Vasily Kantsler

Contact

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Objective

My research is focused on Biological and Complex Fluids. I aim to study dynamics on different scales in biologically relevant fluids by versatile microfluidics and optical video microscopy techniques.

Education

Ph.D. in Physics, 03/2008
Weizmann Institute of Science, Rehovot, Israel.

M.Sc study in Physics 09/2001-06/2002
B.Sc in Physics, 06/2001
Novosibirsk State University, Novosibirsk, Russia.

Research experience

University of Warwick Coventry, UK
Department of Physics

Assistant Professor 06/2013 - now
Soft Matter and Biological Fluids group.

University of Cambridge Cambridge, UK
DAMTP

Research Associate 02/2009 - 05/2013
Physics of Cytoplasmic streaming. Self organization phenomena in actin-myosin systems. Dynamics of single polymers. Active transport and surface interaction in suspensions of microorganisms.

University of California at San Diego La Jolla, California
Department of Physics

Visiting Scientist 08/2008 - 11/2008
Sedimentation of heavier than water particles in various steady flows.

Weizmann Institute of Science Rehovot, Israel
Department of Physics of Complex Systems

Postdoctoral Fellow 01/2008 - 04/2008
PhD student 03/2003 - 12/2007
Summer student and Candidate for PhD 06/2002 - 03/2003

Postdoc: *Design, development and calibration of microfluidic four-roll-mill device.*

PhD: *Vesicle dynamics in flows.*
Summer student:*Developing device and method for particle separation and sorting in fluid media.*

The University of Hull Hull, UK
HIMSA Fluid Dynamics Laboratory

Visiting Scientist 05/2005
Assistance on the project: *PIV measurements of vesicle motion in shear flow.*

Institute of Thermophysics Novosibirsk, Russia
Department of Physical Hydrodynamics

Research Assistant 2000-2002
Investigation of condensation and ionization precesses of silane clusters in free jets via molecular beam mass-spectrometry.

Teaching

Weizmann Institute of Science Rehovot, Israel
Department of Physics of Complex Systems

Mentor 07/2007 - 03/2008
Mentor 06/2003 - 12/2003
Research adviser on the projects : *Device and method for preparation of uniform size GUV's. & Continuous particles size separation and size sorting by ultrasound in micro-channels.*

Patents

- Publication number WO/2007/083295 : *Device and Method for Manipulating Particles in Fluid Medium.*

`http://www.wipo.int/pctdb/en/wo.jsp?wo=2007083295&IA=WO2007083295&DISPLAY=STATUS`

Publications

- P. Denissenko, D. J. Smith, V. Kantsler, J. Kirkman-Brown *Propagation of Spermatozoa Along Series of Traps: An example of Sperm Cell Incidental Cooperation?* in preparation 2013
- V. Kantsler, J. Dunkel, R. E. Goldstein *Swimming of E. coli near micro-structured surfaces* in preparation 2013
- V. Kantsler, J. Dunkel, R. E. Goldstein *Shear and shape guide sperm on upstream spirals* in preparation 2013
- H. H. Wensink, V. Kantsler, R. E. Goldstein and J. Dunkel *Controlling active self-assembly through broken particle symmetries* submitted to PRL 2013
- A. R. Honerkamp-Smith, F. G. Woodhouse, V. Kantsler, R. E. Goldstein *Membrane Viscosity Determined from Shear-Driven Flow in Giant Vesicles* Phys. Rev. Lett. 111, 038103 (2013)

- V. Kantsler, J. Dunkel, M. Polin, R. E. Goldstein *Ciliary contact interactions dominate surface scattering of swimming eukaryotes* Proc. Natl. Acad. Sci. USA 110 1187 (2013)
- P. Denissenko, V. Kantsler, D. J. Smith, J. Kirkman-Brown *Human spermatozoa migration in microchannels reveals boundary-following navigation.* Proc. Natl. Acad. Sci. USA 109 8007 (2012)
- V. Kantsler and R. E. Goldstein *Fluctuations, Dynamics, and the Stretch-Coil Transition of Single Actin Filaments in Extensional Flows.* Phys. Rev. Lett. 108 038103 (2012)
- N. J. Zabusky, E. Segre, J. Deschamps, V. Kantsler and V. Steinberg *Dynamics of Vesicles in shear and rotational flows: Modal Dynamics and Phase Diagram.* Phys. Fluids 23 041905 (2011)
- I. Rushkin, V. Kantsler, R. E. Goldstein *Fluid Velocity Fluctuations in a Suspension of Swimming Protists.* Phys. Rev. Lett. 105 188101 (2010)
- J. Deschamps, V. Kantsler, E. Segre, V. Steinberg *Dynamics of vesicles in general flow.* Proc. Natl. Acad. Sci. USA 106 11444 (2009)
- J. Deschamps, V. Kantsler, V. Steinberg *Phase diagram of single vesicle dynamical states in shear flow.* Phys. Rev. Lett. 102 118105 (2009)
- V. Kantsler, E. Segre, V. Steinberg *Critical dynamics of vesicle stretching transition in elongation flow.* Phys. Rev. Lett. 101 048101 (2008)
- V. Kantsler, E. Segre, V. Steinberg *Dynamics of interacting vesicles and rheology of vesicle suspension in shear flow.* Europhys. Lett. 82 58005 (2008)
- V. Kantsler, E. Segre, V. Steinberg *Vesicle dynamics in time-dependent elongation flow: Wrinkling instability.* Phys. Rev. Lett. 99 178102 (2007)
- S. Kapishnikov, V. Kantsler, and Victor Steinberg *Continuous particle size separation and size sorting using ultrasound in a micro-channel.* J. Stat. Mech. (2006) P01012
- V. Kantsler and V. Steinberg *Transition to tumbling and two regimes of tumbling motion of vesicles in shear flow.* Phys. Rev. Lett. 96 036001 (2006)
- V. Kantsler and V. Steinberg *Orientation and Dynamics of a Vesicle in Tank-Treading Motion in Shear Flow.* Phys. Rev. Lett. 95, 258101 (2005)

Prizes and Awards

- The Dean's Prize for Ph.D. Students, Weizmann Institute of Science, Israel

Academic Activities

- Referee for Physical Review Letters, Physical Review E, Physics of Fluids

Recent talks and seminars

- *Motility control in suspensions of swimming cells* Department of Physics, University of Edinburgh, UK, May 2013
- *Biological soft matter: from buckling of single polymers to motility control of swimming cells* Department of Physics, University of Durham, UK, September 2012

- *Biological soft matter: from buckling of single polymers to motility control of swimming cells* SkTech/MIT Initiative, USA, July 2012
- *Soft matter and biological fluid dynamics* Institute of Science and Technology, Austria, April 2012
- *Motility Control in suspensions of green algae: microfluidic one-way traffic and trapping* MMEC, Department of Engineering, MIT, USA, March 2012
- *Dynamics of Single Semi-flexible Polymers and Gian Vesicles in External Flows.*, School of Engineering, Brown University, USA, February 2012

Recent Conferences

- V. Kantsler, J. Dunkel and R.E. Goldstein *Swimming of E. coli near micro-structured surfaces*, APS DFD Meeting 2012.
- J. Dunkel, V. Kantsler, R.E. Goldstein *Microfluidic one-way streets for algae*, APS March Meeting 2012.
- V. Kantsler and R.E. Goldstein *Fluctuation, Dynamics and the Stretch-Coil Transition of Single Actin Filaments in Extensional Flows.*, APS March Meeting 2012.
- V. Kantsler I. Rushkin, R.E. Goldstein *Random Flow in Suspensions of Swimming Algae*, SIAM Dynamical Systems 2011.
- V. Kantsler I. Rushkin, R.E. Goldstein *Random Flow in Suspensions of Swimming Algae*, APS DFD 2010.
- V. Kantsler, E. Segre, V. Steinberg *Phospholipid Membrane Dynamics in Elongational Flow : Wrinkling Instability and Bud Formation* International Soft Matter Conference, October 2007, Aachen, Germany
- V. Kantsler, E. Segre, V. Steinberg *Vesicle Dynamics in Suspension and Rheology* The 52nd Annual Meeting of the Israel Physical Society, December 2006, Jerusalem, Israel
- V. Kantsler, E. Segre, V. Steinberg *Fluid Vesicle Dynamics and Interaction in Shear Flow* APS Division of Fluid Dynamics 59th Annual Meeting, November 2006, Tampa Bay, Florida, USA