



Alexander Emelyanenko

Personal data:

Date of birth: 3 August 1975, Bugulma, Russia

Marital status: married, one child

Present position:

**Head of the Liquid Crystal Laboratory in Lomonosov Moscow State University,
Professor RAS**

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Education:

Graduated from Lomonosov Moscow State University in 1998

Scientific Degrees:

PhD, Lomonosov Moscow State University, 2001,
«Molecular models of polar and chiral liquid crystals»

Doctor of Science (Habilitation), Lomonosov Moscow State University, 2009,
«Molecular-statistical theory of the smectic states»

Employment history:

Junior Research Associate, Lomonosov Moscow State University, 2001- 2005

Research Associate, Lomonosov Moscow State University, 2005- 2005

Senior Research Associate, Lomonosov Moscow State University, 2005- 2009

Leading Research Associate, Lomonosov Moscow State University, 2009- 2018

Head of Laboratory of Liquid Crystals, Lomonosov Moscow State University, 2018- present

2002-2003 Postdoc in Strathclyde University (Glasgow, UK).
2005 Visiting Scientist, Trinity College, Dublin, Ireland
2006, 2007 Visiting Scientist, Tokyo Denky University, Japan
2010 Visiting Scientist, Tokyo Institute of Technology, Japan

Awards:

G. Soros' Fellowship (1994,1999)
INTAS Fellowship (1997)
Russian Government Fellowship (1998)
Russian President Fellowship (1999)
European Academy Prize for young scientists in physics (2007)
Russian Foundation for Basic Research grants
Russian President grants for young scientists (2004-2005,2006-2007,2008-2009)
Member of the Program Committee of the First Russian Conference on Liquid Crystals (2012)
Professor RAS (2016)
Co-Chairman of the 14-th European Conference on Liquid Crystals (2017)

International cooperation:

National Cheng Kung University, Tainan, Taiwan
Industrial Technology Research Institute, Hsinchu, Taiwan
Tokyo Institute of Technology, Tokyo, Japan
University of Colorado, USA
Kent State University, USA
Institute of Physics of Czech Academy of Sciences, Prague, Czech Republic

Reviewer in scientific journals:

Physical Review Letters, American Physical Society
Physical Review E, American Physical Society
Reviews of Modern Physics, American Physical Society
Journal of Chemical Physics, American Institute of Physics
European Physical Journal
New Journal of Physics, IOPscience
Polymer Science, MAIK Nauka/Interperiodica
Doklady Physics, MAIK Nauka/Interperiodica

Membership in the editorial board:

- 2019 Crystals MDPI, IF=2.67
MDPI Publishing (Basel, Switzerland, Switzerland)
- 2018 Polymer Science, Series C
- 2018 Beilstein Journal of Nanotechnology

Membership in the organizing/program Committees:

25-30 June 2017 14th [European Conference on Liquid Crystals](#)
Vice-Chairman

Scientific Interests:

Liquid crystals, polymers, symmetry breaking, polarity, chirality, biaxiality, surface effects, nanoparticles, droplets, novel phases, phase transitions, ferroelectric and antiferroelectric materials, intermediate phases, energy saving, memory effects, artificial muscles, molecular-statistical physics, computer simulations

Main publications (Scopus: 955 citations, H-index 20):

75. A. V. Emelyanenko, D. V. Shmeliyova, [Optimization of the domain size in stressed liquid crystals](#), *Liq. Cryst. and their Appl.* **24** (1), 60 (2024).
74. V.V. Vasilevskaya, M.O. Gallyamov, A.Yu. Grosberg, R.A. Gumerov, A.V. Emel'yanenko, V.A. Ivanov, E.Yu. Kramarenko, I.I. Potemkin, O.V. Rudenko, A.M. Sergeev, O.E. Philippova, D.R. Khokhlov, [Aleksei Removich Khokhlov \(on his 70th birthday\)](#), *Physics - Uspekhi* **67** (2), 211 (2024). **IF=2.7**
73. A. V. Emelyanenko, V. Yu. Rudyak, S. A. Shvetsov, F. Araoka, H. Nishikawa, K. Ishikawa. [Transformation of polar nematic phases in the presence of an electric field](#), *Phys. Rev. E* **109**, 014701 (2024). **IF= 2.609**
72. C.-Y. Kuo, A. V. Emelyanenko, S.-C. Hung, W.-C. Chen, C.-Y. Liu. [Improving the electro-optical properties of cholesteric liquid crystal devices via cellulose nanoparticle dopants](#), *Polymer Journal* (2024). **IF= 3.08**
71. D.N. Chausov, A.D. Kurilov, A.I. Smirnova, D.N. Stolbov, R.N. Kucherov, A.V. Emelyanenko, S.V. Savilov, N.V. Usol'tseva, [Mesomorphism, dielectric permittivity, and ionic conductivity of cholesterol tridecylate doped with few-layer graphite fragments](#), *Journal of Molecular Liquids* **374**, 121139 (2023). **IF= 6.633**
70. A.V. Emelyanenko, S.A. Shvetsov, [Discotic nematic state in a system of rod-like molecules](#), *Liq. Cryst. and their Appl.* **23**, 78 (2023).
69. S. A. Shvetsov, T. Orlova, A. V. Emelyanenko, A. S. Zolot'ko, and H. L. Ong, [Optical nonlinearity of a dual-frequency nematic liquid crystal via temperature-mediated mapping of dielectric anisotropy](#), *Optics Express* **30**, 47909 (2022).
68. A.V. Emelyanenko, V.Yu. Rudyak, S.A. Shvetsov, F. Araoka, H. Nishikawa, and K. Ishikawa, [Emergence of paraelectric, improper antiferroelectric, and proper ferroelectric nematic phases in a liquid crystal composed of polar molecules](#), *Phys. Rev. E* **105**, 064701 (2022). **IF=2.707**
67. S.A. Shvetsov, T. Orlova and A.V. Emelyanenko, [Light-induced structures and microparticle transportation in a free-surface frustrated chiral nematic film](#), *Crystals* **12**, 549 (2022). **IF=2.67**
66. S.A. Shvetsov, A.S. Zolot'ko, G.A. Voronin, A.V. Emelyanenko, P.A. Statsenko and S.I. Trashkeev, [Coexistence of light-induced thermocapillary and orientational effects in thin nematic films with a free surface](#), *Journal of Physics: Conference Series* **2067**, 012016 (2021).
65. A.V. Emelyanenko, E.S. Filimonova, A.R. Khokhlov, [Molecular origin of the heterogeneity in the nematic and smectic liquid crystals: Elastic constants, gradients of order parameters, and visualization of small objects](#), *Physical Review E* **103**, 022709 (2021). **IF=2.707**
64. S.A. Shvetsov, A.S. Zolot'ko, G.A. Voronin, A.V. Emelyanenko, M.M. Avdeev, M.A. Bugakov, P.A. Statsenko, S.I. Trashkeev, [Light-induced umbilical defects due to temperature gradients in nematic liquid crystal with a free surface](#), *Optical Materials Express* **11**, 1705 (2021). **IF= 3.074**
63. J.-H. Liu, Y.-H. Hung, S.-N. Lin, S. A. Shvetsov, V. Yu. Rudyak, A. V. Emelyanenko, C.-Y. Liu, [Recyclable liquid crystal polymeric sensor beads based on the assistance of radially aligned liquid crystals](#), *Polymer Journal* **53**, 373 (2021). **IF=2.826**
62. S.A. Shvetsov, V. Yu. Rudyak, A.A. Gruzdenko, A.V. Emelyanenko, [Axisymmetric skyrmion-like structures in spherical-cap droplets of chiral nematic liquid crystal](#), *Journal of Molecular Liquids*, **319**, 114149 (2020). **IF= 6.633**

61. Yu. Garbovskiy, A.V. Emelyanenko, A. Glushchenko, [Inverse “guest - host” effect: ferroelectric nanoparticles mediated switching of nematic liquid crystals](#), *Nanoscale* **12**, 16438 (2020). **IF= 8.307**
60. A.V. Emelyanenko, [Molecular–Statistical Theory for the Description of Re-Entrant Ferroelectric Phase](#), *Crystals*, **9**, 583 (2019). **IF=2.404**
59. Shvetsov S.A., Gruzdenko A.A., Emelyanenko A.V., Boiko N.I. [Photoinduced Orientational Structure Transformation in Cholesteric Microdroplets](#), *Bulletin of the Lebedev Physics Institute*, **46**, 201-205 (2019) **IF=0.477**
58. S. Shvetsov, T. Orlova , A.V. Emelyanenko, A. Zolot’ko, [Thermo-Optical Generation of Particle-Like Structures in Frustrated Chiral Nematic Film](#), *Crystals* **9**, 574 (2019) **IF=2.404**
57. M.N. Krakhalev, V.Yu. Rudyak, O.O. Prishchepa, A.P. Gardymova, A.V. Emelyanenko, J.-H. Liu, V.Ya. Zyryanov, [Orientational structures in cholesteric droplets with homeotropic surface anchoring](#), *Soft Matter*, **15**, 5554 (2019). **IF= 4.046**
56. S.A Shvetsov, A.V. Emelyanenko, M.A. Bugako, N.I. Boiko, V.Ya. Zyryanov, [Photo-orientation of nematic liquid crystal without preliminary cell surface treatment](#), *Optical Materials Express*, **9**, 2595 (2019). **IF=3.074**
55. A.V. Emelyanenko A.V., M.A. Osipov, [Modern Problems in the Study of Liquid Crystals](#), *Polymer Science - Series C* **60**, 1 (2018) **IF=0.83**
54. A.V. Emelyanenko, E.S. Filimonova, [Molecular-statistical approach to the description of tilted smectic phases](#). *Phase Transitions* (2018). **IF=1.004**
53. S.A. Shvetsov, A.V. Emelyanenko, M.A. Bugakov, N.I. Boiko, J.H. Liu, [Photo-orientation at the interface between thermotropic nematic liquid crystal and water caused by azobenzene polymer additives](#). *Polymer Science, Series C* **60**, 72 (2018). **IF=0.83**
52. A.R. Khokhlov and A. Emelyanenko, [Nanostructured liquid crystal systems and applications](#). *Beilstein Journal of Nanotechnology* **9**, 2644 (2018). **IF=3.272**
51. A. Kaznacheev, E. Pozhidaev, V. Rudyak, A.V. Emelyanenko, and A. Khokhlov, [Biaxial potential of surface-stabilized ferroelectric liquid crystals](#). *Physical Review E* **97**, 042703 (2018). **IF=2.707**
50. S.A. Shvetsov, V.Yu. Rudyak, A.V. Emelyanenko, N.I. Boiko, Y.-S. Zhang, J.-H. Liu, A.R. Khokhlov, [Photoinduced orientational structures of nematic liquid crystal droplets in contact with polyimide coated surface](#). *Journal of Molecular Liquids* **267**, 222 (2018). **IF= 6.633**
49. S.A. Shvetsov, A.V. Emelyanenko, N.I. Boiko, A.S. Zolot’ko, Y.-S. Zhang , J.-H. Liu , A.R. Khokhlov, [Optical orientation of nematic liquid crystal droplets via photoisomerization of an azodendrimer dopant](#). *Beilstein Journal of Nanotechnology* **9**, 870 (2018). **IF= 3.272**
48. Y.S. Zhang, C.Y. Liu, A.V. Emelyanenko, J.H. Liu, [Synthesis of Predesigned Ferroelectric Liquid Crystals and Their Applications in Field-Sequential Color Displays](#). *Advanced Functional Materials*, 1706994 (2018). **IF=19.924**
47. M.N. Krakhalev, A.P. Gardymova, O.O. Prishchepa, V.Yu. Rudyak, A.V. Emelyanenko, J.-H. Liu, V.Ya. Zyryanov, [Bipolar configuration with twisted loop defect in chiral nematic droplets under homeotropic surface anchoring](#). *Scientific Reports* **7**, 14582 (2017). **IF=3.998**
46. V.Yu. Rudyak, M.N. Krakhalev, V.S. Sutormin, O.O. Prishchepa, V.Ya. Zyryanov, J.-H. Liu, A.V. Emelyanenko, A.R. Khokhlov, [Electrically induced structure transition in nematic liquid crystal droplets with conical boundary conditions](#). *Physical Review E* **96**, 052701 (2017). **IF=2.707**
45. V.Yu. Rudyak, M.N. Krakhalev, O.O. Prishchepa, V.S. Sutormin, A.V. Emelyanenko, and V.Ya. Zyryanov, [Orientational structures of the nematic droplets with conical boundary conditions](#). *JETP Letters* **106**, No. 6, p. 358 (2017). **IF=1.399**
44. E.S. Filimonova, A.V. Emelyanenko, J.H. Liu, [A study of polarization in smectic liquid crystals via statistical-physics methods](#). *Moscow University Physics Bulletin* **72**, No 4, c. 369 (2017). **IF=0.538**
43. Jui-Hsiang Liu, Emelyanenko A.V., Yan-Song Zhang, [Fabrication and Optical Characterization of Imprinted Broad-Band Photonic Films via Multiple Gradient UV](#)

- [Photopolymerization](#). *Journal of Polymer Science, Part B: Polymer Physics* **55**, 1427 (2017). **IF=2.499**
42. S.A. Shvetsov, A.V. Emelyanenko, N.I. Boiko, J.-H. Liu, A.R. Khokhlov, [Communication: Orientational structure manipulation in nematic liquid crystal droplets induced by light excitation of azodendrimer dopant](#). *Journal of Chemical Physics* **146**, 211104 (2017). **IF=2.991**
41. Y.S. Zhang, R. Balamurugan, J.C. Lin, S. Fitriyani, J.H. Liu and A.V. Emelyanenko, [Pd²⁺ fluorescent sensors based on amino and imino derivatives of rhodamine and improvement of water solubility by the formation of inclusion complexes with \$\beta\$ -cyclodextrin](#). *Analyst* (2017). **IF= 3.978**
40. N. V. Kalinin, A. V. Emelyanenko and J.-H. Liu, [Structure, elasticity and phase transitions in liquid crystals with deformations](#). *Phase Transitions* **90**, 86 (2017). **IF=1.004**
39. M. N. Krakhalev, A. P. Gardymova A. V. Emelyanenko, Jui-Hsiang Liu, and V. Ya. Zyryanov, [Untwisting of the Helical Structure of Cholesteric Droplets with Homeotropic Surface Anchoring](#). *JETP Letters* **105**, 51 (2017). **IF=1.399**
38. A.V. Emelyanenko, [Structural and ferroelectric phase transitions, Hucisko, Poland, 16–20 May 2016](#). *Liquid Crystals Today* **25**, 85 (2016).
37. Y.-S. Zhang, A.V. Emelyanenko, J.-H. Liu, [Fabrication of resonance core assisted self-assembling gelators derived from cyclohexanone](#). *Journal of the Taiwan Institute of Chemical Engineers* **65**, 444 (2016). **IF=4.040**
36. A.V. Emelyanenko and E. P. Pozhidaev, [Multistability in the mixtures of smectic-C* materials with compensated twisting power](#). *Physical Review E* **93**, 042705 (2016). **IF=2.707**
35. A.V. Emelyanenko, [Induction of new ferroelectric smectic phases in the electric field](#). *Ferroelectrics* **495**, 129 (2016). **IF=0.669**
34. A.V. Emelyanenko, V.Yu. Rudyak and J.-H. Liu, [Phase transitions in ellipsoidal droplets of nematic liquid crystals](#). *Moscow University Physics Bulletin* 71(1) (2016). **IF=0.538**
33. V.Yu. Rudyak and A.V. Emelyanenko, [Orientational ordering of Janus colloids in cholesteric liquid crystals](#). *Soft Matter* **11**, 7237 (2015). **IF=3.14**
32. A.V. Emelyanenko and A.R. Khokhlov, [Simple theory of transitions between smectic, nematic, and isotropic phases](#). *J. Chem. Phys.* **142**, 204905 (2015). **IF=2.991**
31. M.S. Romashin and A.V. Emelyanenko, [Investigation of polar and nonpolar ordering in a smectic liquid crystal layer](#). *Moscow University Physics Bulletin* 68(3), 249 (2013). **IF=0.538**
30. N.V. Kalinin and A.V. Emelyanenko, [The existence of two nematic phases caused by dimer recombination](#). *Moscow University Physics Bulletin* 68(6), 455 (2013). **IF=0.538**
29. V.Yu. Rudyak, A.V. Emelyanenko, and V.A. Loiko, [Structure transitions in oblate nematic droplets](#). *Physical Review E* **88**, 052501 (2013). **IF=2.707**
28. N.V. Kalinin, A.V. Emelyanenko, L.A. Nosikova, Z.A. Kudryashova, and J.-H. Liu, [Recombination of dimers as a mechanism for the formation of several nematic phases](#). *Physical Review E* **87**, 062502 (2013). **IF=2.707**
27. A.V. Emelyanenko and K. Ishikawa, [Smooth transitions between biaxial intermediate smectic phases](#). *Soft Matter* **9**, 3497 (2013). **IF=3.14**
26. K.L. Sandhya, A.D.L. Chandani, A. Fukuda, J.K. Vij, A.V. Emelyanenko, and K. Ishikawa, [Degeneracy lifting due to thermal fluctuations around the frustration point between anticlinic antiferroelectric SmCA* and synclinc ferroelectric SmC*](#). *Physical Review E* **87**, 012502 (2013). **IF=2.707**
25. Chih-Chieh Chien, Jui-Hsiang Liu, and A.V. Emelyanenko, [Fabrication and characterization of imprinted photonic crystalline polymer matrices via multiple UV polymerizations](#). *J. Mater. Chem.* **22**, 22446 (2012). **IF=6.626**
24. A.V. Emelyanenko, S. Aya, Yu. Sasaki, F. Araoka, K. Ema, K. Ishikawa, and H. Takezoe, [Two transitions between isotropic and nematic phases in confined liquid crystals](#). *Physical Review E* **84**, 041701 (2011). **IF=2.707**

23. S. Aya, Yu. Sasaki, F. Araoka, K. Ema, K. Ishikawa, A.V. Emelyanenko, and H. Takezoe, [Observation of two isotropic-nematic phase transitions near a surface](#). *Physical Review Letters* **106**, 117801 (2011). **IF=8.385**
22. A.V. Emelyanenko, [Theory for the evolution of ferroelectric, antiferroelectric, and ferrielectric smectic phases in the electric field](#). *Physical Review E* **82**, 031710 (2010). **IF=2.707**
21. K.L. Sandhya, Atsuo Fukuda, J.K. Vij, and A.V. Emelyanenko, [Degeneracy lifting near the frustration points due to long-range interlayer interaction forces and the resulting varieties of polar chiral tilted smectic phases](#). *Liquid Crystals* **36**, 1101 (2009). **IF=2.908**
20. A. V. Emelyanenko, [Molecular-statistical approach to a behaviour of ferroelectric, antiferroelectric and ferrielectric smectic phases in the electric field](#). *Eur. Phys. J. E* **28**, 441 (2009). **IF=1.812**
19. A. V. Emelyanenko, [Influence of the electric field on frustration between ferroelectricity and antiferroelectricity in smectics](#). *Moscow University Physics Bulletin* **64**, 67 (2009). **IF=0.538**
18. A. V. Emelyanenko, [Investigation of frustration between ferroelectricity and antiferroelectricity in smectics](#). *Moscow University Physics Bulletin* **63**, 396 (2008). **IF=0.538**
17. A. V. Emelyanenko, [Theory of nematic-smectic phase transition](#). *South Ural State University Bulletin, "Mathematics, Physics and Chemistry"* **11**(22), 43 (2008).
16. A. V. Emelyanenko, [Method of calculation of the elasticity constants for tilted smectic](#). *South Ural State University Bulletin, "Mathematics, Physics and Chemistry"* **11**(22), 38 (2008).
15. A. V. Emelyanenko, [Unified theory for the phase transitions in liquid crystals](#). *Doklady Physics* **53**, 571 (2008). **IF=0.650**
14. A. V. Emelyanenko, [Complex smectic phases: threshold phenomena and application prospects](#). *Doklady Physics* **53**, 559 (2008). **IF= IF=0.650**
13. A. V. Emelyanenko, E. P. Pozhidaev, N. M. Shtykov, and V. E. Molkin, [Antiferroelectric and ferrielectric liquid crystal display: electrically controlled birefringence color switch as a new mode](#). *Journal of the Society for Information Display* **16**(8), 811 (2008). **IF=1.645**
12. J. -K. Song, A. D. L. Chandani, A. Fukuda, J. K. Vij, I. Kobayashi, and A. V. Emelyanenko, [Temperature-induced sign reversal of biaxiality observed by conoscopy in some ferroelectric Sm-C* liquid crystals](#). *Physical Review E* **76**, 011709 (2007). **IF=2.707**
11. A. V. Emelyanenko, Atsuo Fukuda, and J. K. Vij, [Theory of the intermediate tilted smectic phases and their helical rotation](#). *Physical Review E* **74**, 011705 (2006). **IF=2.707**
10. A. D. L. Chandani, N. M. Shtykov, V. P. Panov, A. V. Emelyanenko, Atsuo Fukuda, and J. K. Vij, [Discrete flexoelectric polarizations and biaxial subphases with periodicities other than three and four layers in chiral smectic liquid crystals frustrated between ferroelectricity and antiferroelectricity](#). *Physical Review E* **72**, 041705 (2005). **IF=2.707**
9. N. M. Shtykov, A. D. L. Chandani, A. V. Emelyanenko, Atsuo Fukuda, and J. K. Vij, [Two kinds of smectic-C_α* subphases in a liquid crystal and their relative stability dependent on the enantiomeric excess as elucidated by electric-field-induced birefringence experiment](#). *Physical Review E* **71**, 021711 (2005). **IF=2.707**
8. A. V. Emelyanenko and M. A. Osipov, [Theoretical Studies of the Structure of Intermediate Chiral Smectic Phases with Increasing Periodicity](#). *Ferroelectrics* **309**, 13 (2004). **IF=0.669**
7. A. V. Emelyanenko and M. A. Osipov, [Origin of spontaneous polarization, tilt, and chiral structure of smectic liquid-crystal phases composed of bent-core molecules: A molecular model](#). *Physical Review E* **70**, 021704 (2004). **IF=2.707**
6. A. V. Emelyanenko and M. A. Osipov, [Theoretical model for the discrete flexoelectric effect and a description for the sequence of intermediate smectic phases with increasing periodicity](#). *Physical Review E* **68**, 051703 (2003). **IF=2.707**
5. A. V. Emelyanenko, [Analytical description for the chiral nematic state in terms of molecular parameters](#). *Physical Review E* **67**, 031704 (2003). **IF=2.707**
4. A. V. Emelyanenko, M. A. Osipov, and D. A. Dunmur, [Molecular theory of helical sense inversions in chiral nematic liquid crystals](#). *Physical Review E* **62**, 2340 (2000). **IF=2.707**

3. A. V. Emelyanenko and M. A. Osipov, [Nematic-isotropic phase transition in polar liquid crystals. II. Role of the dispersion interaction.](#) *Crystallography Reports*. **45**, 510 (2000). **IF=0.661**
2. A. V. Emelyanenko and M. A. Osipov, [Nematic-isotropic phase transition in polar liquid crystals. I. Statistical theory.](#) *Crystallography Reports*. **45**, 501 (2000). **IF=0.661**
1. A. V. Emelyanenko and M. A. Osipov, [Influence of dimerization on the nematic-isotropic phase transition in strongly polar liquid crystals.](#) *Liquid Crystals*. **26**, 187 (1999). **IF=2.908**