



Alexander Emelyanenko

Personal data:

Date of birth: 3 August 1975, Bugulma, Russia

Marital status: married, one child

Present position:

Leading Research Associate, Head of the Liquid Crystal Laboratory, Professor RAS
Russia, 119991, Moscow, Leninskie Gory, Lomonosov Moscow State University, bldg. 1, str. 2,
Faculty of Physics, Chair for Polymer and Crystal Physics

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Education:

Graduated from Moscow State University in 1998

Scientific Degrees:

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

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

Employment history:

Junior Research Associate, Moscow State University, 2001- 2005

Research Associate, Moscow State University, 2005- 2005

Senior Research Associate, Moscow State University, 2005- 2009

Leading Research Associate, Moscow State University, 2009- 2018

Leading Research Associate-Head of Laboratory, Moscow State University, 2018- present time

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
Tokyo Institute of Technology, Tokyo, Japan
Kent State University, USA
Institute of Physics of Czech Academy of Sciences, Prague, Czech Republic
Stepanov Institute of Physics, Minsk, Belarus

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

Scientific Interests:

Liquid crystals, polymers, ferroelectric and antiferroelectric smectics, intermediate phases, cholesterics, composite materials, surface effects, phase transitions, unhomogeneous and polydisperse structures, materials for energy-saving displays, optical devices with memory effect, light modulators, molecular-statistical physics, computer simulations

Main publications (522 citations, h-index 14):

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=2.20**
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=0.563**

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=0.563**
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=2.366**
5. A. V. Emelyanenko, [Analytical description for the chiral nematic state in terms of molecular parameters](#). *Physical Review E* **67**, 031704 (2003). **IF=2.366**
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=2.366**
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=2.366**
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=0.53**
9. N. M. Shtykov, A. D. L. Chandani, A. V. Emelyanenko, Atsuo Fukuda, and J. K. Vij, [Two kinds of smectic-C \$\alpha^*\$ 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=2.366**
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=2.366**
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=2.366**
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=2.366**
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=0.877**
14. A. V. Emelyanenko, [Complex smectic phases: threshold phenomena and application prospects](#). *Doklady Physics* **53**, 559 (2008). **IF=0.521**
15. A. V. Emelyanenko, [Unified theory for the phase transitions in liquid crystals](#). *Doklady Physics* **53**, 571 (2008). **IF=0.521**
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).
17. A. V. Emelyanenko, [Theory of nematic-smectic phase transition](#). *South Ural State University Bulletin, "Mathematics, Physics and Chemistry"* **11**(22), 43 (2008).
18. A. V. Emelyanenko, [Investigation of frustration between ferroelectricity and antiferroelectricity in smectics](#). *Moscow University Physics Bulletin* **63**, 396 (2008). **IF=0.503**
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=0.503**
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=1.464**
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=2.20**
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=2.366**

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=5.93**
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=2.366**
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=5.968**
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 synclitic ferroelectric SmC*](#). *Physical Review E* **87**, 012502 (2013). **IF=2.366**
27. A.V. Emelyanenko and K. Ishikawa, [Smooth transitions between biaxial intermediate smectic phases](#). *Soft Matter* **9**, 3497 (2013). **IF=3.889**
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=2.366**
29. V.Yu. Rudyak, A.V. Emelyanenko, and V.A. Loiko, [Structure transitions in oblate nematic droplets](#). *Physical Review E* **88**, 052501 (2013). **IF=2.366**
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=0.503**
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=0.503**
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=2.965**
33. V.Yu. Rudyak and A.V. Emelyanenko, [Orientational ordering of Janus colloids in cholesteric liquid crystals](#). *Soft Matter* **11**, 7237 (2015). **IF=3.889**
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=0.503**
35. A.V. Emelyanenko, [Induction of new ferrielectric smectic phases in the electric field](#). *Ferroelectrics* **495**, 129 (2016). **IF=0.53**
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=2.366**
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=4.217**
38. A.V. Emelyanenko, [Structural and ferroelectric phase transitions, Hucisko, Poland, 16–20 May 2016](#). *Liquid Crystals Today* **25**, 85 (2016).
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=1.235**
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=0.70**
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=3.885**
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=2.965**

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=3.318**
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=0.503**
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=1.235**
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=2.366**
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=4.259**
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=12.12**
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=3.13**
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=3.648**
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=2.366**
52. 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=1.4**
53. A.V. Emelyanenko, E.S. Filimonova, [Molecular-statistical approach to the description of tilted smectic phases](#). *Phase Transitions* (2018). **IF=0.70**
54. A.R. Khokhlov and A. Emelyanenko, [Nanostructured liquid crystal systems and applications](#). *Beilstein Journal of Nanotechnology* **9**, 2644 (2018). **IF=3.13**