 1987.
15. K. Wagner and R. Feinleib, Competitive optoelectronic learning networks, Proc. SPIE, Vol. 882-14, Los Angeles, January, 1988.
16. G. Khitrova, L. Wang, V. Esch, R. Feinleib, H. Chou, R. Sprague, H Macleod, H. Gibbs, K. Wagner, D. Psaltis, Interference filters as nonlinear decision making elements for associative memory, SPIE vol 881, Los Angeles January, 1988.
17. R.T. Weverka, and K. Wagner, Adaptive phased-array radar processing using photorefractive crystals, SPIE vol 1217, p. 173, Los Angeles CA, January 1990.
18. K. Wagner and T. Slagle, Competitive optical learning with winner-take-all modulators, OSA Topical Mtg. on Optical Computing, Salt Lk. City, UT, March, 1991.
19. K. Wagner, R. Weverka, A. Mickelson, K. Wu, C. Garvin, and R. Roth, Low loss acoustooptic permutation interconnection network, OSA Topical Meeting on Photonic Switching, Salt Lake City, UT, March, 1991.
20. Tizhi Huang and Kelvin Wagner, Photoanisotropic incoherent-to-coherent conversion using five wave mixing, SPIE Proc., Vol. 1563, San Diego, CA, July, 1991.
21. Tizhi Huang and Kelvin Wagner, Coupled mode analysis of dynamic polarization volume holograms, SPIE Proc., Vol. 1563, San Diego, CA, July, 1991.
22. K.-Y. Wu, R. T. Weverka, Kelvin Wagner, and C. G. Garvin, Novel acousto-optic photonic switch, SPIE Proceedings, Vol. 1563, San Diego, CA, July 1991.
23. Robert T. Weverka and Kelvin Wagner, Wide angular aperture acoustooptic Bragg cell, SPIE Proceedings, Vol. 1563, San Diego, CA, July 1991.
24. Robert T. Weverka and Kelvin Wagner, Starting phased-array radar using photorefractive crystals, SPIE Proceedings, Vol. 1564-63, San Diego, CA, July, 1991.
25. Robert T. Weverka, Anthony Sarto, and Kelvin Wagner, Starting phased-array radar using photorefractive crystals, DARPA/Rome Photonics in Antennas, Monterey CA, November 1991.
26. Sam Weaver and Kelvin Wagner, Optical SAR processor and target recognition system, Proc SPIE 1704-12, Orlando FL, April 1992.
27. Ted Weverka, Kelvin Wagner and Anthony Sarto, Optical processing for self-cohering of phased-array imaging signals, proc. SPIE vol. 1703, Orlando FL, April 1992.
28. K. Wagner, M. Mozer, P. Smolensky, Y. Miyata, and M. Fellows, Optical neural networks using a new radial nonlinear neural layer, Proc SPIE vol. 1773, San Diego CA, July 1992.

29. Tim Slagle and Kelvin Wagner, VLSI/liquid crystal winner-take-all modulator for optical competitive learning, OSA Topical Meeting on Smart Pixels, Santa Barbara CA, August 1992.
30. Robert T. Weverka, Anthony W. Sarto, and K. Wagner, Photorefractive Phased-Array-Radar Processor Dynamics, DARPA/ROME meeting on Photonics for Antenna Applications, Monterey CA, Jan 1993.
31. Robert T. Weverka, Anthony W. Sarto, and K. Wagner, Photorefractive Phased-Array-Radar Processor Dynamics, OSA Topical Mtg. on Optical Computing, Palm Springs CA, March 1993.
32. K. Wagner and B. Mcleod, Spatial Soliton Dragging Gates and Light Bullets, OSA Topical Mtg. on Optical Computing, Palm Springs CA, March 1993.
33. T. M. Slagle and K. Wagner, VLSI/Liquid Crystal Winner-Take-All Modulators for Optical Competitive Learning, OSA Topical Mtg. on Spatial Light Modulators, Palm Springs CA, March 1993.
34. T. Huang, S. Weaver, S. Blair, and K. Wagner, Photoanisotropic organic volume holograms for spatial light modulation, OSA Topical Mtg. on Spatial Light Modulators, Palm Springs CA, March 1993.
35. B. Mcleod, R.T. Weverka, K.Y. Wu, K. Wagner, A. Mickelson, R. Roth, Acoustooptic Crossbar Photonic Switch, OSA Topical Mtg. on Photonics in Switching, Palm Springs CA, March 1993.
36. Anthony W. Sarto, Robert T. Weverka, and Kelvin Wagner, Photorefractive phased-array-radar processor dynamics, Proc SPIE vol 2026, San Diego CA, July 1993.
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