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Born: August 18, 1974
Ternopil, Ukraine

Research Area

COMPUTATIONAL MOLECULAR BIOLOGY AND BIOPHYSICS.

Education and Theses

- Ph.D. (Chemistry), Institute of Physical Chemistry, Warsaw, Poland. March 1999.
Thesis: “*Single chain statistics in dense polymer systems*” (Cum laude).
Ph.D. thesis advisor: Robert Holyst.
- M.Sc. (Physics), Ivan Franko Lviv State University, Lviv, Ukraine. June 1996.
Thesis: “*Diquark potential models of hadrons*”.

Postdoctoral Training

- Postdoctoral research associate, Theoretical and Computational Biophysics Group, University of Illinois at Urbana-Champaign, USA. October 2001 – present.
- Postdoctoral research associate, Material Science Laboratory R&D Center Mitsui Chemicals, Inc., Japan. April 1999 – September 2001.

Teaching Experience

- Developing lecture materials and hands-on tutorials for Non-Equilibrium Statistical Physics, Theoretical Biophysics, and Biomolecular Modeling courses.
- Instructing computer-lab classes.
- Advising junior graduate students.

Administrative Experience

Preparing grant proposals and reports for various funding agencies including NSF, NIH, NRAC, and DARPA. Approximate load: six activities per year.

List of Publications (as of November, 2004)

Up-to-date list of publications is available at <http://www.ks.uiuc.edu/~alek/papers.html>.

20. A. Aksimentiev and K. Schulten, *Imaging α -hemolysin with molecular dynamics: Ionic conductance, osmotic permeability and the electrostatic potential map*, Submitted (2004).
19. E. Tajkhorshid, J. Cohen, A. Aksimentiev, M. Sotomayor, and K. Schulten, *Towards Understanding Membrane Channels*, In press (2005).
18. A. Aksimentiev, B. J. Heng, G. Timp, and K. Schulten, *Microscopic kinetics of DNA translocation through synthetic nanopores*, Biophysical Journal **87**, 2086-2097 (2004).
17. J.H. Heng, C. Ho, T. Kim, R. Timp, A. Aksimentiev, Y.V. Grinkova, S. Sligar, K. Schulten, and G. Timp, *Sizing DNA Using a Nanometer Diameter Pore*, Biophysical Journal **87**, 2905-2911 (2004).
16. A. Aksimentiev and Klaus Schulten, *Extending the molecular modeling methodology to study insertion of membrane nanopores*, Proceedings of the National Academy of Sciences, USA **101**, 4337-4338, 2004.
15. A. Aksimentiev, I.A. Balabin, R.H. Fillingame and K. Schulten, *Insights into the molecular mechanism of rotation in the Fo sector of ATP synthase*, Biophysical Journal **86**, 1332-1344, 2004.
14. Emad Tajkhorshid, Aleksij Aksimentiev, Ilya Balabin, Mu Gao, Barry Isralewitz, James C. Phillips, Fangqiang Zhu, and Klaus Schulten, *Large scale simulation of protein mechanics and function*, Advances In Protein Chemistry **66**, 195-248, 2003.
13. A. Aksimentiev, R. Holyst, M. Fialkowski, *Morphology of surfaces in mesoscopic polymers, surfactants, electrons, or reaction-diffusion systems: Methods, simulation and measurements*, Advances in Chemical Physics **121**, 141-239 (2002).
12. A. Aksimentiev, R. Holyst, *Application of the Euler characteristic to the study of homopolymer blends and copolymer melts*, Polimery **46**, 309-322 (2001).
11. M. Fialkowski, A. Aksimentiev, R. Holyst, *Scaling of the Euler characteristic, surface area and curvatures in the phase separating/ordering systems*, Phys. Rev. Lett. **86**, 240-243 (2001).
10. A. Aksimentiev, *Morphological transformations during phase-separation/ordering phenomena*, Molecular Crystals and Liquid Crystals **366**: 2745-2752 (2001).
9. A. Aksimentiev, R. Holyst, *Influence of the free-energy functional form on simulated morphology of spinodally decomposing blends*, Phys. Rev. E **62**, 6821-6830 (2000).

8. A. Aksimentiev, R. Holyst, K Moorthi, *Kinetics of the droplet formation at the early and intermediate stages of the spinodal decomposition in homopolymer blends*, Macromol. Theory Simul. **9**, 661-674 (2000).
7. A. Aksimentiev, K. Moorthi, R. Holyst, *Spinodal decomposition of homopolymer blends: geometrical properties of the interface*, Progress of Theoretical Physics Supplement **138**, 398-399 (2000).
6. A. Aksimentiev, K. Moorthi, R. Holyst, *Scaling properties of the morphological measures at the early and intermediate stages of the spinodal decomposition in homopolymer blends*, J. Chem. Phys. **112**, 6049-6062 (2000).
5. A. Aksimentiev and R. Holyst, *Single chain statistics in polymer systems*, Progress in Polymer Science **24**, 1045-1093 (1999).
4. A. Aksimentiev and R. Holyst, *Phase behavior of gradient copolymers*, J. Chem. Phys. **111**, 2329-2339 (1999).
3. R. Holyst, D. Plewczyński, A. Aksimentiev and K. Burdzy, *Diffusion on Curved, Periodic Surfaces*, Phys. Rev. E **60**, 302-307 (1999).
2. A. Aksimentiev and R. Holyst, *Single chain conformations in the system of symmetric and asymmetric diblock copolymers*, Macromol. Theory Simul. **8**, 328-342 (1999).
1. A. Aksimentiev and R. Holyst, *Swelling and shrinking of polymer chains in homopolymer blends*, Macromol. Theory Simul., **7**, 447-456 (1998).

Patents

A. Aksimentiev, T. Biben, R. Holyst, K Moorthi, *Method and system for the analysis three dimensional objects*, Japanese patent application No 2000-221562.

Selected Presentations

- Invited Talk – *Microscopic kinetics of DNA translocation through nanopores*, Focused Workshop on Electronic Recognition of DNA Molecules, Liege, Belgium, 2004.
- Invited Talk – *Single molecule electrical recordings through artificial nanopores*, Symposium at the 228 ACS Meeting “Biophysical Chemistry and Novel Imaging of Single Molecules and Single Cells”, Philadelphia, USA, 2004.
- Invited Talk – *Sizing DNA with artificial nanopores*, Linking Bio and Nano, Purdue University, USA, 2004.
- Invited Talk – *Nano-devices in Action: Torque-generating molecular pump and DNA sequence sensor*, University of British Columbia, Canada, 2004.
- Contributing talk and poster – *Molecular Mechanism of Rotation in the Fo Sector of ATP synthase*, Gordon Research Conference on Molecular & Cellular Bioenergetics, Kimball Union Academy, NH, USA, 2003.
- Invited talk – *Exploring Protein Motors on Multiple Time-Scales: Fo ATP Synthase*, Condensed Matter & Biological Physics Seminar, Purdue University, USA 2003.
- Contributing talk – *Multi scale modeling of Fo ATP synthase*, BPS2003, San Antonio, USA.
- Contributing talk – *Morphological transformations during phase-separation/ordering*, International Conference on Pattern Formation and Self-Organization in Nonlinear Complex Systems, Beijing, China, 2001.
- Invited talk – *Morphology of phase separation*, AMOLF, Amsterdam, Netherlands, 2001.
- Invited talk – *Morphology of spinodal decomposition*, University of Kanazawa, Japan, 2000.
- Invited talk – *Morphology of spinodal decomposition*, National Institute for Material Science and chemical research, Tsukuba, Japan 2000.
- Invited talk – *Morphology of spinodal decomposition*, Hajime Tanaka’s Laboratory, Tokyo University, Japan, 2000.
- Contributing talk – *Phase behavior of gradient copolymers*, 3rd Tohwa International Conference on Statistical Physics, Fukuoka, Japan, 1999.
- Contributing talk – *“Single chain statistics in different polymer mixtures”*, Summer School on “Physics of biosystems: Self-assembly and evolution”, Lisbon, Portugal, 1998.
- Invited talk – *“Single chain statistics in homopolymer blends”*, Department of Theoretical Physics, Warsaw University, Warsaw, Poland 1997.

References

Dr. Klaus Schulten, Swanlund Professor of Physics
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