

Yaroslav Ryabov

CONTACT	260 Congressional In. #204 Rockville, MD, 20852	<i>E-Mail:</i> yaroslav.ryabov@gmail.com http://www.yaroslav-ryabov.info
INFORMATION	<i>Home phone:</i> 301-255-0490 <i>Cell phone:</i> 240-246-6641	
RESEARCH INTERESTS	Computer modeling of protein dynamics, applications of NMR spectroscopy to structural biology, inter- and intra-domain dynamics in multi-domain protein systems, bioinformatics and genetics.	
OTHER RESEARCH FIELDS	Simulations of electromagnetic wave propagation in living tissue, theory of relaxation and transport in soft-condensed matter, dielectric properties of soft-condensed matter, glass-forming liquids, polymers and biopolymers, time domain and broadband frequency domain dielectric spectroscopy, theory of dielectric relaxation, fractional calculus and fluid dynamics.	
PROFESSIONAL POSITIONS	<p data-bbox="345 579 1024 611">National Institutes of Health, Bethesda, Maryland, USA</p> <p data-bbox="345 625 1516 657"><i>Research scientist, CIT, Division of Computational Bioscience</i> 2010 - 2012</p> <p data-bbox="345 672 1516 703"><i>NRC fellow, CIT, Division of Computational Bioscience</i> 2007 - 2010</p> <p data-bbox="345 718 1503 785">New structural restraints for overall protein shape and residue specific bond orientations from protein rotation dynamics implemented into Xplor-NIH.</p> <p data-bbox="345 808 1516 840">Purdue University, West Lafayette, Indiana, USA 2006 - 2007</p> <p data-bbox="345 854 1044 886"><i>Postdoctoral Research Associate, Department of Chemistry</i></p> <p data-bbox="345 900 1503 999">Developed a model of random quasi-evolutionary process, which explains statistics of exon size distribution in real genomes and reveals two distinctive classes of exons with different evolutionary history.</p> <p data-bbox="345 1014 1503 1081">Suggested a new method for accurate accounting of protein rotation diffusion in Molecular Dynamics trajectories.</p> <p data-bbox="345 1096 1187 1127">Designed a new type of electrophoretic gels with colored stacking parts.</p> <p data-bbox="345 1148 1516 1180">University of Maryland, College Park, Maryland, USA 2003 - 2006</p> <p data-bbox="345 1194 1365 1226"><i>Postdoctoral Research Associate, Center for Biomolecular Structure and Organization</i></p> <p data-bbox="345 1241 1503 1308">Developed a new, efficient and fast computational approach for evaluation of protein rotation diffusion tensors, which is 500 times faster than conventional HYDRONMR family programs.</p> <p data-bbox="345 1323 1503 1390">Suggested a new concept of assembling multi-domain protein structures using experimentally measured components of diffusion tensors as constraints for protein structure elucidation.</p> <p data-bbox="345 1404 1503 1537">Developed a method for characterization of inter-domain mobility in multi-domain proteins using NMR relaxation and residual dipolar coupling data. In application to a two-domain di-ubiquitin protein, the method revealed dynamic equilibrium between three distinctive conformation states of the molecule, which are controlled by the charge state of Histidine residue.</p> <p data-bbox="345 1558 1516 1589">The Hebrew University, Jerusalem, Israel 1999 - 2003</p> <p data-bbox="345 1604 1503 1635"><i>Postdoctoral Research Associate, School of applied science, Laboratory of Dielectric spectroscopy</i></p> <p data-bbox="345 1650 1503 1749">Proposed the model of non-monotonous relaxation kinetics in confined systems. The model found numerous applications for porous samples, like silica-glasses and porous silicon, polymer micro-composites, confined liquid crystals, and folding kinetics of biopolymers.</p> <p data-bbox="345 1764 1503 1862">Created frameworks for explanation of symmetric and asymmetric broadening of dielectric relaxation spectra, which opened the possibility of characterizing conformation states of polymer molecules in micro-composites, melts and solutions using dielectric spectroscopy.</p> <p data-bbox="345 1877 1503 1967">Investigated and analyzed relaxation behavior of mixtures of associated liquids for the model system of glycerol/water mixtures in the whole range of mixture compositions and extremely wide-frequency band and temperature intervals.</p>	

Discovered universal behavior of associated mixtures caused by formation of joint dynamic clusters of glycerol and water molecules.

For the first time characterized relaxation behavior of the glycerol crystalline phase.

Conducted numerical calculations of penetration of electromagnetic waves into living tissue.

Created a model of polarization and interaction between cloud droplets with the purpose of evaluating the effect of electrostatic charges on cloud microphysics.

Investigated theoretical aspects of *Fractional Calculus* in application to dissipative problems.

Analyzed asymptotic behavior of two different formulations of anomalous diffusion problem.

Institute for Mechanics and Engineering 1996 - 1999
Kazan Scientific Center, Russian Academy of Sciences, Kazan, Russia

Research Associate

Laboratory of Underground Hydrodynamics

Studied theoretical aspects of multi-component filtration in porous and fractured reservoirs.

Investigated the effect of harmonic pressure waves on commercial oil production.

The Hebrew University, Jerusalem, Israel 12/1997 – 03/1998

Visiting Scientist, School of Applied Science, Laboratory of Dielectric spectroscopy

Created a model of relaxation and dynamic percolation in micro-emulsion systems.

EDUCATION

Kazan State University, Kazan, Russia

Ph.D. in Theoretical Physics 12/1996

Thesis: “Relaxation and transport processes in self similar media”

Advisor: Professor R. R. Nigmatullin

M.S. in Theoretical Physics 05/1993

Thesis: “Investigation of nonexponential relaxation law of luminescence”

Advisor: Professor R. R. Nigmatullin

RECOGNITION

Bill and Melinda Gates Foundation Research Award (100,000 USD) 2011

In round 6 of Grand Challenges Explorations

For the project “*Palm Vein Biometric Identification prototype*”

Fellows Award for Research Excellence 2010

sponsored by *NIH Scientific Directors*,

the *Office of Intramural Training & Education*, the *Office of Research on Women's Health*, as well as the *Fellows Committee*

National Research Council Research Award (230,000 USD) 2007 / 2009

Research associateship at the *National Institutes of Health, Center for Information Technology, Division of Computational Bioscience*

Invited Publication 2006

in special issue on *Fractals, Diffusion and Relaxation in Disordered Complex Systems of Advances in Chemical Physics Series, Chapter 1*

Invited Publication 2002

in special issue on *Strange Kinetics* of *Chemical Physics* journal

Invited Publication 2002

in contributed volume *Scaling and Disordered Systems*

Travel award Gordon Research Conference “Water and Aqueous Solutions” 08 / 2002

The Lady Davis Fellowship (50,000 USD) for postdoctoral research 1999 – 2001
 in The Hebrew University of Jerusalem, Israel

Cover Story in interdisciplinary scientific journal “Priroda” (in Russian) 2 / 1998

- PUBLICATIONS** **Forty** peer-reviewed journal papers in *Journal of the American Chemical Society*, *Nucleic Acids Research*, *Physical Review B*, *Physical Review E*, *The Journal of Chemical Physics*, *Journal of Physical Chemistry B*, *Proteins*, *Physica A*, *Journal of Non-Crystalline Solids*, *IEEE transactions* and others; the first author in **twenty-four** peer-reviewed journal papers; **twenty** invited lectures and seminars; **four** invited publications in special journal issues devoted to problems of the glass-forming state and strange kinetics phenomena, including *Chapter 1 for Special Issue of Advances in Chemical Physics Series*, 2006, John Wiley & Sons, Inc.; **six** patents and **one** patent application; **eleven** papers in conference proceedings volumes; **eight** oral talks and **twenty-seven** poster presentations.
- TEACHING**
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|---|-------------|
| Statistical Mechanics , over 100 students
Department of Physics, Zelenodolsk Campus, Kazan State University, Russia | 1999 |
| Classical Mechanics II , over 100 students
Department of Physics, Zelenodolsk Campus, Kazan State University, Russia | 1999 |
| Classical Mechanics I , over 20 students
Department of Physics, Kazan State University, Russia | 1994 |
| Advanced Physics for gifted high school students ,
Preparatory School for University Applicants, Department of Physics,
Kazan State University, Russia | 1992 - 1998 |
| Advanced Mathematics for gifted high school students ,
Preparatory School for University Applicants, Department of Physics,
Kazan State University, Russia | 1992 - 1998 |
- ADDITIONAL INFORMATION** *Computer Skills*: C/C++, MATLAB, Java, Python, SQL, Oracle, MySQL, Xplor-NIH, Fortran, LaTeX, Windows, Uinux
Languages: English, Russian
Citizenship: USA
- REFERENCES** Available upon request