

CURRICULUM VITAE

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Science Department

Grayson College

6101 Grayson Drive, Denison, TX 75020, USA

Education:

1995-1999: **PhD., Physics and Mathematical Sciences.** Voronezh State University, Russia

1989-1995: **M.S., Physics.** Voronezh State University, Russia

Professional Appointments:

August 2023 – present

Professor of Physics

Science Department

Grayson College, USA

September 2019 - August 2022

Associate Professor

Dept. of Optics and Spectroscopy

Voronezh State University, Russia

September 2018 - December 2019

Senior Research Fellow

Dept. of Materials Science and Nanosystems Technologies

Voronezh State University, Russia

September 2015 - August 2018

Lecturer

Dept. of Physics and Astronomy

The University of Texas Rio Grande Valley, USA

February 2015 – August 2015

Postdoctoral Research Associate

Center for Gravitational Wave Astronomy

The University of Texas at Brownsville, USA

September 2012 – April 2014

Associate Professor

Physics Dept.

Voronezh Institute of Fire Fighting Service of Russian Emercom, Russia

September 2002 – August 2012

Associate Professor

Physics Dept.

Voronezh State University of Architecture and Civil Engineering, Russia

September 1999 - August 2002

Lecturer

Mathematics Dept.

Voronezh State Technological Academy, Russia

Teaching Experience:

2022-present **Grayson College, USA**

Courses: *University Physics I and II* (Lectures, Lab sections); *College Physics I and II* (Lectures, Lab sections); *Stars and Galaxies* (Lectures, Lab sections); *Solar System* (Lectures, Lab sections); *Physical Science* (Lectures, Lab sections – **online courses**);

2019-2022 **Voronezh State University, Russia**

Courses: *Introduction to Acoustooptics* (Lectures: traditional and **online courses**; Lab sections), *Introduction to fiber optics* (Lectures: traditional and **online courses**; Lab sections), *Acoustooptic materials* (Lectures: traditional and **online courses**); *Introduction to Optoelectronics* (Lectures: traditional and **online courses**).

2015-2018 **The University of Texas Rio Grande Valley (UTRGV), USA**

Courses: *General Physics I and II* (Lectures: traditional and **online courses**; Lab sections) *Physics for Scientists and Engineers I and II* (Lectures: traditional and **online courses**; Lab sections) *Nuclear and Particle Physics* (Lectures) *Physical Science I and II* (Lectures) *Introduction to Astronomy I and II* (Lectures, Lab sections)

2012-2014 **Voronezh Institute of Fire Fighting Service of Russian Emercom, Russia**

Courses: *General Physics I*: Mechanics, Thermodynamics, Electricity; *General Physics II*: Magnetism, Oscillations and Waves, Optics, Particle Physics; (Lectures, lab sections, tutorials) *Hydraulics* (Lectures, lab sections, tutorials)
Average class size: Lectures – 70 students, lab sections - 25 students

2002-2012 **Voronezh State University of Architecture and Civil Engineering, Russia**

Courses: *General Physics I*: Mechanics, Thermodynamics, Electricity; *General Physics II*: Magnetism, Oscillations and Waves; *General Physics III*: Optics, Quantum Theory, Particle Physics; *Building Physics* (Lectures, lab sections, tutorials)
Average class size: Lectures – 100 students, lab sections - 25 students

1999-2002 **Voronezh State Technological Academy, Russia**

Courses: *Algebra, Analysis, Probability Theory and Statistics* (Lectures, tutorial).
Average class size: 20 students

Supervision:

Thesis supervised: 6 M.S. students

Grants/Fellowships:

As Senior Investigator:

- 2018-2021. Grant of the Russian Foundation for Basic Research 18-29-11062 “Synthesis of lithium niobate thin films for elemental basis of opto- acouso- and microelectronic devices”
- 2009-2011. Grant of the Russian Foundation for Basic Research 09-03-00189-a “Synthesis, structure and properties of the condensed lithium niobate thin films”

Professional activities:

Referee/Reviewer:

Based on the Publons Rankings:

96th percentile of reviewers in Materials Science (all) on Publons up until February 2023.

Journals:

- *ACS Applied Materials & Interfaces*
- *Crystal Growth & Design*
- *Remote Sensing*
- *Ceramics International*
- *Materials Science in Semiconductor Processing*
- *Sensors*
- *Materials*
- *Journal of Materials Science: Materials in Electronics*
- *Crystals*
- *Thin Solid Films*
- *Surface and Interface Analysis*
- *Optik - International Journal for Light and Electron Optics*
- *Plasma Science and Technology*
- *International Journal of Materials and Product Technology*
- *The Journal of Physical Chemistry*
- *The Journal of Alloys and Compounds*
- *Surfaces and Interfaces*
- *The Journal of Materiomics*

For more information see: <https://www.webofscience.com/wos/author/record/608144>

Editorial Advisory Board Member: *Cambridge Scholars Publishing*

Editorial Board Member: Journals: *Recent Patents on Materials Science, Current Materials Science*

Departmental service:

2018: a member of the Three-Year Lecturer Search Committee (Dept. of Physics and Astronomy, UTRGV).

2018: a member of the Lab Revising Committee (Dept. of Physics and Astronomy, UTRGV).

Publications:

Books

1. M. Sumets, *Lithium Niobate-Based Heterostructures: Synthesis, properties and electron phenomena* (Second Edition), IOP Publishing Ltd, Bristol, UK, 2024. <https://doi.org/10.1088/978-0-7503-6305-1>
2. M. Sumets, *Lithium Niobate-Based Heterostructures: Synthesis, properties and electron phenomena*, IOP Publishing Ltd, Bristol, UK, 2018. <https://doi.org/10.1088/978-0-7503-1729-0>

(Included in the **British Library Cataloging-in-Publication Data** and distributed to the most respectful University Libraries through the WorldCat platform)

Refereed Journal Publications

1. M. Sumets, V. Ievlev, V. Dybov, D. Serikov, E. Belonogov, A. Grebennikov, Transport properties and crystallization of Li–Nb–O system on silicon, *Mater. Sci. Semicond. Process.* **142** (2022) 106519. <https://doi.org/10.1016/J.MSSP.2022.106519>.
2. M. Sumets, E. Belonogov, V. Dybov, D. Serikov, S. Kannykin, A. Kostyuchenko, and V. Ievlev, Pulsed photon treatment effect on the optical bandgap of LiNbO₃ films grown by radio-frequency magnetron sputtering method, *J. Mater. Sci. Mater. Electron.* **32**, 4290 (2021). doi:10.1007/s10854-020-05172-y
3. M. Sumets, E. Belonogov, V. Ievlev, V. Dybov, D. Serikov, A. Polovinkin, A. Grebennikov, Synthesis and properties of NiSi₂–LiNbO₃ heterostructures fabricated by radio-frequency magnetron sputtering, *Surfaces and Interfaces.* **21** (2020) 100797. doi:10.1016/j.surf.2020.100797.
4. A.P. Turygin, A.S. Abramov, D.O. Alikin, M.P. Sumets, V.A. Dybov, A. V. Kostyuchenko, E.K. Belonogov, V.M. Ievlev, V. Ya. Shur, The domain structure and local switching of LiNbO₃ thin films deposited on Si(001) by radio-frequency magnetron sputtering, *Ferroelectrics.* **560** (2020) 86–94. doi:10.1080/00150193.2020.1722888.
5. M. Sumets, V. Dybov, D. Serikov, E. Belonogov, P. Seredin, D. Goloshchapov, A. Grebennikov, V. Ievlev, Effect of reactive gas composition on properties of Si/LiNbO₃ heterojunctions grown by radio frequency magnetron sputtering method, *J. Sci. Adv. Mater. Devices.* (2020). doi:10.1016/j.jsamd.2020.08.004.
6. V. Dybov, D. Serikov, G. Ryzhkova, and M. Sumets, Early stages of lithium niobate films growth fabricated by radio-frequency magnetron sputtering on crystalline (001)Si and amorphous carbon substrates, *Surfaces and Interfaces* **19**, 100530 (2020).
7. M. Sumets, V. Ievlev, E. Belonogov, V. Dybov, D. Serikov, G. Kotov, A. Turygin, Oxide Charge Evolution under Crystallization of Amorphous Li–Nb–O Films, *J. Sci. Adv. Mater. Devices.* (2020). doi:10.1016/j.jsamd.2020.02.006.
8. M.N. Volochaev, A.B. Granovsky, O.V. Zhilova, Y.E. Kalinin, V.V. Ryl'kov, M.P. Sumets, V.A. Makagonov, S.Y. Pankov, A.V. Sitnikov, E. Fadeev, E. Lahderanta, V.A. Foshin, Transport and magnetic phenomena in ZnO–C thin-film heterostructures, *Superlattices Microstruct.* **140** (2020) 106449. doi:10.1016/j.spmi.2020.106449.
9. H.T. Nguyen, A.S. Sidorkin, S.D. Milovidova, M. Sumets, Dielectric properties of ferroelectric nanocomposites of nanocrystalline cellulose and sodium nitrite, *Appl. Nanosci.* **10** (2020) 499–506. doi:10.1007/s13204-019-01131-0.
10. E. Belonogov, V. Dybov, A. Kostyuchenko, S. Kushev, D. Serikov, S. Soldatenko, and M. Sumets, *Lett. Mater.* **10**, 189 (2020).

11. E. Belonogov, A. Grebennikov, V. Dybov, S. Kannykin, A. Kostyuchenko, S. Kushev, D. Serikov, S. Soldatenko, M. Sumets, Photon treatment effect on the surface and figure of merit of thermoelectric material $\text{Bi}_2\text{Te}_3\text{-xSex}$, *Mater. Renew. Sustain. Energy*. **9** (2020) 1–7. doi:10.1007/s40243-019-0162-z.
12. M. Sumets, E. Belonogov, V. Dybov, D. Serikov, A. Kostyuchenko, V. Ievlev, G. Kotov, Effective Charge in LiNbO_3 Films Fabricated by Radio-Frequency Magnetron Sputtering Method, *Phys. Solid State* **61** (2019) 2367–2370. doi: 10.1134/S1063783419120552
13. V.M. Ievlev, E.K. Belonogov, V.A. Dybov, S. V. Kannykin, D. V. Serikov, A. V. Sitnikov, M.P. Sumets, Synthesis of Lithium Niobate during Crystallization of Amorphous Li-Nb-O Film, *Inorg. Mater.* **55** (2019) 1237–1241. doi:10.1134/S0020168519120069.
14. M. Sumets, V. Ievlev, V. Dybov, A. Kostyuchenko, D. Serikov, S. Kannykin, E. Belonogov, Synthesis and properties of multifunctional Si-LiNbO_3 heterostructures for non-volatile memory units, *J. Mater. Sci. Mater. Electron.* **30** (2019) 16562–16570. doi:10.1007/s10854-019-02033-1.
15. M. Sumets, V. Ievlev, V. Dybov, A. Kostyuchenko, D. Serikov, S. Kannykin, G. Kotov, E. Belonogov, Electrical properties of amorphous films and crystallization of Li-Nb-O system on silicon, *J. Mater. Sci. Mater. Electron.* **30** (2019) 15662–15669. doi:10.1007/s10854-019-01948-z.
16. V.O. Kuzmina, A.A. Sinelnikov, S.A. Soldatenko, M. Sumets, Activation energy of subgrain growth process and morphology evolution in $\beta\text{-SiC/Si(111)}$ heterostructures synthesized by pulse photon treatment method in a methane atmosphere, *J. Mater. Sci. Mater. Electron.* **29** (2018) 20097–20103.
17. G.C. Dannangoda, C. Key, M. Sumets, K.S. Martirosyan, Transition of p-to n-Type Conductivity in Mechanically Activated Bismuth Telluride *J. Electron. Mater.* **47**, (2018) 5800-5809.
18. M. Sumets, V. Ievlev, A. Kostyuchenko, V. Dybov, G. Kotov, and A. Sidorkin, Charge phenomena at the Si/LiNbO_3 heterointerface after thermal annealing, *Ceram. Int.* **44**, (2018) 15058-15064
19. M. Sumets, V. Dybov, V. Ievlev, LiNbO_3 films: Potential application, synthesis techniques, structure, properties, *Inorg. Mater.* **53** (2017) 1361-1377.
20. M. Sumets, O. Ovchinnikov, V. Ievlev, A. Kostyuchenko, Optical Band Gap Shift in Thin LiNbO_3 Films Grown by Radio-Frequency Magnetron Sputtering, *Ceram. Int.* **43** (2017) 13565-13568.
21. M. Sumets, Charge transport in LiNbO_3 -based heterostructures, *J. Nonlinear Opt. Phys. Mater.* **26** (2017) 1750011.
22. M. Sumets, G.C. Dannangoda, A. Kostyuchenko, V. Ievlev, V. Dybov, K.S. Martirosyan, Temperature transition of p- to n- type conduction in the $\text{LiNbO}_3/\text{Nb}_2\text{O}_5$ polycrystalline films, *Mater. Chem. Phys.* **191** (2017) 35–44.
23. M. Sumets, A Kostyuchenko, V Ievlev, V Dybov, Electrical properties of phase formation in LiNbO_3 films grown by radio-frequency magnetron sputtering method, *J. Mater. Sci.: Mater. Electron.* **27** (2016) 7979-7986.
24. M. Sumets, A. Kostyuchenko, V. Ievlev, S. Kannykin, V. Dybov, Influence of thermal annealing on structural properties and oxide charge of LiNbO_3 films, *J. Mater. Sci.: Mater. Electron.* **26** (2015) 7853-7859.
25. M. Sumets, A. Kostyuchenko, V. Ievlev, S. Kannykin, V. Dybov, Sputtering condition effect on structure and properties of LiNbO_3 films, *Journal of Materials Science: Materials in Electronics*, **26** (2015) 4250–4256.
26. V.M. Ievlev, S.B. Kushev, O.V. Ovchinnikov, M.P. Sumets, A.N. Latyshev, M.N. Bezryadin, L.Y.

Leonova, S.V. Kannykin, A.M. Vozgorkov, M.S. Smirnov, Synthesis of thin p-type rutile films, *Semiconductors*, 48 (2014) 251-256.

27. M. Sumets, V. Ievlev, A. Kostyuchenko, V. Vakhtel, S. Kannykin, A. Kobzev, Electrical properties of Si–LiNbO₃ heterostructures grown by radio-frequency magnetron sputtering in an Ar + O₂ environment, *Thin Solid Films*, 552 (2014) 32-38.
28. M. Sumets, V. Ievlev, A. Kostyuchenko, V. Kuz'mina, Influence Sputtering Conditions on Electrical Characteristics of Si–LiNbO₃ Heterostructures Formed by Radio-Frequency Magnetron Sputtering, *Molecular Crystals and Liquid Crystals*, 603 (2014) 202-215.
29. V. Ievlev, V. Shur, M. Sumets, A. Kostyuchenko, Electrical properties and local domain structure of LiNbO₃ thin film grown by ion beam sputtering method, *Acta Metallurgica Sinica (English Letters)*, 26 (2013) 630-634.
30. V. Ievlev, M. Sumets, A. Kostuchenko, Electrical conductivity of the LiNbO₃ heterostructures grown by ion sputtering method, *Proc of SPIE* (2013) 87701M-87701M.
31. V. Ievlev, M. Sumets, A. Kostyuchenko, Conduction mechanisms in Si–LiNbO₃ heterostructures grown by ion-beam sputtering method, *Journal of Materials Science*, 48 (2013) 1562-1570.
32. V. Ievlev, M. Sumets, A. Kostyuchenko, N. Bezryadin, Dielectric losses and ac conductivity of Si–LiNbO₃ heterostructures grown by the RF magnetron sputtering method, *Journal of Materials Science: Materials in Electronics*, 24 (2013) 1651-1657.
33. V. Ievlev, M. Sumets, A. Kostyuchenko, O. Ovchinnikov, V. Vakhtel, S. Kannykin, Band diagram of the Si–LiNbO₃ heterostructures grown by radio-frequency magnetron sputtering, *Thin Solid Films*, 542 (2013) 289-294.
34. V. Iyevlev, M. Sumets, A. Kostyuchenko, Current–voltage characteristics and impedance spectroscopy of LiNbO₃ films grown by RF magnetron sputtering, *Journal of Materials Science: Materials in Electronics*, 23 (2012) 913-920.
35. M.Sumets. V. Ievlev, A. Kostyuchenko, Effect of Thermal Annealing on Electrical Properties of Si LiNbO₃, *Materials Science Forum, Advanced Materials and Nanotechnology* (2012) 53-57.
36. V. Iyevlev, A. Kostyuchenko, M. Sumets, V. Vakhtel, Electrical and structural properties of LiNbO₃ films, grown by RF magnetron sputtering, *Journal of Materials Science: Materials in Electronics*, 22 (2011) 1258-1263.
37. V. Iyevlev, A. Kostyuchenko, M. Sumets, Fabrication, substructure and properties of LiNbO₃ films, *Proc of SPIE* (2010) 77471J-77471J-77478.
38. B.L. Agapov, N.N. Bezryadin, G.I. Kotov, M.P. Sumets, I.N. Arsent'ev, Reconstruction and electron states of a Ga₂Se₃-GaAs heterointerface, *Semiconductors*, 33 (1999) 658-661.
39. N.N. Bezryadin, É.P. Domashevskaya, G.I. Kotov, R.V. Kuz'menko, M.P. Sumets, I.N. Arsent'ev, Electron states in the surface region of gallium arsenide treated in selenium and arsenic vapor, *Semiconductors*, 33 (1999) 665-667.

Selected Presentations:

1. “Effect of reactive gas environment on domain structure and local switching of LiNbO₃ thin films deposited on Si(001) by radio-frequency magnetron sputtering”, Joint International Conference “Scanning Probe Microscopy. Russia-China Workshop on Dielectric and Ferroelectric Materials”, 25-28

August, 2019, Ekaterinburg, Russia.

2. "Effective charge in LiNbO₃ films fabricated by radio-frequency magnetron sputtering method", International conference "Mechanisms and non-linear problems of nucleation and growth of crystals and thin films", 1-5 July 2019, Saint-Petersburg, Russia.
3. "Structure and electrical properties of LiNbO₃ films on silicon" XXII Russian workshop on inorganic and organic-silica coatings, 17-19 November, 2014, Saint-Petersburg, Russia.
4. "Influence reactive gas environment on electrical properties of LiNbO₃ thin films grown by RF magnetron sputtering" 12th International Conference on Frontiers of Polymers and Advanced Materials 8 - 13 December 2013, Auckland, New Zealand.
5. "Structure and electrical properties of LiNbO₃ films, fabricated by radio-frequency magnetron sputtering method in an Ar+O₂ atmosphere" V Russian conference on nano-materials «Nano 2013», September 23-27, 2013, Zvenigorod, Russia.
6. "Domain structure of the LiNbO₃ thin films grown by the ion beam sputtering method" 11th International Symposium on Ferroic Domains and Micro- Nanoscopic Structures, August 20-24, 2012, Ekaterinburg, Russia
7. "Electrical conductivity of the LiNbO₃ heterostructures grown by ion sputtering method" 17th International School on Quantum Electronics "Laser physics and applications" 24-28 September 2012, Nessebar, Bulgaria.
8. "Effect of Thermal Annealing on Electrical Properties of Si-LiNbO₃" Fifth International Conference on Advanced Materials and Nanotechnology (AMN-5), 7-11 February, 2011, Wellington, New Zealand.
9. "Substructure and electrical properties of LiNbO₃ thin films" 5th International Workshop on Crystal Growth Technology, June 26 - 30, 2011, Berlin, Germany.
10. "Electrical properties of LiNbO₃ films on (100)Si" IV Russian conference on nano-materials «Nano 2011», March 1-4, 2011, Moscow, Russia.
11. "Structure and properties of the nano-crystalline LiNbO₃ films" XXI Russian symposium on temperature resistant functional coatings, April 26-28 2010, Saint-Petersburg, Russia.
12. "Substructure and electrical properties of LiNbO₃ films after thermal annealing" Symposium on Surface and Interface of Advanced Thin Films, 16-17 September 2010, Kraków, Poland.
13. "Fabrication, substructure and properties of LiNbO₃ films" Sixteenth International School on Quantum Electronics "Laser Physics and Applications", 20-24 September, 2010, Nessebar, Bulgaria.
14. "Calculation of total energy in the GaAs(100)-Se₂ system" III Russian conference "Physical and chemical processes in solids and at interfaces (FAGRAN-2006), Voronezh State University, October 2006, Voronezh, Russia.
15. "Modeling of properties of an intermediate surface phase GaAs(310) formed by passivity selenium of surface GaAs(100)" VI International congress on mathematical modeling, University of Nizhny Novgorod, March 2004, Nizhny Novgorod, Russia.
16. "Relaxation and reconstruction at GaAs/Ga₂Se₃ interface The XXI International Conference on Relaxation Phenomena in Solids, Voronezh State University, October 2004, Voronezh, Russia.
17. "Reconstruction at GaAs/Ga₂Se₃ interface" XVII Russian conference on electron microscopy, October 1998, Chernogolovka, Russia.
18. "Reconstruction of the interface at the gallium arsenide-gallium chalcogenide heterosystem"

International Conference on “Relaxation Phenomena in Solids”. Voronezh State Technical University, September 1995, Voronezh, Russia.