

# CURRICULUM VITAE

## PERSONAL DATA



Name: Nikolai Ivanov  
Date of Birth: 1954. 02. 07  
Sex : Male  
Scientific degree: PhD  
Position: professor assistance of Irkutsk National Research Technical University \ Institute of high technology ()

Address: Office: 83 Lermontova str., Irkutsk, 664074, Russia  
E-mail: [ivnik@istu.edu](mailto:ivnik@istu.edu)  
Tel/Fax +7-3952-405903

## .EDUCATION & EMPLOYMENT

1961 – 1971 High school  
1971 – 1976 Irkutsk State University \ Department of Physics (Student)  
1976 – 1977 Irkutsk State University\Experimental Physics (Head of experimental lab)  
1977 – 1979 Irkutsk State University\Applied Physics Institute (Research engineer)  
1977 – 1980 Irkutsk State University\ Postgraduate course (Postgraduate student)  
1980 – 1985 Irkutsk State University\ PhD research course (PhD thesis: "F-aggregate Color Centers in LiF and NaF Crystals and Parameters Optimization of Optical Laser Elements on the base on."  
1985 – 1991 Irkutsk State University\ Applied Physics Institute\ Researcher of Laboratory of Crystals Luminescence and Physics of Lasers Media (Researcher)  
1991 – 2005 Irkutsk State University\ Applied Physics Institute (Head of research group, Prof. Assistance of General Physics Department).  
2005-2008 Irkutsk State Technical University\ Physics-Technical Institute (Vice-Director)  
2008-2011 Irkutsk State Technical University\ Physics-Technical Institute (Head of department of laser physics and nanotechnology).  
2012-2017 Irkutsk National Research Technical University\ Physics-Technical Institute (Director)  
2017-2022 Irkutsk National Research Technical University \ Institute of high technology (professor assistance)

## PROJECTS

1976 – 1977 "Thermoluminescent stratification geological rocks"  
1977 – 1979 "Color centers luminescence in alkali halides crystals and tunable laser"  
1980 – 1985 " Passive Q-switch on the base color centers in alkali halides crystals"  
1985 – 1989 "Lasers on the base LiF and NaF crystals with transformation  $F, F_2 - F_2^+$  at flash lamp pumping"  
1990 – 1996 "Raman lasers with intracavity stimulated Raman scattering "  
1997 – 2002 "Polarization of luminescence in alkali halides crystals with color centers"  
2002 – 2004 "Solid state lasers for photodynamic therapy"  
2005 – 2012 "Optical properties of crystals and crystalline films with nanoparticles  
2009 – 2011 "Theoretical and practical foundations for the isolation and use of carbon nanoparticles from solid carbon-containing wastes of aluminum production"  
2010 – 2012 "Development of technology and creation of an integrated high-tech production of high-purity spherical quartz granules for the electronic component base of the Russian Federation"  
2010-2012 " Development of Algorithms for X-Ray Spectral Measurement of Wear Particle Parameters in an Oil Flow".  
2016 – 2018 "Development of an integrated resource-saving technology and organization of high-tech production of nanostructures based on carbon and silicon dioxide to improve the properties of building and structural materials".  
2018 – 2020 "Development and creation of a software and hardware microwave plasma complex for monitoring, control and safe operation of the oil system of ground and air engines".

## MAIN PUBLICATIONS

1. N.A.Ivanov, V.D.Lohnigin, G.I.Onishukov, A.A.Fomichev, V.M.Khulugurov, V.A.Chepurnoy. Generation on high concentration stable and unstable  $F_2^+$  centers in LiF at continues wave Nd:YAG laser excitation. J. of Tech. Phys. Letter. 1983, v.9, N6, p.321-324.
2. N.A.Ivanov, I.A.Parfianovich, V.M.Khulugurov, V.A.Chepurnoy. Nonlinear saturation filters on the base alkali halides crystals with color centers. Izvestia of Academy of Science USSR, Phys. 1982, v.46, N10, c.1985-1991.
3. I.A.Parfianovich, V.M.Khulugurov, N.A.Ivanov, U.M.Titov, V.A.Chepurnoy, O.P.Varnavski, V.P.Shevchenko, A.M.Leontovich, Color centers lasers in alkali halides crystals. Izvestia of Academy of Science USSR, Phys. 1981, v.45, p.309-314.
1. 4.V.M.Khulugurov, N.A.Ivanov, L.N.Sinitisa, V.I.Serdukov. SemiCW generation of  $F_2^+$  centers in LiF crystals. Optics and Spectroscopy, 1981, v.50, N4, p.801-802.
4. V.M.Khulugurov, N.A.Ivanov, B.D.Lobanov, V.M.Klimkin, L.V.Mosarnovski. Frequency lasers on the base LiF crystals pumped of vapor cooper laser. J. of Tech. Phys. Letter. 1981, v.51, N1, p.164-165.
5. N.A.Ivanov, I.A.Parfianovich, U.M.Titov, V.M.Khulugurov, V.A.Chepurnoy. Passive Q-switchers of laser resonators on the base LiF crystals with color centars. . J. of Tech. Phys. Letter. 1984, v.10, N7, p.425-429.
6. Z.G.Ahvlediany, N.A.Ivanov, A.A.Michalenko, V.M.Khulugurov, A.P.Shkadarevich. Generation on the base new color centers in LiF crystals at 0.64-0.72 mkm spectral range. . J. of Tech. Phys. Letter. 1985, v.11, N3, p.187-191.
7. N.A.Ivanov, D.V.Inshakov, I.A.Parfianovich, V.M.Khulugurov. Investigation of nonactive loses mechanism in LiF( $F_2^-$ ) crystals. Quantum electronics, 1986, v.13, N4, p.831-833.
8. V.A.Grigorov, N.A.Ivanov, D.V.Inshakov, E.F. V.M.Khulugurov. Peculiarities generation of LiF crystals  $F_3^+$  color centers laser. Optics and Spectroscopy, 1986, v.61, N5, p.1161-1163.
9. N.A.Ivanov, D.V.Inshakov, I.A.Parfianovich, V.M.Khulugurov. Lasers on the base LiF and NaF crystals with transformation  $F, F_2 - F_2^+$  at flash lamp pumping. . J. of Tech. Phys. Letter., 1991, v.12, N20, p.1250-1253.
10. N.A.Ivanov, V.D.Lohnigin, V.M.Khulugurov. Peculiarities of generation of active media on the base crystals with  $F_2^+$  like centers. Quantum electronics, 1986, N12, p.2491-2496.
11. N.A.Ivanov, E.D.Isyanova, F.V.Karpushko, B.D.Lobanov, N.T.Maximova, A.M.Provorov, N.A.Saskevich, V.M.Khulugurov, A.G.Shneider, A.S.Yasukevich. Lamp pumping laser on the base
12. N.A.Ivanov, D.V.Inshakov, V.M.Khulugurov. IR luminescence irradiated LiF crystals with oxygen containing impurities. J. Applied Spectroscopy, 1987, v.46, p.136-138.
2. N.A.Ivanov, D.V.Inshakov, A.A.Fomichev, V.M.Khulugurov, B.P.Chernyago. About nature of losses at generation on  $F_2^+$  centers in LiF crystals. J. Applied Spectroscopy, 1987, v.46, p.207-211.
13. N.V.Volkova, N.A.Ivanov, D.V.Inshakov, S.P.Kuznetsov, V.M.Khulugurov. Laser on the base  $F_2^+$  color centers in NaF crystals at flash lamp pumping. Optics and Spectroscopy, 1987, v.63, N6, p.455-456.14.
- N.A.Ivanov, D.V.Inshakov, V.M.Khulugurov. Photothermal transformation of color centers in LiF crystals. Optics and Spectroscopy, 1989, v.66, N3, p.716-718.
14. N.A.Ivanov, D.V.Inshakov, V.E.Mnuskin, A.N.Tokoreva, B.F.Trinchuk, V.M.Khulugurov. About possibility of radiation spectral region spread in LKI-301-1 laser with coherent pumping. J. Applied Spectroscopy, 1989, v.51, p.319-320.
15. V.Khulugurov, N.Ivanov, D.Inshakov, E.Oleynikov and other. Amplification in the LiF:  $F_2^-$  crystal under SRS in the Ba(NO<sub>3</sub>)<sub>2</sub> crystal. Quantum electronics, 1992, v.19, N2, p.162-163.
16. V.Khulugurov, N.Ivanov, E.Oleynikov. Nanosecond lasers based on SRS with resonant excitation. Proceeding SPIE, Vol. 2095 Laser Physics, pp. 188-192, June 1993.
17. V.Khulugurov, N.Ivanov, D.Inshakov, E.Oleynikov. Raman laser with intracavity SRS and radiation amplification by  $F_2^-$  -centers in fluoride lithium crystals. Quantum electronics, 1993, v.20, N6, p.567-568.
18. N.A.Ivanov, E.E.Penzina, S.Zilov. Peculiarities of polarisation of colour centre red emission in heavy  $\gamma$ -irradiation LiF:Mg crystals. Phys. stat.sol. 1999. v.213. N1. p.197-202.
19. Khulugurov V., Ivanov N. Tunable and Raman lasers and their application // Proc.of Int. Simposium for the future information and communication, 2000, Taegu, South Korea, p.157-170.
20. S.A.Zilov, N.A.Ivanov, E.E.Penzina. Mechanism of depolarization of color centers luminescence with 670 nm luminescence band in gamma-irradiated LiF:Mg crystals. . Optics and Spectroscopy, 2002, v.92, N1, p.69-72
21. V. Khulugurov, N.A.Ivanov, B.C. Kim, A. Mayorov, D. Bordzilovsky, V. Masycheva, E. Danilenko, M.K. Chung. All solid state lasers for photodynamic therapy of the malignant neoplasm. Proc. SPIE 4615-33, 2002.
22. N.A.Ivanov, V.L.Paperny, A.E.Rzhechitsky, D.V.Inshakov, C.B.Kim, M.B.Kim, A.P.Lopatin Metallic nanoparticles in LiF crystals. Izvestia vuzov.. Fizika. 2006, №4, c.57-60.
23. N. Ivanov, V. Paperny, A. Rzhechitsky, A. Lopatin, B. Kim Chul, B. Kim Mun. Fabrication of a new type of optical medium with metallic nanolayers by ion implantation technique and vacuum evaporation // Surface & Coatings Technology, 201 (2007), p. 8263-8266.

24. N. Ivanov, V. Paperny, A. Rzhchitsky, A. Lopatin, B. Kim Chul, B. Kim Mun. Optical Properties of Alkali Halides Crystals with Metallic Nanoparticles // *Nanoscience and nanotechnology. Физика. Известия высших учебных заведения*, 2006, с. 538-542.
25. A.D. Afanasiev, N.A.Ivanov, A.E. Rzhchitsky, V.V.Kondratjev. Carbon nanoparticles in products of alumina industry and it's modified properties. *Vestnik of Irkutsk State Technical University*, 2009, N4, p. 96-98.
26. V.V.Kondratjev, N.A.Ivanov, A.E. Rzhchitsky, I.A.Sysoev. Promising application of nanotechnology and nanomaterials in the mining and metal-lurgical industry. *Vestnik of Irkutsk State Technical University*, 2010, N1, p. 169-174.
27. N. A. Ivanov\*, S. S. Kolesnikov, V. L. Paperny, Yu. N. Osin, and A. L. Stepanov. Synthesis and Nonlinear Optical Properties of LiF Films Containing Gold Nanoparticles. *Technical Physics Letters*, 2011, Vol. 37, No. 10, pp. 939–941.
28. Yury Pozhidaev, Oksana Lebedeva, Evgenya Sipkina, Alexandra Chesnokova and Nikolay Ivanov. Synthesis and Properties of Hybrid Materials for Ion-Exchange and complexing Membranes *Advanced Materials Research Vol. 749 (2013) pp. 283-288.*
29. Yury Pozhidaeva, Oksana Lebedevab, Evgenya Sipkinac, Alexandra Chesnokovad and Nikolay Ivanov. Copolymers and Proton Conducting Films Based on N-Vinylpyrazole. *Advanced Materials Research Vol. 749 (2013) pp 71-76.*
30. IGOR K. PETRUSHENKO AND NIKOLAY A. IVANOV. DFT Study of the Structural and Mechanical Properties of oxydated Single-walled Carbon Nanotubes. *Fullerenes, Nanotubes, and Carbon Nanostructures*, 2014, v.22, p.405–412. DOI: 10.1080/1536383X.2012.684181.
31. N. V. Kurbatova, M. F. Galyautdinov, N. A. Ivanov, S. S. Kolesnikov. Raman Spectroscopy of Gold Nanoparticles in Polycrystalline LiF Film. *Physics of the Solid State*, 2013, Vol. 55, No. 9, pp. 1899–1902.
32. V. L. Papernyic, Yu. N. Osind, and A. L. Stepanov3. N.L. Lazareva, V.P. Dresvyanskii, A.L. Rakevich, V.L. Papernyi, O.I. Shipilova, S.S. Kolesnikov, N.V. Astrakhantsev, N.A. Ivanov, E.F. Martynovich. Transformation of the Microstructure and Luminescence Characteristics of LiF Films during Annealing. *Physics of the Solid State*, 2016, Vol. 58, No. 9, pp. 1772–1776. DOI: 10.1134/S1063783416090213.
33. Alexandra N. Chesnokova, Oksana V. Lebedeva, Yury N. Pozhidaev, Nikolay A. Ivanov, Alexander E. Rzhchitskii. Synthesis and Properties of Composite Membranes for Polymer Electrolyte Membrane Fuel Cells. *Advanced Materials Research*, 2014, Vols. 884-885, pp. 251-256. doi:10.4028/www.scientific.net/AMR.884-885.251.
34. Yury Pozhidaev, Oksana Lebedeva, Evgenya Sipkina, Alexandra Chesnokova and Nikolay Ivanov. Synthesis and Properties of Hybrid Materials for Ion-Exchange and Complexing Membranes. *Advanced Materials Research*, 2013, Vol. 749, pp 283-288. doi:10.4028/www.scientific.net/AMR.749.283.
35. N. A. Ivanov, A. E. Balanovskiy, Yu. D. Kalashnikov, V. V. Ryazantsev, and A. C. Skripnichenko. Experimental Investigation of High Temperature Cleaning of Admixture Elements from Granulated Quartz. *High Temperature*, 2016, Vol. 54, No. 2, pp. 290–294. DOI: 10.1134/S0018151X16020061.
36. . Lyubov I. Bryukvina, Nikolay A. Ivanov. Fermi resonance of molecular complexes with strong hydrogen bond in irradiated LiF:OH crystals. *Journal of Fluorine Chemistry*, 2016, V. 192, p.124–130. <http://dx.doi.org/10.1016/j.jfluchem.2016.11.003>.
37. N.V. Shipitsin, A.I. Krivoshein, N.A. Ivanov, I.K. Petrushenko, A.E. Rzhchitskii. Thermally induced diffusion of F<sup>2+</sup> color centers in lithium fluoride crystals. *Journal of Luminescence*, 2017, V. 192, pp. 283–287. <http://dx.doi.org/10.1016/j.jlumin.2017.06.065>.
38. Ya.V. Suvorkin, L.I. Shchepina, I.Ya. Shchepin, V.L. Paperny, N.A. Ivanov, S.S. Kolesnikov. Studying the Quantum Size Effect in LiF-Based Thin Films with Ag and Cu Nanoclusters. *Bulletin of the Russian Academy of Sciences: Physics*, 2017, Vol. 81, No. 9, pp. 1048–1051. DOI: 10.3103/S1062873817090258.
39. V. V. Kondrat'ev, V. A. Ershov, S. G. Shakhrai, N. A. Ivanov, and A. I. Karlina. Formation and utilization of nanostructures based on carbon during primary aluminum production. *Metallurgist*, 2016, Vol. 60, Nos. 7–8, pp.877-882. DOI 10.1007/s11015-016-0380-x.
40. . V G Drovok, V V Drovok, N A Ivanov, V V Myrishenko, Y D Skudaeв and A Y Hodunaev. Development of microwave plasma method for measurement of wear particle parameters in lubricant oil samples from aircraft gas turbine engines. *IOP Conf. Series: Materials Science and Engineering 560 (2019) 012059 IOP Publishing doi:10.1088/1757-899X/560/1/0120592.*
41. V G Drovok, V V Drovok, N A Ivanov, V V Myrishenko, Y D Skudaeв and A Y Hodunaev. Technical state evaluation of oil-lubricated parts and units of aircraft gas turbine engines using microwave plasma method. *IOP Conf. Series: Materials Science and Engineering 560 (2019) 012058. doi:10.1088/1757-899X/560/1/012058.*
42. A I Karlina, V V Kondrat'ev, A D Kolosov, A E Balanovskiy and N A Ivanov. Production of new nanostructures for modification of steels and cast irons. *IOP Conf. Series: Materials Science and Engineering 560 (2019) 012183. doi:10.1088/1757-899X/560/1/012183.*
43. B. G. Sukhov, N. M. Gogoleva, A. N. Chesnokova, S. D. Maksimenko, N. A. Ivanov, V. L. Paperny, S. F. Malysheva, N. A. Belogorlova, V. A. Kuimov, Yu. I. Litvintsev, and T. V. Kon'kova. Electroconducting properties infusion for dielectric track membrane by means novel phosphorus-containing proton-

- conducting ionic liquids impregnation. AIP Conference Proceedings 2069, 040003 (2019); <https://doi.org/10.1063/1.5089846>.
44. L. I. Bryukvina, N. A. Ivanov, and D. S. Glazunov. The role of impurity magnesium complexes in formation efficiency of F<sup>2+</sup> laser color centers in LiF crystals. AIP Conference Proceedings 2392, 020002 (2021); <https://doi.org/10.1063/5.006199320>.
  45. L. I. Shchepina, R. Yu. Shendrik, T. S. Lasareva<sup>1</sup>, and N. A. Ivanov. Electron-phonon interaction of color centers in MgF<sub>2</sub> and LiF-O,OH crystals. AIP Conference Proceedings 2392, 040003 (2021); <https://doi.org/10.1063/5.0061805>.
  46. L. I. Bryukvina, N. A. Ivanov and D. S. Glazunov. Stabilization of U1-Centers and Laser Color Centers in LiF:OH Crystals. AIP Conference Proceedings 2069, 020008 (2019); <https://doi.org/10.1063/1.5089836>.
  47. N. A. Ivanov, S. A. Nebogin, S. S. Kolesnikov, and L. I. Bryukvina. Structure and Mechanisms of Formation of Nanosized Films of Impurity Metal of Cobalt and Nickel in Single Crystals of LiF and MgF<sub>2</sub>. Physics of the Solid State, 2021, Vol. 63, No. 9, pp. 1387–1396. DOI: 10.1134/S1063783421090134.
  48. Petrushenko, I.K.; Ivanov, N.A.; Petrushenko, K.B. Theoretical Investigation of Carbon Dioxide Adsorption on Li<sup>+</sup>-Decorated Nanoflakes. Molecules 2021, 26, 7688. <https://doi.org/10.3390/molecules26247688>.

#### **PRESENTATION (Poster or Oral)**

35 presentations on International and Russian Conferences.

#### **PATENTS**

38 patents of Russian Federation and 1 USA patent and 1 Germany patent

#### **RESEARCH INTERESTS**

1. Laser Physics.
2. Solid State Physics (Radiation Effects).
3. Tunable Solid State Lasers.
4. Medical laser systems.
5. Nanotechnology