

CURRICULUM VITAE

SERGEY B. MIROV

INSTITUTION The University of Alabama at Birmingham, Department of Physics

TITLE **University Professor of Physics**
Director, Center for Optical Sensors and Spectroscopies

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EDUCATION

1983 Ph. D. degree in Physics and Mathematics at P.N. Lebedev Physics Institute USSR Academy of Sciences for the work "Room temperature stable color center lasers tunable in the near IR region." (Adviser Prof. T.T.Basiev)

1972-1978 Master degree (with honors) in Electronic Engineering, Moscow Power Engineering Institute - Technical University; Direction - Semiconductors and Insulators; Specialization: Materials for Quantum Electronics. Thesis: "Laser Spectroscopy of Nd-ions in disordered crystals."

PROFESSIONAL RECORD

2012-now Director, Center for Optical Sensors and Spectroscopies, UAB
2010 – pr. time University Professor of Physics, UAB
1999 - 2010 Professor of Physics, UAB
2005 – 2012 Co-Director, Center for Optical Sensors and Spectroscopies, UAB
1997 - 2005 Associate Director, Laser & Photonics Research Center, UAB
1994 - 1999 Associate Professor of Physics; Secondary appointment - Associate Professor of Biomedical Engineering
1993 - 1994 Visiting Associate, The University of Alabama at Birmingham, Biomedical Engineering & Physics Departments
1988 - 1992 Principal Research Scientist and Group Leader at Solid State Physics Department, General Physics Institute Russian Academy of Sciences, Moscow. 2 Master and 4 Ph.D. Degree Recipients Supervised
1983-1988 Senior Staff Research Physicist and Group Leader at the Department of Solid State Physics, Laboratory of Laser Spectroscopy of Solids
1978-1983 Staff Research Physicist, P.N. Lebedev Physics Institute of the USSR Academy of Sciences
1990 (2 mon.) Visiting Professor, University of San Paulo, Brazil

PROFESSIONAL ORGANIZATIONS Optical Society of America, SPIE, American Physical Society, National Academy of Inventors

AWARDS AND HONORS

2014 Elected National Academy of Inventors Fellow
2012 Elected OSA Fellow
2012 Chair of the OSA Optical Materials Studies Technical Group
2010 Appointment to a rank of University Professor of Physics, UAB
2009 Caroline P. and Charles W. Ireland Prize for Scholarly Distinction
Snell Premium Laureate (Royal Institute of Electrical Engineers, UK 2004)
Soviet Union Young Scientist's First Prize Winner (Lenin Komsomol Laureate 1982)
General Physics Institute Prize Winner for Scientific Research (1985, 1989)
P.N. Lebedev Physics Institute Research Award (1980)
Ministry of People's Education Medal for Academic Achievements (1978)

RESEARCH INTERESTS:

Long-term research is directed toward the development and investigation of novel vibronic active media for middle-infrared tunable lasers, passive Q-switches, and mode lockers. Prior work includes room temperature stable color center crystals and tunable color center lasers development and application. Research in the physics of color centers formation under ionizing irradiation, color center's photo chemistry, laser spectroscopy of solids led to the development of the first room temperature operable commercial color center lasers, passive Q-switches and nonlinear filters for various types of neodymium lasers from mini lasers to powerful laser glass systems. Current research interests include physics and technology of transition metal doped II-VI polycrystalline, hot-pressed ceramic, waveguides, quantum dot, powders, and composite mid-IR gain media for optical and electrical excitation, commercial tunable lasers on their basis, development of laser based techniques for environmental monitoring and medical diagnostics on the micro- and macroscopic levels, as well as Raman characterization of protein crystals, and developing of time-resolved laser induced fluorescence and Raman spectroscopy of normal and malignant tissues.

PUBLICATIONS: 464 research publications in physics: 1 book, 145 peer-reviewed publications in refereed articles, 111 papers published in conference proceedings, book chapters and preprints, 207 not peer-reviewed publications - extended conference abstracts. Google Scholar Citations – 4417; h-index 32, i10-index 112, URL: <https://scholar.google.com/citations?user=3MQmFzwAAAAJ&hl=en>

PATENTS: 24 patents.

RESEARCH FUNDING AT UAB (1994-2017): \$9,199,744 (Amount funded only lists the funds available to Sergey Mirov's research program. This does not include the total project costs, UAB and commercial matching. The amount funded includes indirect costs.)

RESEARCH FUNDING AT PHOTONICS INNOVATIONS, INC (2008-2009): \$2,479,795

ADMINISTRATIVE & PROFESSIONAL SERVICE ACTIVITIES

Non-Instructional Administrative Activities

- Director, Center for optical Sensors and Spectroscopies (2012-now)
- Co-Director, Center for optical Sensors and Spectroscopies (2005-2012)
- Associate Director, Laser and Photonics Research Center, UAB (1997-2005)

Departmental Service Activities

- Chair Physics Faculty Affairs Committee (2017-present time)
- Member Physics Faculty Affairs Committee (1999-present time)
- Member of the Graduate Students Acceptance Committee (1999-2017)
- Committee chair "Optics/Lasers" qualifying exam (1999-2011)

College of Art and Sciences (CAS) Service Activities

- Member, CAS Faculty Promotion and Tenure Committee (2011, 2013, 2014-16)
- Member, Natural Sciences and Math School (NS&M) Faculty Affairs Committee (2010)
- Chair, NS&M Faculty Affairs Committee (2004)

University Service Activities

- Member of Research Advisory Committee for Nuclear Medicine and Health Physics, UAB
- Mentor and preliminary reviewer of University submitted CAS, MRI, and young faculty proposals.
- Member of the UAB Post-doctoral Education Committee (2005-Fall 2009)

Professional Service Activities

▪ Conferences

- Co-Chair, Advanced Solid State Lasers, ASSL 2017, Nagoya, Japan
- Member of the Scientific Program Committee Advanced Solid State Lasers, ASSL'16, Boston, USA, October-November 2016.
- Member of the Scientific Program Committee, Middle Infrared Coherent Sources, MICS'16, Long Beach, CA, USA, March 2016.

- Member of the Scientific Program Committee Advanced Solid State Lasers, ASSL'15, Berlin, Germany, October 2015.
 - Member of the Scientific Program Committee Advanced Solid State Lasers, ASSL'14, Shanghai, China, November 2014.
 - Member of the Organizing Committee International Conference on Lasers, Optics & Photonics, Philadelphia, PA, USA, September 8-10, 2014.
 - Chaired sessions Advanced Science and Technology for Laser Systems and Optics and Lasers in Medicine at the International Conference on Lasers, Optics & Photonics, Philadelphia, PA, USA, September 8-10, 2014.
 - Member of the Scientific Program Committee Advanced Solid State Lasers Congress, ASSL'13, Paris, France, October-November 2013.
 - Member of the Scientific Program Committee, Middle Infrared Coherent Sources, MICS'13, Paris, France, October-November 2013.
 - Chaired sessions Advanced Science and Technology for laser Systems and Applications and Advancements of Lasers in Science at the International Conference on Lasers, Optics & Photonics, San Antonio, TX, USA, October 7-9, 2013.
 - Member of the Scientific Program Committee, Advances in Optical Materials, AIOM'12 OSA meeting, San Diego, USA, February 2012.
 - 2012 Chair of the OSA Optical Materials Studies Technical Group for a three-year term beginning 01/01/12
 - Member of the National Advisory Committee of 16th International Conference on Luminescence (ICL 2011), June 26-July 1, Ann Arbor, Michigan, USA.
 - Member of the Program Committee of the XIV International Feofilov Symposium, October 2010, St. Petersburg, Russia.
 - Member of the Organizing Committee, 5th International Symposium on High Power Fibre Lasers and Their Applications, June 2010, St. Petersburg, Russia.
 - Session Chair. CLEO, Photonics West, Optics at the SouthEast (multiple times), 4th International Symposium on High Power Fibre Lasers and Their Applications 2008, 21st International Commission for Optics Congress, Sydney, Australia, July 2008; 4th Laser Ceramic Symposium, Shanghai, China, November, 2008.
 - Chair of Organizing Committee, International Conference on Tunable Lasers, Baikal, USSR, 1989.
- **External Proposal Reviewer**
 - NSF panels: Electronics, Photonics and Device Technology, DMR, Bioengineering, Biophotonics, Biosensing, Career, MRI, STTR/SBIR nanotechnology, Light Sources, NSF Graduate Fellowship (in average 4-5 panels per year).
 - Department of Homeland Security (~once per three years)
 - US Civilian and Research Development Foundation (~once per three years)
 - European Union Foundation (~once per three years)
 - Oklahoma Applied Research Support Competition (once per year)
 - **Editorial Board**
 - Member of editorial board "Research Letters in Physics"
 - **Manuscript Reviewer**
 - IEEE Quantum Electronics, Applied Physics B, Applied Physics Letters, Applied Physics, Applied Optics, Optics Letters, Optics Express, Optical Engineering, Optics and Communications, Journal of Physics and Chemistry of Solids, Journal of Luminescence, Journal of Physics D, Journal of Optics, Optical Materials (in average 10-15 manuscripts per year).
 - External reviewer, textbook, Introduction to Optics, Pedrotti, Third Edition, Prentice Hall
 - **Coordinator**
 - Collaboration with General Physics Institute, Russian Academy of Sciences

- Collaboration with Ibaraki University, Japan (UAB sister University)
- Faculty Sponsor, UAB student chapter of the Optical Society of America (1999-2005).
- **Community Service Activities**
 - Evaluated and wrote review letters on applications for tenure and promotion, letters of references for REU students, students applying to medical, dental and optometry schools, different graduate schools, and post-doctoral education (~15 letters per year)

EDUCATIONAL CONTRIBUTIONS: (scored 3.8 out of 4 in student's evaluations)

Developed and currently teach a three parts Undergraduate/Graduate Laser Physics/Laser Spectroscopy curricula. Laser Physics I & II courses include basic physics and engineering of lasers of all kinds as well as various issues of relevance to lasers and electrooptics including application of nonlinear optics harmonic generation and parametric processes. The Laser Spectroscopy course embraces basic concepts and instrumentation of laser spectroscopy as well as applications of laser spectroscopy in physics, chemistry, biology and medicine.

Developed and taught Advanced Solid State Physics Graduate course illustrating properties of defects in crystals, defects classification, specific defect's models, their thermodynamics, mechanisms of defects formation, optical properties of defects in crystals, localized energy levels, and application of defects to practical devices.

Taught two semester College Physics and General Physics curricula numerous times. The first course covers kinematics, dynamics, energy, momentum, and rotational motion covers harmonic motion, waves, fluid dynamic, heat and thermodynamics. The second course covers electricity and magnetism, circuits, optics, and nuclear and modern physics.

Directed twenty one undergraduate research projects at the UAB in the frames of NSF program Research Experience for Undergraduates and supervised four undergraduate students. Currently supervise four graduate students. Previously supervised at the UAB six post-doctoral Research Associates, thirteen physics M.S. degree graduates, ten Ph.D. degree graduates (12-physics, 2-biomedical engineering), and four Ph.D. degree graduates and 2 M.S. while at the General Physics Institute of Russian Academy of Sciences.

Graduate Thesis Committees (excluding those mentioned above)

M. Abraham (Ph.D. Biomedical Engineering); M. McCracken (Ph.D. Biomedical Engineering); C. Clary (Ph.D. Biomedical Engineering); H. Zeng (Ph.D. Materials and Biomedical Engineering); H.Hua (Ph.D. Physics); M. Robinson (Ph.D. Physics), D. Gore (Ph.D. Physics), C. Byeon (Ph.D. Physics), Wang (PhD, Physics, Dr. Zvanut-Chair), Yanxi Zhang (Chemistry, Dr. Vyazovkin -Chair), S.Wang (PhD, Physics, UA), S.Cole (Ph.D. Electrical Engineering, UAH), M. Matsumura (PhD, Physics, Dr. Camata – Chair), Jonathan Williams (PhD, Physics, Dr. Camata – Chair), Kim Chang Su (PhD Engineering, Ibaraki University, Japan), Jejal Bathi (PhD, Environmental Engineering, UA), Hadiyah Green (PhD, Physics, Chair), Doug White (PhD, physics, Dr. Gerakines, Chair), Julien Jaeck (PhD, Physics, Ecole Polytechnique, Paris, France, Dr. R. Haidar, Chair), Christopher Chlique (PhD, Material Science, University of Rennes, France), Gang Shen (PhD, Electrical and Computer Engineering, University of Alabama, Tascaloosa), Nabil Dawahre (PhD, Electrical and Computer Engineering, University of Alabama, Tascaloosa).

PUBLICATIONS

PUBLICATIONS: 464 research publications in physics: **1** book, **145** peer-reviewed publications in refereed articles, **111** papers published in conference proceedings, book chapters and preprints, **207** not peer-reviewed publications - extended conference abstracts. Google Scholar Citations – 4417; h-index 32, i10-index 112, URL: <https://scholar.google.com/citations?user=3MQmFzwAAAAJ&hl=en>

Books (1)

1. "Room temperature tunable color center lasers", T.T. Basiev, **S.B. Mirov**, *Laser Science & Technology book Ser.*, **16**, 1-160, V.S. Letokhov, C.V. Shank, Y.R. Shen, H. Walter, Eds., Gordon and Breach Science Publ./Harwood Acad. Publ. (1994).

Papers Published in Refereed Journals (145):

2. T.T. Basiev, S.B. Mirov, and A.M. Prokhorov (academician, Nobel Prize Laureate), "Pulsed period tunable LiF:F₂⁺ laser pumped by the second harmonic of YAG:Nd laser", *Dokl. Acad. Nauk SSSR*, vol. 246, pp. 72-74, 1979.
3. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, V.V. Osiko, and A.M. Prokhorov, "Kinetics of accumulation and oscillation of F₂⁺ color centers in LiF crystals", *Pis'ma v JETP*, vol. 30, pp. 661-665, 1979; *Sov. JETP Lett.*, vol. 30, pp. 626-629, 1979.
4. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, and A.M. Prokhorov, "Frequency selection of Nd ions in glass, excited by monochromatic laser radiation at the resonant transition $^4I_{9/2} \Rightarrow ^4F_{3/2}$ ", *Pis'ma v JETP*, vol. 29, pp. 696-700, 1979; *Sov. JETP Lett.*, vol. 29, pp. 639-642, 1980.
5. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, V.V. Osiko, A.M. Prokhorov, "New laser spectroscopic method of investigation of solid state media with nonhomogenous broadened spectra", *Pis'ma v JETP*, vol. 29, pp. 142-147, 1979.
6. T.T. Basiev, N.S. Vorob'ev, S.B. Mirov, V.V. Osiko, P.P. Pashinin, V.E. Postovalov, and A.M. Prokhorov, "Investigation of picosecond oscillation of F₂⁺ color centers in LiF crystals with tunable frequency", *Pis'ma v JETP*, vol. 31, pp. 291-294, 1980.
7. T.T. Basiev, Yu.K. Voron'ko, E.O. Kirpichenkova, S.B. Mirov, V.V. Osiko, M.S. Soskin, and V.B. Taranenko, "Tunable laser on LiF:F₂⁺ color centers with a holographic selector", *Kvant. Elektron.*, vol. 8, pp. 419-421, 1981; *Sov. J. Quantum Electron.*, vol. 11, pp. 255-256, 1981.
8. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, V.V. Osiko, and A.M. Prokhorov, "Efficient passive LiF:F₂⁻ Q-switches in neodymium lasers", *Kvant. Elektron.*, vol. 9, pp. 837-839, 1982; *Sov. J. Quantum Electron.*, vol. 12, pp. 530-531, 1982.
9. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, V.V. Osiko, A.M. Prokhorov, M.S. Soskin, and V.B. Taranenko, "Efficient tunable LiF:F₂⁻ lasers", *Kvant. Elektron.*, vol. 9, pp. 1741-1743, 1982; *Sov. J. Quantum Electron.*, vol. 12, pp. 1125-1126, 1982.
10. T.T. Basiev, B.I. Denker, N.N. Il'ichev, A.A. Malyutin, S.B. Mirov, V.V. Osiko, and P.P. Pashinin, "Laser on high-concentrated Li-Nd-La - phosphate glass with passive Q-switch", *Kvant Elektron.*, vol. 9, pp. 1536-1542, 1982; *Sov. J. Quantum Electron.*, vol. 12, pp. 984-988, 1982.
11. T.T. Basiev, Yu.K. Voron'ko, E.O. Kirpichenkova, S.B. Mirov, and V.V. Osiko, "Transformation of color centers in LiF crystals under laser irradiation", *Kratkie Soobcheniya po fizike*, vol. 3, pp. 3-9, 1982; *Sov. Phys. Lebedev Inst., Rep.*, No 3, pp. 1-8, 1982.
12. T.T. Basiev, E.M. Dianov, A.Ya. Karasik, A.V. Luchnikov, S.B. Mirov, and A.M. Prokhorov, "Stimulated Mandel'shtam-Brillouin scattering in a multimode glass fiber light guide", *Pis'ma v JETP*, vol. 26, pp. 85-87, 1982; *Sov. JETP Lett.*, vol. 36, pp. 104-107, 1982.
13. T.T. Basiev, Yu.K. Voron'ko, P.G. Zverev, S.B. Mirov, and A.M. Prokhorov, "Four wave phase conjugation in LiF crystals with F₂, F₂⁺ and F₂⁻ CC", *Pis'ma v JETP*, vol. 8, pp. 1532-1535, 1982.
14. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, V.V. Osiko, and A.M. Prokhorov, "Solid state tunable lasers on color centers in ionic crystals", *Izv. AN SSSR, Ser. Phys.*, vol. 46, pp. 1600-1610, 1982; *Bull Acad. Sci. USSR, Phys. Ser.*, vol. 49, pp. 145-154, 1982.
15. T.T. Basiev, E.M. Dianov, E.A. Zakhidov, A.Ya. Karasik, S.B. Mirov, and A.M. Prokhorov, "Selective nonlinear spectroscopy of non uniformly broadened phonon resonances in a disordered medium", *Pis'ma v JETP*, vol. 37, pp. 192-195, 1983; *Sov. JETP Lett.*, vol. 37, pp. 229-233, 1983.
16. T.T. Basiev, I.Ya. Itskhoki, B.G. Lysoy, S.B. Mirov, and O.B. Cherednichenko, "Pulsed YAG:Nd-laser with LiF:F₂⁻ Q-switch", *Kvant. Elektron.*, vol. 10, pp. 619-621, 1983; *Sov. J. Quantum Electron* vol. 13, pp. 370-372, 1983.
17. T.T. Basiev, V.S. Burakov, F.V. Karpushko, D.V. Kovalev, S.B. Mirov, V.P. Morozov, A.M. Prokhorov, G.V. Sinitsyn, and A.P. Shkadarevich, "Output characteristics of strongly excited LiF:F₂⁻ crystal lasers", *Kvant. Elektron.*, vol. 10, pp. 1919-1922; *Sov. J. Quantum Electron.*, vol. 16, pp. 1276-1278, 1983.
18. T.T. Basiev, S.A. Boldyrev, B.I. Denker, N.N. Il'ichev, G.S. Leonov, A.A. Malyutin, S.B. Mirov, and P.P. Pashinin, "Optimization of the parameters of active elements in miniature lasers utilizing concentrated Li-Nd-La phosphate glass", *Kvant. Elektron.*, vol. 11, pp. 1671-1674, 1984; *Sov. J. Quantum Electron.*, vol. 16, pp. 1125-1130, 1986.

19. T.T. Basiev, Yu.K. Voron'ko, B.V. Ershov, S.B. Kravtsov, S.B. Mirov, V.V. Osiko, A.M. Prokhorov, V.A. Spiridonov, and V.B. Fedorov, "Application of large-aperture passive shutters from crystals LiF:F_2^- for the generation of sub microsecond single pulses in neodymium-glass lasers with large-scale active elements", *Kratkie Soobshcheniya po Fizike* No 2, pp. 36-40, 1984, *Sov. Phys. Lebedev Inst. Rep.*, No 2, pp. 34-38, 1985.
20. Yu.M. Aleksandrov, K.V. Glagolev, V.N. Mahov, S.B. Mirov, T.I. Syreishikova, M.N. Yakimenko, "Optical properties in vacuum UV region and mechanisms of color centers formation in LiF", *Zhurnal prikladnoi spektroskopiyi*, vol. XL, No 2, pp. 244-249, 1984; *Sov. J. Appl. Spectroscopy*.
21. T.T. Basiev, B.V. Ershov, S.B. Kravtsov, S.B. Mirov, V.A. Spiridonov, V.B. Fedorov, "Lithium fluoride color center laser with an output energy of 100 J", *Kvant. Elektron.*, vol. 12, pp. 1125-1126, 1985; *Sov. J. Quantum Electron.*, vol. 15 (6), pp. 745-746, 1985.
22. T.T. Basiev, S.B. Mirov, A.N. Stepanov, A.M. Shirokov, "N-absorption band increasing in γ -irradiated LiF crystals under plastic deformation and it's polarization properties", *Zhurnal Prikladnoy Spektroskopii*, vol. 45, pp. 508-509, 1986; *Sov. J. Appl. Spectroscopy*.
23. G.L. Muscalu, S.T. Gaceff, G. Nemes, A. Stratan, C. Fenic, R. Dabu, I. Lancranjan, T.T. Basiev, S.B. Mirov, "Optical coatings for multiwavelength solid state laser and laser beam testing experiments", *Rev. Rom. Phys.*, vol. 31, pp. 937-944, Bucharest, 1986.
24. T.T. Basiev, F.A. Vakhidov, Yu.K. Voron'ko, and S.B. Mirov, "Tunable laser utilizing LiF crystal with F_2^- color centers with an improved service life", *Kvant. Elektron.*, vol. 13, pp. 422-425, 1986; *Sov. J. Quantum Electron.*, vol. 16, pp. 277-279, 1986.
25. A.V. Babushkin, T.T. Basiev, N.S. Vorob'ev, S.B. Mirov, A.M. Prokhorov, Yu.N. Serdyuchenko, and M.Ya. Shchelev, "Generation and detection of continuously tunable subpicosecond radiation in a lithium fluoride crystal laser with F_2^- color centers", *Kvant. Elektron.*, vol. 13, pp. 2262-2266, 1986; *Sov. J. Quantum Electron.*, vol. 16, pp. 1492-1494, 1986.
26. S.A. Abrosimov, T.T. Basiev, M.E. Brodov, A.V. Ivanov, S.B. Mirov, P.P. Pashinin, R.V. Serov, and E.V. Shashkov, "Shaping of the laser pulse time profile by saturable filters", *Kvant Elektron.*, vol. 13, pp. 1718-1720, 1986; *Sov. J. Quantum Electron.*, vol. 16, pp. 1129- 1130, 1986.
27. T.T. Basiev, E.V. Zharikov, S.B. Mirov, S.Yu. Natarov, V.V. Osiko, P.P. Pashinin, A.M. Prokhorov, E.I. Shklovsky, and I.A. Shcherbakov, "Two-pass compact laser amplifier made of a gadolinium scandium galuim garnet crystal doped with Cr nd Nd ", *Kvant. Elektron.*, vol. 13, pp. 412-414, 1986; *Sov. J. Quantum Electron.*, vol. 16, pp. 269-270, 1986.
28. T.T. Basiev, A.Yu. Dergachev, P.G. Zverev, V.A. Konyushkin, B.G. Lysoi, S.B. Mirov, and V.V. Osiko, "Passive Q-switching with LiF:F_2^- crystals in a continuous- wave YAG:Nd laser", *Izv. AN SSSR, ser. Phys.*, vol. 51, pp. 1440-1446, 1987, *Bull. Acad. Sci. USSR, Phys. Ser.*, vol. 51, pp. 166-170, 1987.
29. T.T. Basiev, F.V. Karpushko, S.M. Kulaschik, S.B. Mirov, V.P. Morozov, V.S. Motkin, N.A. Saskevich, and G.V. Sinitin, "Automated tunable MALSAN-201 laser", *Kvant. Elektron.*, vol. 14, pp. 1726-1727, 1987; *Sov. J. Quantum Electron.*, vol. 17, pp. 1102-1103, 1987.
30. T.T. Basiev, F.V. Karpushko, S.M. Kulaschik, S.B. Mirov, V.P. Morozov, N.A. Saskevich, and G.V. Sinitin, "Automated tunable MALSAN-201 laser", *Zhurnal Prikladnoy Spektroskopii*, vol. 47, pp. 682-687, 1987, *Sov. J. Appl. Spectroscopy*, 1987.
31. T.T. Basiev, N. Voitsekhovskiy, P.G. Zverev, F.V. Karpushko, A.V. Lyubimov, S.B. Mirov, V.P. Morozov, I.V. Mochalov, A.A. Pavlyuk, G.V. Sinitin, and V.E. Yakobson, "Conversion of tunable radiation from a laser utilizing an LiF crystal containing F_2^- color centers by stimulated Raman scattering in $\text{Ba}(\text{NO}_3)_2$ and $\text{KGd}(\text{WO}_4)_2$ crystals", *Kvant. Elektron.*, vol. 12, pp. 2452-2454, 1987; *Sov. J. Quantum Electron.*, vol. 17, pp. 1560-1561, 1987.
32. T.T. Basiev, F.A. Vakhidov, and S.B. Mirov, "Radiative transformations in a new LiYF_4 laser crystal with color centers", *Kratkie Soobshcheniya po Fizike*, No 7, pp. 3-5, 1988; *Sov. Phys. Lebedev Inst. Rep.*, pp. 1-5, 1988.
33. T.T. Basiev, A.A. Gusev, S.V. Kruzhalov, S.B. Mirov, and V.Yu. Petrun'kin, "Continuous-wave ring LiF:F_2^- - laser", *Kvant. Elektron.*, vol. 15, pp. 499-500, 1988; *Sov. J. Quantum Electron.*, vol. 18, pp. 315 - 316, 1988.
34. T.T. Basiev, F.A. Vakhidov, P.G. Zverev, N.A. Ivanov, D.F. Inshakov, F.V. Karpushko, V.A. Konyushkin, S.B. Mirov, V.G. Pak, A.G. Papashvili, and V.M. Khulugurov, "1,1-1,34 micron tunable generation in NaF crystals with color centers in a MALSAN-201 laser system", *Kratkie Soobshcheniya po Fizike*, No 1, pp. 18-20, 1988; *Sov. Phys. Lebedev Inst. Rep.* No 1, 20-24, 1988.

35. T.T. Basiev, S.B. Mirov, V.V. Osiko, "Room-temperature color center lasers", *IEEE J. of Quantum Electronics*, vol. 24, pp. 1052-1069, 1988.
36. T.T. Basiev, S.V. Dolzhenko, B.V. Ershov, S.B. Kravtsov, S.B. Mirov, V.A. Spiridonov, and V.B. Fedorov, "LiF:F₂⁻ laser parameter optimization for Nd laser pumping", *Izv. Akademii Nauk SSSR, Ser. Fiz.*, vol. 52, pp. 400-402, 1988; *Bull. Acad. Sci. USSR, Phys. Ser.*, pp. 164-166, 1988.
37. T.T. Basiev, Yu.K. Voron'ko, S.B. Mirov, A.V. Osiko, S.A. Sychev, "Spectroscopic parameters of the new passive Q-switcher based on MeF₂:Nd²⁺", *Kratkie Soobshcheniya po Physike* No 1, pp. 20-22, 1989; *Sov. Phys. Lebedev Inst. Rep.*, 1989.
38. T.T. Basiev, R. Dabu, C. Fenic, I. Lancranjan, G. Nemes, A. Stratan, B. Carstocea, T.T. Basiev, S.B. Mirov, "A passively Q-switched Nd:YAG laser for ophthalmology", *Laser and Optoelectronic*, 21 (6), pp. 67-69, 1989.
39. S.B. Mirov, P.P. Pashinin, V.S. Sidorin, E.I. Shklovsky, "Developing of ultimately high LiF:F₂ color center concentration with a help of soft x-ray laser plasma source", *Kvant. Elektron.*, vol. 16, pp. 1646-1648, 1989; *Sov. J. Quantum Electron* 1989.
40. K.A. Gippius, Yu.N. Danileiko, P.V. Ionov, S.B. Mirov, A.G. Musatov, V.V. Osiko, A.V. Sidorin, T.V. Tulaikova, "Excitation of metals by the radiations of two YAG:Nd lasers", *Dokl. Acad. Nauk SSSR*, vol. 308, pp. 1122-1127, 1989.
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8. “Room Temperature Color Center Lasers, Practical Applications” S.B.Mirov*, **invited lecture** presented to the Spectra-Physics Lasers, Inc. Special Seminar, Mountain View, CA, February 1, 1996.
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30. "Laser atomic characterization of materials", S.B.Mirov* **invited lecture** presented at Materials Characterization and Optical Probes Techniques, Critical Reviews, part of SPIE's Optical Science, Engineering and Instrumentation'97 Conference, 27 July-1 August 1997, San Diego, CA.
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32. "All Solid State Laser System Continuously Tunable Over 0.2-10 Micron Spectral Range" S.Mirov*, Presentation of results on SBIR grant, Somerset, NJ, November 1997.
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41. "Recent Progress in Color Center Lasers", S.B.Mirov* colloquium speaker, Department of Physics, UAB, September 25, 1998
42. "All Solid State Laser System, Continuously Tunable Over 0.2-10 Micron Spectral Range", S.B. Mirov*, invited speaker, colloquium, Department of Physics, University of Tennessee, Knoxville, October 6, 1998.
43. "Solid State White Light Laser", N. Jenkins*, S.B.Mirov, A. Okorogu, 1998 OSA annual Meeting, Baltimore, October 10, 1998.
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45. "Nonradiative relaxation and inhomogeneous splitting of aggregated optical centers in $\text{CaF}_2: \text{Nd}^{3+}$ ", Y. V. Orlovskii*, T. T. Basiev, V. V.Osiko, H. Gross, J. Heber, S. Mirov, contributed talk presented to the *International Conference on Dynamical Processes (DPC'99)*, Puerto- Rico, May 23-27, 1999.
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49. "Spectroscopic properties and mechanisms of superbroadband lasing from F_2^+ -like color centers in LiF" N.W. Jenkins*, S.B. Mirov, contributed talk presented to Optical Society of America Annual Meeting, San Jose, CA, September 1999.
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54. "Peculiarities of education system in Russia" S.Mirov* contributed talk presented to New Horizon's Program, Marshall Conference Center, UAB, Birmingham, April 12, 2000.

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55. "Applications of Lasers in Medicine and Technology", S Mirov*, four different presentations were performed for High School Students visiting UAB in 1999-2000.
56. "Progress Toward a Solid-State White Light Laser", N.W. Jenkins*, S.B. Mirov, University of Louisville, Department of Physics Seminar, Invited Speaker, October 1, 1999.
57. Powerful ultrabroadly tunable LiF:F₂⁺ laser", N.W Jenkins*, S.B. Mirov, contributed talk presented to the SPIE Photonics West Conference, San Jose, CA, January 2000.
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61. "A Laser Breakdown Spectrometer for Environmental Analysis of Metals", D.Martyshkin*, S.Mirov, W.Lee, R. Pitt, contributed talk presented to the *67th Annual Southeastern Section Meeting of American Physical Society*, Starkville, Mississippi, November 2-4, 2000.
62. "Laser Characteristics of Cr²⁺ doped ZnS", K.Graham*, S.Mirov, V.Fedorov, M.E.Zvanut, A.Avanesov, V.Badikov, B.Ignat'ev, V.Panutin, G.Shevirnyaeva, contributed talk presented to the *67th Annual Southeastern Section Meeting of American Physical Society*, Starkville, Mississippi, November 2-4, 2000.
63. "External Cavity Multiwavelength or Superbroadband Diode Laser for Wavelength Division Multiplexing Applications", I.Moskalev*, S.Mirov, V.Fedorov, T.Basiev, G.Grimes, E.Berman, contributed talk presented to the *67th Annual Southeastern Section Meeting of American Physical Society*, Starkville, Mississippi, November 2-4, 2000.
64. "Spectroscopic Analysis and Persistent Photon Gated Spectral hole Burning in LiF Crystals with F₂⁻ Color Centers", M.Ashenafi, V.Fedorov, S.Mirov, L.Xie, contributed talk presented to the *67th Annual Southeastern Section Meeting of American Physical Society*, Starkville, Mississippi, November 2-4, 2000.
65. "Narrowband Tunable, Multiline, and Superbroadband Lasers for Spectroscopic and Telecommunication Applications", S.B.Mirov*, (November 22, 2000) **invited lecture** presented at *Kitami Institute of Technology*, Kitami, Japan, November 2000.
66. Multiline, and Superbroadband Lasers for Telecommunication Applications", S.B.Mirov*, (November 25, 2000), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, November 2000.
67. "Laser performance of Cr²⁺-doped ZnS", K.Graham*, S.Mirov, V.Fedorov, M.E.Zvanut, A.Avanesov, V.Badikov, B.Ignat'ev, V.Panutin, G.Shevirnyaeva, contributed talk presented to the *SPIE Photonics West Conference*, San Jose, CA, January 2001.
68. "External cavity multiline semiconductor laser for WDM applications" I.Moskalev*, S.Mirov, V.Fedorov, T.Basiev, G.Grimes, E.Berman, (January 2001) contributed talk presented to the *SPIE Photonics West Conference*, San Jose, CA, January 2001.
69. "External cavity multiline semiconductor laser for WDM applications", S.B.Mirov*, (January 2001), **invited lecture** presented at *Lightwave Microelectronics, Inc.* San Jose, CA, January 2001.
70. "Spectroscopic characterization and laser performance of diffusion doped Cr²⁺:ZnS", K. Graham*, S.B. Mirov, V.V. Fedorov, M.E. Zvanut, A.Avanesov, V. Badikov, B. Ignat'ev, V. Panutin, G. Shevirnyaeva, (January 31, 2001) contributed talk presented to the *Advanced Solid State Lasers Conference*, Seattle, WA, USA, January 28-31, 2001.
71. "Laser Performance and Technology of Preparation of Cr²⁺:ZnS", S.B. Mirov*, (April 2, 2001) contributed talk presented to the *Infrared Materials Workshop*, Fisk University, West End Courtyard by Marriott, Nashville, TN, April 1-3, 2001.
72. "CdGa₂S₄:Cr Absorption and EPR studies", M.Johnson*, S.B.Mirov, M.E.Zvanut, (April 2, 2001) contributed talk presented to the *Infrared Materials Workshop*, Fisk University, West End Courtyard by Marriott, Nashville, TN, April 1-3, 2001.
73. "Spectroscopic characterization and laser performance of diffusion doped Cr²⁺:ZnS", K. Graham*, S.B. Mirov, V.V. Fedorov, M.E. Zvanut, (April 2, 2001) contributed talk presented to the *Infrared Materials Workshop*, Fisk University, West End Courtyard by Marriott, Nashville, TN, April 1-3, 2001.

74. "Persistent Photon-Gated Spectral Hole Burning in LiF:F₂⁻ Color Center Crystal", V.V.Fedorov*, S.B.Mirov, M.Ashenafi, L.Xie (May 10, 2001), **PostDeadline** contributed talk presented to the *Quantum Electronics and Laser Science Conference, QELS 2001*, Baltimore, MD, May 2001.
75. "Multiphonon Relaxation of Mid-IR Transitions of Rare-Earth Ions in Laser Crystals", S.B.Mirov* (August 17, 2001) contributed talk presented to the *NSF-ECS/EPSCoR National Grantees Conference on Electronics, Photonics and Device Technologies*, Fayetteville, Arkansas, August 2001.
76. "Er fiber laser pumped CW Cr:ZnS and ZnSe lasers" S.B.Mirov* (September 15) **invited lecture** presented at IPG Photonics, Inc. Starbridge, MA, September 15, 2001.
77. "Mid-IR CW Cr²⁺:ZnS and ZnSe Microchip Lasers," S.B. Mirov*, V.V. Fedorov, K. Graham, I.Moskalev, V. Badikov, V. Panutin, (February 6, 2002) contributed talk presented to the *Advanced Solid State Lasers Conference*, Quebec City, Canada, February 3-6, 2002.
78. "Tunable continuous-wave room-temperature Cr²⁺:ZnS laser," I.T. Sorokina*, E. Sorokin, V. Fedorov, S. Mirov, A. Di Lieto, M. Tonelli, (February 6, 2002) contributed talk presented to the *Advanced Solid State Lasers Conference*, Quebec City, Canada, February 3-6, 2002.
79. "Er fiber laser pumped CW and pulsed Cr:ZnS and ZnSe microchip lasers" S.B.Mirov* (February 20) **invited lecture** presented at IPG Photonics, Inc. Oxford, MA, February 20, 2002
80. "In situ Monitoring of Crystal-Solution Interface During Lysozyme Crystal Growth via micro-Raman Spectral Imaging", A.B.Kudryavtsev*, S.B.Mirov, L.J.DeLucas (March 25), contributed talk presented to the 9th International Conference on the Crystallization of Biological Molecules, Jena, Germany, March 23-28, 2002 .
81. "Novel All Solid State UV-Mid IR Tunable Laser Sources. Narrowband, Ultrabroadband, "White Light", and Multiline Modifications", S.Mirov* (April 12), **invited lecture** presented at Eglin AFB, FL, April 2002."Multiphonon Relaxation of Mid IR Transitions of Rare- Earth Ions in Laser Crystals," Yu.V.Orlovskii*, T.T.Basiev, V.V.Osiko, N.P. Barnes, S.B.Mirov (May 20), contributed talk presented to the *Conference on Lasers and Electro-Optics*, Long Beach, CA May 19-24, 2002.
83. "CW and pulsed Cr²⁺:ZnS and ZnSe microchip lasers," S.B. Mirov*, V.V. Fedorov, K. Graham, I. S. Moskalev, V.V. Badikov, V. Panutin (May 20), contributed talk presented to the *Conference on Lasers and Electro-Optics*, Long Beach, CA May 19-24, 2002.
84. "Broadly Tunable Continuous-Wave Cr²⁺:ZnS Laser," I.T. Sorokina*, E. Sorokin, S. Mirov, V. Fedorov, V.V. Badikov, V. Panutin (May 20), contributed talk presented to the *Conference on Lasers and Electro-Optics*, Long Beach, CA May 19-24, 2002.
85. "Efficient, Broadly Tunable Deep UV And Mid-IR Solid-State Laser Source," S.B.Mirov, V.V.Fedorov*, B. Boczar, R. Frost, N. Kramer, B. Pryor, T.Thevar, J.C.Walling (May 21), contributed talk presented to the *Conference on Lasers and Electro-Optics*, Long Beach, CA May 19-24, 2002.
86. "External cavity multiwavelength semiconductor laser,"I. S. Moskalev*, S. B. Mirov, V. V. Fedorov, G. J. Grimes, T. T. Basiev, E. Berman, J. Abeles, (May 22), contributed talk presented to the *Conference on Lasers and Electro-Optics*, Long Beach, CA May 19-24, 2002.
87. "Efficient, Broadly Tunable Deep UV and Mid-IR Solid State Laser Sources" S.B.Mirov* (June 5) presentation for REU Physics Students, UAB, June 2002
88. "Cr²⁺:ZnS mid-IR external cavity and microchip lasers" S.B.Mirov*, (July 6) invited lecture at the Oregon State University, Corvallis, Oregon, July 6, 2002.
89. "Transformation of spatial domain of the pumping beam into spectral domain of the output oscillation," I.S. Moskalev, S.B. Mirov*, V.V.Fedorov, T.T.Basiev, P.G.Zverev, (July 11), contributed talk presented to the SPIE 's 47th annual meeting, Seattle, WA July 7-11, 2002.
90. "Diode, fiber, and potentially electrically pumped Cr²⁺:ZnS mid-IR external cavity and microchip lasers", S.B. Mirov*, V.V. Fedorov, K. Graham, I. S. Moskalev, I.T. Sorokina and E. Sorokin, V Gapontsev, D. Gapontsev, V.V. Badikov, V. Panyutin, (September 11), contributed talk presented to the 5th International Conference on Mid-Infrared Optoelectronic Materials and Devices, Annapolis, MA, September 8-11, 2002.
91. "Detection of Zn deficient SOD by means of laser spectroscopy and surface enhanced laser spectroscopy (SERS)", D.V. Martyskhin*, S.B.Mirov, J.Crow, Y.Zhuang, J.Beckman, V.Ermilov, (September 30) contributed talk presented to the *OSA Annual meeting/18th Laser Science Conference*, Orlando, Florida September 29-October 3, 2002.

92. "External cavity multiwavelength semiconductor laser", I.S. Moskalev*, S.B.Mirov, V.V.Fedorov, G.J.Grimes, T.T.Basiev, E.berman, J.Abeles, (October 1) contributed talk presented to the *OSA Annual meeting/18th Laser Science Conference*, Orlando, Florida September 29-October 3, 2002.
93. "CW and gain-switched Cr²⁺:ZnS and ZnSe mid-IR microchip lasers" S.B.Mirov*, V.V.Fedorov, K.Graham, I.S.Moskalev, V.V.Badikov, V.Panyutin, (October 2) contributed talk presented to the *OSA Annual meeting/18th Laser Science Conference*, Orlando, Florida September 29-October 3, 2002.
94. "All solid state system based on alexandrite-LiF:F₂⁺** laser for deep UV (196 nm) and mid-IR (4000nm) spectral ranges", S.B.Mirov*, V.V.Fedorov, B.Boczar, R.Frost, B.Pryor, A.Yu. Dergachev, (October 2) contributed talk presented to the *OSA Annual meeting/18th Laser Science Conference*, Orlando, Florida September 29-October 3, 2002.
95. "Diode, fiber, and potentially electrically pumped Cr²⁺:ZnS mid-IR external cavity and microchip lasers", S.Mirov*, (October 17), Presentation for BTG International, Inc., Birmingham, UAB, October 17, 2002.
96. "Spatial-to-frequency Fourier-transform external cavity lasers", I.S.Moskalev*, S.B.Mirov, V.V.Fedorov, T.T.Basiev, P.G.Zverev, (October 24), contributed talk presented to the *Optics in the Southeast 2002 Conference*, Huntsville, Alabama October 24-25, 2002.
97. "Detection of Zn deficient SOD by means of laser spectroscopy and surface enhanced laser spectroscopy (SERS)", D.V. Martyshkin*, S.B.Mirov, J.Crow, Y.Zhuang, J.Beckman, V.Ermilov, (October 24) contributed talk presented to the *Optics in the Southeast 2002 Conference*, Huntsville, Alabama October 24-25, 2002.
98. "Deep ultraviolet generation in an all-solid-state laser system based on a K₂Al₂B₂O₇ crystal", C.E.Wehrenberg*, S.B.Mirov, V.V.Fedorov, (October 24) contributed talk presented to the *Optics in the Southeast 2002 Conference*, Huntsville, Alabama October 24-25, 2002.
99. "Er Fiber Laser Pumped Microchip and External cavity Cr²⁺-doped ZnS and ZnSe mid-IR Lasers", S.Mirov*, (May 5), invited talk presented at the IPG Photonics Corporation, Oxford, MA, May 5, 2003.
100. "Spatial- spectral transformation of the laser radiation" Vladimir V. Fedorov*, Igor S. Moskalev, Sergey B. Mirov, Tasoltan T. Basiev, Petr G. Zverev, contributed talk presented to the SPIE's 48th meeting, 2003.
101. "Novel TM doped II-VI mid-IR lasers", S.Mirov*, invited talk presented at the seminar of the Laser and Materials Technology Center at the General Physics Institute, Russian Academy of Sciences, June 27, 2003.
102. "High power, broadly tunable, Er-fiber laser pumped Cr²⁺:ZnS and ZnSe mid-IR external cavity and microchip lasers" S.Mirov*, invited talk presented to the XI International Conference Laser Optics 2003, St.-Petersburg, Russia, July 4, 2003.
103. "High Power, Broadly Tunable Mid-IR Lasers", S.Mirov*, Presentation for the BTG International, Inc. Birmingham, UAB, July 17, 2003.
104. "Promising materials for high density optical storage devices", S.Mirov*, invited talk presented to the Physics Seminar at the University of Alabama, Tuscaloosa, November 2003.
105. "New mid-infrared laser materials based on transition metal doped II-VI semiconductors" S.Mirov*, contributed talk presented to the UAB Physics Seminar, November 7, 2003.
106. "Novel media for Mid-IR lasers", S.Mirov*, contributed talk to the NSF Design Service and Manufacturing Grantees and Research Conference, Dallas, TX January 6, 2004.
107. "Tunable distributed feedback color center laser using stabilized F₂⁺** color centers in LiF crystal", D. Martyshkin, J.G. Parker*, V.V. Fedorov, S.B. Mirov, contributed talk presented to the Photonics West' 04, San Jose, CA, January 2004.
108. "Fluorescence light suppression in Raman Spectroscopy using ultrafast time gated CCD camera", D.V. Martyshkin, R. C. Ahuja, A. Kudriavtsev, S. B. Mirov*, contributed talk presented to the Photonics West' 04, San Jose, CA, January 2004.
109. "Synthesis and spectroscopic properties of Cr doped ZnS crystalline thin films", S. Wang, S. B. Mirov*, V. V. Fedorov, R. P. Camata, contributed talk presented to the Photonics West' 04, San Jose, CA, January 2004.
110. "Pulse laser deposition growth and spectroscopic properties of chromium doped ZnS crystalline thin films", S. B. Mirov*, S. Wang, V. V. Fedorov, R. P. Camata, contributed talk presented to the Advanced Solid State Photonics Conference, Santa Fe, NM, February 1-4, 2004.
111. "Multiphonon relaxation of mid- IR transitions of RE ions in fluorite type crystals", Yu.V.Orlovskii*, T.T.Basiev, K.K.Pukhov, N.A.Glushkov, O.K.Alimov, S.B.Mirov, contributed talk presented to the Advanced Solid State Photonics Conference, Santa Fe, NM, February 1-4, 2004.

112. “Continuous-wave polycrystalline Cr²⁺:ZnSe laser pumped by a 1.85 μm InGaAsP/InP laser diode”, I. Moskalev, A.Gallian, V. Fedorov, S. Mirov*, V.Badikov, V. Panyutin, D. Garbuzov, I.Kudryashov, S.Todorov, contributed talk presented to the Conference on Lasers and Electrooptics, CLEO’2004, San-Francisco, CA, May 19, 2004.
113. “General theory of lasers”, S.B.Mirov*, (August 10, 2004), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, August 2004.
114. “Laser materials”, S.B.Mirov*, (August 10, 2004), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, August 2004.
115. “Color center lasers-principles and applications”, S.B.Mirov* (August 19, 2004), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, August 2004.
116. “Ultrabroadband and multiwavelength spatially-dispersive lasers” S.B.Mirov* (August 19, 2004), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, August 2004.
117. “Modern applications of lasers and laser spectroscopy”, S.B.Mirov* (August 20, 2004), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, August 2004.
118. “Interpretnership in optics”, S.B.Mirov* (August 20, 2004), **invited lecture** presented at *Ibaraki University*, Hitachi, Japan, August 2004.
119. “Evanescent cavity ring-down spectroscopy (eCRDS) of hemoglobin absorption at the silica-water interface”, W.B. Martin*, S.Mirov, D.Martyshkin, R.Vengopalan, contributed talk presented at *Annual International Conference of the IEEE Engineering in Medicine and Biology, San Francisco, CA, September 2004*.
120. “Photoluminescence studies of MBE grown thin films and bulk Cr:ZnSe”, Andrew Gallian*, Vladimir Fedorov, John Kernal, Justin Allman, Sergey Mirov, Evgueni Dianov, A. Zabezhaylov, Igor Kazakov, contributed talk presented at the *71st Annual Meeting of the Southeastern Section of the APS*, Oak Ridge, Tennessee, November 11-13, 2004.
121. “Laser Oscillation at 2.4 μm from Cr²⁺ in Znse Optically Pumped over Cr Ionization Transitions”, A.Gallian, V.V.Fedorov, J.Kernal, S.B.Mirov*, V.V. Badikov, contributed talk presented to the Advanced Solid State Photonic, Vienna, Austria, February 7, 2005.
122. “Multiwavelength mid-IR spatially-dispersive CW laser based on polycrystalline Cr²⁺:ZnSe”, I.S.Moskalev, V.V.Fedorov and S.B.Mirov*, contributed talk presented to the Advanced Solid State Photonic, Vienna, Austria, February 8, 2005.
123. “En Route to Electrically Pumpable Cr²⁺ Doped II-VI Semiconductor Lasers”, A.Gallian*, V.V.Fedorov, J.Kernal, J.Allman, S.B.Mirov, E.M.Dianov, A.O.Zabezhaylov, I.P.Kazakov, contributed talk presented to the Advanced Solid State Photonic, Vienna, Austria, February 8, 2005.
124. “Cr²⁺:ZnSe Laser Pumped via Cr Ionization”, A.Gallian*, V.V.Fedorov, I.S. Moskalev, S.B.Mirov, V.V. Badikov, contributed talk presented to the International Conference on Coherent and Nonlinear Optics/ International Conference on Lasers, Applications and Technologies (ICONO/LAT 2005) May 11-15, 2005, St.Petersburg, Russia.
125. “Summer 2005 research projects in the Laser Lab”, S.B.Mirov* talk presented to the REU physics students on May 16, 2005.
126. “Cr²⁺:ZnSe Laser Pumped over Cr Ionization Transitions”, A.Gallian, V.V.Fedorov*, I.S. Moskalev, S.B.Mirov, V.V. Badikov, contributed talk presented to the CLEO’05, Baltimore, MD, May 22-27, 2005.
127. “Hot-Pressed Ceramic Cr²⁺:ZnSe Gain-Switched Laser”, A.Gallian, V.V.Fedorov, S.B.Mirov*, V.V. Badikov S.N. Galkin, E.F. Voronkin, A.I. Lalayants, contributed talk presented to the CLEO’05, Baltimore, MD, May 22-27, 2005.
128. “Mid- IR Laser Transitions in Nd³⁺ Doped CaGa₂S₄, PbGa₂S₄, and PbCl₂ Laser Crystals”, Yu.V. Orlovskii*, T.T. Basiev, L.N. Dmitruk, V.V. Osiko, D.V. Badikov, V.V. Badikov, S.B.Mirov, contributed talk presented to the CLEO’05, Baltimore, MD, May 22-27, 2005.
129. “MBE Growth and study of Cr²⁺:ZnSe Layers for Mid-IR Lasers”, I.P. Kazakov*, S.B.Mirov, V.V.Fedorov, A.Gallian, J.Kernal, J.Allman, A.O.Zabezhaylov, E.M.Dianov, contributed talk presented to the *13th Int. Symp. “Nanostructures: Physics and Technology”*, St Petersburg, Russia, June 20–25, 2005.
130. “Research projects at the Laser Lab”, S.B.Mirov* talk presented to students of Taugaloo College interested in the Physics Graduate program at the UAB, UAB, Birmingham, June 25, 2005.
131. “Study of the optical properties of Cr²⁺:ZnSe epitaxial layers grown by MBE technique”, I.P. Kazakov, S.B.Mirov, V.V.Fedorov, A.Gallian, J.Kernal, J.Allman, A.O.Zabezhaylov, E.M.Dianov, contributed talk presented to the *VII Russian Conference on Semiconductor Physics*, Moscow, September 18-23, 2005.

132. "Multiwavelength, ultrabroadband semiconductor and solid-state spatially-dispersive lasers", I.S. Moskalev*, V.V. Fedorov, S.B. Mirov, contributed talk presented to the *Optics in the Southeast Atlanta*, USA, October 6-8, 2005.
133. "Co:ZnS and Co:ZnSe saturable absorbers for alexandrite laser", R. A. Sims*, J. Kernal, V. V. Fedorov, S. B. Mirov, contributed talk presented to the *Optics in the Southeast Atlanta*, USA, October 6-8, 2005.
134. "Cr²⁺:ZnSe Laser Pumped Utilizing Cr Ionization", A.Gallian*, V.V.Fedorov, L. Luke, I.S. Moskalev, S.B.Mirov, V.V. Badikov, contributed talk presented to the *Optics in the Southeast Atlanta*, USA, October 6-8, 2005.
135. "UV-Mid-IR broadly tunable lasers for optical sensing", S.Mirov* talk presented during NIST site visit, UAB, Birmingham, October 7, 2005.
136. "Program: Center for Optical Sensors and Spectroscopies", C.Lawson* and S.Mirov* talk presented during NSF site visit (Dr.Farwell, Director of the NSF EPSCoR), UAB, Birmingham, October 17, 2005.
137. "3.9-4.5 μm gain-switched lasing of Fe:ZnSe at room temperature" S. B. Mirov*, V. V. Fedorov, J. Kernal, A. Gallian, V. V. Badikov, contributed talk presented at *Mid-Infrared Coherent Sources Conference*, Barcelona, Spain, November 6-11, 2005.
138. "Advances in Optically and Possibly Electrically Pumpable Transition Metal Doped II-VI Broadly Tunable Mid-IR Lasers", S.B.Mirov, **invited talk** presented to the *2nd Symposium on Infrared Materials and Technologies (DoD)*, November 21-22, The Pennsylvania State University, PA, 2005.
139. "Characterization of cobalt doped ZnSe and ZnS crystals as saturable absorbers for alexandrite lasers", R.A.Sims*, J.Kernal, V.V.Fedorov, S.B.Mirov, contributed talk presented to the Photonics West 2006, February 22-26, San Jose, CA, USA, 2006.
140. "Middle-infrared electroluminescence of n-type Cr-doped ZnSe crystals", L.Luke*, V.V.Fedorov, I.Moskalev, A.Gallian, S.B.Mirov, contributed talk presented to the Photonics West 2006, February 22-26, San Jose, CA, USA, 2006.
141. "3.9-4.8 μm gain-switched lasing of Fe-ZnSe at room temperature", J.Kernal, V.V.Fedorov*, A.Gallian, S.B.Mirov, contributed talk presented to the Photonics West 2006, February 22-26, San Jose, CA, USA, 2006.
142. "Mid-infrared Electroluminescence of Cr²⁺ Ions in ZnSe Crystals", V.V. Fedorov, I. Moskalev, L. Luke, A. Gallian*, S.B. Mirov, contributed talk presented to the *Advanced Solid-State Photonics Conference*, January 29-February 1, Lake Tahoe, Nevada, USA, 2006.
143. "Room Temperature 3.9-4.5 μm Gain-Switched Lasing of Fe:ZnSe", J. Kernal, V. Fedorov, A. Gallian, S. Mirov*, V. Badikov, contributed talk presented to the *Advanced Solid-State Photonics Conference*, January 29-February 1, Lake Tahoe, Nevada, USA, 2006.
144. "Efficient Ho:YAG Laser Resonantly Pumped by Tm-Fiber Laser", I. S. Moskalev, V.V. Fedorov*, S.B. Mirov, A.Babushkin, V.P.Gapontsev, D.V.Gapontsev, N.Platonov, contributed talk presented to the *Advanced Solid-State Photonics Conference*, January 29-February 1, Lake Tahoe, Nevada, USA, 2006.
145. "Stimulated Raman Scattering in the Mid IR Range 2.31-2.75-3.7 μm in a BaWO₄ Crystal under 1.9 and 1.56 μm Pumping", T. Basiev*, M. N. Basieva, M. E. Doroshenko, V. V. Fedorov, V. V. Osiko, S. B. Mirov, contributed talk presented to the *Advanced Solid-State Photonics Conference*, January 29-February 1, Lake Tahoe, Nevada, USA, 2006.
146. "Mid-IR lasers-four interrelated pieces of intellectual property", S.B.Mirov*, **invited talk** at the UABRF Venture Capital Forum, University of Alabama at Birmingham, Birmingham, March 14, 2006.
147. "Center for Optical Sensors and Spectroscopies", C.Lawson*, S. Mirov, contributed talk presented to the Alabama EPSCoR Annual Meeting, Tuskegee, March 28, 2006.
148. "Parametrically Amplified Room Temperature 4.4 μm Gain-Switched Fe:ZnSe Laser" A.Gallian*, I.S. Moskalev, V.V.Fedorov, S.B.Mirov, and K.L. Vodopyanov, contributed talk presented to the Conference on Lasers and Electrooptics, CLEO'06, Long Beach, CA, May 21-26, 2006.
149. "New regimes of excitation and Mid-IR lasing of transition metal doped II-VI crystals", S.B.Mirov*, **invited talk** presented to the Laser Optics Conference, June 26-30, St. Petersburg, Russia, June 2006.
150. "Optically and possibly electrically pumped Cr and Fe doped mid-IR chalcogenide lasers", S.B.Mirov*, **invited talk** presented to the Europhoton 2006, Pisa, Italy, September 10-15, 2006.
151. "Fiber-bulk hybrid systems for effective generation of 2-3 μm coherent radiation and their applications", S.B.Mirov*, I. Moskalev, V.Fedorov, A.Babushkin, N.Platonov, D.Gapontsev, V.Gapontsev, **invited talk** presented to the 2006 Advanced Laser Applications Conference, September 18-21, 2006, Novi, Michigan, USA.

152. "UAB Lasers", S.B.Mirov*, **invited talk** presented to the UAB Research Foundation Board of Directors, Birmingham, AL, September 27, 2006.
153. "En route to broadly tunable middle-infrared optically and electrically pumped Cr²⁺ and Fe²⁺ doped II-VI semiconductor lasers", S.B.Mirov*, **invited talk** presented to the Optoelectronic Industry Development Association (OIDA) Annual Forum, Washington, DC, December 6, 2006.
154. "Passive Q-Switching of Er:Cr:YSGG cavities with Fe:ZnSe/S crystals", S.B.Mirov*, **invited talk** presented to the leadership of Biolase Technologies, Inc, Irvine, CA, January 2, 2007.
155. "Optical nose: a novel mid-infrared laser system for ultrasensitive detection of biomarkers and early diagnosis and monitoring of diseases", talk presented to the students and faculty of the Biomedical Engineering Department, UAB, Birmingham, January 12, 2007.
156. "Fe:ZnSe passive q-switching of 2.8- μ m Er:Cr:YSGG laser Cavity", A. Gallian, A. Martinez*, P. Marine, V. Fedorov, S. Mirov, V. Badikov, D. Boutousov, and M. Andriasyan, contributed talk presented to Photonics West'07 - Solid State Lasers XVI: Technology and Devices, January 2007, San Jose, CA.
157. "Fe:ZnSe and ZnS polycrystalline passive Q-switching of 2.8 μ m Er:Cr:YSGG laser", A. Gallian, A. Martinez, P. Marine, V. Fedorov, S. Mirov*, V. Badikov, contributed talk presented to Advanced Solid State Photonics, February 2007, Vancouver, CA.
158. "Recent progress in transition metal doped II-VI mid-IR lasers", S.Mirov*, V.Fedorov, I.Moskalev, D.Martyshkin, contributed talk presented to SPIE Symposium on Defense & Security 2007 -Laser Source Technology for Defense and Security III, 9-13 April 2007, Orlando, Florida USA.
159. "High-power, single frequency tunable, CW, Er-fiber laser pumped Cr²⁺:ZnSe laser", I.S.Moskalev*, V.V.Fedorov, S.B.Mirov, contributed talk presented to SPIE Symposium on Defense & Security 2007 -Laser Source Technology for Defense and Security III, 9-13 April 2007, Orlando, Florida USA.
160. "CW single frequency tunable, CW multi-Watt polycrystalline, and CW Hor-Pressed ceramic Cr²⁺:ZnSe lasers", I.S.Moskalev*, V.V.Fedorov, S.B.Mirov, contributed talk presented to CLEO'07, Baltimore, MD, May 6-11, 2007.
161. "Mid-IR luminescence of nanocrystalline II-VI semiconductors doped with transition metal ions", C.Kim*, D.V.Martyshkin, V.V.Fedorov, S.B.Mirov, contributed talk presented to CLEO'07, Baltimore, MD, May 6-11, 2007. "Room temperature, mid-infrared Cr:ZnSe and Cr:ZnS random powder lasers", C. Kim*, D. V. Martyshkin, V. V. Fedorov, S.B. Mirov, contributed talk presented to Photonics West'08, San Jose, CA, January 19-24, 2008.
162. "Iron doped Cd_xMn_{1-x}Te crystals, a new gain media for mid-IR room temperature lasers", W. Mallory, Jr., V. V. Fedorov*, S. B. Mirov, U. Hömmerich, W. Palosz, and S. B. Trivedi, contributed talk presented to Photonics West'08, San Jose, CA, January 19-24, 2008.
163. "Mid-IR photoluminescence and lasing of chromium doped II-VI quantum dots", D. V. Martyshkin*, C. Kim, I. S. Moskalev, V. V. Fedorov, S. B. Mirov, contributed talk presented to Photonics West'08, San Jose, CA, January 19-24, 2008.
164. "Power scaling of CW Cr:ZnSe lasers", I. Moskalev, V. Fedorov, S. B. Mirov*, contributed talk presented to Photonics West'08, San Jose, CA, January 19-24, 2008.
165. "Single-Frequency, Widely-Tunable, and Multi-Watt Polycrystalline CW Cr²⁺:ZnSe Lasers", I. S. Moskalev, V. V. Fedorov and S. B. Mirov*, contributed talk presented to Advanced Solid State Photonics'08, Nara, Japan, January 27-30, 2008.
166. "New gain medium for Mid-IR room temperature lasers based on Fe doped CdMnTe crystals", W. Mallory, Jr., V. V. Fedorov, S. B. Mirov*, U. Hömmerich, W. Palosz, and S. B. Trivedi contributed talk presented to Advanced Solid State Photonics'08, Nara, Japan, January 27-30, 2008.
167. "Recent Advances in Cr²⁺ and Fe²⁺ Doped Mid-IR Laser Materials", S.Mirov* **invited talk** presented to Conference on Lasers and Electrooptics, CLEO'08, San Jose, CA, USA, May 4-9, 2008.
168. "Self-Starting Kerr-Mode-Locked Polycrystalline Cr²⁺:ZnSe Laser", Igor S. Moskalev*, Vladimir V. Fedorov, and Sergey B. Mirov, contributed talk presented to Conference on Lasers and Electrooptics, CLEO'08, San Jose, CA, USA, May 4-9, 2008.
169. "Room Temperature Mid-IR Cr²⁺:ZnSe Random powder laser", C. Kim*, D.V. Martyshkin, V.V. Fedorov, S.B. Mirov, contributed talk presented to Conference on Lasers and Electrooptics, CLEO'08, San Jose, CA, USA, May 4-9, 2008.

170. "Middle-IR Random lasing of Cr:ZnS nanocrystalline powder - from diffusion to photon localization regimes", D.V. Martyshkin*, C. Kim, I.S. Moskalev, V.V. Fedorov, S.B. Mirov, contributed talk presented to Conference on Lasers and Electrooptics, CLEO'08, San Jose, CA, USA, May 4-9, 2008.
171. "New frontiers of Cr²⁺ and Fe²⁺ Doped II-VI Mid-IR Lasers", S.Mirov*, **invited talk** presented to 21st Annual Solid State and Diode Laser Technology Review" Albuquerque, NM, USA June 2-5, 2008.
172. "Fiber-bulk-hybrid systems for effective mid-IR lasing", S.Mirov*, **invited talk** presented to 4th International Symposium on High Power Fibre Lasers and Their Applications, St Petersburg, Russia, June 24-26, 2008.
173. "New frontiers of middle-infrared lasers based on transition metal doped II-VI semiconductors, S. Mirov*, **invited talk** presented to 21st International Commission for Optics Congress, Sydney, Australia, July 7-10, 2008.
174. "Recent Advances in Cr²⁺ and Fe²⁺ doped ZnSe and ZnS mid-IR ceramic laser materials," S. Mirov*, **invited talk** presented to the 4th Laser Ceramic Symposium, Shanghai, China, November 10-14, 2008.
175. "Chromium doped ZnSe and ZnS gain media for optically and electrically pumped mid-IR lasers," C. Kim*, J. M. Peppers, D. V. Martyshkin, V. V. Fedorov, S.B. Mirov, contributed talk presented to Photonics West'09, San Jose, CA, January 24-29, 2009.
176. "10-Watt room-temperature Er-fiber-laser-pumped pure CW polycrystalline Cr:ZnS laser," I. S. Moskalev*, V. V. Fedorov, S. B. Mirov, contributed talk presented to Photonics West'09, San Jose, CA, January 24-29, 2009.
177. "12-Watt CW Polycrystalline Cr²⁺:ZnSe Laser Pumped by Tm-fiber Laser," I. S. Moskalev, V. V. Fedorov, S. B. Mirov P. A. Berry, K. L. Schepler, contributed talk presented to Advanced Solid State Photonics 2009, Denver, CO, February 1-4, 2009.
178. "RT Mid-IR random lasing of Cr²⁺ doped ZnS, ZnSe, CdSe powders, polymer liquid and polymer films", C. Kim, D.V. Martyshkin*, V.V. Fedorov, S.B. Mirov, contributed talk presented to Conference on Lasers and Electrooptics - CLEO'09, Baltimore, MD, May 31-June 5, 2009.
179. "High-Power, Widely-Tunable, Continuous-Wave Polycrystalline Cr²⁺:ZnS Laser," I.S. Moskalev*, V.V. Fedorov, and S.B. Mirov, contributed talk presented to Conference on Lasers and Electrooptics - CLEO'09, Baltimore, MD, May 31-June 5, 2009.
180. "Mid-IR Electroluminescence of Cr:ZnSe crystals co-doped with Donor and Acceptor impurities," C. Kim, J. Peppers, V.V. Fedorov*, S.B. Mirov, contributed talk presented to Conference on Lasers and Electrooptics - CLEO'09, Baltimore, MD, May 31-June 5, 2009.
181. "Progress in Cr²⁺:II-VI gain materials for high power and random mid-IR lasers," S.B. Mirov*, V.V. Fedorov, I.S. Moskalev, D. Martyshkin, C. Kim, **invited talk** presented to 3rd International Conference on Middle Infrared Coherent Sources – MICS'2009, Trouville, France, June 8-12, 2009.
182. "Recent progress in Cr²⁺ and Fe²⁺ doped ZnSe and ZnS mid-IR ceramic and powder laser materials", S.B.Mirov*, I.S. Moskalev, V.V. Fedorov, D. Martyshkin, N. Myong, M. Mirov, contributed talk presented to 5th Laser Ceramic Symposium, Bilbao, Spain, December 9-11, 2009.
183. "New Frontiers of middle-infrared lasers based on transition metal doped II-VI semiconductors", S. Mirov*, **invited talk** presented to the Physics Colloquium at ONERA (French analog of NASA), Paris, France, December 14, 2009.
184. "InP diode-pumped Cr:ZnS and Cr:ZnSe highly-efficient, widely-tunable, mid-IR lasers", I. S. Moskalev*, V. V. Fedorov, S. B.Mirov, contributed talk presented to Photonics West'10, San Francisco, CA, January 23-28, 2010.
185. "Cr-ZnSe passively Q-switched fiber-bulk Ho:YAG hybrid laser", Y. Terekhov*, I.S. Moskalev, D. Martyshkin, V.V. Fedorov, S.B. Mirov, contributed talk presented to Photonics West'10, San Francisco, CA, January 23-28, 2010.
186. "Optically dense Fe:ZnSe crystals for energy scaled gain switched lasing", N. Myoung*, V.V. Fedorov, S.B. Mirov contributed talk presented to Photonics West'10, San Francisco, CA, January 23-28, 2010.
187. "Ultrabroad continuous-wave tuning of ceramic Cr:ZnSe and Cr:ZnS lasers", E. Sorokin*, I.T. Sorokina, M.S. Mirov, V.V. Fedorov, I.S. Moskalev, S.B. Mirov, contributed talk presented to Advanced Solid State Photonics 2010, San Diego, CA, USA, January 31- February 3, 2010.
188. "Progress in Cr²⁺:II-VI Ceramic Lasers", S. Mirov*, I. Moskalev, V. Fedorov, D. Martyshkin, N. Myoung, M. Mirov, **invited talk** presented to Europhoton'10, Hamburg, Germany, August 29- September 3, 2010.
189. "Mid-IR Laser Oscillation In Cr:ZnSe Planar Waveguide Structures and in Cr:ZnSe/As₂S₃:As₂Se₃ Composite Materials", J. E. Williams, J. T. Goldstein, V.V. Fedorov, D. V. Martyshkin, R. P. Camata, and S. B. Mirov* contributed talk presented to 2010 Frontiers in Optics (FiO)/Laser Science XXVI (LS) Conference, October 24-28, 2010, Rochester Riverside Convention Center, Rochester, NY.

190. "Energy scaling of nanosecond gain-switched Cr²⁺:ZnSe lasers", V. V. Fedorov*, I. S. Moskalev, M. S. Mirov, S. B. Mirov, T. J. Wagner, M. J. Bohn, P. A. Berry, K. L. Schepler, contributed talk presented to Photonics West'11, San Francisco, CA, January 22-27, 2011.
191. "Mid-IR lasing of Cr:ZnSe/As₂S₃:As₂Se₃ composite materials", D. V. Martyshkin*, V.V. Fedorov, J.T. Goldstein, S.B. Mirov, contributed talk presented to Photonics West'11, San Francisco, CA, January 22-27, 2011.
192. "Cr:ZnSe planar waveguide mid-IR laser", J. E. Williams, D. V. Martyshkin, V. V. Fedorov, I. S. Moskalev, R. P. Camata, and S. B. Mirov*, contributed talk presented to Photonics West'11, San Francisco, CA, January 22-27, 2011.
193. "Energy scaling of room temperature Fe²⁺:ZnSe gain-switched 4.3 μm laser", N. Myoung*, D. V. Martyshkin, V. V. Fedorov, A. Martinez and S. B. Mirov, contributed talk presented to Photonics West'11, San Francisco, CA, January 22-27, 2011.
194. "Effects of γ-irradiation on optical, electrical, and laser characteristics of pure and transition metal doped II-VI semiconductors," T. Konak*, M. Tekavec, V. V. Fedorov, and S. B. Mirov, contributed talk presented to Photonics West'11, San Francisco, CA, January 22-27, 2011.
195. "A Minimally Invasive Multifunctional Nanoscale System for Selective Targeting, Imaging, and NIR Photothermal Therapy of Malignant Tumors", H. N. Green*, D. V. Martyshkin, E. L. Rosenthal, S. B. Mirov, contributed talk presented to Photonics West'11, San Francisco, CA, January 22-27, 2011.
196. "Progress in mid-IR Cr²⁺ and Fe²⁺ doped II-VI Materials and Lasers", S.B. Mirov*, V.V. Fedorov, I.S. Moskalev, D.V. Martyshkin, N. Myoung, R. Camata, J.E. Williams, M.S. Mirov, J.T. Goldstein, **invited talk** presented to Advanced Solid State Photonics 2011, Istanbul, Turkey, February 2011.
197. "Mid-Infrared lasers based on transition metal doped II-VI semiconductors", S. Mirov*, I. Moskalev, V. Fedorov, D. Martyshkin, M. Mirov, N. Myoung, **invited talk** presented to OASIS III conference, Tel Aviv, Israel, March 9-10, 2011.
198. "Progress in Mid-IR Cr²⁺ and Fe²⁺ doped II-VI materials and lasers", Sergey Mirov, **invited talk** presented to joint Seminar of Applied Physics and Engineering Departments, Tel-Aviv University, March 13, 2011.
199. "High-Energy Gain-Switched Mid-IR Lasers Based on Cr and Fe Doped ZnSe", NoSoung Myoung, Mikhail S. Mirov, Vladimir V. Fedorov*, Sergey B. Mirov, contributed talk presented to **CLEO'11: Laser Science to Photonic Applications**, CMY4 (oral), 1-6 May 2011 Baltimore, Maryland, USA.
200. "New Mid-IR Gain Media Based on Transition Metal Doped II-VI Ternary – Quaternary Compounds and Glassy Composites," Dmitry Martyshkin*, Jonathan Goldstein, Renato Camata, Vladimir V. Fedorov, Sergey B. Mirov, contributed talk presented to, **CLEO'11: Laser Science to Photonic Applications**, CTuE4 (oral), 1-6 May 2011 Baltimore, Maryland, USA.
201. "Active targeting, fluorescence imaging, and NIR photothermal therapy of malignant tumors," H.N. Green*, E.L. Rosenthal, C.M. Rodenburg, D.V. Martyshkin, S.B. Mirov, contributed talk presented to 3rd International Conference from nanoparticles & Nanomaterials to Nanodevices and Nanosystems, June 26-29, Crete island, Greece.
202. "Crystal Field Engineering Of Transition Metal Doped II-VI Ternary And Quaternary Semiconductors For Mid-IR Tunable Laser Applications", Dmitry V. Martyshkin*, Jonathan T. Goldstein, Renato P. Camata, Vladimir V. Fedorov, Sergey B. Mirov, contributed talk presented to **Int. Conf. on Luminescence & Optical Spectroscopy of Condensed Matter** (ICL'11), M4, June 27-July 1, Ann Arbor, Michigan, USA.
203. "Frontiers of mid-infrared lasers based on transition metal doped II–VI semiconductors" S. Mirov*, V. Fedorov, I. Moskalev, M. Mirov, D. Martyshkin, **invited talk** presented to **Int. Conf. on Luminescence & Optical Spectroscopy of Condensed Matter** (ICL'11), FRR1, June 27-July 1, Ann Arbor, Michigan, USA.
204. "Mid-IR lasing of iron–cobalt co-doped ZnS(Se) crystals via Co–Fe energy transfer", NoSoung Myoung, Dmitri V. Martyshkin, Vladimir V. Fedorov*, Sergey B. Mirov, contributed talk presented to **Int. Conf. on Luminescence & Optical Spectroscopy of Condensed Matter** (ICL'11), MH2, June 27-July 1, Ann Arbor, Michigan, USA.
205. "Mid-Infrared transition metal doped II-VI semiconductor lasers", Sergey Mirov*, contributed talk presented to 2011 Frontiers in Optics (FiO)/Laser Science XXVII (LS) Conference, October 16-20, 2011, Fairmont Hotel, San Jose, CA, USA.
206. "Mid-Infrared lasers based on transition metal doped II-VI ceramics", S. Mirov*, I. Moskalev, V. Fedorov, D. Martyshkin, M. Mirov, **invited talk** presented to 7th Laser Ceramic Symposium, November 14-17, 2011 Singapore.

207. "Biomedical applications of UAB lasers", S.B. Mirov, invited talk presented to 1st Annual BioAlabama Technology Conference, May 30, 2012, Southern Research Institute, Birmingham, AL, USA.
208. "Characterization of photorefractive materials based on LiF color center crystals for mid-IR volumetric Bragg gratings", Dmitri V. Martyshkin, Anton V. Fedorov, Anitha Arumugam, David J. Hilton, Vladimir V. Fedorov, and Sergey B. Mirov, contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), JTh2A.60, San Jose, CA, 10 June (2012).
209. "Photorefractive material for mid-IR applications based on LiF color center crystals", Anitha Arumugam, Anton V. Fedorov, Dmitri V. Martyshkin, Vladimir V. Fedorov, David J. Hilton, Sergey B. Mirov*, contributed talk presented to the Lasers, Sources, and Related Photonic Devices, Advances in Optical Materials – part of Lasers, Sources, and Related Photonic Devices Congress, San Jose, California, USA 29 January-3 February 2012.
210. "Iron Doped II-VI ternary and quaternary semiconductors for mid-IR laser applications", D.V. Martyshkin, V.V. Fedorov, S.B. Mirov*, contributed talk presented to the Lasers, Sources, and Related Photonic Devices, Advances in Optical Materials – part of Lasers, Sources, and Related Photonic Devices Congress, San Jose, California, USA 29 January-3 February 2012.
211. "Single-Frequency Passively Q-Switched Er:YAG Laser", Yu. Terekhov*, D. V. Martyshkin, V. V. Fedorov, I. Moskalev, S. B. Mirov contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), CTu2D.6, San Jose, CA, 8 June (2012).
212. "High Energy 4.1-4.6 μm Fe:ZnSe laser", V. V. Fedorov*, D. V. Martyshkin, M. Mirov, I. Moskalev, S. Vasilyev, Sergey B. Mirov, contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), CM3D.3, San Jose, CA, 7 June (2012).
213. "Photoluminescence in a Fe^{2+} Doped ZnSe Crystal Using Near Absorption Edge Quantum Cascade Laser Pumping", Yu Song*, Sergey B. Mirov, Claire Gmachl, Jacob B. Khurgin contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), 3CTu2D.3 CM3D.3, San Jose, CA, 8 June (2012).
214. "Progress in Cr^{2+} and Fe^{2+} doped II-VI mid-IR materials and lasers", S.B. Mirov*, V.V. Fedorov, D.V. Martyshkin, I.S. Moskalev, S. Vasilyev, M.S. Mirov, V.P. Gapontsev, contributed talk presented to the 6th International Symposium on High Power Fiber lasers and their Applications, St. Petersburg, Russia, June 25-28, 2012.
215. "Compact 1J mid-IR Cr:ZnSe Laser", V. Fedorov*, M. S. Mirov, S. Mirov, V. Gapontsev, A. V. Erofeev, M. Z. Smirnov, and G. B. Altshuler, contributed talk presented to the Frontiers in Optics Conference, OSA Technical Digest (online) (Optical Society of America), post-deadline paper FW6B.9. (2012).
216. "Nanostructured Cr^{2+} :ZnSe-based Thin Films for Mid-IR Laser Sources," P. J. Marino, T. Konak, Z. R. Lindsey, V.V. Fedorov, S.B. Mirov, R. P. Camata*, contributed talk presented to the 2012 Fall Meeting of the Materials Research Society, November 25-30, 2012, Boston, Massachusetts.
217. "Mid-Infrared lasers based on transition metal doped II-VI semiconductors", S. Mirov*, I. Moskalev, V. Fedorov, D. Martyshki1, M. Mirov, S. Vasilyev, **invited talk** presented to the USA-UK workshop in Mid-Infrared to Terahertz Technology and Applications, Edinburgh, United Kingdom, February 18-19, 2013.
218. "Recent Progress and Applications of Mid-Infrared Lasers Based on Transition Metal doped II-VI Semiconductors", S.B. Mirov*, contributed talk presented to CAS Interdisciplinary Innovation Forum, UAB, Birmingham, AL, May 14, 2013.
219. "Mid-Infrared lasers based on transition metal doped II-VI semiconductors", S.B. Mirov **invited talk** presented to BioAlabama Annual Meeting and Science Symposium, Doubtree Hotel, Birmingham, AL, May 16, 2013.
220. "Fe-doped II-VI Mid-Infrared Laser Materials for the 3 to 8 μm Region", V. V. Fedorov*, D. V. Martyshkin, M. S. Mirov, I. S. Moskalev, S. Vasilyev, J. Peppers, S. B. Mirov, V. P. Gapontsev, invited talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), San Jose, CA, June 11-13, 2013.
221. "Recent Advances in High Power, High Energy Tunable Cr:ZnS/Se Lasers", S. B. Mirov*, V. V. Fedorov, I. S. Moskalev, S. Vasilyev, D. V. Martyshkin, M. S. Mirov, V. P. Gapontsev, contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC) , San Jose, CA, June 11-13, 2013.
222. "Frontiers in Mid-Infrared Lasers Based on Transition Metal doped II-VI Semiconductors", S. Mirov*, I. Moskalev, V. Fedorov, D. Martyshkin, M. Mirov, S. Vasilyev, contributed talk presented to the International Conference on Lasers, Optics & Photonics, San Antonio, TX, USA, October 7-9, 2013.

223. "Recent Progress in Tunable Cr:ZnS/Se Lasers", S. B. Mirov*, V. V. Fedorov, I. S. Moskalev, S. Vasilyev, D. V. Martyshkin, M. S. Mirov, V. P. Gapontsev, contributed talk presented to the Advanced Solid State Laser Congress, ASSL'13, Paris, France, October 30-November 2, 2013.
224. "Fe-doped Binary and Ternary II-VI Mid-Infrared Laser Materials", V. V. Fedorov, D. V. Martyshkin, M. S. Mirov, I. S. Moskalev, S. Vasilyev, J. Peppers, V. P. Gapontsev, S. B. Mirov*, contributed talk presented to the Advanced Solid State Laser Congress, ASSL'13, Paris, France, October 30-November 2, 2013.
225. "Spectroscopy and mid-IR lasing of Cr²⁺ ions in ZnSe/ZnS crystals under visible excitation", J. M. Peppers*, T. Konak, D. V. Martyshkin, V. V. Fedorov, S. B. Mirov, contributed talk presented to Photonics West'14, San Francisco, CA, February 2-7, 2014.
226. "Spectroscopic characterization of Fe²⁺-doped II-VI ternary and quaternary mid-IR laser active powders", A. D. Martinez*, D. V. Martyshkin, V. V. Fedorov, S. B. Mirov, contributed talk presented to Photonics West'14, San Francisco, CA, February 2-7, 2014.
227. "Spectroscopic characterization and energy transfer process in cobalt and cobalt-iron co-doped ZnSe/ZnS crystals", J. M. Peppers*, D. V. Martyshkin, V. V. Fedorov, S. B. Mirov, contributed talk presented to Photonics West'14, San Francisco, CA, February 2-7, 2014.
228. "Recent progress in 1.9 – 6 μm mid-IR lasers based on Cr and Fe doped II-VI chalcogenides", S.B. Mirov*, V.V. Fedorov, D.V. Martyshkin, I.S. Moskalev, S. Vasilyev, M.S. Mirov, V.P. Gapontsev, contributed talk presented to the 7 th International Symposium on High Power Fiber lasers and their Applications, St. Petersburg, Russia, June 30-July 4, 2014.
229. "Mid-infrared lasers based on transition metal doped II-VI semiconductors", S.B. Mirov*, V.V. Fedorov, D.V. Martyshkin, I.S. Moskalev, S. Vasilyev, M.S. Mirov, V.P. Gapontsev, contributed talk presented to the International Conference on Lasers, Optics & Photonics, Philadelphia, PA, USA, September 8-10, 2014.
230. "Progress in Cr and Fe Doped ZnSe and ZnS Polycrystalline Materials and Lasers", S.B. Mirov*, V. Fedorov, D. Martyshkin, I. Moskalev, M. Mirov, V. Gapontsev, contributed talk presented to the Advanced Solid-State Lasers Conference, Shanghai, China, November 17-21, 2014.
231. "Mid-IR Lasing and Excitation of Cr²⁺ ions in II-VI Semiconductors via ionization transitions", J. Peppers*, V. Fedorov, S. B. Mirov, contributed talk presented to the Advanced Solid-State Lasers Conference, Shanghai, China, November 17-21, 2014.
232. "Gamma Radiation-Enhanced Thermal Diffusion of Transition Metal Ions into II-VI Semiconductor Crystals", A. Martinez*, L. Williams, V. Fedorov, S. B. Mirov, contributed talk presented to the Advanced Solid-State Lasers Conference, Shanghai, China, November 17-21, 2014.
233. "Spectroscopic characterization of Cr²⁺ ions in ZnSe/ZnS crystals under visible excitation", J. M. Peppers*, V. V. Fedorov, S. B. Mirov, contributed talk presented to Photonics West'15, San Francisco, CA, February 7-12, 2015.
234. "Radiation-Enhanced Thermal Diffusion of Transition Metal and Rare Earth Ions into II-VI Semiconductors", A. Martinez*, L. Williams, O. Gafarov, D. Martyshkin, V. Fedorov, S Mirov, contributed talk presented to Photonics West'15, San Francisco, CA, February 7-12, 2015.
235. "Mid-IR lasers based on transition and rare-earth ion doped crystal (Invited Paper)", S. B. Mirov*, V. V. Fedorov, D. V. Martyshkin, I. S. Moskalev, M. B. Mirov, S. Vasilyev, contributed talk presented to SPIE DSS, Micro- and Nanotechnology Sensors, Systems, and Applications, Baltimore, MD, 20-24 April 2015.
236. "High Average Power (35 W) Pulsed Fe:ZnSe laser tunable over 3.8-4.2 μm", D. V. Martyshkin, V. V. Fedorov, M. Mirov, I. Moskalev, S. Vasilyev, and S. B. Mirov*, contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), San Jose, CA, May 10-15, 2015.
237. "Spectroscopic characterization of Pr³⁺:ZnSe crystals fabricated via post growth thermal diffusion," A. Martinez*, O. Gafarov, D. Martyshkin, V. V. Fedorov, and S. B. Mirov contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), San Jose, CA, May 10-15, 2015.
238. "Mid-IR and Near-IR Photoluminescence of Fe²⁺ and Cr²⁺ Ions in ZnSe Excited via Ionization Transitions," J. Peppers*, V. V. Fedorov, and S. B. Mirov, contributed talk presented to the Conference on Lasers and Electro-Optics (CLEO)/The International Quantum Electronics Conference (IQEC), San Jose, CA, May 10-15, 2015.

239. "High Average Power Fe:ZnSe and Cr:ZnSe Mid-IR Solid State Lasers," S. B. Mirov*, V. Fedorov, D. Martyshkin, I. Moskalev, M. Mirov, and S. Vasilyev, contributed talk presented to the Advanced Solid-State Lasers Conference, Berlin, Germany, October 4-9, 2015.
240. "Cr and Fe doped II-VI mid-IR gain media. Fabrication challenges and practical applications in fiber-bulk mid-IR laser systems (invited)", S.B. Mirov*, V.V. Fedorov, D.V. Martyshkin, I.S. Moskalev, M.S. Mirov, A. Martinez, S. Vasilyev, **invited talk** presented to the 20th American Crystal Growth and Epitaxy conference (ACCGE-20), August 2015, Bug Sky, Montana, USA.
241. "Thermally-induced optical bistability and temperature broadening of spectroscopic bands in Cr:ZnSe and Fe:ZnSe mid-IR laser materials," Chandler Bernard*, Rick Watkins, Ozarfar Gafarov, Vladimir Fedorov, Sergey Mirov, contributed talk presented to the 82nd Annual Meeting of the Southeastern Section of the American Physical Society (SESAPS), Mobile, AL, November 18-21, 2015.
242. "Pulsed laser deposition of ZnS_xSe_{1-x} and its integration into multilayered Cr^{2+} :ZnSe structures for mid-IR electroluminescence," Z.R. Lindsey*, M.W. Rhoades, V.V. Fedorov, S.B. Mirov, R.P. Camata contributed talk presented to the 82nd Annual Meeting of the Southeastern Section of the American Physical Society (SESAPS), November 18 - 21, 2015, Mobile, Alabama.
243. "Carrier Concentration Control for n-Type Conductivity in Mid-Infrared Active Cr^{2+} :ZnSe Thin Film Structures," Matthew Rhoades*, Zachary Lindsey, Vladimir Fedorov, Sergey Mirov, Renato Camata, contributed talk presented to the 82nd Annual Meeting of the Southeastern Section of the American Physical Society (SESAPS), November 18 - 21, 2015, Mobile, Alabama.
244. "Mid-IR Gain Media Based on Transition Metal Doped II-VI Chalcogenides", S.B. Mirov*, V.V. Fedorov, D.V. Martyshkin, I.S. Moskalev, M.S. Mirov, O. Gafarov, A. Martinez, J. Peppers, V. Smolski, S. Vasilyev, and V. Gapontsev, **invited talk** presented at Photonics West 2016, Optical Components and Materials XIII conference, February 15, 2016, San Francisco, CA, USA.
245. "Mid-IR lasers based on Cr- and Fe-doped ZnSe and ZnS polycrystals," S.B. Mirov*, V.V. Fedorov, D.V. Martyshkin, I.S. Moskalev, M.S. Mirov, S. Vasilyev, V.P. Gapontsev," **invited talk** presented at Photonics West 2016 Novel In-Plane Semiconductor Lasers XV conference, February 16, 2016, San Francisco, CA, USA.
246. "Mid-IR Kerr-lens mode-locked polycrystalline Cr:ZnS and Cr:ZnSe lasers with intracavity frequency conversion via random quasi-phase-matching," Sergey Vasilyev*, Igor Moskalev, Mike Mirov, Sergey Mirov, Valentin Gapontsev, **invited talk** presented at Photonics West 2016, Nonlinear Frequency Generation and Conversion: Materials, Devices, and Applications XV conference, February 16, 2016, San Francisco, CA, USA.
247. "7 W Few-Cycle Mid-Infrared Laser Source at 79 MHz Repetition Rate," Sergey Vasilyev, Igor Moskalev, Mike Mirov, Sergey Mirov*, and Valentin Gapontsev, contributed talk presented at OSA High-Brightness Sources and Light-Driven Interactions Congress (EUV, HILAS, MICS): 2016, March 20-22, Long Beach, CA, USA.
248. "Mid-IR Kerr-lens mode-locked polycrystalline Cr^{2+} :ZnS lasers," Sergey Vasilyev, Igor Moskalev, Mike Mirov, Sergey Mirov*, Valentin Gapontsev," **invited talk** presented at Defense and Commercial Sensing, Ultrafast Bandgap Photonics Conference, April 17-21, 2016, Baltimore, MA, USA.
249. "Enhancement of Diffusion Length and Optical Quality of Cr^{2+} :ZnSe via Annealing in Vapors of Zn," Ozarfar Gafarov*, Alán Martinez, Vladimir Fedorov and Sergey Mirov, contributed talk presented at CLEO'16, June 5-10, 2016, San Jose, Ca, USA.
250. "Transitioning Cr^{2+} and Fe^{2+} Doped Zn Chalcogenide Laser Technology to Commercial Products – Lessons Learned," S.B. Mirov*, I.S. Moskalev, M.S. Mirov, S. Vasilyev, V.V. Fedorov, D.V. Martyshkin, V. Smolski, and V. Gapontsev, **invited talk** presented at CLEO'16, June 5-10, 2016, San Jose, Ca, USA.
251. "Subharmonic GaAs OPO pumped by a Cr:ZnS laser with an instantaneous bandwidth 3.6–5.6 μm ," V.O. Smolski*, S. Vasilyev, P.G. Schunemann, S.B. Mirov, K.L. Vodopyanov, **invited talk** presented at Laser Optics (LO), 2016 International Conference, 27 June-1 July, St. Petersburg, Russia 2016.
252. "New Ultrafast Laser Sources and Nonlinear Devices Based on TM:II-VI Semiconductors," Sergey Vasilyev*, Igor Moskalev, Mike Mirov, Viktor Smolski, Sergey Mirov, Valentin Gapontsev, contributed talk presented at 42nd European Conference on Optical Communication, ECOS 2016, 18-22 September 2016, Dusseldorf, Germany.
253. "Pulsed Laser Deposition of Relaxed ZnS_xSe_{1-x} Thin Films for Waveguiding Applications in Mid-IR Active Cr^{2+} :ZnSe Multilayered Structures," Z. R. Lindsey, M. Rhoades, V. V. Fedorov, S. B. Mirov*, and R. P. Camata, contributed talk presented at Advanced Solid State Laser Conference (ASSL'16) part of *Lasers Congress 2016* (ASSL, LSC, LAC), 30 October – 3 November 2016, The Westin Boston Waterfront, Boston, MA, USA.

254. "Kerr-Lens Mode-Locked Middle IR Polycrystalline Cr:ZnS Laser with a Repetition Rate 1.2 GHz," S. Vasilyev, I. Moskalev, M. Mirov, V. Smolski*, S. Mirov, and V. Gapontsev, contributed talk presented at Advanced Solid State Laser Conference (ASSL'16) part of *Lasers Congress 2016 (ASSL, LSC, LAC)*, 30 October – 3 November 2016, The Westin Boston Waterfront, Boston, MA, USA.
255. "Acousto-Optically Tuned CW Cr:ZnS Mid-IR Laser," D. V. Martyshkin, T. M. Kesterson*, V. Fedorov, and S. B. Mirov, contributed talk presented at Advanced Solid State Laser Conference (ASSL'16) part of *Lasers Congress 2016 (ASSL, LSC, LAC)*, 30 October – 3 November 2016, The Westin Boston Waterfront, Boston, MA, USA.
256. "Enhancement of Cr and Fe Diffusion in ZnSe/S Laser Crystals via Annealing in Vapors of Zn and Hot Isostatic Pressing," Ozarfar Gafarov*, Vladimir Fedorov and Sergey Mirov, contributed talk presented at Advanced Solid State Laser Conference (ASSL'16) part of *Lasers Congress 2016 (ASSL, LSC, LAC)*, 30 October – 3 November 2016, The Westin Boston Waterfront, Boston, MA, USA.
257. "Frontiers of Mid-IR lasers based on transition metal doped II-VI chalcogenide ceramics," S.B. Mirov*, I.S. Moskalev, S. Vasilyev, M.S. Mirov, V.V. Fedorov, D.V. Martyshkin, V. Smolski, V. Gapontsev, **keynote talk** presented at 12th Laser Ceramics Symposium, Saint Louis, France, 28 Nov-2nd Dec. 2016.
258. "Significance and control of microstructure in ceramic Cr:ZnSe and Cr:ZnS gain media for ultrafast Mid-IR lasers and nonlinear optical devices," Mike Mirov*, Sergey Vasilyev, Igor Moskalev, Sergey Mirov, Viktor Smolski, Andrey Zakrevskiy, Georgiy Tsoy, contributed talk presented at 12th Laser Ceramics Symposium, Saint Louis, France, 28 Nov-2nd Dec. 2016.

RESEARCH GRANTS OF SERGEY MIROV

UAB Research Proposals Written and Funded³

1. Co-PI (Chris Lawson is PI, David Shealy is Co-PI), "Alabama Laser Research Initiative", 7/94-7/96, NSF/EPSCoR grant OSR-9450570 for \$ 199,869 (with \$451,285 of UAB and commercial matching money, the total program value is \$651,196). Of the NSF funds **\$104,279** was available to Sergey Mirov's research program.
2. Co-PI (Chris Lawson is PI), "Acquisition of Alexandrite Laser for NLO Materials Research" 7/94-7/96, NSF Grant DMR-9404712 for \$ **169,167** (with \$95,000 of matching money, the total program value is \$264,167).
3. Co-PI, (Ken Pruitt, UAB is PI of the overall grant with numerous other co-PI's) "An Integrated Approach to Edit Value Reclamation of Solid Waste" 6/95-6/99 NSF/EPSCoR grant OSR-9550480 for \$4,500,000. UAB portion of the grant is \$281,060, or \$574,860 with UAB and industrial matching. Of the UAB funds **\$212,767** (\$484,967 with UAB and industrial matching) is for a task (Laser Atomic Fluorescence Spectroscopy of Heavy Metals in Water Samples) led by S. Mirov, and \$68,293 (\$89,893 with UAB matching) is for task led by Robert Pitt from Civil & Environmental Engineering.
4. Co-PI (Thomas Wdowiak is PI, David Agresti is Co-PI) "A Laser Raman Spectrometer System Suitable for Incorporation into Lander Spacecraft," 6/96-5/99, NASA/PIDDP grant for \$312,000. Of these funds **\$42,229** available to Sergey Mirov's research.
5. Task PI**, "Raman Characterization of the Quality of Protein Crystals" Task, \$ **147,827**, 9/95-8/96 Center for Macromolecular Crystallography UAB, Agreement 06.16.95.
6. Task leader for "Raman Spectroscopy of Protein Crystals" task for **\$331,471**, 11/96-10/97, part of \$5,633,848 NAGW-813 (Supplemental Space Station Grant), Larry DeLucas is PI of the overall grant and led the proposal (to which Dr. Mirov contributed).
7. Task leader "All Solid State Laser System Continuously Tunable Over 0.2-10 Micron Spectral Range" task for **\$20,000**, 5/97-8/98, part of \$60,000 SBIR/DoD/BMDO Phase I Grant # DASG60-97-M-0110, W-B.Yan (Light Age, Inc.) is PI of the overall grant (to which Dr. Mirov significantly contributed).
8. PI, "All Solid State Laser System Continuously Tunable Over 1.7-10 Micron Spectral Range", 4/97-9/97, Alabama Space Grant Consortium SUB90-204 for **\$10,000** (with \$22,909 of UAB and industrial matching money, the total program value is \$32,909).
9. PI, "Multiline or Superbroadband Semiconductor Transmitter for Optical Communication", 4/97-9/97, Laser & Photonics Research Center, UAB Grant for **\$8,000**.
10. PI, "Tunable Middle IR Laser Source Based on GaSe Crystal", 10/01/97-09/30/98, Faculty Development Grant, UAB for **\$10,000**.
11. Co-PI and task leader for "MicroRaman Imaging Spectroscopy of Protein Crystals" task for **\$117,048**, 11/25/97-10/31/98, part of \$6,894,141 Center for Macromolecular Crystallography NASA Grant, Larry DeLucas is PI of the overall grant and led the proposal (to which Dr. Mirov contributed).
12. PI, Multiline or Superbroadband Semiconductor Transmitter for Optical Communication", 4/01/98-03/31/99, Laser & Photonics Research Center, UAB, **\$15,000**.

³ Amount funded only lists the funds available to Sergey Mirov's research program. This does not include the total project costs, UAB and commercial matching. The amount funded includes indirect costs.

** The following programs are funded research tasks initiated and performed by Dr. Mirov under a large umbrella grant or contract. In each case Dr. Mirov wrote the task proposal (and directed the task research and expenditures) but did not initiate or contribute to the original proposal for the umbrella grant.

13. PI, "Raman Spectroscopy of Malignant Tumors", 04/01/98-05/30/99, Alabama Space Grant Consortium for **\$10,000** (with \$24,812 of UAB and industrial matching money, the total program value is \$34,812).
14. PI, "UAB-General Physics Institute Cooperation in Comprehensive Study of the Fast Relaxation Processes in Laser Materials" 05/01/98-04/30/01, NSF Grant ECS-9710428 for **\$40,000**.
15. PI, "Spectroscopic Study of I-III-VI₂ and II-III-VI₂ Chalcopyrite Crystals. Search for Potential Laser Materials for the 2-5 μm Spectral Range" 09/01/99-08/30/00, LPRC for **\$15,000**.
16. Co-PI, "Development of High Affinity Sensors for Biological Pathogenes" L.DeLucas (PI), S.Mirov (Co-PI), 10/01/99-09/30/01, NASA for **\$1,325,336**, Physics portion **\$244,528**
17. PI, "All Solid State Laser for Generating Deep Ultraviolet and Middle Infrared Coherent Light", 03/15/00-03/14/02, DoD/Light Age, Inc. for **\$228,322**.
18. PI, "Multiline Diode Transmitter for Telecommunication Applications", 09/01/00-08/30/02, Atlantic Vision, Inc. **\$513,963**.
19. Co-PI, "Development of a Multi-Purpose Laser Deposition Facility for Research and Education in Nanostructured Materials" R. Camata (PI) 09/01/01-18/30/03, NSF \$ **146,642**
20. PI, "Er fiber laser pumped microchip and external cavity Cr²⁺ doped ZnS and ZnSe mid-IR lasers", 05/01/02 – 04/30/03, **IPG Photonics – UABRF \$169,240**
21. PI, "Characterization of LB4 crystals" 03/19/02-07/31/02, **Mitsubishi Materials/ Q-Peak \$11,680**
22. PI, "Mid-IR laser transitions in crystals with short phonon spectra" 09/01/02-08/30/03. **NATO, \$9,000**
23. PI, "International cooperative study of multiphonon relaxation of mid-IR transitions in laser crystals with short phonon spectra", 09/01/02-08/30/05, **NSF/ECI \$84,808**.
24. PI, "EPR-Optical Characterization of LB4 crystals", 05/01/03-10/30/03 **Mitsubishi Materials/Q-Peak \$32,000**.
25. PI, "Multiphonon relaxation in fluoride laser crystals with low phonon spectra", 05/01/04-04/30/06, **US Civilian and Research Development Foundation (CRDF), \$67,000**.
26. PI, "6.45 μm ZnGeP₂ (ZGP) OPO with output energy up to 5 mJ pumped by D₂ (2nd Stokes) Raman shifted Nd:YAG laser" 09/01/04-02/28/05, **Light Age, Inc, \$23,896**.
27. PI, "Tm fiber laser cw-pumped, repetitively Q-switched Ho:YAG or YLF laser", 07/01/04-09/30/05, **IPG Photonics Corporation, \$93,352**.
28. PI, "En route to broadly tunable middle-infrared optically and electrically pumpable Cr²⁺ and Fe²⁺ doped II-VI semiconductor lasers" 03/01/05-02/28/08, **NSF/ECS/Electronics, Photonics, & Device Technol., \$210,000**.
29. Co-PI, "Center for Optical Sensors and Spectroscopies" 05/01/05- 04/30/08, **NSF/EPSCoR, \$2.25 M**. Of these funds **\$0.9M** available to Sergey Mirov's research.
30. PI, "Development of middle-infrared optical nose" 09/01/05-03/31/09, **NSF/Bioengineering and Environmental Systems, \$0.39M**.
31. PI, "Er-fiber laser cw-pumped, passively Q-switched Er:YAG laser" 05/15/06 to 11/01/07
IPG Photonics-UABRF Research Agreement, \$79,692
32. PI, "Fiber (Er)-bulk (Cr:ZnSe) mid-IR hybrid laser tunable over 2.3-2.8 μm spectral range with up to 1.5W output power", November 16, 2006-June 30, 2007, **Reliant Technologies-UABRF Sponsored Agreement, \$87,680**.
33. PI, "Material Studies in the Area of Infrared Laser Materials", November 15, 2007 – December 30, 2008, **Lockheed Martin-UAB Research Agreement, \$56,347**.

34. PI “Relief-Free Infrared Diffraction Optics Based on Semiconductor Materials” April 1, 2008- June 30, 2008. ANTEOS, Inc-UAB Research Agreement, **\$10,000**.
35. Co-PI, “Center for Optical Sensors and Spectroscopies” 09/01/08- 08/31/14, **NSF/EPSCoR, \$3.125M**. Of these funds **\$1.38 M** available to Sergey Mirov's research.
36. PI, “Nano-composite semiconductor lasers” 11/15/08-05/15/09, **Photonics Innovations, Inc/ARL-SBIR Phase I Subcontract, \$20,000**.
37. PI, “Development of high optical quality LiF:F₂⁻ gain elements” 05/01/09-04/30/11 **Kirtland AFB, \$150,000**.
38. PI, “New class of broadly tunable middle infrared electrically pumped solid state lasers”, 06/01/09-05/30/13, **NSF/ECCS, \$399,899**.
39. PI, “Investigation of Co, Ni, and Fe doped II-VI chalcogenides” 06/04/10-03/31/13, Kirtland AFB-UAB contract #FA9451-10-C-0254, **\$300,000**.
40. PI, “Workshop and Assessment of New Technologies for Rapid Detection of Infectious Diseases, 01/01/13-01/01/15, **NSF/ CBET-1321551, \$97,283**.
41. PI, "Transition Metal and Rare Earth Doped II-VI Chalcogenides for Optical and Electrically Pumped Broadly Tunable Lasers”, 09/30/13-09/29/18, grant # FA9550-13-1-0234, **AFOSR, \$1,158,000.00**.
42. PI, “Portable photoacoustic platform for glucose sensing”, 10/01/14-09/30/16, **NSF/CBET, \$299,942.00**.
43. PI, “Ultracompact Spectral Comb Source with Instantaneous Bandwidth of 3-10 μm for Massively Parallel Spectroscopic Sensing”, 09/22/15-09/22/18, **DARPA/University of Central Florida, \$793,672.00**.

RESEARCH FUNDING AT UAB (1994-2017)

\$9,199,744.00.

Photonics Innovations Research Proposals Written and Funded

1. Co-PI, “Nano-composite semiconductor lasers” **11/06/08-09/05/09, ARL/SBIR Phase I, \$69,795**.
2. PI, “High power broadly tunable middle-infrared laser sources”, **FY’09 Congressional plus-up Defense Appropriation Bill, \$2.4M**. Of this funds \$1.1M available for Photonics Innovations, Inc with subcontract to the UAB of ~\$329K; \$1.1M for Defense Contractor Onyx Optics, Inc, and \$0.2M for Wright Patterson AFRB.

RESEARCH FUNDING AT PHOTONICS INNOVATIONS, INC (2008-2009)

\$2,479,795