Curriculum Vita

Sergei F. Lyuksyutov
Department of Physics
The University of Akron, Akron, OH 44325
Tel: (330) 972-8356
Email: sfl@uakron.edu

US Citizen

EDUCATION

1991 **Ph.D. in Physics and Mathematics,** Russian (former USSR) Academy of Sciences, Dissertation: "Hybrid lasers based on photorefractive crystals"

1989-1990 **Soros Scholar,** Oxford University, Hertford College, Oxford UK Department of Material Science and Engineering

1984 **M.S. in Physics and Engineering**, Moscow Institute of Physics and Technology **(Alma Mater)**; Theses: "Intra-cavity laser spectroscopy in lasers based on LiF^{2+} centers"

PROFESSIONAL EMPLOYMENT

8/13-present **Professor of Physics and Chemistry**

8/05-7/13 **Associate Professor (Tenure 2006, Early Promotion 2005) of Physics and Chemistry**

9/00-8/05 **Assistant Professor of Physics, Chemistry (2001) and Polymer Engineering (2003-2006)**

Department of Physics University of Akron, OH

An invention of the AFMEN technique (Lyuksyutov et al US Patents **7,241,992; 7,431,970, 7,538,332;** Lyuksyutov et al., *Nature Materials*, **2**, *468 2003*) has been reported. Current research interests include Optics (Fiber Bragg gratings and photorefractive effect), physical phenomena using atomic force microscopy, and planetary science. Author of **49** refereed publications with current citation index **1627+; Hi: 16;** (Google). Had graduated 12 MS students and 1 PhD.

11/97-8/00 **Faculty Research Scientist**

Electrical Engineering Department: Nanotechnology Center, University of Louisville

Research was focused on AFM studies of silicon, carbon nanotubes (Chen, Rao, Lyuksyutov et al *J Chem Physics* **105**, *2525 2001*), diamonds, membranes, and ground water filters

9/95-10/97 **Postdoctoral Research Scientist**

Department of Physics Technical University of Denmark, Lyngby, Denmark

Research was focused on photorefractive materials and fibers. Domains in spontaneous laser beams and self-excitation of space charge waves have been reported (Lyuksyutov et al., *Phys. Rev. Lett.* **79**, *67, 1997*) in photorefractive $Bi_{12}SiO_{20}$.

3/97-5/97 **Visiting Research Scientist**

GKSS Research Nuclear Reactor, Geesthacht , Germany

Research was focused on Small Angle Neutron Scattering (SANS) at Nuclear Reactor. It has resulted in discovery of neutron high order diffraction in polymers (Lyuksyutov et al *Phys. Rev. Lett.* ***80,*** *3272, 1998*).

7/84-8/95 **Research Scientist**
Institute of Physics, National Academy of Science, Kiev, Ukraine
Research: Hybrid laser system based on Cu-vapor laser and photorefractive nonlinear element.

9/89-8/90 **Visiting PhD student: George Soros Scholar**
Oxford University, Department of Engineering Science, Oxford, UK
Graduate Research: Photorefractive gain mechanism and imaging based on wave mixing (Jones, Lyuksyutov and Solymar, *Opt. Lett*, **15**, *935 1990*).

9/80-5/84 **Internship**
Lebedev Physical Institute, Moscow, USSR
Honors project: Laser system design for intra-cavity laser spectroscopy

AWARDS, DISTICTIONS, VISITING APPOINTMENTS:

2016 **Glenn Faculty Fellow, NASA**
2014 **NASA Glenn Fellowship** GRC, Cleveland OH
2012-2013 **Senior Fellow, Office Naval Research,** Naval Research Lab, Washington DC
2010-2011 **NASA Summer Faculty Fellowship** Glenn Research Center, Cleveland OH
2008 **Fulbright Senior Specialist,** Institute of Physics, Kiev, Ukraine
2005 **Earlier Career Research Award,** College Arts Sciences, University of Akron, OH
2004-2005 **Japan Society for the Promotion of Science Fellow**, Musashi Institute of Technology, Tokyo, Japan
2002-2004 **National Research Council Summer Faculty Fellow**, AFRL, OH
2001 **Visiting Professor,** Technical University of Denmark, Lyngby, Denmark
1997 **Deutsche Forschungsgemeinschaft Award,** GKSS, Hamburg, Germany
1989 **George Soros Fellow,** Hertford College, Oxford University, Oxford, UK
1988 **Outstanding Student Award,** Institute of Physics, Academy of Science, Kiev, USSR

Member: American Physical Society (2000-present), American Chemical Society (2005-present), Optical Society of America (1994-2003), SPIE (1997-present)

Program Committee member of International Society of Optical Engineers (SPIE) (2008-present)
Editorial board member of **Current Nanoscience Magazine** (2004-2015)

PUBLICATIONS (Peer reviewed articles only)

49. W-K Lee, S. Tsoi, K. E. Whitener, R. Stine, J. T. Robinson, J. S. Tobin, A. Weerasinghe, P. E. Sheehan, S. F. Lyuksyutov, "Robust reduction of graphene fluoride using an electrostatically biased scanning probe," **Nano Research** 6(11) 767-774 (2013) DOI 10.1007/s12274-013-0355-1

48. G. Adamovsky, S.F. Lyuksyutov , J.R. Mackey, B. Floyd, U. Abeywickrema, I. Fedin, M. Rackaitis, "Peculiarities of thermo-optic coefficient under different temperature regimes in optical fibers containing Fiber Bragg gratings," **Opt. Communications** 285, 766-773 (2013) http://dx.doi.org/10.1016/j.optcom.2011.10.084

47. S. F. Lyuksyutov, M. Rackaitis, V. Nedashkivska, "Instability of nanostructures patterned in polystyrene under high electric field gradients," **Appl. Surface Science 257**, 4581-4585 (2011) doi:10.1016/j.apsusc.2010.12.057

46. M. Rackaitis, D. Kashyn, T. Hirano, S. F. Lyuksyutov, "Topological peculiarities in liquid phase of styrene butadiene rubber thin films induced by electrostatic nanolithography," **Appl. Phys. Lett. 93** 183110 (2008)

45. M. Rackaitis, D. Kashyn, E. Rowicka, P. B. Paramonov, R. R. Mallik, S. F. Lyuksyutov, "Electric Voltage-assisted Asperity Formation in Styrene Butadiene at Room Temperature: Cross-linking at the Nano-scale, " **Physical Review B 78** 064201 (2008)

44. M. A. Reagan, D. Kashyn, S. Juhl, R. A. Vaia, S. F. Lyuksyutov; "Electric charging and nanostructure formation in polymeric films using combined amplitude-modulated atomic force microscopy-assisted electrostatic nanolithography and electric force microscopy," **Appl. Phys. Lett. 93** 033109 (2008) Virtual Journal of Nanoscale Science and Technology **18** (5), August 4, 2008

43. E. Rowicka, D. Kashyn, M. A. Reagan, I. Dolog, P. B. Paramonov, R. R. Mallik, and S. F. Lyuksyutov "Influence of water condensation on charge transport and electric breakdown between an atomic force microscope tip, polymeric and (semiconductor) CdS surfaces," **Current Nanoscience 4** 166-172 (2008)

42. I. Dolog, R. R. Mallik, and S. F. Lyuksyutov, "Robust functionalization of amorphous cadmium sulfide films using z-lift amplitude modulated atomic force microscopy-assisted electrostatic nanolithography," **Appl. Phys. Lett. 90**, 213111 (2007)

41. S. F. Lyuksyutov, P. B. Paramonov, M. A. Reagan, O. V. Mayevska, E. Sancaktar, R. A. Vaia, and S. Juhl, and "Atomic force microscope tip retraction from dielectric surfaces under applied electrostatic potential," **Ultramicroscopy 106,** 909-913 (2006)

40. P. B. Paramonov, S. F. Lyuksyutov, O. V. Mayevska, M.A. Reagan, R. A. Vaia, S. Juhl, K. Umemura, H. Tobari, and M. Hara, "Rearrangements in alkylthiolate self-assembled monolayer

using electrostatic interactions between nanoscale asperity and organomercaptan molecules," **Langmuir 22**(15), 6555-6561 (2006)

39. P.B. Paramonov and S.F. Lyuksyutov, "Density-fuctional description of water condensation in proximity of nanoscale asperity: Erratum," **J. Chemical Physics 124**, 219905 (2006)

38. S. F. Lyuksyutov, "Nano-patterning in polymeric materials and biological objects using atomic force microscopy electrostatic nanolithography," **Current Nanoscience 1**, 245-251 (2005)

37. R. Vaia, S. Juhl, and S. Lyuksyutov, "Multipurpose AFMEN opens many doors," **MICRO NANO, 10** (3), (2005)

36. D. P. Dharaiya, S. C. Jana, and S. Lyuksyutov, "Production of electrically conductive networks in immiscible polymer blends by chaotic mixing," **Polymer Engineering and Science 46** 19-28 (2006)

35. N. V. Kukhtarev, T. Kukhtareva, S. F. Lyuksyutov, M. A. Reagan, P. P. Banerjee, and P. Buchhave, "Running gratings in photoconductive materials," **Journal Optical Society of America B 22** 1917-1922 (2005)

34. P. B. Paramonov and S. F. Lyuksyutov, "Density functional description of water condensation in proximity of nanoscale asperity," **Journal of Chemical Physics 123** 084705 (2005)

33. N.V. Kukhtarev, T. Kukhtareva, M. E. Edwards, J. Jones, M. Bayssie, J. Wang, S.F. Lyuksyutov, M.A. Reagan, and P. Buchhave, "Smart photogalvanic running-grating interferometer," **Journal of Applied Physics 97** 054301 (2005)

32. S.F. Lyuksyutov, P.B. Paramonov, R.A. Sharipov, and G. Sigalov, "Induced deformations in polymers on nanoscale using atomic force microscopy," **Physical Review B 70** (17), 174110 (2004)

31. S. Juhl, D. Philips, R. A. Vaia, S. F. Lyuksyutov, and P. B. Paramonov, "Precise formation of nanoscopic dots in polystyrene film using z-lift electrostatic nanolithography," **Applied Physics Letters 85** 3836-3838 (2004)

30. S.F. Lyuksyutov, R.A. Vaia, P.B. Paramonov, and S. Juhl, "Amplitude-modulated electrostatic nanolithography in polymers based on atomic force microscopy," **Applied Physics Letters 83 (21),** 4405-4407 (2003)

29. S.F. Lyuksyutov, P.B. Paramonov, I. Dolog, and R.M. Ralich, "Peculiarities of anomalous electronic current during AFM-assisted nanolithography on n-type silicon," **Nanotechnology 14**, 716-721 (2003)

28. S.F. Lyuksyutov, R.A. Vaia, P.B. Paramonov, S. Juhl, L. Waterhouse, R.M. Ralich, G. Sigalov, and E. Sancaktar, "Electrostatic nanolithography in polymers using atomic force microscopy," **Nature Materials 2(7)** 468-472 (2003)

27. R.D. Ramsier, R. M. Ralich, and S.F. Lyuksyutov, "Nanolithography of silicon: An approach for investigating tip-surface interactions during writing," **Applied Physics Letters, 79,** 2820 (2001)

_____Before coming to The University of Akron

26. S. Sharma, M. K. Sunkara, M.M. Crain, S.F. Lyuksyutov, S. A. Harfenist, K. M. Walsh, and R.W. Cohn, "Selective plasma nitridation and contrast reversed etching of silicon," **J. Vacuum Science Technology B 19,** 1743 (2001)

25. J. Chen, A. M. Rao, S. Lyuksyutov, M. E. Itkis, M. A. Hamon, H. Hu, R. W. Cohn, P. C. Eklund, D. T. Colbert, R. E. Smalley, R. C. Haddon, "Dissolution of full-length single-walled carbon nanotubes," **J. Physical Chemistry B 105**, 2525-2528 (2001)

24. J.K. Gotpagar, S.F. Lyuksyutov, R.W. Cohn, E.A. Grulke, D. Bhattacharyya "Reductive dehalogenation with sero-valent iron: Surface studies by using electron and atomic force microscopy," **Langmuir 15,** 8412-8420 (1999)

23. R.W. Cohn, S.F. Lyuksyutov, K. Walsh, and M.M. Crain, "Nanolithography considerations for multi-passband filters," **Optical Review**, **6(4)** 345-354 (1999)

22. N.V. Kukhtarev, S.F. Lyuksyutov, P. Buchhave, T. Kukhtareva, K. Sayano and P. Banerjee, "Self-enhancement of dynamic gratings in photogalvanic crystals," **Physical Review A 58**, 4051-4055 (1998)

21. F. Havermeyer, S.F. Lyuksyutov, R.A. Rupp, H. Eckerlebe, P. Staron, and J. Vollbrandt, "Non-destructive resolution of high harmonics of light-induced volume gratings in PMMA with cold neutrons", **Physical Review Letters**, **80**, 3272-3275 (1998)

20. M.V. Vasnetsov, S.F. Lyuksyutov, P. Buchhave, P.E. Andersen, and P.M. Petersen "Spectral dependence of cross talk between photrefractive gratings in $Bi_{12}SiO_{20}$ in diffusion regime", **Applied Physics B 65,** 523-526 (1997)

19. S.F. Lyuksyutov, P. Buchhave, and M.V. Vasnetsov, "Self-excitation of space charge waves", **Physical Review Letters, 79,** No.1, 67-70 (1997)

18. N. V. Kukhtarev, P. Buchhave, and S. F. Lyuksyutov, "Optical and electric properties of dynamic holographic gratings with arbitrary contrast", **Physical Review A, 55**, No.4, 3133-3136 (1997)

17. M. Vasnetsov, P. Buchhave, and S. Lyuksyutov (1996) "Phase modulation spectroscopy of space charge wave resonances in $Bi_{12}SiO_{20}$",**Optics Communications, 137,** 181-191 (1997)

16. N. Kukhtarev, S. Lyuksyutov, P. Buchhave, H.J. Caulfield and M. Vasnetsov, "Anisotropic photoconductivity and current deflection iduced in BSO crystals by a high-contrast interference pattern", **Optics Letters, 21**, No. 23, 1891-1893 (1996)

15. P. Buchhave, S. Lyuksyutov, M. Vasnetsov, and C. Heyde, "Dynamical spatial structure of spontaneous beams in photorefractive bismuth silicon oxide", **Journal Optical Society of America B, 13**, No.11 2595-2602 (1996)

14. P. Buchhave, S. Lyuksyutov, and M. Vasnetsov, "Relations between spontaneously occurring beams in BSO with two frequency detuned pump beams," **Optics Letters 20**, 2363-2365 (1995)

13. Ya.D. Lampeka, S.F. Lyuksyutov, B.A. Snopok, E.A. Tikhonov, and I. M. Maloshtan, "Amphiphilic macrocycling nickel (II) complex in a liquid-crystalline matrix: specific effects of conductivity and self-organisation", **Teoreticheskaya I Eksperimentalnaya Khimiya, 6,** No.6, 522-526 (1993)

12. V.I. Vashchuk, K.F. Gorot´, C. Y. Kozak, S.F. Lyuksyutov, E.A. Tikhonov, "Characteristics of the amplitude modulation of light as a result of the Fredericksz transition in a liquid crystal cell with dichroic dye", **Kvantovaya Electronika 21**, 337 (1994)

11.V. Lisetskii, S.F. Lyuksyutov, A.G. Tereshenko, Y.A. Tikhonov, and Y.A. Reznikov, "Photoinduced shift of selective reflection band and temperature dependence of a pitch of cholesteric liquid crystal spiral," **Kristallografia 38**, No.6, 207-216 (1993)

10. S.F. Lyuksyutov and O.I. Yuschuk, "Spectral equalisation and autosweeping effects in pulsed dye laser with intracavity photorefractive element," **Applied Optics 31**, 1217-1221 (1992)

9. D.C. Jones, S.F. Lyuksyutov and L. Solymar, "Competition between subharmonic and signal beams for photorefractive gain in BSO with two pump beams", **Applied Physics B 52 (3)**, 173-175 (1991)

8. S.F. Lyuksyutov, M.V. Vasnetsov and L. Solymar, "Phase modulation of the signal beam in the three -wave forward mixing in photorefractive BSO". **Optics Communications, 80**, No.5,6, 385 (1991)

7. S.F. Lyuksyutov and O.I. Yushchuk, "Discreet sel-returning of the output line of a pulsed dye laser with a photorefractive crystal," **JETP Letters**, **53**, 15-18 (1991)

6. D.C. Jones, S. F. Lyuksyutov, and L. Solymar, "Three-wave and four-wave forward phase-conjugate imaging in photorefractive BSO", **Optics Letters**, **15**, 935-937 (1990)

5. S.F. Lyuksyutov and O. I. Yushchuk, "A pulsed-dye laser with an intracavity nonlinear mirror utilizing a photorefractive crystal," **Kvantovaya Electronika 17**, 297 (1990)

4. V.Yu Bazhenov, S.F. Lyuksyutov, S.G. Odulov, and M.S. Soskin, "Kinetics of the stimulated-emission from a copper-vapour laser with a nonlinear mirror utilizing a photorefractive crystal," **Kvantovaya Elektronika**, **16**, 1843 (1989)

3. V. Yu. Bazhenov, S. F. Lyuksyutov, S. G. Odulov, and M. S. Soskin, "A loop oscillator with a holographic amplifier," **Kvantovaya Electronika 16**, 1412 (1989)

2. K.I. Zemskov, M.A. Kazaryan, S.F. Lyuksyutov, S.G. Odoulov, N. G. Orlova, G.G. Petrash, and M.S. Soskin "Holographic preamplifier for a quantum amplifier," **JETP Letters, 48**, 202-205, (1988)

1.S. F. Lyuksyutov, S. G. Odulov, and M. S. Soskin, "Optical oscillator with ring phase conjugate mirror containing 2-wave holographic amplifier," **Ukrainskii Fizicheskii Zhurnal** 33, 338 (1988)

REPORTS, PROCEEDINGS, ARCHIVE PAPERS, BOOK CHAPTERS

P.P. Banerjee, U. Abeywickrema, G. Nehmetallah, S.F. Lyuksyutov, N. Kukhtarev, P. Buranasiri, "Application of Bragg and non-Bragg orders in holography and interferometry," Proceedings of SPIE 8883, 888307 **DOI: 10.1117/12.2022126** (2013)

P.P. Banerjee, U. Abeywickrema, G. Nehmetallah, S.F. Lyuksyutov, N. Kukhtarev, "Non-Bragg diffraction orders in holographic Recording and its application to one-shot phase-shifting holographic interferometry," Proceedings of SPIE 8644, 864402 **DOI: : 10.1117/12.2005489** (2013)

S. Lyuksyutov, G. Adamovsky, J.R. Mackey, B. Floyd ,U. Abeywickrema, I. Fedin, "Competition of linearly polarized modes in fibers containing Bragg gratings in wide temperature range, **"**Proceedings of SPIE **8497,** 849707 **DOI:** 10.1117/12.928667 **(**2012)

H. P. Banerjee, A.T. Werasinghe, S.F. Lyuksyutov, "Analysis of beams interference reflected from atomic force microscope tip and periodic silicon surface under various humidity conditions," Proceedings of SPIE **8497,** 849715 **DOI:** 10.1117/12..928451 **(**2012)

S. F. Lyuksyutov, P. B. Paramonov, O. V. Mayevska "High resolution patterning in organo-mercaptan self-assembled monolayers using electrostatic nanolithography," **Abstracts of papers of ACS 231**, 26-COLL (2006)

S. F. Lyuksyutov, S. B. Juhl, P. B. Paramonov, and R. A. Vaia, "Atomic force microscopy electrostatic nanolithography (AFMEN): Manipulation of thin polymer films under extreme electrostatic potentials," **Abstracts of papers of ACS 229**, U1124, 140-PMSE (2005)

S. F. Lyuksyutov, P. B. Paramonov, and R. A. Vaia "Free energy analysis of system comprising biased atomic force microscope tip, water meniscus, and dielectric surface," **arXiv: cond-mat/0505457** (2005)

S. F. Lyuksyutov and R. A. Sharipov, "Separation of plastic deformations in polymers based on elements of general nonlinear theory," **arXiv: cond-mat/0408433** (2004)

S. F. Lyuksyutov, R. A. Sharipov, G. Sigalov, and P. B. Paramonov, "Exact analytical solution for electrostatic field produced by biased AFM tip dwelling above dielectric-conductor bi-layer," **arXiv: cond-mat/0408247** (2004)

M. E. Edwards, N. Kukhtarev, T. Kukhtareva, J. C. Wang, M. Bayssie, S. F. Lyuksyutov, and M. A. Reagan, "Voltage pulsations in photogalvanic crystals as power supply for EO-modulator," **Proceed of SPIE 5363**, 98-106 (2004)

S. F. Lyuksyutov, G. Sigalov, E. Sancaktar, P. B. Paramonov, and J. Kim, "A novel method of SPM-based nanolithography in polyethylene-terephthalate polymer films," Ed. K.L. Mittal **Polymer Surface Modification: Relevance to Adhesion 3**, 417-433 (2003)

S. F. Lyuksyutov and R.A. Sharipov, "Note on kinematics, dynamics, and thermodynamics of plastic glassy media," **arXiv: cond-mat/0304190** (2003)

I. Dolog, R. R. Mallik, S. Lyuksyutov, and P. Paramonov, "Spectroscopic and topographical characterization of oxidized amorphous silicon," **Bulletin of the APS 47(4),** 14 (2002)

S. Lyuksyutov, P. Paramonov, I. Dolog, and R. Mallik ,"Breakdown current study of amorphous CdTe ultathin films," **Bulletin of the APS 47(4),** 13 (2002)

S. F. Lyuksyutov, N. V. Kukhtarev, P. Buchhave, Y. Kukhtareva, and P. P. Banerjeee, "Experimental observation of grating contrast enhancement due to photorefractive effects," **Trends in Optics and Photonics 27**, 229-232 (1999)

P. Buchhave, S. Lyuksyutov, M. Vasnetsov, "Photorefractive domains and the far field distribution of photorefravtive subharmonic beams : paper WA21,"part of: OSA Trends in Optics and Photonics Vol. 27, Advances in Photorefractive Materials, Effects, and Devices (isbn: 1-55752-606-0) , pages: 224-228, (1999). Type: Book chapter

S. F. Lyuksyutov, P. Buchhave, M.V. Vasnetsov, P.E. Andersen, P.M. Petersen, "Reduction of photoexcited carrier modulation due to long distance photoelectron pass in photorefractive $Bi1_2SiO_{20}$,"9 part of: OSA Trends in Optics and Photonics Vol. 27, Advances in Photorefractive Materials, Effects, and Devices, pages: 96-100, (1999). Type: Book chapter

N. Kukhtarev, T. Kukhtarev, J. Jones, H.J. Caulfield, S. Lyuksyutov, P. Buchhave, "Photoinduced biophysical nonlinearities in the suspension of microorganisms," part of: Proceedings of the SPIE Vol. 3488, pages: 293-298, (1998). Type: Book chapter

P. Buchhave, S. F. Lyuksyutov, M. V. Vasnetsov, "Direct observation of space-charge waves and their self-exitation in sillenites," part of: Proceedings on the Topical Meeting on Photorefractive Materials, Effects and Devices (PR'97), pages: 129-132, (1997). Waseda University, Tokyo, Japan, Type: Book chapter

P. Buchhave, M. Vasnetsov, S. Lyuksyutov, "Resonances in BSO with frequency shifted input beams," part of: XX International Quantum Electronics Conference, Technical Digest (isbn: 1-55752-459-9), pages: 17/163, (1996). Optical Society of America, Washington DC Type: Book chapter

N. Kukhtarev, T. Kukhtareva, J. Jones, E. Ward, H. J. Caulfield, S. Lyuksyutov, and P. Buchhave, "Bio-optical nonlinearities in the suspension of motile microorganisms," **Proceedings SPIE 3488**, 293 (1998)

P. Buchhave, S. Lyuksyutov, and M. V. Vasnetsov, "Space-charge waves in photorefractive BSO crystals," **Proceedings SPIE 3488**, 193, (1998)

S. F. Lyuksyutov, P. Buchhave, M. V. Vasnetsov, "Reduction factor in photorefractive cubic crystals," **Proceedings SPIE 3470**, 110, (1998)

N. Kukhtarev, T. Kukhtareva, E. Ward, J. Jones, S. Lyuksyutov, and P. Buchhave, "Current generation by running holographic gratings and photo-induced self-organization in the suspension of microorganisms," **Technical Digest of International Quantum Electronics 6**, 208 (1998)

N. Kukhtarev, T. Kukhtareva, S. Lyuksyutov, P. Buchhave, and B. Volodin, "Anomalous diffusion in dynamic reflection grating recording in photorefractive polymers," **Technical Digest of International Quantum Electronics 7**, 101 (1998)

P. Buchhave, S.F. Lyuksyutov, and M.V. Vasnetsov, "Direct observation of space charge waves and their sel-excitation in sellinites", **Proceedings of Annual Meeting in "Photorefractive effects and devices",** Japan, WP09, 129-132, (1997)

N. V. Kukhtarev, S.F. Lyuksyutov, P. Buchhave, M.V. Vasnetsov and T. Kukhtareva, "Anisotropic photoconductivity and holographic current in sellinites", **Proceedings of Annual Meeting in "Photorefractive effects and devices",** Japan, WPE19, 314-318, (1997)

N. Kukhtarev, H.J. Caulfield, T. Kukhtareva, P. Buchhave, and S. Lyuksyutov, in book **Critical Reviews in Optical Science and Technology, CR64**, Ed. P. Clocek, SPIE Press, 280, (1996)

S.F. Lyuksyutov and M.V. Kurik, "Qualitative analysis of human blood disease using fractals" in book **Fractal Reviews in the Natural and Applied Sciences**, (1995). Chapman Hall, London.

S.F. Lyuksyutov, Yu.A. Reznikov, E.A. Tikhonov, "Asssymetry of Brag Reflective Band of Cholesteric Liquid Crystal caused by Doping Molecules", **Proceedings SPIE**, **2731**, 81 (1995)

V.Yu Bazhenov, S.F. Lyuksyutov, S.G. Odoulov, and R. Jungen, "Copper-vapor laser with adaptive holographic mirror based on photorefractive crystal", **Proceedings SPIE**, **1273**, 48 (1990)

PRESENTATIONS AND ABSTRACTS

J. McCaisland, S. Withanage, R. Mallik, S. Lyuksyutov "Nanoscopic oxidation of p-type and un-doped Si (100) surfaces using un-externally biased atomic force microscope tips in the presence of selected organic solvents," APS 2016, March 17, Baltimore, MD (abstract R28.00001)

L. Barabanova, J. McCausland, A. Buldum, S. Lyuksyutov, "Peculiarities of sliding friction in graphene, graphene fluoride, graphite: Comparison of experiment with atomistic simulations," APS 2016, March 17, Baltimore, MD (abstract T1.00106)

S.F. Lyuksyutov, "Graphene fluoride functionalization using high electrostatic fields generated by atomic force microscope tips: Comparison with functionalization of polymers," (invited) Akron Physics Club, 11.23.15, Akron OH

S. Lyuksyutov, "From supernova dust to darkness of black hole," (invited) University of Dayton, International Year of Light conference, 04.10.15, Dayton OH

S. Lyuksyutov, "Reduction in graphene fluoride and hydrogenated graphene: Separation of processes," (invited) University of California Riverside, 08.22.13, Riverside CA

S. Lyuksyutov, "History of Kukhtarev's equations and their legacy," (invited) SPIE 3013, August 2013, San Diego CA

S. Lyuksyutov, "Friction study in fluorinated graphene," Naval Research Lab, 06.26.13, Washington DC

S. Lyuksyutov, "Robust reduction of fluorographene using electrostatic pressure," Naval Research Lab, 08.17.12, Washington DC

S. Lyuksyutov, G. Adamovsky, J. R. Mackey, B. Floyd, U. Abeywickrema, I. Fedin, "Competition of linearly polarized modes in fibers with Bragg gratings over a wide temperature range," SPIE 2012, August 12, 2012, San Diego, CA

H.P. Banerjee, A. Weerasinghe, S.F. Lyuksyutov, "Analysis of beams interference reflected from atomic force microscope tip and periodic silicon surface under various humidity conditions," SPIE 2012, August 2012, San Diego, CA

S.F. Lyuksyutov, G. Adamovsky,"Precise measurement of thermo-optics coefficient at temperatures from 20 to 1000^{o}C in silica-based fibers containing Bragg gratings," NASA GRC, August 11, 2011

S.F. Lyuksyutov, G. Adamovsky, "Dynamical behavior of thermal optical and thermal expansion coefficients in fiber Bragg grating-based high temperature optical sensors," NASA GRC, August 12, 2010

S. Lyuksyutov, V. Nedashkivska, M. Rackaitis, "Specifics of nanostructures stability patterned in polystyrene under high electric fields," 2010 APS March Meeting (A17.00011), Portland OR March 15, 2010

S. Lyuksyutov, I. Fedin, V. Nedashkivska, C. Lyuksyutova, W. Geldenhuys, V. Sutariya, "Physical properties of poly(lactic-co-glycolic) and poly(ethylene glycol) nanoparticles for drug delivery using atomic force microscopy (AFM) and electrostatic nanolithography**,"** 2010 APS March Meeting (S1.00220), Portland OR, March 17, 2010

M. Rackaitis, S.F. Lyuksyutov, D. Kashyn, P. Paramonov, R.R. Mallik, "Peculiarities in liquid phase of Styrene Butadiene rubber surface induced by Atomic Force Microscopy-assisted electrostatic nanolithography," 2009 APS March Meeting (Y18.00005), Pittsburgh, PA March 16–20, 2009

S.F. Lyuksyutov, "Modified Electric Force Microscopy combined with Atomic Force Microscopy Electrostatic Nanolithography," 2009 APS March Meeting (C1.00190), Pittsburgh, PA March 16–20, 2009

V. Nedashkivska, S.F. Lyuksyutov, L-M. Bezuidenhout, C. Van der Schyf, "Electrostatic perturbation in neurons and endothelial cells under stress using Atomic Force Microscopy-assisted Electrostatic Nanolithography," 2009 APS March Meeting (K1.00298), Pittsburgh, PA March 16–20, 2009

S.F. Lyuksyutov, J.B. Ferguson, J.R. Deneault, N.V. Kukhtarev, "Novel technique for characterization of photovoltaic devices using light phase modulation," SPIE Optics and Photonics (7056-12), San Diego, CA, August 2008

S.F. Lyuksyutov, P.B. Paramonov, O.V. Mayevska, R. Vaia, S. Juhl, K. Umemura, H. Tobari, and M. Hara, "High resolution patterning in organo-mercaptan self-assembled monolayers using electrostatic nanolithography," 231st ACS National Meeting, Atlanta GA, March 26-30 2006

M. A. Reagan, S. F. Lyuksyutov, I. Dolog, R. R. Mallik, S. Juhl, R. A. Vaia, M. Durstock, J. Ferguson, "Charge dissipation on the surface of polymeric materials using modified surface potential electric force microscopy," (D30-12) APS National Meeting, Baltimore MD, March13-16, 2006

E. Rowicka, O. Mayevska, S. F. Lyuksyutov, and M. Sasou, "Atomic force microscopy electrostatic nanolithography for protein study in wiseana iridovirus and barley chromosomes," (G26-11) APS National Meeting, Baltimore MD, March 13-16, 2006

S. Lyuksyutov, S. Juhl, and R. Vaia, "Humidity influence on atomic force microscopy electrostatic nanolithography," (H24-9) APS National Meeting, Baltimore MD, March 13-16, 2006

O.V. Mayevska, S. F. Lyuksyutov, P. B. Paramonov, K. Umemura, S. Juhl, and R. A. Vaia, "'Conformational molecular architecture in alkylthiolate monolayer using atomic force microscopy electrostatic nanolithography" (V16-13) APS National Meeting, Baltimore MD, March 13-16, 2006

S.F. Lyuksyutov, S. B. Juhl, P. B. Paramonov, and R. A. Vaia, "Atomic force microscopy electrostatic nanolithography (AFMEN): Manipulation of thin polymer films under extreme electrostatic potentials," **(invited talk)**, American Chemical Society Annual Meeting, San Diego, CA March 13-17, 2005

M. A. Reagan, O. V. Mayevska, P. B. Paramonov, S. F. Lyuksyutov, S. Juhl, R. A. Vaia, and K. Umemura, "Atomic force microscopy electrostatic nanolithography on self-assembled monolayer of organo-mercaptan molecules," APS Annual Meeting, Los Angeles, CA March 20-25, 2005

S. F. Lyuksyutov, O. Mayevska, P. Paramonov, S. Juhl, and R. Vaia, "Induced electrostatic interactions between atomic force microscope tip and iridovirus," APS Annual Meeting, Los Angeles, CA, March 20-25, 2005

S. F. Lyuksyutov, "Electrostatic interactions between atomic force microscope tip and mostly dielectric surface near glass transition point," #J40-11 APS Annual Meeting, Los Angeles, CA
March 20-25, 2005

P. B. Paramonov and S. F. Lyuksyutov, "Water condensation in proximity of a nanoscale asperity: A density functional description for isotropic fluid," #J35-5 APS Annual Meeting, Los Angeles, CA, March 20-25, 2005

P. B. Paramonov, S. F. Lyuksyutov, E. Sancaktar, G. Sigalov, R. A. Vaia, and S. Juhl, "Induced AFM tip displacement for enhanced nanostructures formation in polymer films," paper# 236 PPS 20 Annual Meeting, Akron, OH, June 21-25, 2004

S. Lyuksyutov, P. Paramonov, R. Vaia, and S. Juhl, "Data storage in polymer films and biological materials," Polymer Photonics Annual Workshop, Akron, OH, April 22-23, 2004

M. Reagan, S. Lyuksyutov, N. Kukhtarev, T, Kukhtarev, R. Vaia, and S. Juhl, "Photomechanical interferometer based on photoactuation of "smart" holographic element," Polymer Photonics Annual Workshop, Akron, OH, April 22-23, 2004

S. Lyuksyutov, P. Paramonov, O. Mayevska, K. Umemura, R. Vaia, S. Juhl, and L. Waterhouse, "Modifications and lithography on iridovirus surface using amplitude modulated nanolithography," OS/APS, Athens, OH, April 16-17, 2004

S. Lyuksyutov, M. Reagan, N. Kukhtarev, T. Kukhtarev, M. Bayssie, and P. Buchhave, "Optical transport of chlorella microorganisms using photogalvanic response of photorefractive mirror," OS/APS, Athens, OH, April 16-17, 2004

S. Lyuksyutov and P. Paramonov, "Two experimental techniques for nano-writing in thin polymer films: A Comparison," OS/APS, Athens, OH, April 16-17, 2004

S. Lyuksyutov, P. Paramonov, E. Sancaktar, R. Vaia, and S. Juhl, "Pattering of nanostructures with high aspect ratio in polymer materials," OS/APS, Athens, OH April 16-17, 2004

S. Lyuksyutov and R. Sharipov, "A technique for separation of plastic deformation in polymer materials," OS/APS, Athens, OH, April 16-17, 2004

M. E. Edwards, N. Kukhtarev, T. Kukhtarev, M. Bayssie, J. Wang, M. Reagan, and S. Lyuksyutov, "Photogalvanic crystal as a pulsed high-voltage power supply and light modulator," SPIE Optoelectronics Symposium [5363-15], 1.24-29.04 San Jose, CA

S.F. Lyuksyutov, P.B. Paramonov, G. Sigalov, R.A. Vaia, S. Juhl, and E. Sancaktar, "Electrostatic nanolithography in polymer materials: an alternative technique for nanostructure formation," OS/APS &OS/AAPT, Cleveland, OH, October, 17-18, 2003

S.F. Lyuksyutov, R.W. Deneen, P.B. Paramonov, G. Sigalov, S. Juhl, and R.A. Vaia, "Humidity factor in AFM-assisted nanolithography in mono- and bi-layer polymer films," OS/APS &OS/AAPT, Cleveland, OH October 17-18, 2003

P. Buchhave, N.V. Kukhtarev, T. Kukhtareva, M.E. Edwards, M.A. Reagan, and S.F. Lyuksyutov, "Electric current generation in photorefractive bismuth silicon oxide without application of external electric field," OS/APS &OS/AAPT, Cleveland OH, October 17-18, 2003

M. Reagan, S.F. Lyuksyutov, D. Galehouse, N.V. Kukhtarev, and T. Kukhtareva, "Peculiarities of ferroelectric emission from photorefractive z-cut $LiNbO_3$,"The 87th Optical Society of America Meeting, Tucson AZ, November 5-9, 2003

S.F. Lyuksyutov, "Nanolithograpy in polymeric photonic materials," 1st Annual STW-21 Program Review Meeting, WPAFB OH, August 21, 2003

S.F. Lyuksyutov, R.W. Deneen, P.B. Paramonov, R.A. Vaia, and S. Juhl, "Amplitude-modulated electrostatic AFM-nanolithography," 1st Annual STW-21 Program Review Meeting, WPAFB OH, August 21, 2003

S.F. Lyuksyutov, E. Sancaktar, P.B. Paramonov, J. Kim, "A novel method of SPM-based nanolithography in polyethylene-terephthalate polymer films," Material Science and Technology Conference (IV International Symosium of Surface Modification), FL, June 9-11, 2003

S.F Lyuksyutov, R.A. Vaia, S. Juhl, P.B. Paramonov, "Resistless AFM-assisted nanolithography in polymer materials," Ohio Section APS Meeting A3.002, East Lansing MI, April 11-12, 2003

S.F. Lyuksyutov, G. Sigalov, P. Paramonov, R.A. Vaia, S. Juhl, “Electronic breakdown influence on AFMEN nanolithography in thin polymer films,” Ohio Section APS Meeting 1A.001, East Lansing MI, April 11-12, 2003

S. Lyuksyutov, R. Vaia, G. Sigalov, P. Paramonov, R. Ralich, S. Juhl, E. Sancaktar, “Electrostatic AFM nanolithography in polymers,” American Physical Society Meeting H35.001, Austin TX March 3.9, 2003

G. Sigalov, P. Paramonov, S. Juhl, R. Vaia, S. Lyuksyutov, “Mass transport in thin polymer films during AFM-assisted nanolithography,” American Physical Society Meeting R1.077, Austin TX March 3-9, 2003

S. Juhl, R.A. Vaia, S.F. Lyuksyutov, and R.M. Ralich, “Peculiarities of electrostatic resistless AFM nanolithography in polymers,“ Material Research Society Annual Meeting, Boston MA December 2-6, 2002

P.B. Paramonov, I. Dolog, R.R. Mallik, and S.F. Lyuksyutov, “Breakdown current study in nanolithography on silicon,” Ohio Section of the APS, Columbus, OH, October 18-19, 2002

R. M. Ralich, S. F. Lyuksyutov, P. Paramonov, and R. D. Ramsier, “Anomalous current in scanning probe nanolithography”, Annual American Physical Society Meeting P33.215, Indianapolis, IN, March 18-22, 2002

N. Farkas, S.F. Lyuksyutov, and R.D. Ramsier, “Nanolithography on Zirconium surfaces”, Ohio Section of the APS, B1-5, p.6-7, Youngstown, OH, April 12-13, 2002

I. Dolog, R.R. Mallik, S.F. Lyuksyutov and P.B. Paramonov, "Spectroscopic and topological characterizationof oxied amorphous silicon", Ohio Section of the APS, B1-6, pp.7-8, Youngstown OH, April 12-13, 2002

S.F. Lyuksyutov, P.B. Paramonov, and R.D. Ramsier, “Electronic current in AFM nanolithography on silicon”, Ohio Section of the APS, B1-7, pp.7-8, Youngstown, OH, April 12-13, 2002

M. K. Sunkara, S. Sharma, M. M. Crain, S. F. Lyuksyutov, K. M. Walsh, R. W. Cohn, and E. C. Dickey, "Selective nitridation of silicon substrates using microwave nitrogen plasma," Annual Meeting, American Institute of Chemical Engineers (AICHE), Dallas, TX, October 31, 1999

R. W. Cohn, S. F. Lyuksyutov, M. M. Crain, and K. W. Walsh, "Nanofabricated gratings for wavelength division multiplexing," Gordon Research Conference on Chemistry and Physics of Nanostructure Fabrication, Tilton, NH, June 27, 1998

S.F. Lyuksyutov, M.V. Vasnetsov, and P. Buchhave, “Reduction factor in photorefractive cubic crystals,” Paper #3470-17, SPIE Annual Meeting July, San-Diego CA, August, 1998

R. W. Cohn, S. F. Lyuksyutov, M.M. Crain, and K. W. Walsh, “Nanofabricated Gratings for Wavelength division Multiplexing,” Gordon Research Conference on Chemistry and Physics of Nanostructure Fabrication, Tilton, NH, June 1998

N. Kukhtarev, T. Kukhtareva, E. Ward, J. Jones, S. Lyuksyutov, and P. Buchhave “Current generation by running holographic gratings and photo-induced self-organization in the suspension of microorganisms,” Paper #QWD6, International Quantum Electronics Conference (IQEC’98), San Francisco CA, May 1998

N. N. Kukhtarev, T. Kukhtareva, S. Lyuksyutov, P.Buchhave, and B. Volodin, "Anomalous diffusion in dynamic reflection grating recording in photorefractive polymers, Paper #CWA4, International Quantum Electronics Conference (IQEC'98), San Francisco CA, May 1998

S.F. Lyuksyutov, P. Buchhave, and M.V. Vasnetsov, " Dynamic spatial structures of supontaneous beams and sel-excitation of space charge waves in photorefractive sellinites", 3137-03, SPIE-97, San-Diego CA, August 1997

N. Kukhtarev, S. Lyuksyutov, P. Buchhave, and B. Volodin, "Holographic gratings in photorefractive polymers without external electric field", 3137-02, SPIE-97, San-Diego CA, August 1997

S. Lyuksyutov, P. Buchhave, M. Vasnetsov, and N. Kukhtarev (1996), "Anisotropic photoconductivity and current deflection in sillenites", Annual Danish Optical Society Meeting, RISØ, Roskilde, Denmark, 21-22 November 1996

P.Buchhave, S. Lyuksyutov and M. Vasnetsov (1995), "Spontaneous diffracted beams in photorefractive BSO - an unsolved mistery", 10th Annual Meeting of the Danish Optical Society, Snekkersten, Denmark, 24-25 November, 1995

N.V. Kukhtarev, H.J. Caulfield, T.Kukhtareva, P. Buchhave, and S. Lyuksyutov "Nonlinear optical and electrical materials in high contrast dynamic holography" SPIE Annual Meeting, Denver CO, August 1996

P. Buchhave, M. Vasnetsov, and S. Lyuksyutov (1996), Resonances in BSO with frequency shifted input beams" XX International Quantum Electronic Conference WL55, Sydney, Australia, 14-19 July, 1996

P. Buchhave, S. Lyuksyutov and M. Vasnetsov (1995), "Dynamical spatial structure of spontaneous beams and their competition with ordinary diffracted beams in photorefractive BSO", "Photorefractive Materials, Effects and Devices Conference", Aspen Lodge at Estes Park, CO, June 11th-15th, 1995

S.F. Lyuksuytov, Y.A. Tikhonov and Y.A. Reznikov, "Asymmetry of Brag reflective band in cholesterics", International Liquid Crystals Workshop "Surface Phenomena" (SPIE), S. Petersburg, Russia, June 1995

S.F. Lyuksyutov and M. V. Kurik, "Qualitative analysis and statistics of human blood deseases using fractals", Topical Meeting "Fractals-95", Marseille, France, February 1995

GRANTS AND CONTRACTS AWARDED SINCE 2000

PI, "Optical sensors for harsh environment," NASA, **$16,000** (May 2016)

PI, "Modeling of light propagation through a Fiber Bragg Grating: A first step to generate optical singularities in FBG," NASA, **$15,000** (May 2014)

PI, "Separation of electrochemical effects during electrostatic nanolithography in graphene fluoride," Office of Naval Research, **$16,000** (April 2013)

PI, "Study of mechanical properties of functionalized graphene using squeezing technique and electrostatic nanolithography," Office of Naval Research, **$16,000** (March 2012)

PI, "Separation of optical and thermal expansion effects in FBG sensors based on silica and sapphire: Next step and fundamental study" National Aeronautics and Space Administration (summer 2011 contract), **$14,000** (May 2011)

PI, "High temperature optical sensors," National Aeronautics and Space Administration (summer 2010 contract), **$14,000** (April 2010)

PI, (with 1 Co-PI) "Study of electrostatic perturbation in neurons and endothelial cells under stress using Atomic-force assisted electrostatic nanolithography and Bioscope instrument," RIG Grant, **$10,000** (August 2008) (personal share $5,000)

PI, Fulbright Senior Specialist grant: "Photovoltaic technology utilizing CdTe," Institute of Physics, Kiev Ukraine, **$2,821** (May 2008);

PI, "Holographic nanoimprinting in polymers," NATO Expert visit, **$5,556** (December 2005)

PI (with 1 Co-PI), "Nanoscopic conductivity in polymeric, composite, and organic materials due to induced charge transport and interactions with electromagnetic radiation" AFOSR: STW-21 Polymer Photonics, **$145,800** (personal share) (August 2005 – August 2008)

OMNOVA award (together with 1 Co-PI) for supervising PhD student, OMNOVA, **$5,000** (personal share $2,500**)** (June 2005)

PI "Hierarchical nanostructure formation using atomic force microscopy," FRG UA, **$4,000** (Summer 2005)

PI, "Electrostatic nanolithography: new opportunities" National Research Council, **$12,500** (March 2004)

PI, "Theoretical study of polymer nanolithography" National Academies/NSF, **$7,700** (August 2003)

PI, “Electrostatic AFM-based nanolithography in polymers” National Research Council, **$15,000** (May 2003)

Co-PI (with 9 Co-PIs), “Akron/Air Force Center in Polymer Photonics”, Department of Defense (AFOSR F49620-02-1428), **$2,700,000** (September 1 2002- July 31 2005)**: $127,528** (personal share)

PI, “Atomic force microscope for electrostatic nanolithography,” Ohio Board of Regents, **$90,000** (August 2002)

PI, “Nanoholography: Expanding the Range of Nanolithography,” **$8,000** (Summer 2002)

PI, “Nanoholography: A novel approach for nanolithography in polymers,” National Research Council, **$12,500** (May 2002)

Co-PI (with 4 CO-PIs), “Large area nanolithographic fabrication of photonics components,” Department of Defense (DEPSCoR), **$109,992** (September 2000-August 2003)

Co-PI (with 1 PI), “Practicum in nanometer-scale science and technology,” National Science Foundation, **$15,550** (April 2000)

PATENTS

S. Juhl, S. F. Lyuksyutov, and R. A. Vaia, “Method of Z-lift electrostatic nanolithography,” **U.S. Patent 7,538,332 (granted May 26, 2009)**

S.F. Lyuksyutov, R.A. Vaia, and S. Juhl, “Method of Polymer Nanolithography,” **U.S. Patent 7,431,970 (granted October 7, 2008)**

S. F. Lyuksyutov, R. A. Vaia, S. Juhl, and P. B. Paramonov, “Method of amplitude modulated electrostatic nanolithography,” **U.S. Patent 7,241,992 (granted July 10, 2007)**