

Address: Institute for Nonlinear Science, UCSD,
9500 Gilman Dr, La Jolla, CA 92093-0402
Tel.: (858)-822-2247, Fax: (858) 534-7664,
Email: dvolfs@ucsd.edu
Web: <http://inls.ucsd.edu/~volfs>

**PROFESSIONAL
EMPLOYMENT**

Jan 2004 - present: Department of Bioengineering & Institute for Nonlinear Science, University of California, San Diego. Assistant Project Scientist.

Sep 2001 - Dec 2003: Institute for Nonlinear Science, University of California, San Diego. Postgraduate Research Associate.

Dec 2000 - Aug 2001: School of Computational Science & Information Technology, Florida State University, Tallahassee. Postdoctoral Research Associate.

Nov 1998 - Dec 2000: Supercomputer Computations Research Institute, Florida State University, Tallahassee. Postdoctoral Research Associate.

Sep 1995 - Oct 1998: Parallel Computing Laboratory. Perm University, Perm, Russia. System Administrator.

EDUCATION

1995-1998: Ph.D. in Fluid Mechanics.
Perm State University, Perm, Russia & Université d'Aix-Marseille II, Marseille, France.
Advisors: Prof. D.V. Lyubimov & Prof. B. Roux.
Thesis: "Some Problems of Thermal Vibrational Convection in Plane and Cylindrical Layers".

1989-1994: M.Sc. in Physics (*diploma with honor*).
Perm State University, Perm, Russia. Department of Physics. Advisor: Prof. D.V. Lyubimov.
Thesis: "Bifurcations in the Problem of Thermal Convection in an Infinite Horizontal Layer Subject to Vertical Oscillation".

**RESEARCH
INTERESTS****Gene regulation:**

Theoretical design of synthetic gene regulatory networks
Control of the dynamics of genetic circuits
Automated image recognition

Condensed matter physics:

Phase ordering dynamics in diblock copolymers,
Granular materials: phase transitions between fluid
and solid states in shear flows, vibro and air fluidized beds.

Fluid dynamics, nonlinear dynamics and pattern formation:

Convection and convective instabilities,
Heat/mass transfer in microgravity,
Directional solidification.

Parallel computing:

Molecular dynamics with history dependent forces (OpenMP, mixed OpenMP & MPI),
FFT-based pseudo-spectral algorithms (MPI),
Multi-mode dynamical systems (Parix).

**TEACHING
EXPERIENCE**

1995-1998: Department of Physics. Perm University, Perm, Russia.
Ordinary Differential Equations (second year undergraduate course).
Theoretical Mechanics (second year undergraduate course).
Quantum Mechanics (third year undergraduate course).
Symbolic computations with Maple (second year undergraduate course).
Numerical Methods in Hydrodynamics (first year graduate course).

PUBLICATIONS

L.S. Tsimring, D. Volfson, J. Hasty
Modeling of stochastically driven genetic circuits,
Chaos, May (2006), accepted.

D. Volfson, B. Meerson, L.S. Tsimring,
Thermal collapse of a granular gas under gravity,
Phys. Rev E., May (2006), accepted.

D. Volfson, J. Marciniak, N. Ostroff, W. J. Blake, L. S. Tsimring, and J. Hasty,
Origins of extrinsic variability in eukaryotic gene expression,
Nature, [doi:10.1038/nature04281](https://doi.org/10.1038/nature04281), Dec, 2005

S. Cookson, N. Ostroff, W. L. Pang, D. Volfson, and J. Hasty,
Dynamics of single-cell gene expression over multiple cell cycles,
Molecular Systems Biology, [doi:10.1038/msb4100032](https://doi.org/10.1038/msb4100032), Nov, 2005

L. S. Tsimring and D. Volfson,
Modeling of impact cratering in granular media,
Powders and Grains, Balkema, Rotterdam, 2005

D. A. Bratsun, D. Volfson, L. S. Tsimring, and J. Hasty,
Delay-induced stochastic oscillations in gene regulation,
Proc. Natl Acad. Sci., **102**(41), 14593-14598, 2005

D. A. Bratsun, D. Volfson, J. Hasty, and L. S. Tsimring,
Non-Markovian Processes in Gene Regulation,
Proceedings of SPIE **5845**, 210-219, 2005

S. Dorbolo, D. Volfson, L. S. Tsimring, A. Kudrolli,
Dynamics of a bouncing dimer,
Phys. Rev Lett. **95**, 044101, 2005

T. Lu, D. Volfson, L. S. Tsimring, J. Hasty,
Cellular growth and division in the Gillespie algorithm,
IEE Systems Biology, **1**, 121, 2004

D. Volfson, A. Kudrolli, L. S. Tsimring,
Anisotropy driven dynamics in vibrated granular rods,
Phys. Rev E., **70**, 051312, 2004

D. Volfson, L. S. Tsimring, I. S. Aranson,
Stick-slip dynamics of a granular layer under shear,
Phys. Rev E., **69**, 031302, 2004

D. Volfson, L. S. Tsimring, I. S. Aranson,
Partially fluidized shear granular flows: Continuum theory and MD simulations,
Phys. Rev E., **68**, 021301, 2003

D. Volfson, L. S. Tsimring, I. S. Aranson,
Order parameter description of stationary partially fluidized shear granular flows,

Phys. Rev Lett. **90(25)**, 254301, 2003

D. Volfson, J. Viñals,
Morphological stability analysis of directional solidification into an oscillatory fluid layer,
Phys. Fluids, **13**, 3599, 2001

D. Volfson, J. Viñals,
Flow induced by a randomly vibrating boundary.
J. Fluid Mech., **432**, 387-408, 2001

D. V. Lyubimov, T. P. Lyubimova, B. Roux, D. N. Volfson,
Thermovibrational convection between two coaxial cylinders: the case of circularly polarized vibrations. In book: G. Z. Gershuni and D. V. Lyubimov, Thermal Vibrational Convection. *John Wiley & Sons*, 1998, 322-331.

D. V. Lyubimov, B. Roux and D. N. Volfson,
Bifurcations in multi-mode model of thermal convection in modulated gravitational field.
Vibrational effects in hydrodynamics., Perm, 1998,(in Russian).

D. V. Lyubimov, T. P. Lyubimova, B. Roux and D. N. Volfson,
Vibrational flows in the gap between two infinite cylinders.
Eur. J. Mech., B/Fluids, **16**, N5, 705-724, 1997

D. V. Lyubimov, T. P. Lyubimova, B. Roux and D. N. Volfson,
Stability of Couette-Taylor flow generated by the Schlichting mechanism.
10th Int. Couette-Taylor workshop, Paris, France, July, 1997 pp.113-114

D. A. Bratsun, D. Volfson,
Dynamical systems exploration on distributed-memory parallel processors.
FINAL REPORT on CEC-DG III CONTRACT ITDC-203, Parallel Computing for
Continuous Media Mechanics; Russian-EU Network, November, 1997, part 7.

V. K. Henner, D. N. Wolfson
Multichannel description of rho-meson excitations and s-matrix unitarity for overlapping resonances.
Nuovo Cimento A, **107**, N11, 2511-2517, 1994.

CONFERENCE PRESENTATIONS

Invited

Cellular and Molecular Dynamics Seminar, Scripps Research Institute, Nov 2005, San Diego, CA

Mathematical Modeling Group Seminar, Jun 2004, GlaxoSmithKline, Upper Merion, PA

Molecular Imaging Seminar, Scripps Research Institute, Jan 2004, San Diego, CA

Second Workshop on Granular Flow and Kinetics, Jan 2003, Argonne National Lab., IL

Other

ASME/ASCE/SES Mechanics and Materials Conference, June 2005, Baton Rouge, LA

Annual APS March Meeting, March 2005, Los Angeles, CA

Annual APS March Meeting, March 2004, Montreal, Canada

SIAM Conference on Applications of Dynamical Systems, May 2003, Snowbird, UT

Annual APS March Meeting, March 2003, Austin, TX

Gordon Research Conf. on "Granular & Granular-Fluid Flow", July 2002, Plymouth, NH

54nd Annual Meeting of the Division of Fluid Dynamics, APS, Nov 2001, San Diego, CA

Annual APS March Meeting, March 2001, Seattle, WA

52nd Annual Meeting of the Division of Fluid Dynamics, APS, Nov 1999, New Orleans, LA
Gordon Research Conf. on "Gravitational Effects in Physico-Chemical Systems" July 1999,
Henniker, NH.

10th Int. Couette-Taylor workshop, Paris, France, July, 1997.

**COMPUTER
SKILLS**

System administration: Solaris, Linux, Windows.
Operating systems: Linux, SunOS, Solaris, Irix, OSF, AIX, Windows.
Parallel interfaces: MPI, OpenMP, Parix.
Parallel platforms: Parsytec Power Xplorer, IBM RS/6000 SP.
Programming languages: C, FORTRAN (77/90), HTML, perl, Unix shells.
Post-processing, etc: sed, awk, Gnuplot, PGPLOT, IDL, HDF, LaTeX.
Packages: Maple, Mathematica, MatLab, AUTO97, DSTOOL.
Image Analysis: IDL.

**ACADEMIC
FELLOWSHIPS**

Friedman Scholarship (1993),
President of Russia Fellowship (1996)

**PERSONAL
INFORMATION**

Born: April 28, 1972, Perm, Russia.
Citizenship: Russia.
Family status: Married.
Languages: Russian (native), French.