CURRICULUM VITAE

Dr. MICHAEL (MISHA) CHERTKOV
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PERSONAL

Born: September 20, 1967, Moscow, USSR
Nationality: Israel, Russia, US permanent resident since 2000
Marital status: married, 3 sons (born 1989,1993,2004)
Languages: Russian, English, Hebrew

EDUCATION

1996 Ph.D. Physics, Weizmann Institute of Science
1990 M.Sc. Physics, Novosibirsk State University

EMPLOYMENT

2002- Full Term Technical Staff Member, Theoretical Division, Los Alamos NL
1999-2001 J.R. Oppenheimer Fellow, Theoretical Division, Los Alamos NL
1996-99 R.H. Dicke Fellow, Department of Physics, Princeton University
1993-96 Research Assistant, Weizmann Institute of Science
1990-92 Junior Researcher, Budker Institute, Novosibirsk

CONSULTING

1996-99 Bell Laboratories, Lucent Technologies

AWARDS

1999 J.R. Oppenheimer Fellowship at LANL
1996 R.H. Dicke Fellowship at Princeton
1996 Prize of the Feinberg Graduate School
1995 Prize of the Charles Clore Israel Foundation

WORKSHOPS and SEMINAR SERIES ORGANIZED

05/2004 CNLS Annual Conference on "Statistical Physics of Macromolecules:
- from electronic structure to fluid mechanics" (Santa Fe)
03/2002 Workshop on Progress in Statistical Hydrodynamics, CNLS (LANL)
2001-02 Statistical Physics Informal Seminar, CNLS (LANL)
03/2001 Workshop on Statistical Physics of Fiber Optics Communications, CNLS (LANL)
1999-2000 Theoretical Physics Seminar, CNLS (LANL)
1997-1999 Turbulence Theory Seminar, IAS (Princeton)

POSTDOCS at LOS ALAMOS NL

2001-2004 Avner Peleg
2002- Yeo-Jin Chung
2004- Misha Stepanov

INVITED PRESENTATIONS at CONFERENCES and WORKSHOPS

09/2003 "Kolmogorov's legacy in Physics", Trieste
08/2003 "Dynamical Chaos in Classical and Quantum Physics", Novosibirsk
05/2003 SIAM Annual Meeting, Utah
03/2003 Conference on Turbulence, IAS, Princeton
02/2003 Los Alamos-Arizona Days, Tucson
06/2002 Landau Days, Moscow
06/2002 Program on Developed Turbulence, Vienna
11/2001 AMS Meeting, Irvine
06/2001 Fronts in Scalar and Vector Geophysical Workshop, NCAR, Boulder
05/2001 Workshop on Active Chaotic Flows, LANL
11/2000 Workshop on Theoretical Physics, Cuernavaca
07/2000 JASON Committee on Drag Reduction, General Atomics, San Diego
01-06/2000 Workshop on Fluid Turbulence, ITP Santa-Barbara
11/1999 IUTAM Symposium on Geometry and Statistics of Turbulence, Kanagawa
10/1999 AMS Meeting, Charlotte
09/1999 Transport processes in the Atmosphere and the Ocean, Palma de Mallorca

06/1999 Fifth workshop on Burgers Turbulence (and beyond), Nice
05/1998 Turbulence'98, Los Alamos
04/1998 Transport processes in the Atmosphere and the Ocean, Porto
03/1998 APS March Meeting, Los Angeles
06/1997 International Congress of Mathematical Physics, Brisbaine
03/1997 Workshop on Turbulence, IHES, Bur sur Yvette

REFEREE FOR:

Phys.Rev.E, Phys.Rev.Lett., Phys.Fluids, Euro.Phys.Lett, Physica D, JOSA B, JFM, Phys. Lett. A.

FIELDS OF INTEREST:

Statistical Hydrodynamics (Turbulence), Statistical and Nonlinear Optics, Information Theory, Error Correction Theory, Polymer Physics, Combustion, Geophysical Fluid Mechanics, Soft Condensed Matter, Quantum magnetism

List of Publications

1. The motion of a phase transition front in deep metastability, Sow. Solid. State **32**, 287 (1990), Co-author: A.Z.Patashinski.

2. The supersonic motion of a phase transition front, Sow. Solid. State **32**, 550 (1990), Co-author: A.Z.Patashinski.

3. High-temperature phase of the 2D Couloumb gas model near the Kosterlitz- Thouless phase transition, Phys. Lett.A **162**, 402(1992).

4. Functional integral and effective Hamiltonian t-J-V model of strongly correlated electron system, J. of Stat. Phys. **69**, 231 (1992), Co-author: V.I. Belinicher.

5. Long-time dynamics of the infinite-temperature Heisenberg magnet, Phys.Rev.B **49**, 3592 (1994), Co-author: I. Kolokolov.

6. Structural instability of two-dimensional turbulence, Physica D **78**, 11 (1994), Co-author: G. Falkovich.

7. Passive scalar convection in a 2D long-range delta-correlated velocity field: exact results, Journ. of Phys.A **27**, 4925 (1994), Co-authors: Y. V. Fyodorov and I. Kolokolov.

8. Statistics of a passive scalar advected by a large-scale 2D velocity field: analytic solution, Phys.Rev.E **51**, 5609 (1995), Co-authours: G. Falkovich, I. Kolokolov and V. Lebedev.

9. Equilibrium dynamics of a paramagnet cluster, Phys.Rev.B **51**, 3974 (1995), Co-author: I. Kolokolov.

10. Exact field-theoretical description of passive scalar convection in N-dimensional long-range velocity field, Phys.Lett.A **192**, 435 (1994), Co-authors: A. Gamba and I. Kolokolov.

11. Equilibrium and nonequilibrium mean-field dynamics of quantum spin cluster., Sov.Phys.JETP **79**, 824 (1994), Co-author: I. Kolokolov.

12. Normal and anomalous scaling of the fourth-order correlation function of a randomly advected passive scalar, Phys.Rev.E **52**, 4924 (1995), chao-dyn/9503001. Co-authours: G. Falkovich, I. Kolokolov, and V. Lebedev.

13. The fourth-order correlation function of a randomly advected passive scalar, JETP Lett **61**, 1012 (1995), chao-dyn/9508002, Co-authors: E. Balkovsky, I. Kolokolov, and V. Lebedev.

14. Theory of random advection in two dimensions, Int.J.Mod.Phys.B **10**, 2273 (1996), Co-authors: G. Falkovich, I. Kolokolov, and V. Lebedev.

15. Anomalous scaling exponents of a white-advected passive scalar, Phys.Rev.Lett. **76**, 2706 (1996), chao-dyn/9509007, Co-author: G. Falkovich.

16. Non-universality of the scaling exponents of a passive scalar convected by a random flow, Phys.Rev.Lett. **76**, 3707 (1996), chao-dyn/9601016, Co-authors: G. Falkovich, and V. Lebedev.

17. Instanton for random advection, chao-dyn/9606011, Phys. Rev. E **55**, 2722 (1997).

18. Inverse cascade and intermittency of passive scalar in 1d smooth flow, chao-dyn/9706017, Phys.Rev.E **56**, 5483 (1997), Co-authors: I. Kolokolov, and M. Vergassola.

19. Inverse versus direct cascades in turbulent advection, chao-dyn/9706016, Phys.Rev.Lett. **80**, 512 (1998), Co-authors: I. Kolokolov, and M. Vergassola.

20. Intermittent dissipation of a passive scalar in turbulence, chao-dyn/9709005, Phys.Rev.Lett. **80**, 2121 (1998), Co-authors: G. Falkovich, and I. Kolokolov.

21. Propagation of a Huygens front through turbulent medium, chao-dyn/9709028, Phys.Rev.Lett. **80**, 2837 (1998), Co-author: V. Yakhot.

22. On how a joint interaction of two innocent partners (smooth advection & linear damping) produces a strong intermittency, chao-dyn/9803007, Phys. Fluids**10**, 3017 (1998).

23. Passive advection in nonlinear medium, chao-dyn/9809010, Physics of Fluids 11, 2257 (1999).

24. Lagrangian Tetrad Dynamics and Phenomenology of Turbulence, Physics of Fluids**11**, 2394 (1999), Co-authors: A. Pumir, and B. Shraiman.

25. Small-scale turbulent dynamo, chao-dyn/9906030, Phys.Rev.Lett.**83**, 4065 (1999), co-authors: G. Falkovich, I. Kolokolov and M. Vergassola.

26. Polymer Stretching by Turbulence, chao-dyn/9911011, Phys.Rev.Lett.**84**, 4761 (2000).

27. Turbulence in Polymer Solutions, Proceedings of IUTAM 99 symposium on Geometry and Statistics of Turbulence, editors T. Kambe, T. Nakano and T. Miyauchi, Fluid Mechanics and Its application Bookseries, ISBN 0-7923-6711-1, Kluwer Academic Publisher, 2001.

28. Geometry of Lagrangian Dispersion in Turbulence, Phys.Rev.Lett.**85**, 5324 (2000), co-authors: A. Pumir, B. Shraiman.

29. The Lagrangian view of energy transfer in turbulent flow, Euro.Phys.Lett.**56**, 379 (2001), co-authors: A. Pumir, B. Shraiman.

30. Pulse confinement in optical fibers with random dispersion, Proc. Natl. Acad. Sci. USA **98**, 14208 (2001), co-authors: I. Gabitov, J. Moeser.

31. Shedding and Interaction of Solitons in Imperfect Medium, Pis'ma v ZhETF **74**, 391 (2001) [JETP Letters **74**, 357 (2001)], co-authors: I. Gabitov, I.Kolokolov, V. Lebedev.

32. Solitons in Optical Medium with Disorder and Anisotropy, Pis'ma v ZhETF **74**, 608 (2001), co-authors: I. Gabitov, I.Kolokolov, V. Lebedev.

33. Pinning method of pulse confinement in optical fiber with random dispersion, JOSA B 19, 2538 (2002), co-authors: I. Gabitov, P. Lushnikov, J. Moeser, Z. Toroczkai.

34. Decay of scalar turbulence revisited, Phys.Rev.Lett **90**, 034501 (2003), co-author: V. Lebedev.

35. Boundary effects on chaotic advection-diffusion chemical reactions, Phys.Rev.Lett **90**, 134501 (2003), co-author: V. Lebedev.

36. Shedding and interaction of solitons in weakly disordered optical fibers, Phys.Rev.E. **67**, 036615 (2003), co-authors: Y. Chung, A. Dyachenko, I. Gabitov, I. Kolokolov, and V. Lebedev.

37. Inelastic collisions of pulses in optical fibers, JOSA B **21**, 18 (2004), co-authors: A.Peleg and I. Gabitov.

38. Inter-channel interaction of optical solitons, Phys. Rev. E 68, 026605 (2003), co-authors: A. Peleg and I. Gabitov.

39. Passive Compensation of Polarization Mode Dispersion via Periodic Control of Birefringent Disorder, JOSA B 21, 486 (2004), co-authors: I. Gabitov, I. Kolokolov and T. Schäfer.

40. Probability of anomalously large Bit-Error-Rate in long haul optical transmission, to appear in Phys.Rev.E **68**, 066619 (2003), co-authors: Vladimir Chernyak, Igor Kolokolov, and Vladimir Lebedev.

41. Extreme Outages due to Polarization Mode Dispersion, Optics. Lett. **28**, (2003), co-authors: Vladimir Chernyak, Igor Kolokolov, and Vladimir Lebedev.

42. Compensation for Extreme Outages caused by Polarization Mode Dispersion and Amplifier noise, Optics. Express. **11**, 1607 (2003), http://www.opticsexpress.org/abstract.cfm?URI=OPEX-11-14-1607, co-authors: Vladimir Chernyak, Igor Kolokolov, and Vladimir Lebedev.

43. Periodic and Quasi-Periodic Compensation Strategies of Extreme Outages caused by Polarization Mode Dispersion and Amplifier Noise, JETP Lett. **78**, 198-201 (2003), http://arXiv.org/abs/physics/0303015, co-authors: Vladimir Chernyak, Igor Kolokolov, and Vladimir Lebedev.

44. PMD induced fluctuations of Bit-Error-Rate in optical fiber systems, to appear in special issue of Journal of Lightware Technology (invited), co-authors: Vladimir Chernyak, Ildar Gabitov, Igor Kolokolov, and Vladimir Lebedev.

45. Phenomenology of Rayleigh-Taylor Turbulence, Phys.Rev.Lett. **91**, 115001 (2003).

46. Outage probability for soliton transmission, to appear in Euro.Phys.Lett 04/04, co-authors: Vladimir Chernyak, Igor Kolokolov, and Avner Peleg.

47. Error correction on a tree: An instanton approach , submitted to Phys.Rev.Lett 03/24/04, co-authors: Vladimir Chernyak, Michail Stepanov, Bane Vasic.

48. Effects of surface tension on immiscible Rayleigh-Taylor turbulence, submitted to Phys.Rev.Lett. 08/04, co-authors: Igor Kolokolov, Vladimir Lebedev.

49. Tumbling of polymers in random flow with mean shear, submitted to JFM 09/04, co-authors: Igor Kolokolov, Vladimir Lebedev and Konstantin Turitsyn.

50. Statistics of Polymer Extension in Random Flow with Mean Shear, submitted to JFM 09/04, co-authors: Igor Kolokolov, Vladimir Lebedev and Konstantin Turitsyn.