

LIST OF RECENT PUBLICATIONS

August 2010

Reviewed Publications in Scientific and Professional Journals:

1. Y. Y. Schechner, J. Shamir and N. Kiryati, "Polarization and statistical analysis of scenes containing a semi-reflector" *JOSA A*, Vol. 17, pp. 276-284, (2000).
2. R. Piestun, Y. Y. Schechner, J. Shamir, "Propagation invariant wave-fields with finite energy" *JOSA A*, Vol. 17, pp. 294-303, (2000).
3. B. Spektor, M. Lisiansky, J. Shamir, M. Klebanov and V. Lyubin, "Linear holographic recording at 514 nm in amorphous As_2S_3 ," *Appl. Phys. Lett.* Vol. 76, pp. 798-800, (2000).
4. B. Spektor, M. Lisiansky, J. Shamir, M. Klebanov and V. Lyubin, "On the linearity of holographic recording in amorphous As_2S_3 films" *J. Appl. Phys.* Vol. 87, pp. 3234-3239, (2000).
5. Joseph Shamir, "Reconsidering the concepts of (optical) computing ", *International Journal of Optical Memory & Neural Networks*, Vol. 10, pp. 1-11, (2001).
6. Y. Censor, N. Cohen, T. Kutscher (Kotzer) and J. Shamir. "Summed squared distance error reduction by simultaneous multiprojections and applications" *Applied Mathematics and Computation*, Vol. 126, pp. 157-179, (2002). (Also, *EE Publ.* 909, Aug. 1994).
7. R. Piestun and J. Shamir, "Synthesis of three-dimensional light-fields and applications" *Proc. IEEE*, Vol. 90(2), 220-244, (2002) — **INVITED**.
8. J. Shamir, "On partially absorbing layers and interference, *J. Mod. Opt.* Vol. 49(9), pp. 1419-1422, June (2002)
9. J. Shamir and K. Wagner, "Generalized Bragg effect in volume holography" *Appl. Opt.* Vol. 41 (32), pp. 6773-6785 (2002)
10. B. Spektor, J. Shamir, V. Lyubin and M. Klebanov, "Recording on As_2S_3 glassy films by pulsed and continuous illumination — optical evaluation and comparison" *Opt. Eng.* Vol. 42(11), pp. 3279-3284, (2003)
11. G. Niederer, H.-P. Herzig, J. Shamir, H. Thiele, M. Schnieper and C. Zschokke, "Tunable, oblique incidence resonant grating filter for telecom" *Appl. Opt.* **43**(8), 1683-1694, (2004)
12. Y. Parkhomenko, B. Spektor and J. Shamir "Two regions of mode selection in resonators with bi-prism-like elements" *Appl. Opt.* Vol. 44(13), pp. 2546-2552, (2005).
13. J. Shamir, "Analysis of volume holographic storage allowing large-angle illumination," *J. Opt. Soc. Am. B*, Volume 22, Issue 5, 975-986, (2005)
14. Y. Parkhomenko, B. Spektor and J. Shamir, "Laser mode selection by combining a bi-prism-like reflectors with a narrow amplitude masks" *Appl. Opt.* Vol. 45(12), pp: 2761-2765— April (2006)
15. A. I. Zavalin, J. Shamir, C. S. Vikram, and H. J. Caulfield "Achieving stabilization in interferometric logic operations", *Appl. Opt.* Vol. 45, Issue 2, 360-365, (2006).
16. H. J. Caulfield, J. Shamir, A. I. Zavalin, E. Silberman, L. Qian, and C. S. Vikram "Simple online recognition of optical data strings based on conservative optical logic," *Appl. Opt.* Vol. 45(17), June 10, pp: 4069-4074, (2006)
17. J. Shamir "Paradigms for bit-oriented holographic information storage" *Appl. Opt.* Vol. 43(21), 5212-5222, (2006)
18. Z. Bomzon, M. Gu and J. Shamir "Angular momentum and geometrical phases in tight-focused circularly polarized plane waves" *Appl. Phys. Lett.*, Vol. 89, 241104 (2006) (online: 11 December 2006, in *Applied Physics Letters* (Vol.89, No.24):

19. J. Hardy and J. Shamir, "Optics inspired logic architecture" *Optics Express*, Vol. 15(1), 150-165, (2007)
20. J. Shamir "Volume holographic information storage and beam structuring," *Asian J. Physics* Vol. 15, No 4, 373-386, (2006) — **(INVITED)**,
21. Y. N. Parkhomenko, B. Spektor and J. Shamir, "Mode selection in diffraction coupled semi-concentric resonators by means of a bi-prism like element" *Opt .Eng.* vol. 46, no.11, pp.114201-1 -114201-7. Nov. 2007.
22. B. Spektor, A. Normatov and J. Shamir, "Singular Beam Microscopy" *E. Leith special issue: Appl. Opt.* Vol. 47, A78-A87 (2008) — **INVITED**
23. Y. N. Parkhomenko, B. Spektor, and J. Shamir, "Mode Selection in Resonators with Conical Reflectors" *IEEE J. Quant. Electr.* Vol. 44(5), 456-461, (2008)
Digital Object Identifier 10.1109/JQE.2007.916695
24. J. Shamir, "Fourier optics representation of volume holography and some applications" *Journal of Holography and Speckle* Vol. 5, pp. 10-22, (2009) – **INVITED** for the special issue, honoring Yurii Denisyuk.
25. Alexander Normatov*, Boris Spektor and Joseph Shamir , "Tight focusing of wavefronts with piecewise quasi constant phase ", *Opt. Eng.* Vol. 48, 028001 (2009) (also, CCIT Report #681 January 2008, EE Pub No. 1638)
26. Y. N. Parkhomenko, B. Spektor, and J. Shamir, "Mode Selection in Resonators with Bi-lens Mirror", *JQE-131981-2009*; Vol. 46(4) pp. 478-483, (April 2010).
27. A. Normatov, B. Spektor and J. Shamir, "Singular beam scanning microscopy: preliminary experimental results." 090909 *Journal of Optical Engineering*, Vol. 49(4), 048001-6 (2010)

In Press

28. A. Normatov, B. Spektor and J. Shamir, "The quadratic phase factor of tightly focused wavefronts" *Optics Communications*
29. A. Normatov, B. Spektor, Y. Leviatan and J. Shamir, "Plasmonic resonance scattering from a silver nanowire illuminated by a tightly focused singular beam," *Opt. Let.*

Publications in Refereed Conference Proceedings:

1. J. Shamir, "Optics in computing, - 40 year later", *Critical Technologies for the Future of Computing*, Proc. SPIE Vol. 4109, San Diego, 30 July - 4 August 2000. — **Invited** paper 4109-05
2. Y. Y. Schechner, N. Kiryati and J. Shamir, "Blind recovery of transparent and semireflected scenes", *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)* Vol. 1, pp. 38-43, South Carolina, June 2000.
3. Y. Y. Schechner, N. Kiryati and J. Shamir, "Multi-Valued Images and their Separation", in *Multi-Image Analysis, 10th International Workshop on Theoretical Foundations of Computer Vision*, Dagstuhl Castle, Germany, March 12-17, 2000, R. Klette, T. Huang, G. Gimel'farb (Eds.) LNCS 2032, pp. 129-141, (2001) Springer-Verlag, Berlin Heidelberg, 2001. (<http://link.springer.de/link/service/series/0558/tocs/t2032.htm>)
4. G. Toker, A. Brunfeld, J. Shamir, and B. Spektor, "In-line optical surface roughness determination by laser scanning," *Proc. SPIE* Vol. 4777, *Interferometry XI: techniques and analysis*, pp. 323-329, (July 2002) – **INVITED**.
5. B. Spektor, G. Toker, J. Shamir, M. Friedman and A. Brunfeld "High-resolution surface evaluation using multi-wavelength optical transforms", *Proc. SPIE* Vol. 4777, *Interferometry XI: techniques and analysis*, pp. 345-351, (July 2002).

6. J. Shamir and K. Wagner, "New look at volume holography," Proc. SPIE vol. 4737, *Holography: A tribute to Yuri Denisyuk and Emmett Leith*, pp. 64-76, (April 2002).
7. B. Spektor, Y. Parkhomenko and J. Shamir, "Intracavity beam shaping for nanoscale surface metrology," Proc. SPIE VOL. 5144, *Optical Measurement Systems for Industrial Inspection III*, pp. 17-25, (June, 2003).
8. A. Tavrov, N. Kerwien, R. Berger und H. Tiziani, B. Spektor und J. Shamir and G. Toker, "Vector simulations of dark-beam interaction with nanoscale surface features." Proc. SPIE Vol. 5144, *Optical Measurement Systems for Industrial Inspection III*, pp. 26-36, (June, 2003).
9. B. Spektor, J. Shamir and Y. Parkhomenko "Optical Wave Engineering for nano-scale surface metrology," Proc. SPIE Vol. 5182, *Wave-Optical Systems Engineering II* pp. 197-205, August 2003, San Diego— **INVITED**.
10. B. Spektor, Y. Parkhomenko and J. Shamir, "Bi-prism-like optical elements in intra-cavity mode selection" Proc. SPIE 5525, paper 18 OPTICAL SCIENCE AND TECHNOLOGY, SPIE'S 49TH ANNUAL MEETING, Denver. 2 - 6 August, 2004
11. J. Shamir, "Volume holographic recording of narrow-band information," Proc. SPIE Vol. 6252, pp. 625217-1 - 625217-11, Holography '05 — International Conference on Holography, Optical Recording and Processing of Information, May 21-25, Varna, Bulgaria 2005 — **Invited**.
12. Y. Parkhomenko, B. Spektor, J. Shamir, "Improving the mode selection of bi-prism-like reflectors with intracavity amplitude masks" Proc. SPIE Vol. 5876, pp. 221-226, *50th annual meeting*, San Diego, July 31-Aug. 4, 2005.
13. J. Shamir "Volume holographic storage and beam shaping analyzed by Gaussian beam decomposition" SPIE's digital library as a part of the Optical Information Systems IV conference proceedings: (<http://spiedl.org>) Paper No. 6311-54; San Diego, August 2006.
14. Y.N. Parkhomenko, B. Spektor and J. Shamir, "Odd mode separation in hemispheric resonator with bi-prism like element" Proc. SPIE Vol. 6452-8, Photonics West, San Jose, Jan. 2007. CCIT Pub. #610; EE Pub. No. 1567 January 2007
15. A. Normatov, B. Spektor and J. Shamir, "Capabilities and limitations of paraxial operator approach for modelling of nano-scale feature evaluation" SPIE Proc. 6617-3, 18th International Congress on Photonics in Europe, Optical Metrology, June 2007, Munich,
16. B. Spektor, A. Normatov and J. Shamir, "Experimental validation of 20nm sensitivity of Singular Beam Microscopy" Proc. SPIE, 6616-54, DOI: 10.1117/12.728539, 18th International Congress on Photonics in Europe, Optical Metrology, June 2007, Munich.
17. A. Normatov, B. Spektor and J. Shamir, " Numerical analysis of tight focusing and scattering of singular beams," Proc. 25-th Convention of Electrical and Electronics Engineers in Israel (IEEEI2008), pp. 66-69, Dec. 3-5, Eilat (2008).
18. Yuriy N. Parkhomenko, Boris Spektor and Joseph Shamir, "Modes of resonator with conical reflector", Proc. 25-th Convention of Electrical and Electronics Engineers in Israel (IEEEI2008), pp. 318-322, Dec. 3-5, Eilat (2008).
19. A. Normatov, B. Spektor and J. Shamir, "High numerical aperture focusing of singular beams", Proceedings Photonics West 2009, OPTO, Vol. 7227, paper PW09O-OE117-8, Jan. 24-29, 2009, San Jose DOI: 10.1117/12.808115
20. Yuriy N. Parkhomenko, Boris Spektor and Joseph Shamir, "Beam shaping in resonators with conical reflectors", Proceedings Photonics West 2009, LASE, Vol. 7194 paper 719405, Jan. 24-29, 2009, San Jose
21. J. Shamir, "Attributes and Limitations of Linear Optics in Computing" Proc. OSC2009 2nd International Workshop on Optical Super Computing, pp. 37-46, November 18-20, 2009, Bertinoro, Italy, Springer-Verlag Berlin Heidelberg 2009.
22. A. Normatov, B. Spektor and J. Shamir, "Analysis of Phase Distribution of Focused Light in High Numerical Aperture Systems," Key Engineering Materials Vol. 437 pp. 616-620 (2010), Selected Papers of the 9th International Symposium on Measurement Technology and Intelligent Instruments (ISMTII-2009), June 29 - July 2, 2009, Saint-Petersburg, Russia. Trans Tech Publications, Switzerland

23. Yuriy N. Parkhomenko, Boris Spektor, Joseph Shamir “Shaping of dark beams in resonators with a bi-lens reflector.” Proc. SPIE Vol. 7579, Alexis V. Kudryashov; Alan H. Paxton; Vladimir S. Ilchenko, Editors, Paper No. 4, Photonics West, LASE, San Francisco, January 2010.

Book:

J. Shamir, *Optical Systems and Processes*, SPIE Press, Bellingham, 1999. Reprinted by Prentice-Hall India, 2004.

Book Chapters:

1. J. Shamir, “Storage of 3D information on 2D diffractive elements,” in *Unconventional optical elements for information storage, processing and communications*, N. A. Vainos, Ed., pp. 29-37, Kluwer Academic Publishers, Netherlands, 2000.
2. H. J. Caulfield and J. Shamir, “Holograms of real and virtual point trajectories” in *Three-Dimensional Holographic Imaging*, C. J. Kuo and M. H. Tsai, Eds., pp. 5-19, John Wiley & Sons, New York 2002.
3. J. Shamir and R. Piestun, “Sculpturing of three-dimensional light-fields by iterative optimization” in *Holography for the next millennium*, J. Ludman, H. J. Caulfield and J. Riccobono Eds., pp. 121-153, Springer, New York, 2002
4. J. Shamir, “On beam splitters, beam combiners, phases, interference and energy,” *Perspectives in Modern Optics, Photonics and Optical Instrumentation*, pp. 156-162, January 2002, New Delhi
5. J. Shamir, “Fourier Optics” in *Dekker Encyclopedia of Optical Engineering*, 2003
6. J. Shamir, “Holograms of Volumes and Volume Holograms” in *The Art and Science of Holography: A Tribute to Emmett Leith and Yuri Denisyuk*, H. J. Caulfield Ed., Chapt 14, pp. 239-260, SPIE press PM124, Bellingham, 2004.

Conference Presentations:

Photonics West, Optoelectronics 2000, Jan. 22-28, 2000, San Jose.

1. B. Spektor, M. Lisiansky, J. Shamir, M. Klebanov and V. Lyubin, “Chalcogenide glassy films as linear phase recording materials” (3951-09)
2. B. Spektor, V. Lyubin, M. Klebanov and J. Shamir, “Enhanced photosensitivity of As-S glassy films by short pulse (10 ns) optical recording,” (3951-08).

Optics Within Life Sciences - OWLS VI, 22-24 February 2000, Sydney Australia

3. J. Shamir, “3D light structuring and some applications” — INVITED

Dagstuhl Workshop on Theoretical Foundations of Computer Vision (2000), March 2000, Germany.

4. Y. Y. Schechner, N. Kiryati and J. Shamir, “Multi-Valued Images and Their Separation”

IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR) June 2000, South Carolina

5. Y. Y. Schechner, N. Kiryati and J. Shamir, “Blind recovery of transparent and semireflected scenes”,

Critical Technologies for the Future of Computing, SPIE’s International Symposium on Optical Science and Technology in San Diego next summer (co-sponsored by Electronic Engineering Times) 30 July - 4 August 2000

6. J. Shamir, "Optics in computing, - 40 year later" (paper 4109-05) — **INVITED**

2nd International Photonics Conference IPC 2000, December 12-15, 2000 National Chiao Tung University, Hsinchu, Taiwan ROC

7. J. Shamir, "Considerations of analog-digital, optical-electronic signal processing", — **INVITED**.

Lasers 2001 (paper FC 6), Tucson, December 3-7, 2001

8. B. Spektor and J. Shamir, "Unconventional optical elements"

Holography: A tribute to Yuri Denisyuk and Emmett Leith, within AeroSense - SPIE's Annual International Symposium, Orlando, April 1-5, 2002.

9. J. Shamir and K. Wagner, "New view on volume holograms" — **INVITED**

Interferometry XI: techniques and analysis, Seattle, 8-10 July 2002.

10. G. Toker, A. Brunfeld, J. Shamir, and B. Spektor "In-line optical surface roughness determination by laser scanning" — **INVITED**.

11. B. Spektor, G. Toker, J. Shamir, M. Friedman and A. Brunfeld "High-resolution surface evaluation using multi-wavelength optical transforms".

7th International Symposium on Laser Metrology - LM 2002, Novosibirsk, Russia, 9-13 September, 2002.

12. Boris Spektor and Joseph Shamir, "A new optical method for sub-wavelength surface feature evaluation"

Optical Measurement Systems for Industrial Inspection III, Munich, 23-26 June, 2003.

13. A. Tavrov, N. Kerwien, R. Berger und H. Tiziani, B. Spektor und J. Shamir and G. Toker, "Sub-micron images by Dark-Beam microscopy: evaluation of resolution and polarization effects,"

14. Boris Spektor, Yuriy Parkhomenko and Joseph Shamir "Analysis of intracavity beam shaping for scanning beam microscopy."

Wave-Optical Systems Engineering II, August 2003, San Diego.

15. B. Spektor, J. Shamir and Y. Parkhomenko "Optical Wave Engineering for nano-scale surface metrology," — **INVITED**.

European Optical Society Topical Meeting on Advanced Imaging Techniques, Delft, The Netherlands, 20-23 October 2003.

16. B. Spektor and J. Shamir, "Dark (singular) beam scanning microscopy, — a new approach to sub-wavelength imaging."

Optical Science and Technology, SPIE'S 49th Annual Meeting, Denver, 2 - 6 August 2004.

17. B. Spektor, Y. Parkhomenko and J. Shamir, "Bi-prism-like optical elements in intra-cavity mode selection"

International Conference on Holography, Optical Recording and Processing of Information May 21-25, Varna, Bulgaria 2005

18. J. Shamir, "Volume holographic recording of narrow-band information," — **Invited**.

50th Annual Meeting of the SPIE, San Diego, July 31-Aug. 4, 2005

19. Y. Parkhomenko, B. Spektor, J. Shamir, "Improving the mode selection of bi-prism-like reflectors with intracavity amplitude masks" paper 5876-26.

Meeting of the Australian Optical Society 2006, 10-13 July 2006, RMIT University, Melbourne, Australia.

20. **Z. Bomzon and J. Shamir, "Angular momentum in tightly focused beams with circular polarization"**
Page 20 of abstract book (Paper ID 39).

Tribute to Emmett Leith and Yuri Denisyuk within the 2006 annual meeting of the SPIE - OP06 Optics & Photonics; Optical Information Systems IV, San Diego, August 13-17, 2006.

21. J. Shamir "Volume holographic storage and beam shaping analyzed by Gaussian beam decomposition" Paper No. 6311-54

Frontiers in Optics/Laser Science XXII, OSA Annual Meeting, Rochester, N.Y. October 8-12, 2006

22. J. Shamir and J. Hardy, "Implementation of Boolean Logic by an Optics-Inspired Architecture"

Photonics West, San Jose, California, Jan. 20-25, 2007.

23. Y..N. Parkhomenko, B. Spektor and J. Shamir, "Odd mode separation in hemispheric resonator with bi-prism like element"

OASIS The 11th meeting on optical engineering and science, March 26-27, 2007, Tel-Aviv

24. B. Spektor, A. Normatov and J. Shamir "High resolution microscopy based on singular beams"

Nano-Photonics for Spatial Imaging and Super Resolution, 30-31 May 2007, the Dead Sea

25. B. Spektor, A. Normatov and J. Shamir, "Singular beam microscopy beyond the diffraction limit" — **INVITED**

18th International Congress on Photonics in Europe, Optical Metrology, 18-21 June 2007, Munich

26. A. Normatov, B. Spektor and J. Shamir, "Capabilities and limitations of paraxial operator approach for modelling of nano-scale feature evaluation"

27. B. Spektor, A. Normatov and J. Shamir, "Experimental validation of 20nm sensitivity of Singular Beam Microscopy"

OSA Annual meeting, FIO 2007, San Jose, September 2007.

28. B. Spektor, Y. N. Parkhomenko and J. Shamir, "Intracavity mode selection with conical-shaped mirror,"

29. B. Spektor, A. Normatov and J. Shamir, "Singular beam microscopy for nanoscale feature analysis"

IsrAnalytica 2008, January 22-23, Tel Aviv

30. B. Spektor, M. Teichner, A. Normatov and J. Shamir, "Nanoscale size analysis by singular beam microscopy"

IEEEI 2008, the 25-th Convention of Electrical and Electronics Engineers in Israel, Dec. 3-5, Eilat (2008).

31. A. Normatov, B. Spektor and J. Shamir, " Numerical analysis of tight focusing and scattering of singular beams," paper 25.

32. Yuriy N. Parkhomenko, Boris Spektor and Joseph Shamir, "Modes of resonator with conical reflector," paper 93

Photonics West 2009, Jan. 24-29, 2009, San Jose

33. A. Normatov, B. Spektor and J. Shamir, "High numerical aperture focusing of singular beams"

34. Yuriy N. Parkhomenko, Boris Spektor and Joseph Shamir, "Beam shaping in resonators with conical reflectors"

OASIS - Optical Engineering and Science in Israel, Tel-Aviv, March 16-17, 2009

35. Alexander Normatov, Boris Spektor and Joseph Shamir, "Analysis of tight focusing and scattering of singular beams"

9-th International Symposium on Measurement Technology and Intelligent Instruments, ISMTII-2009, St. Petersburg, June 29-July 2, 2009.

36. Alexander Normatov, Boris Spektor, Joseph Shamir, "Analysis of phase distribution of focused light in high NA systems."

2nd International Workshop on Optical Super Computing, OSC2009, Bertinoro, Italy, November 18-20 2009

37. J. Shamir, "Attributes and Limitations of Linear Optics in Computing"

The IASTED International Conference on ACIT - Optical Information Technology, ACIT-OIT 2010, Novosibirsk, Russia, June 15 18, 2010

38. E. Hemo, B. Spektor and J. Shamir, "Nano-particle material classification by focused Gaussian beam scattering,"