December 7, 2018

Alexander Mikishev, PhD

5727 Indigo St
Houston, TX 77096, USA
Home phone: (713)723-6568
Mobile: (713)302-4769
E-Mail: alexmikish@gmail.com

Curriculum Vitae

Academic Degrees

1983 M.Sc. in Physics (Five year program)
Perm State University, Perm, USSR.
1990 Ph.D. Perm State University, Perm, USSR.
Theses:
1983 "Influence of magnetic field on thermohaline convection of electro-conductive binary fluid". Adviser: Prof. G.Z. Gershuni.
1990 "Local structure of two-dimensional turbulent flows". Adviser: Prof. V.D. Zimin.

Positions

Oct. 1983 - Sept. 1985
Perm State University, Perm, USSR. Department of Theoretical Physics. Instructor, Assistant (1983).
Oct. 1985 - May 1991
Institute of Continuous Media Mechanics of the Ural Branch of the USSR Academy of Sciences, Perm, USSR. Doctorate (1985), Junior Scientific Worker (1988-91).
Oct. 1991- June 1994
Tel-Aviv University, School of Mathematical Sciences, Tel-Aviv, Israel. Post-Doctorate in Applied Mathematics. Adviser: Prof. G. I. Sivashinsky.
Sept. 1994-Dec. 1994
College of Jordan Valley, Zemakh, Israel. Instructor in Physics.
Oct. 1996-June 2001
Different companies developing computer software. Israel: S/w engineer (Simula, 1996), Senior s/w engineer (Inverness, 1997), IT Manager (Virata, 2000).
Sept. 2005 -Sept. 2008
University Center, Department of Mathematics, Ariel, Israel. Lecturer
Oct. 2007-Sept. 2011
The Technion, Dept. of Mathematics, Haifa, Israel. Adjunct Professor (since 2007-till 2010), Research Fellow (since 2008-until 2011).
Aug. 2011-2013
Adjunct Professor of Mathematics, Katy Campus, Strayer University, Houston, TX.
Aug. 2012-Aug. 2015
Lecturer, Dept. of Physics, Sam Houston State University, Huntsville, TX.
June 2012-present
Adjunct Assistant Professor (online teaching), Embry-Riddle Aeronautical University-Worldwide,

Daytona Beach, FL .
Aug. 2015 - May 2018
Visiting Assistant Professor, Dept. of Physics, Sam Houston State University, Huntsville, TX.
Aug. 2018 - present
Lecturer, Dept. of Engineering Technology, Sam Houston State University, Huntsville, TX.

Visiting Positions

Short-Time Visits

June 2014, July 2015	TIPs - Fluid Physics, Université Libre de Bruxelles, Belgium.
Sept. 2010	Institute of Mechanics, Chinese Academy of Science (National Microgravity Laboratory), Beijing, China.
Sept. 2010	State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, Xi'an, China.

Research Fields

Nonlinear stability theory of viscous and convection flows. Pattern formation and stability. Generation of large-scale structures. Generation of chaos in distributed systems. Thermogravitational and thermocapillary convection in systems with interfaces. Microgravity phenomena. Application of wavelets in physics and fluid mechanics.

Awards

2016	Winner of 2016-2017 ERAU Worldwide Research Award, ERAU-13373 ($2,500.00).
2014	Winner of 2014-2015 ERAU Worldwide Research Award, ERAU-13360 ($5,000.00).
2013	Winner of 2013-2014 ERAU Worldwide Research Award, ERAU-13353 ($4,046.00).
1989	Winner of the 3rd All-Union competition of young scientists "Modern problems of thermodynamics and hydrogasodynamics", Institute of Thermophysics SB of USSR AS, Novosibirsk.
1990	Prize of Institute of Continuous Media Mechanics.

Fellowships

1991	Shapiro Fellowship

Participating in Grants

2008-2010	Israeli Ministry of Science, Culture & Sport. Joint grant with RFFI, Russia (Co-investigator)
2009-2012	European Network "MULTIFLOW" (Co-investigator)
2013-2015, 2016-2017	ERAU Research Awards ERAU-13353, ERAU-13360, and ERAU-13373 (Principal investigator)

Invited Lectures / Oral Presentations

1. 5th EPS Liquid State Conference on Turbulence. Moscow, October 1989. Title: "Integral and local characteristics of large-scale turbulence in thin layers of fluid".

2. Int. Symposium "Generation of large-scale structures in continuous media." Perm - Moscow, June 1990. Title: "Appearance of large-scale structures in turbulent rotating layers of fluid".

3. Summer Research Conference on wavelets and its application of American Mathematical Society, Mt. Holyoke College, Sourth Hadley, MA, USA, 1992. Title: "Wavelets and turbulence".

4. MAC-2002 International Science Symposium on the Leonid meteor storms, May 2002, Odaiba, Tokyo, Japan. Title: "Comprehensive analysis of Leonids, 1997-2001".

5. Regular Scientific Seminar of Institute of Continuous Media Mechanics, Perm, September 2008. Title: "Marangoni convection under altering external field".

6. The 2nd Chaotic Modeling and Simulation International Conference (CHAOS-2009), June 1-5, 2009, Chania, Crete, Greece. Title: "Parametric excitation of a longwave Marangoni convection".

7. The 3rd International Symposium on Bifurcations and Instabilities in Fluid Dynamics, August 10 - 13, 2009, Nottingham, UK. Title "Long-scale evolution of parametrically excited Marangoni convection".

8. The 4th International Topical Team Workshop on "Two-Phase Systems for Ground and Space Applications", Novosibirsk, September 6-8 2009. Title: "Long-wave Marangoni convection in modulated thermal field".

9. Regular Scientific Seminar of Institute of Continuous Media Mechanics, Perm, September 14th, 2009. Title: " One problem of thermocapillary convection".

10. The 5th Conference of the International Marangoni Association, Florence, Italy, June 7-10, 2010. Title: "Nonlinear dynamics of long-wave Marangoni convection in a liquid layer with insoluble surfactant".

11. The 6th International Conference "Mathematical Modeling and Computer Simulation of Materials Technologies", August 23-27, 2010, Ariel University Center of Samaria, Ariel, Israel. Title: "Marangoni convection in surfactant solutions and nanoliquids".

12. The 5th International Topical Team Workshop on "Two-Phase Systems for Ground and Space Applications", Kyoto, Japan, September 26-29 2010. Title: "Long-wave Marangoni convection in a liquid layer with insoluble surfactant: Linear and nonlinear analysis".

13. Applied Mathematics Seminar, Department of Mathematics, Southern Methodist University, Dallas, November 8th, 2010. Title: "Marangoni convection in parametric external field".

14. The 63rd Annual Meeting of the American Physical Society Division of Fluid Dynamics, Long Beach, CA, November 21-23 2010. Title: "Long-wavelength Marangoni convection in liquid layer with insoluble surfactant in modulated thermal field".

15. Joint Spring 2012 Meeting of the Texas Sections of the APS and AAPT and Zone 13 of the SPS, Angelo State University, San Angelo, TX. March 22-24 2012. Title "Onset of Marangoni convection of a liquid layer with insoluble surfactant in modulated thermal field".

16. The 6th Conference of the International Marangoni Association, Haifa, Israel, June 18-21, 2012. Title: "Marangoni Instability of a Liquid Layer with Insoluble Surfactant under Heat Flux Modulation" .

17. The 7th International Symposium on "Two-Phase Systems for Ground and Space Applications", Beijing, China, September 17-22 2012. Title: "On dynamic excitation of Marangoni instability of a liquid layer with insoluble surfactant".

18. The 65th Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Diego, CA, November 18-20 2012. Title: "Stability of evaporating liquid layer with insoluble surfactant".

19. The 5th International Symposium on Bifurcations and Instabilities in Fluid Dynamics, July 8 - 11, 2013, Haifa, Israel. Title "The influence of heating conditions on the instabilities in an evaporating liquid layer with insoluble surfactant ".

20. The 66th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Pittsburgh, PA, November 24-26 2013. Title: "The influence of evaporation on instabilities of liquid layer with insoluble surfactant".

21. The 7th Conference of the International Marangoni Association, Vienna, Austria, June 23-26, 2014. Title: "On dynamic excitation of Marangoni instability of deformable liquid layer with insoluble surfactant" .

22. The 67th Annual Meeting of the American Physical Society Division of Fluid Dynamics, San Francisco, CA, November 23-25 2014. Title: "Instabilities of evaporating non-isothermal ultra-thin film with insoluble surfactant".

23. The 6th International Symposium on Bifurcations and Instabilities in Fluid Dynamics, July 15 - 17, 2015, Paris, France. Title "Parametric wave excitation in a nonisothermal liquid layer with insoluble surfactant".

24. The 68th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Boston, MA, November 22-24 2015. Title: "Vibrational instabilities of a nonisothermal liquid layer with insoluble surfactant".

25. The 8th Conference of the International Marangoni Association, Bad Honnef, Germany, June 12-16, 2016. Title: "Oscillatory Marangoni instability and capillary-gravity waves in a heated liquid layercovered by insoluble surfactant".

26. The 24th International Congress of Theoretic and Applied Mechanics (ICTAM), August 21-26 , 2016, Montreal, Canada. Title: "Waves in a heated liquid layer covered by insoluble surfactant".

27. The 69th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Portland, OR, November 20-22 2016. Title: "High-frequency vibration of heated liquid layer covered by insoluble surfactant".

28. The 7th International Symposium on Bifurcations and Instabilities in Fluid Dynamics, July 11 - 14, 2017, The Woodlands, TX, USA. Title "Parametrically excited long-scale Marangoni convection in a liquid layer covered by insoluble surfactant".

29. The 70th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Denver, CO, November 19-21 2017. Title: "Parametric excitation of large-scale Marangoni convection in a liquid layer with insoluble surfactant".

30. The 71th Annual Meeting of the American Physical Society Division of Fluid Dynamics, Atlanta, GA, November 18-20 2018. Title: "Oscillatory long-wave Marangoni convection in a heated liquid layer covered by insoluble surfactant. Bifurcation analysis".

Participation in Other Meetings

- All-Union School of young scientists on Numerical Methods in Continuous Media Mechanics, Shushenskoe, May 1987; Abakan, May 1989.
- All-Union School on Computational Mathematics and Mathematical Physics, Odessa, October 1988.
- Siberian School on Computational Mathematics, Novosibirsk, May 1988.
- All-Union Conference "Mathematical Simulation: nonlinear problems and computational mathematics", Zvenigorod , 1988.
- Winter School on Continuous Media Mechanics, Perm, February 1989, February 1991, February 2009.
- All-Union Conference "Modern problems of heat physics and physical hydrogasodynamics", Novosibirsk, June 1989.
- International Scientific School "Lyapunov functions and their applications", Irkutsk, September 1989.
- International School "Nonlinear Problems of Hydrodynamic Stability Theory", Moscow, Feb. 1990.
- International conference "Advances in Microfluidics & Nanofluidics", University Notre-Dame, Notre-Dame, IN, USA, May 24-26 2013 (poster).
- IMA Conference on Turbulence, Waves and Mixing, King's College Cambridge, UK, July 6 - 8 2016 (poster).

Organization of Meetings

1. The 7th International Symposium "Bifurcations and Instabilities in Fluid Dynamics", July 2017, The Woodlands, TX, USA. *Chair of Local Organizing Committee.*

2. Winter School on Continuous Media Mechanics, Perm, February 1989; February 1991.

3. International Conference "Generation of large-scale structures in continuous media", Perm - Moscow, June 1990.

4. International Workshops on Amateur Astronomy, Mt. Chiran, France, September 2001; St. Martin, France, September 2002; Blera, Italy, April 2008.

Teaching Experience

- Perm State University, Department of Physics: Courses and practical training on Differential Equations, Calculus of variation, Complex variables, Theoretical Mechanics, Matrix and Tensor Analysis.
- College of Jordan Valley: Course of high-school physics; Projects for high-school students on physical simulation.
- University Center, Ariel: Courses "Mathematics for Economists", "Computing for Economists", Theory of Probability and Statistics.
- Technion, Department of Mathematics: Courses, training and grading on Partial differential equations, Ordinary differential equations, Calculus I, Calculus II, Numerical methods.
- Educere Tutoring Center, Houston, TX, USA. Individual tutoring in Mathematics, Physics and Chemistry (high school and college-level students).
- Strayer University, Katy Campus, Houston, TX
  MAT 090: Fundamentals of Mathematics
  MAT 104: Algebra with Applications
  SCI 110: Introduction to Physical Sciences
  MAT 540: Quantitative Methods
  MAT 300: Statistics
- Embry-Riddle Aeronautical University-Worldwide (online teaching):
  PHYS 102: Explorations in Physics
  MATH112: College Mathematics for Aviation II
  MATH111: College Mathematics for Aviation I
  MATH250: Calculus & Analitycal Geometry I
  PHYS250: Physics III for Engineers
  PHYS253: Physics Lab for Engineers
  MATH142: Trigonometry
  PHYS150: Physics I for Engineers
  PHYS 160: Physics II for Engineers
- Sam Houston State University, Huntsville, TX
  PHYS 1311: Introductory Astronomy
  PHYS 1301: Physics-Mechanics and Heat
  PHYS 1302: Physics: Electromagnetism and Optics
  PHYS 1305:Classical Physics and Thermodynamics
  PHYS 3391: Modern Physics
  PHYS 1404: Solar system
  PHYS 1403: Galaxies & Stars
  ETEE 1340: Electronics Technology I

Professional Activity

- - Member of the American Physical Society, Division of Fluid Dynamics, APS Texas Section
- - Member of Society of Industrial and Applied Mathematics
- **Reviewer for**:
  - Physics of Fluids
  - European Journal of Physics - Special Topics
  - Fluid Dynamics Research
  - Microgravity Science and Technology
  - Ultrasonics

- Journal of Biological Physics
- The Journal of the Franklin Institute
- Applied Mathematics and Computation

- - Guest Editor of "Fluid Dynamics Research" (special issue, 2018)
- - Founder and Coordinator of International Group of Amateur Astronomers (2000).
- - Editor of "Astronomical Almanac" (2000, 2002).

LIST OF PUBLICATIONS

Theses:

1. A.B. Mikishev, "Influence of magnetic field on thermohaline convection of electro-conductive binary fluid". M.Sc. Thesis, Perm, 1983 (in Russian).

2. A.B. Mikishev, "Local structure of two-dimensional turbulent flows". PhD Thesis, Perm, 1990 (in Russian).

Papers Published in Refereed Journals and Books.

1. Intermittence in ideal two-dimensional magnetohydrodynamic turbulence, Magnetohydrodynamics, Vol. 25, No. 1, p. 127 - 130 (1989) (with P.G. Frick).

2. Spectral laws in two-dimensional turbulent flow with linear friction, Magnetohydrodynamics, Vol. 25, No. 1, p. 124-127 (1990) (with P.G. Frick).

3. Quasi-equilibrium in upward propagating flames, Phys. Letters A, vol. 175, p.409-414 (1993) (with Sivashinsky G.).

4. Multifractality of large turbulent fluctuations and the topology of strange attractors, Physical Review E, vol. 50, p. 3723 (1994) (with Bershadskii A.).

5. A Semenov-Rayleigh-Bennard problem, Preprint, University of Poitiers, Poitiers (1996) (with Joulin G. and Sivashinsky G.).

6. Visual observations of the 1998 and 1999 Leonids in Israel, Earth, Moon and Planets, vol. 82-83, p. 257-263 (1998) (with Levina A.).

7. Thermocapillary instability of a liquid layer under heat flux modulation, Physics of Fluids, vol 21 (6), 062102 (2009) (with Smorodin B., Nepomnyashchy A. and Myznikova B.).

8. Long-wavelength Marangoni convection in a thermally modulated field, Microgravity - Science & Technology, vol. 21 (suppl. 1), p. S193-S198 (2009) (with Smorodin B., Nepomnyashchy A. and Myznikova B.).

9. Parametric excitation of a longwave Marangoni convection, in: Chaotic Systems. Theory and Applications, ed. by Christos H. Skiadas and Ioannis Dimotikalis, p.207-215, World Scientific, Singapore et al., 2010 (with Nepomnyashchy A. and Smorodin B.).

10. Long-scale nonlinear evolution of parametrically excited Marangoni convection, Journal of Physics - Conference Series, vol. 216, 012004 (2010) (with Nepomnyashchy A. and Smorodin B.). doi: 10.1088/1742-6596/216/1/012004

11. Long-wavelength Marangoni convection in a liquid layer with insoluble surfactant: Linear theory, Microgravity Science & Technology, v. 22 Number 3, p. 415-423 (2010) (with Nepomnyashchy A.), doi:10.1007/s12217-010-9214-9.

12. Nonlinear large-scale Marangoni convection in a heated liquid layer with insoluble surfactant, Phys. Rev. E, vol. 82 Number 4, 046306 (2010) (with Nepomnyashchy A.). doi:10.1103/PhysRevE.82.046306 .

13. Large-scale Marangoni convection in liquid layer with insoluble surfactant of low concentration, Eur. Phys.J. Special Topics, vol. 192, p. 135-143 (2011) (with Nepomnyashchy A.).

14. Large-scale Marangoni convection in a liquid layer with insoluble surfactant under heat flux modulation, Journal of Adhesion Science and Technology, vol. 25, p. 1411-1423 (2011) (with Nepomnyashchy A.). doi: 10.1163/016942411X555999.

15. Amplitude equations for large-scale Marangoni convection in a liquid layer with insoluble surfactant on deformable free surface, Microgravity Science & Technology (2011) (with Nepomnyashchy A.). doi:10.1007/s122117-011-9271-8.

16. Marangoni instability of a liquid layer with insoluble surfactant under heat flux modulation, Eur. Phys. J. Special Topics, vol. 219, p.81-88 (2013) (with Nepomnyashchy A.). doi: 10.1140/epjst/e2013-01783-5.

17. Periodically excited Marangoni convection in a locally heated liquid layer, Eur. Phys. J. Special Topics, vol. 219, p.155-165 (2013) (with Wertgeim I. and Kumachkov M.). doi: 10.1140/epjst/e2013-01790-6.

18. Instabilities in evaporating liquid layer with insoluble surfactant, Physics of Fluids, vol. 25, 054109 (2013) (with Nepomnyashchy A.) doi:10.1063/1.4807161.

19. The influence of evaporation on long-wavelength instabilities in liquid layer with insoluble surfactant, Fluid Dyn. Res., vol. 46 , 041420 (2014) (with Nepomnyashchy A.) doi: 10.1088/0169 - 5983/46/4/041420 .

20. On dynamic excitation of Marangoni instability in a liquid layer with insoluble surfactant on the deformable surface, Eur. Phys. J. Special Topics, vol. 224, p.229-239 (2015)(with Nepomnyashchy A.). doi: 10.1140/epjst/e2015-02355-5.

21. Generation of transverse waves in a liquid layer with insoluble surfactant subjected to temperature gradient, Fluid Dyn. Res., vol. 48, 061403 (2016) (with B. Friedman and A. Nepomnyashchy) doi: 10.1088/0169-5983/48/6/061403

22. Oscillatory Marangoni instability in a heated layer with insoluble surfactant adsorbed on the free surface (with A. Nepomnyashchy), Colloids and Surfaces A:Physicochem. and Eng. Aspects. vol. 521, p. 161-166 (2017) doi: 10.1016/j.colsurfa.2016.07.017

23. Parametric excitation of ocillatory Marangoni instability in aa heated liquid layer covered by insoluble surfactant (with A. Nepomnyashchy), Eur. Phys. J. Special Topics, vol. 226, p. 1287 - 1296 (2017), doi:10.1140/epjst/e2016-60228-8

24. Impact of an insoluble surfactant on the thresholds of evaporative Benard-Marangoni instability under air (with A. Rednikov and P. Colinet), Eur. Phys. J. E, vol. 40, 90 (2017) doi:10.1140/epje/i2017-11580-x

25. Parametric excitation of Marangoni instability in a heated thin layer covered by insoluble surfactant (with Nepomnyashchy A.), Microgravity Sci. Technol., vol. 30, 173-181 (2018) doi: https://doi.org/10.1007/s12217-017-9586-1

26. Large-scale nonlinear evolution of parametrically excited Marangoni convection in a liquid layer covered by insoluble surfactant (with Nepomnyashchy A.), Fluid Dyn. Res., vol. 50, 051405 (2018), doi:https://doi.org/10.1088/1873-7005/aab1e8

Papers Submitted/Prepared to Refereed Journals

27. Large-scale nonlinear evolution of Marangoni convection in a liquid layer covered by insoluble surfactant: numerical analysis (with Nepomnyashchy A.).

Papers Published in Proceedings

1. Use of shell-model for calculation of local structure of two-dimensional turbulence, Proc. of All-Union School of Young Scientists: Numerical Methods of Continuous Media Mechanics, 85 - 97 (Krasnoyarsk 1987) (in Russian).

2. Local structure of turbulence in thin non-isothermal rotating layers of liquid, Proc. of Conference "Investigations of young scientists in physics and mathematics", Perm State Univ., 14 - 15 (Perm 1988) (in Russian).

3. Local structure of decaying two-dimensional turbulence. Preprint No. 111 of ICMM UB of USSR AS, 23 - 33 (Sverdlovsk 1988) (in Russian) (with Frick P.).

4. Turbulent convection in Hele-Shaw cell. in: Fluid Dynamics and Heat and Mass Transfer Processes, 82 - 85 (Sverdlovsk 1989) (in Russian).

5. Simulation of local structure of two-dimensional turbulence using the shell-model. in: Fluid Dynamics and Heat and Mass Transfer Processes, 74 - 81 (Sverdlovsk 1989) (in Russian) (with Frick P.).

6. On Kolmogorov constants in two-dimensional turbulent flow with linear friction. Proc. of All-Union Conference "Modern problems of heat physics and physical hydrodynamics", 26 - 27 (Novosibirsk 1989) (in Russian).

7. Integral and local characteristics of large-scale turbulence in thin layers of fluids. Proc. of the 5th EPS Liquid State Conference, Moscow, 176 - 179 (Moscow 1989).

8. Self-similar gas jets in external force field. in: Orientation effects of dispersion systems. ed. K. Morozov, 38 - 44 (Sverdlovsk 1989) (in Russian) (with Aristov S.).

9. Investigation of local and integral characteristics of developed two-dimensional turbulence using the hierarchical model. Proc. of WCCM-II - World Congress of Computational Mechanics, 23nd, Universitaet Stuttgart, Germany, Aug. 27 - 31 (Stuttgart 1990) (with Frick P.).

10. Comprehensive analysis of Leonids in last 5 years. Proc. of International Science Symposium MAC-2002 (Tokyo 2002).

11. Parametric excitation of a longwave Marangoni convection. Proc. of International Conference "Chaos 2009" June 1-5 2009, article 127, 1-8 (Chania 2009) (with Nepomnyashchy A. and Smorodin B.)

Edited Books

1. "Astronomical Almanac 2000", 72 pp. ed. by Mikishev A.B. (FEL, Anwerp, Belgium, 2000).

2. "Astronomical Almanac 2002", 56 pp. ed. by Mikishev A.B. (FEL, Anwerp, Belgium, 2002).

Additional Information

Permanent resident of the United States.

List of Recommenders

1. Prof. Gregory Sivashinsky, Department of Applied Mathematics, School of Mathematical Sciences, Tel-Aviv University, Israel; e-mail: grishas@post.tau.ac.il

2. Prof. Alexander Nepomnyashchy, Department of Mathematics, Technion-Israel Institute of Technology, Haifa, Israel; email: nepom@math.technion.ac.il

3. Prof. and Corr. member of RAS Vladislav V. Pukhnachev, Lavrentyev Institute of Hydrodynamics, Novosibirsk, Russia; email: pukhnachev@gmail.com

4. Prof. Pierre Colinet, TIPs-Fluid Physics, Université Libre de Bruxelles, Bruxelles, Belgium; e-mail: pcolinet@ulb.ac.be

5. Prof. Barry A. Friedman, Department of Physics, Chair, Sam Houston State University, Huntsville, TX; phone: (936)294-1604, email: phy_baf@shsu.edu