MATYUSHOV CURRICULUM VITAE

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EDUCATION

Ph. D., 1989	*Theoretical and Mathematical Physics*, Kiev State University and National Ukrainian Academy of Sciences, Kiev, Ukraine (under Profs. A. V. Gorodyskii and A. I. Karasevskii)
M. S., 1986	*Chemical Physics*, National Ukrainian Academy of Sciences, Kiev, Ukraine (under Prof. K. B. Yatsimirskii)
B. S., 1985	*Chemical Physics*, Moscow Institute for Physics and Technology, Moscow, Russia.

EMPLOYMENT

2011–now	Professor, 50-50 School of Molecular Sciences/Department of Physics, ASU
2010–2012	Center for Biological Physics, ASU (Director)
2006–2011	Associate Professor, 50-50 Departments of Chemistry/Physics, ASU
2000–2006	Assistant Professor, Department of Chemistry and Biochemistry, Arizona State University.
1998–2000	Research Associate, University of Utah, Salt Lake City
1996–1998	Postdoctoral Research Associate, Colorado State University, Fort Collins
1995–1996	Visiting Professor, Vienna Technical University, Vienna, Austria
1993–1994	Lise-Meitner Postdoctoral Fellow, Austrian Science Foundation
1989–1993	Senior Research Fellow, Inst. of General and Inorganic Chemistry, Ukrainian National Academy of Sciences, Kiev, Ukraine

RESEARCH AND TEACHING INTERESTS

Research:	Protein dynamics and thermodynamics, interfaces, photosynthesis, electron transfer, spectroscopy, solvation, liquid-state theory, phase/glass transitions
Teaching:	Physical Chemistry, Quantum Physics/Chemistry, General Chemistry, General Physics

AWARDS AND FELLOWSHIPS

2002-2004	Research Innovation Award by the Research Corporation
2000-2001	PRF G Start-up Grant
1993-1994	Lise Meitner Fellow by the Austrian Science Foundation

Courses Taught

Arizona State University

Fall 2023:	BCH-341 (PChem)
Spring 2023:	PHY473, Biophysics: "From molecules to Cells" (undergraduate)
Fall 2022:	BCH-341 (PChem)
Spring 2022:	PHY473, Biophysics: "From molecules to Cells" (undergraduate)
Fall 2021:	BCH-341, CHM-598, CHM-501 (PChem)
Spring 2020:	PHY473, Biophysics: "From molecules to Cells" (undergraduate)
Fall 2020:	Sabbatical leave
Spring 2020:	PHY473, Biophysics: "From molecules to Cells" (undergraduate)
Fall 2019:	CHM-495/598 ("Statistical Mechanics I: Solutions, Polymers, Soft Matter
Spring 2019:	PHY473, Biophysics: "From molecules to Cells" (undergraduate)
Fall 2018:	CHM-345 (Quantum Mechanics, undergraduate)
Spring 2018:	PHY473, Biophysics: "From molecules to Cells" (undergraduate)
Fall 2017:	CHM-345 (Quantum Mechanics, undergraduate)
Fall 2016:	PHY441 (Statistical Mechanics, undergraduate)
Spring 2015:	CHM545, Quantum Chemistry (graduate)
Fall 2015:	NAN/PHY/MSE571 (Statistical Mechanics)
Fall 2014:	NAN/MSE/PHY571, Quantum Mechanics (graduate)
	CHM545, Quantum Chemistry (graduate)
Fall 2013:	NAN/PHY571, Quantum Mechanics (graduate)
Spring 2013:	CHM341, Elementary Physical Chemistry (undergraduate)
Fall 2012:	NAN/PHY571, Quantum Mechanics (graduate)
Spring 2012:	CHM341, Elementary Physical Chemistry (undergraduate)
Fall 2011:	NAN/PHY571, Quantum Mechanics (graduate)
Spring 2011:	Excused
Fall 2010:	NAN/PHY571, Quantum Mechanics (graduate)
Spring 2010:	CHM341, Elementary Physical Chemistry (undergraduate)
Fall 2009:	NAN/PHY571, Quantum Mechanics (graduate)
Spring 2009:	CHM341, Elementary Physical Chemistry (undergraduate)
Fall 2008:	PHY571, Quantum Mechanics (graduate)
Spring 2008:	PHY241, University Physics III (undergraduate)
Fall 2007:	CHM545, Quantum Chemistry I (graduate)
Spring 2007:	CHM545, Quantum Chemistry I (graduate)
Fall 2006:	Sabbatical leave
Spring 2006:	CHM 545, Quantum Chemistry I (graduate)
Fall 2005:	CHM 543, Computational Chemistry (graduate)
Spring 2005:	CHM 545, Quantum Chemistry I (graduate)
Fall 2004:	Excused
Spring 2004:	CHM 545, Quantum Chemistry I (graduate)
Fall 2003:	CHM 598, Quantum Chemistry II (graduate)
Spring 2003:	CHM 545, Quantum Chemistry I (graduate)
Fall 2002:	CHM 341, Elementary Physical Chemistry (graduate)
Spring 2002:	CHM 546, Quantum Chemistry II (graduate)
Fall 2001:	CHM 341, Elementary Physical Chemistry (undergraduate)
Spring 2001:	Excused
Fall 2000:	CHM 101, Introductory Chemistry (undergraduate)

Vienna Technical University

	Modern Chemical Kinetics (graduate)
	Liquid-State Theory for Chemists (graduate)

Mentoring

Graduate
Shikha Gupta, MS (Chemistry), "Effect of solute and solvent polarizability on electron transfer reactions", 2004.
Anatoli Milischuk, PhD (Chemistry), "Theory and Computer Simulations of Equilibrium Polar Solvation with Applications to Electron Transfer in Organic Molecules", 2006.
David LeBard, PhD (Chemistry), "Computational studies of electron transfer proteins", 2008, (currently faculty member at Yeshiva U.).
Daniel Martin, MS (Chemistry) "Electric field and solvation in microscopic liquids", 2008.
Allan Friesen, PhD (Chemistry) "Electrostatic properties of water at interfaces with nanoscale solutes", 2012.
Hadi Dinpajooh, PhD (Chemistry), "Solvent Electrostatic Response: From Simple Solutes to Proteins", 2016.
Salman Seyedi, "FDT violation in Proteins" PhD (Physics), 2018.
Morteza Waskasi, PhD (Chemistry), "Temperature and polarizability effects on electron transfer in biology and artificial photosynthesis" 2019.
Taylor Colburn, 2021-current, PhD (Physics).
Mohammad Pirnia, 2022-current, PhD (Chemistry).

Postdoctoral
Mark Lilichenko, (2001-2003).
Andriy Okhrimovskyy, (2004).
Pradip Ghorai, (2005), currently faculty member at IISER, Kolkata.
Vitaliy Kapko, (2005-2007), currently at PayPal.
Anatoli Milischuk (2006), currently postdoc at Colorado State.
Alexander Morozov, (2009-2010).
Allan Friesen, (2012-2013), Currently High School teacher.
Daniel Martin, (2010-2017), Currently at Caris Life Sciences.
Tuhin Samanta, (2019-2022).
Setare Sarhangi, (2021-).

EXTERNAL FUNDING

Past Funding

- Postdoctoral Fellowship by the Austrian Science Foundation, 1993–1994, $54,000.
- "Band-shape analysis of optical spectra in liquid solvents", PRF-G, 01/01/2001–08/31/2003, $25,000; single PI: D. Matyushov.
- "Anisotropic polarization and control of electron transfer rates", Research Innovation Award by Research Corporation, 12/01/01–12/01/03, $35,000; single PI: D. Matyushov.
- "Nanoscale charge transport in DNA", Northwestern University sub-contract, 11/16/02–5/15/03, $12,000.
- "Activation parameters of electron transfer in large molecules dissolved in molecular solvents", PRF AC grant, 07/01/03–08/31/05, $80,000; single PI: D. Matyushov.
- "Control of electron transfer in liquid crystalline solvents", NSF, 08/01/03–07/31/06, $294,000; single PI: D. Matyushov.

- "Solvation and Electron Transfer in Glassy and Anisotropic Media", NSF, 08/01/06–07/31/09, $370,000.
- " Nanodielectrics For High Power Capacitors And Passive Applications", Air Force, STTR, subcontract with Synkera Technologies, 08/01/06–07/31/07, $30,000.
- "Dynamical Arrest, Structural Disorder, and Optimization of Organic Photovoltaic Devices", DOE, 08/01/07–07/31/10, $420,000, co-PI with I. R. Gould.
- "Electrostatics at the nano-scale in application to protein solvation and function", NSF, 08/01/09–07/31/13, $405,000; single PI: D. Matyushov.
- "Structure of water at interface with nanometer solutes and bioenergetics", NSF, 07/01/12–06/31/15, $280,000; single PI: D. Matyushov.
- "Protein Dynamics in Electron Transfer", NSF, 04/01/2012–03/31/2017, $ 1,184,825, PI: N. Woodbury, co-PI: S. Lin and D. Matyushov.
- "Electron transport in energy production complexes of biology", NSF, 04/01/2015-03/31/2018, $442,000; single PI: D. Matyushov.
- "Activated and nonlinear kinetics in biomolecules and interfaces", NSF, 04/01/2018-03/31/2022, $458,873.00; single PI: D. Matyushov.
- "Theories of homogeneous and electrochemical electron transfer in complex media", DOE, Office of Science, 05/01/2016-07/31/2022, $465,608; single PI: D. Matyushov.
- "Nanoscale Study of Quantum Criticality in Single Protein Molecules", DOD-ARMY-ARL, 08/30/2020–12/30/2022, $306,000; PI: S. Lindsay.

Current Funding

- "The Type I Homodimeric Reaction Center in Heliobacterium modesticaldum", DOE, 9/1/2022–8/31/2025, $1,160,000; PI: K. Redding, co-PI: S. Singharoy and D. Matyushov.
- "Transport Coefficients, Electroelasticity, and Conductivity of Proteins" NSF, 05/05/2022–04/30/2025, $510,000; single PI: D. Matyushov.

PUBLICATIONS

Books

1. D. V. Matyushov, *Manual for Theoretical Chemistry*, World Scientific, 2021. link.

Non-refereed Reviews and Book Chapters

3. D. V. Matyushov and G. A. Voth, *New Developments in the Theoretical Description of Charge-Transfer Reactions in Condensed Phases*, Rev. Comp. Chem. V.18 (2002), K. B. Lipkowitz and D. B. Boyd eds., Wiley-VCH, pp. 147-210.

[1]Graduate students are underlined, postdocs are listed in bold

4. D. V. Matyushov, *Electron transfer reactions: Theory*, Encyclopedia of Inorganic Chemistry, 2nd Edition, Wiley, 2005.

5. D. V. Matyushov, *Nonlinear Dielectric Response of Polar Liquids*, in Nonlinear Dielectric Spectroscopy, R. Richert Ed., Springer International Publishing AG, part of Springer Nature 2018.

Refereed Journals

6. A. I. Karasevskii, D. V. Matyushov, and A. V. Gorodiskii, *Radiationless transitions in systems with movable defects and proceeding of redox reactions*, Dokl. Acad. Sci. USSR **297** (1987) pp. 1156-1158.

7. D. V. Matyushov and Y. A. Maletin, *Electron transfer accompanied by bond rupture*, Chem. Phys. **127** (1988) pp. 325-334.

8. A. I. Karasevskii, D. V. Matyushov, and A. V. Gorodyskii, *Electron transfer in media with local fluctuations*, Chem. Phys. **142** (1990) pp. 1-15.

9. A. V. Gorodyskii, A. I. Karasevskii, and D. V. Matyushov, *Adiabatic outer sphere electron transfer through the metal-electrolyte interface*, J. Electroanal. Chem. **315** (1991) pp. 9-28.

10. D. V. Matyushov, *Electron transfer induced by liquid defect motion. Exact solution*, Chem. Phys. **155** (1991) pp. 331-344.

11. D. V. Matyushov, *Donor-acceptor vibrations in nonadiabatic electron transfer reactions*, Chem. Phys. **164** (1992) pp. 31-46.

12. D. V. Matyushov, *Electron transfer in molecules with conformational transitions*, Chem. Phys. Lett. **203** (1993) pp. 131-136.

13. A. V. Gorodyskii, A. I. Karasevskii, and D. V. Matyushov, *Electrochemical impedance under nonequilibrium electrode polarization*, Electrochim. Acta **38** (1993) pp. 1671-1678.

14. D. V. Matyushov, *A molecular theory of electron transfer reactions in polar liquids*, Mol. Phys. **79** (1993) pp. 795-808.

15. D. V. Matyushov, *Reorganization energy of electron transfer in polar liquids. Dependence on reactant size, temperature and pressure*, Chem. Phys. **174** (1993) pp. 199-218.

16. D. V. Matyushov, *Potential-step transient response of an electrochemical system*, J. Electroanal. Chem. **367** (1994) pp. 1-6.

17. D. V. Matyushov and R. Schmid, *Stationary points in the temperature dependence of electron transfer rates*, Chem. Phys. Lett. **220** (1994) pp. 359-364.

18. D. V. Matyushov and R. Schmid, *A molecular treatment of solvent effects on intervalence electron transfer*, J. Phys. Chem. **98** (1994) pp. 5152-5159.

19. D. V. Matyushov and R. Schmid, *Properties of Liquids at the Boiling Point: Equation of State, Internal Pressureand Vaporization Entropy*, Ber. Bunsenges. Phys. Chem. **98** (1994) pp.1590-1595.

20. D. V. Matyushov and R. Schmid, *Liquid molecularity: the effect of solvent on chemical reactivity*, Current Topics in Solution Chemistry, review, Research Trends, 1994.

21. R. Schmid and D. V. Matyushov, *Entropy of Attractive Interactions in Liquids at 298 K: A Measure of Structural Ordering*, J. Phys. Chem. **99** (1995) pp. 2893-2402.

22. D. V. Matyushov and R. Schmid, *Charge separation/recombination reactions in nonpolar fluids: a molecular description*, Mol. Phys. **84** (1995) pp. 533-552.

23. D. V. Matyushov and R. Schmid, *Optical and radiationless intramolecular electron transitions in nonpolar fluids: Relative effects of induction and dispersion interactions*, J. Chem. Phys. **103** (1995) pp. 2034-2049.

24. D. V. Matyushov and R. Schmid, *Calculation of Lennard-Jones energies of molecular fluids*, J. Chem. Phys. **104** (1996) pp. 8627-8638.

25. D. V. Matyushov and R. Schmid, *A thermodynamic analysis of solvation in dipolar liquids*, J. Chem. Phys. **105** (1996) pp. 4729-4741.

26. D. V. Matyushov, *Solvent reorganization energy of electron transfer in weakly polar solvents*, Chem. Phys. **211** (1996) pp. 47-71.

27. D. V. Matyushov, R. Schmid, and B. M. Ladanyi, *A thermodynamic analysis of the π^* and $E_T(30)$ polarity scales*, J. Phys. Chem. **101** (1997) pp. 1035-1050.

28. D. V. Matyushov and B. M. Ladanyi, *Nonlinear effects in dipole solvation: I. Thermodynamics*, J. Chem. Phys. **107** (1997) pp. 1362-1374.

29. D. V. Matyushov and B. M. Ladanyi, *Nonlinear effects in dipole solvation: II. Optical spectra and electron transfer activation*, J. Chem. Phys. **107** (1997) pp. 1375-1387.

30. D. V. Matyushov and B. M. Ladanyi, *Cavity Formation Energy in Hard Sphere Fluids: An Asymptotically Correct Expression*, J. Chem. Phys. **107** (1997) pp. 5815-5820.

31. D. V. Matyushov and B. M. Ladanyi, *Dispersion Solute-Solvent Coupling in Electron Transfer Reactions: I. Effective Potential*, J. Chem. Phys. **108** (1998) pp. 6362-6377.

32. D. V. Matyushov and B. M. Ladanyi, *Spontaneous emission and electron transfer rates in condensed phases*, J. Phys. Chem. **102** (1998) pp. 5027-5039.

33. C. M. Elliott, D. Derr, D. V. Matyushov, and M. D. Newton, *A Direct Experimental Comparison of the Electron Transfer Theories of Marcus and Hush Employing a Mixed-Valence Dinuclear Iron Polypyridyl*, J. Am. Chem. Soc. **120** (1998) pp. 11714-11726.

34. D. V. Matyushov and B. M. Ladanyi, *A perturbation theory and simulations of the dipole solvation thermodynamics. Dipolar hard spheres*, J. Chem. Phys. **110** (1999) pp. 994-1009.

35. D. V. Matyushov and G. A. Voth, *A perturbation theory and simulations of dipole solvation thermodynamics: Dipolar-quadrupolar liquids*, J. Chem. Phys. **111** (1999) pp. 3630-3638.

36. D. V. Matyushov, D. Henderson, and K.-Y. Chan, *The solvent-solute distribution function of binary hard sphere mixtures for dilute concentrations of the large sphere*, Mol. Phys. **96** (1999) pp. 1813-1816.

37. P. Vath, M. B. Zimmt, D. V. Matyushov, and G. A. Voth, *A failure of continuum theory: Temperature dependence of the solvent reorganization energy in highly polar solvents*, J. Phys. Chem. **103** (1999) pp. 9130-9140.

38. D. V. Matyushov and G. A. Voth, *A theory of electron transfer and steady-state optical spectra of chromophores with varying electronic polarizability*, J. Phys. Chem. **103** (1999) pp. 10981-10992.

39. D. V. Matyushov and G. A. Voth, *Reorganization parameters of electronic transition in electronically delocalized systems. I. Electron transfer reactions*, J. Phys. Chem. **104** (2000) pp. 6470-6484.

40. D. V. Matyushov and G. A. Voth, *Reorganization parameters of electronic transition in electronically delocalized systems. II. Optical spectra*, J. Phys. Chem. **104** (2000) pp. 6485-6494.

41. D. V. Matyushov and G. A. Voth, *Modeling the free energy surfaces of electron transfer in condensed phases*, J. Chem. Phys. **113** (2000) pp. 5413-5424.

42. D. V. Matyushov and M. D. Newton, *Understanding the Optical Band-Shape: Steady-State Coumarin-153 Spectroscopy*, J. Phys. Chem. A **105** (2001) pp. 8516-8532 (17 pages).

43. D. V. Matyushov, *Time-resolved fluorescence of polarizable chromophores*, J. Chem. Phys. **115** (2001) pp. 8933-8941 (9 pages).

44. A. Milischuk and D. V. Matyushov, *Dipole Solvation: Nonlinear Effects, Density Reorganization, and the Breakdown of the Onsager Saturation Limit*, J. Phys. Chem. A (invited) **106** (2002) pp. 2146-2157 (12 pages).

45. D. Small, D. V. Matyushov, and G. A. Voth, *The theory of electron transfer reactions: What may be missing?*, J. Am. Chem. Soc. **125** (2003) pp. 7470-7478 (8 pages).

46. A. Milischuk and D. V. Matyushov, *On the validity of dielectric continuum models in application to solvation in molecular solvents*, J. Chem. Phys. **118**, (2003) pp. 1859-1862 (4 pages).

47. A. Milischuk and D. V. Matyushov, *Non-Condon theory of electron transfer in V-shaped donor-bridge-acceptor complexes*, J. Chem. Phys. **118** (2003) pp. 5596-5606 (11 pages).

48. **M. Lilichenko** and D. V. Matyushov, *Control of electron transfer rates in liquid crystalline media*, J. Phys. Chem. B **107** (2003) pp. 1937-1940 (letter, 4 pages).

49. **M. Lilichenko** and D. V. Matyushov, *Reorganization energy of intermolecular electron transfer in solvents near isotropic/nematic transition*, J. Chem. Phys. **119** (2003) pp. 1559-1568 (10 pages).

50. D. N. LeBard, **M. Lilichenko**, D. V. Matyushov, Y. A. Berlin, M. A. Ratner, *Solvent reorganization energy of charge transfer in DNA hairpins*, J. Phys. Chem. B **107** (2003) pp. 14509-14520 (12 pages).

51. S. Gupta and D. V. Matyushov, *Effects of solute and solvent polarizability on the solvent reorganization energy of electron transfer reactions*, J. Phys. Chem. A **108** (2004) pp. 2087-2096 (10 pages).

52. D. V. Matyushov, *Dipole solvation in dielectrics*, J. Chem. Phys. **120** (2004) pp. 1375-1382 (8 pages).

53. D. V. Matyushov, *Solvent reorganization energy of electron transfer reactions in polar solvents*, J. Chem. Phys. **120** (2004) pp. 7532-7556 (25 pages).

54. D. V. Matyushov, *On the microscopic theory of polar solvation dynamics*, J. Chem. Phys. **122** (2005) 044502 (11 pages).

55. D. V. Matyushov, *A phenomenological model of dynamical arrest of electron transfer in solvents in the glass-transition region*, J. Chem. Phys. **122** (2005) 084507 (11 pages).

56. D. V. Matyushov and **A. Okhrimovskyy**, *Paraelectric and ferroelectric order in two-state dipolar fluids*, J. Chem. Phys. **122** (2005) 191101 (communication, 4 pages).

57. D. V. Matyushov and C. A. Angell, *Two-Gaussian excitations model for the glass transition*, J. Chem. Phys. **123** (2005) 034506 (12 pages).

58. A. Milischuk and D. V. Matyushov, *Equilibrium solvation in quadrupolar solvents*, J. Chem. Phys. **123** (2005) 044501 (20 pages).

59. **P. K. Ghorai** and D. V. Matyushov, *Dynamical arrest of electron transfer in viscous solvents*, J. Am. Chem. Soc. **127**, (2005) 16390-16391 (communication, 2 pages).

60. **P. K. Ghorai** and D. V. Matyushov, *Reorganization energy of electron transfer in viscous solvents above the glass transition*, J. Phys. Chem. B **110**, (2006) 1866-1871.

61. **P. K. Ghorai** and D. V. Matyushov, *Solvent reorganization of electron transfer in viscous solvents*, J. Chem. Phys. **124** (2006) No. 144510 (18 pages).

62. **V. Kapko** and D. V. Matyushov, *Theory of solvation in polar nematics*, J. Chem. Phys. **124** (2006) No. 114904 (13 pages).

63. A. A. Milischuk, D. V. Matyushov and M. D. Newton, *Activation entropy of electron transfer reactions*, Chem. Phys. (**invited**) **324** (2006) pp. 172-194.

64. **P. K. Ghorai** and D. V. Matyushov, *Reorganization entropy of electron transfer in polar solvents*, J. Phys. Chem. A **110** (2006) pp. 8857-8863.

65. D. V. Matyushov, *Reorganization asymmetry of electron transfer in ferroelectric materials and principles of artificial photosynthesis*, J. Phys. Chem. B **110** (2006) pp. 10095-10104.

66. **V. Kapko** and D. V. Matyushov, *Dynamical arrest of electron transfer in liquid crystalline solvents*, J. Phys. Chem. B **110** (2006) pp. 13184-13194.

67. **A. A. Milischuk** and D. V. Matyushov, *Quadrupolar solvatochromism: 4-amino-phtalimide in toluene*, J. Chem. Phys. **124** (2006) No. 204502 (6 pages).

68. Naoki Ito, Kalyan Duvvuri, D. V. Matyushov, and R. Richert, *Solvent response and dielectric relaxation in supercooled butyronitrile*, J. Chem. Phys. **125** (2006) 024504 (8 pages).

69. D. V. Matyushov and C. A. Angell *Gaussian excitations model of glass-former dynamics and thermodynamics*, J. Chem. Phys. **126** (2007) 094501 (19 pages).

70. D. V. Matyushov, *Energetics of electron transfer in soft condensed media*, (**invited review**) Acc. Chem. Res. **40** (2007) pp. 294-301.

71. D. V. Matyushov, *Model energy landscapes of low-temperature fluids: Dipolar hard spheres*, Phys. Rev. E **76** (2007) 011511 (7 pages).

72. D. V. Matyushov, *Dielectric response of one-dimensional polar chains*, J. Chem. Phys. **127** (2007) 054702 (5 pages).

73. D. R. Martin and D. V. Matyushov, *Cavity field in liquid dielectrics*, Europhys. Lett. **82** (2008) 16003 (6 pages).

74. **V. Kapko**, D. V. Matyushov, and C. A. Angell, *Thermodynamics and dynamics of a monoatomic glass-former. Constant pressure and constant volume behavior*, J. Chem. Phys. **128** (2008) 144505 (12 pages).

75. D. N. LeBard and D. V. Matyushov, *Glassy protein dynamics and gigantic reorganization energy of plastocyanin*, J. Phys. Chem. B **112** (2008) pp. 5218-5227.

76. D. N. LeBard and D. V. Matyushov, *Redox entropy of plastocyanin: Developing a microscopic view of mesoscopic solvation*, J. Chem. Phys. **128** (2008) 155106 (17 pages).

77. D. N. LeBard, **V. Kapko**, and D. V. Matyushov, *Energetics and kinetics of primary charge separation in bacterial photosynthesis*, J. Phys. Chem. B, **112** (2008) pp. 10322-10342.

78. D. V. Matyushov, *Non-Gaussian statistics of binding/unbinding events and the energetics of electron transfer reactions*, Chem. Phys. **351** (2008) pp. 46-50.

79. D. R. Martin and D. V. Matyushov, *Electrostatic fluctuations in cavities within polar liquids and thermodynamics of polar solvation*, Phys. Rev. E **78** (2008) 041206 (10 pp).

80. D. R. Martin and D. V. Matyushov, *Microscopic fields in liquid dielectrics*, J. Chem. Phys. **129** (2008) 174508 (14 pp).

81. D. N. LeBard and D. V. Matyushov, *Dynamical transition, hydrophobic interface, and the temperature dependence of electrostatic fluctuations in proteins*, Phys. Rev. E **78** (2008) 061901 (9 pp).

82. D. N. LeBard and D. V. Matyushov, *Energetics of bacterial photosynthesis*, J. Phys. Chem. B **113** (2009) pp. 12424-12437.

83. D. V. Matyushov, *Standard electrode potential, Tafel equation, and the solvation thermodynamics*, J. Chem. Phys. **130** (2009) 234704 (10 pp).

84. D. V. Matyushov, *Nonergodic activated kinetics in polar media*, J. Chem. Phys. **130** (2009) 164522 (8 pp).

85. D. V. Matyushov, *Terahertz response of dipolar impurities in polar liquids: On anomalous dielectric absorption of protein solutions*, Phys. Rev. E **81** (2010) 021914 (11 pp).

86. D. N. LeBard and D. V. Matyushov, *Ferroelectric hydration shells around proteins: Electrostatics of the protein-water interface*, J. Phys. Chem. B **114** (2010) pp. 9246–9258.

87. D. N. LeBard and D. V. Matyushov, *Protein-water electrostatics and principles of bioenergetics*, Phys. Chem. Chem. Phys. (**invited "Perspective" review**) **12** (2010) pp. 15321-15556.

88. A. D. Friesen and D. V. Matyushov, *Local polarity excess at the interface of water with a nonpolar solute*, Chem. Phys. Lett. **511** (2011) 256-261.

89. D. V. Matyushov and **A. Y. Morozov**, *Electrostatics of the protein-water interface and the dynamical transition in proteins*, Phys. Rev. E **84** (2011) 011908.

90. D. V. Matyushov, *Nanosecond Stokes shift dynamics, dynamical transition, and gigantic reorganization energy of hydrated heme proteins*, J. Phys. Chem. B, **115** (2011) pp. 10715-10724.

91. A. D. Friesen and D. V. Matyushov, *Non-Gaussian statistics of electrostatic fluctuations of hydration shells*, J. Chem. Phys. **135** (2011) 104501 (7 pp).

92. **D. R. Martin**, A. D. Friesen and D. V. Matyushov, *Electric field inside a "Rossky cavity" in uniformly polarized water*, J. Chem. Phys. **135** (2011) 084514 (8 pp).

93. D. V. Matyushov, *Dipolar response of hydrated proteins*, J. Chem. Phys. **136** (2012) 085102 (15 pp).

94. D. V. Matyushov, *Non-Ergodic Electron Transfer in Mixed-Valence Charge-Transfer Complexes*, J. Phys. Chem. Lett. **3** (2012) pp. 1644-1648.

95. **D. R. Martin**, S. B. Ozkan, and D. V. Matyushov, *Dissipative electro-elastic network model of protein electrostatics*, Phys. Biol. **9** (2012) 036004 (11 pp).

96. D. V. Matyushov, *On the theory of dielectric response of protein solutions*, J. Phys.: Condense Mat. **24** (2012) 325105 (8 pp).

97. **D. R. Martin** and D. V. Matyushov, *Non-Gaussian Statistics and Nanosecond Dynamics of Electrostatic Fluctuations Affecting Optical Transitions in Proteins*, J. Phys. Chem. B **116** (2012) pp. 10294-10300.

98. **D. R. Martin** and D. V. Matyushov, *Solvated dissipative electro-elastic network model of hydrated proteins*, J. Chem. Phys. **137** (2012) 165101 (12 pp) (*JCP Editors' Choice 2012*).

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INVITED TALKS

"Brownian motion from Einstein to Born and forward", TSRC 2023 Workshop on Ions in solution: Biology, Energy, and Environment, July 2023.
"Capturing proteins from solutions by dielectrophoresis", ASU's Center for Biological Physics Seminar, Mar. 2023.
"Wet and Warm: Nonergodicity, Mobility, and Interfacial Polarization in Molecular Biology", Purdue University Physics Dep, Feb. 2023.
"From Gibbs to biology: Maxwell's demon, nonergodicity, and biological function", ASU's Physics, Nov. 2022.
"Electron transfer: New opportunities in complex systems", University of Akron, Chemistry Department, Oct. 2022.
"Tug-of-war of subatomic particles: Electron pushing the proton", Jons Hopkins University, Apr. 2022.
"Competing nonpolar and electrostatic interactions in protein mobility" PacifiChem-2021, Dec. 2021.
"Polarization of interfacial water", Northwestern U., Nov. 2021.
"Brownian motion from Einstein and Born and forward", Purdue U. Chemistry seminar, Sep. 2021.
"Diffusion in water", CBP Seminar, ASU, Jan 2021.
"Protein electron transfer: Nonergodic sampling, FDT violation, and solvent dynamical effect", Recent Advances in Electron and Proton Transfer Theories, NYC, Oct., 2019.

"Gigantic Electrophoresis of Proteins", SciX 2019, Palm Springs, Oct., 2019.
"Fluctuations, aging, and efficiency of enzymes through electrochemistry of proteins", Moscow State University, Russia, July 2019.
"Is biology thermodynamic? Fluctuations, aging, and efficiency of enzymes", ITMO, St. Petersburg, Russia, July 2019.
"Many faces of the protein-water interface: From wetting of the active sites to protein mobility", "Frontiers in Water Biophysics", Sicily, July, 2019.
"Many faces of the protein-water interface: From wetting of the active sites to protein mobility", Water Structure, Dynamics and Thermodynamics in Biology, Telluride, June, 2019.
"Protein fluctuations and efficiency of enzymes ", The Role of Fluctuations and Dynamics in Biomolecular Function, Telluride, Jan. 2019.
"Dynamics, aging, and efficiency of enzymes", Biophysical Dynamics, Telluride, June 2018.
"Water dynamics determine how enzymes work", Frontiers in Water Biophysics, Sicily, July, 2017.
"Temperature and solvent (solute) polarizability in electron transfer reactions", DOE contractors meeting, Washington DC, June 2017.
"Depolarized light scattering and terahertz absorption of protein solutions", ACS National Meeting, San Francisco, 2017.
"Dynamics of protein hydration shells, dynamical transition, and enzyme's function", 8th International Discussion Meeting on Relaxations in Complex Systems, July 23-28, 2017, Wisla, Poland.
"Electrostatic soup of biology: Production of biological energy by the protein-water interface", Dep. of Physics, Virginia Tech University, 2016.
"Configurational entropy, dynamical transition, and many-particle correlations in low-temperature polar liquids", ACS Regional Meeting, Galveston, 2016.
"Fun with problems long solved: dielectrics", Telluride workshop on Condensed Phase Dynamics, Telluride, 2016.
"Electron transport in biology: Ergodicity breaking and protein-water interface", PacifiChem, Honolulu, 2015.
"Efficiency of charge transfer in biology's energy chains", Energy Transport Materials and Systems: Designing for Adaptive Character and Emergent Properties, Boulder, CO, 2015.
"Theory and simulation of electron transfer in proteins", 7th Meeting on Molecular Simulations, Mexico City, 2015.
"Photosynthetic and Protein Electron Transfer: Is Biology (Thermo)Dynamic?", Dept. seminar, U. Calgary, 2014.
"What can biology teach us about the condensed phase?", Dept. seminar, U. of South Florida, 2014.
"Protein Electron Transfer: Is biology (thermo)dynamic?", Gordon Research Conference "Electron Donor Acceptor Interactions", Aug. 2014.
"Electrostatics of the protein-water interface", "Protein Electrostatics", Lisbon, Jul. 2014.
"Protein electron transfer: Is biology (thermo)dynamic?", 2014 International Symposium on Laser and Computational Biophysics, Shanghai, China, 2014.
"Structure and dynamics of hydration shells (of proteins)", Telluride workshop "Hydrophobicity: From Theory, Simulation, to Experiment", 2014.
"Charge Transport in Bacterial Photosynthesis", ACS Natl. Meeting, Dallas, 2014.
"Protein-water interface and natural photosynthesis", PNNL, Nov. 2013.
"Protein electron transfer", Theoretical and Biophysics Seminar at University of Illinois at Urbana-Champaign, Nov. 2013.
"Is nature (thermo)dynamic?", Biophysics seminar at Purdue University, Oct. 2013.
"Electrostatics of the protein-water interface", ACS National Meeting in Indianapolis, Sep. 2013.

"Depolarized light scattering by dipeptide solutions", Telluride conference "Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy", July 2013.
"Dielectric response of hydrated proteins", APS March Meeting in Baltimore, Mar. 2013.
"Time or energy? Biology's function through relaxation, fluctuations, and nonergodicity (to rule them all)", Physics Department Colloquium, Ohio State University, 2013.
"Frontiers in Water Biophysics", Perugia, Italy, 2012.
"Frontiers of THz Science Workshop", Stanford, 2012.
ACS 244th National Meeting, Philadelphia, August, 2012.
GRC, "Water & Aqueous Solutions", August, 2012.
Telluride workshop, "Interfacial Molecular and Electronic Structure and Dynamics", July, 2012.
Telluride workshop, "Condensed Phase Dynamics", June, 2012.
Telluride workshop on Vibrational Dynamics, 2011.
Passion for Knowledge, San Sebastian, Spain, 2010.
Workshop on Dynamics in Condensed Phases, Telluride, 2010.
Frontiers in Water Biophysics, Trieste, Italy, May, 2010.
University of Oregon, Department of Chemistry, May, 2010.
Rice University, Department of Chemistry seminar, October, 2009.
University of Nevada Reno, Department of Chemistry seminar, September, 2009.
IDMRCS, Rome, Italy, August, 2009.
GRC on Photochemistry, July, 2009.
DOE BES Solar Photochemistry Meeting, June, 2009.
"Proteins and Water", Phoenix, AZ, May, 2009.
"Viscous liquids and the glass transition (VII)", Søminestationen, DK, April, 2009
International Workshop "Glass and Entropy II", Aberystwyth University, UK, April, 2009
ASU Physics Colloquium, Fall, 2008.
ACS National Meeting, Philadelphia, 2008.
Workshop on Dynamics in Condensed Phases, Telluride, 2008.
Physics of Liquid Matter: Modern Problems, Kiev, Ukraine, 2008.
Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy, Telluride, 2007.
Electron donor-acceptor interactions, Gordon Research Conference, 2006.
Workshop on Dynamics in Condensed Phases, Telluride, 2006.
South-West ACS Meeting, Houston, 2006.
Thermodynamics of electron transfer reactions, ACS National Meeting, Washington, DC, 2005.
Controlling electron transfer in molecules, University of Washington, 2005.
Electron transfer, optical spectroscopy, and solvation in polar liquids, MIT, 2004.
Polar solvation: Born vs Onsager picture, Carnegie Mellon University, 2004.
Solute polarizability in electron transfer reactions, University of Pittsburgh, 2004.
Workshop on Dynamics in Condensed Phases, Telluride, 2004.
University of Missouri Columbia, March 2004.
ACS National Meeting, New Orleans, 2003.
Workshop on Dynamics in Condensed Phases, Telluride, 2002.
Workshop on Dynamics in Condensed Phases, Telluride, 2000.
Arizona State University, Tempe, February 2000.
Rice University, Houston, March 2000.
Wayne State University, Detroit, December 1999.
Gordon Research Conferences: Electron Donor Acceptor Interactions, 1998.
Workshop on Electron Transfer Reactions, Munich 1995.

Technical University of Munich, 1994.
5th International Congress of Quantum Chemistry, Sophia Antipolis 1991.