

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 Departments of Chemistry/Physics, ASU
2010–2012 Center for Biological Physics, ASU (Interim 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
1993 Scientific Award by the International Science Foundation

Courses Taught**Arizona State University**

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, “Effect of solute and solvent polarizability on electron transfer reactions”, 2004. Anatoli Milischuk, PhD, “Theory and Computer Simulations of Equilibrium Polar Solvation with Applications to Electron Transfer in Organic Molecules”, 2006. David LeBard, PhD, “Computational studies of electron transfer proteins”, 2008, (currently faculty member at Yeshiva U.). Daniel Martin, MS “Electric field and solvation in microscopic liquids”, 2008. Allan Friesen, PhD “Electrostatic properties of water at interfaces with nanoscale solutes”, 2012. Hadi Dinpajoo, PhD, “Solvent Electrostatic Response: From Simple Solutes to Proteins”, 2016. Salman Seyedi, PhD candidate (Physics). Morteza Waskasi, PhD candidate (Chemistry).
Undergraduate	David LeBard, 2002–2004. Jesse Giron (2016-)
Postdoctoral	Mark Lilichenko, (2001-2003) Andriy Okhrimovskyy, (2004) Pradip Ghorai, (2005), currently faculty member at IISER, Kolkata. Vitaliy Kapko, (2005-2007). Anatoli Milischuk (2006), currently postdoc at Colorado State. Alexander Morozov, (2009-2010). Allan Friesen, (2012-2013). Daniel Martin, (2010-present).

Service (2016)

Personnel committee/Graduate admission committee (Biophysics section)/Undergraduate Studies/Computer Resources (Physics), Undergraduate Research (SMS).

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.
- “Anisotropic polarization and control of electron transfer rates”, Research Innovation Award by Research Corporation, 12/01/01–12/01/03, \$35,000.
- “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.

- “Control of electron transfer in liquid crystalline solvents”, NSF, 08/01/03–07/31/06, \$294,000.
- “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.
- “Structure of water at interface with nanometer solutes and bioenergetics”, NSF, 07/01/12–06/31/15, \$280,000.

Current Funding

- “Protein Dynamics in Electron Transfer”, NSF, 04/01/2012–03/31/2016, \$ 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; PI: D. Matyushov.
- “Theories of homogeneous and electrochemical electron transfer in complex media”, DOE, Office of Science, 05/01/2016-04/31/2018, \$183,000; PI: D. Matyushov.

PUBLICATIONS

Refereed Journals

1. 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.
2. D. V. Matyushov and Y. A. Maletin, *Electron transfer accompanied by bond rupture*, Chem. Phys. **127** (1988) pp. 325-334.
3. A. I. Karasevskii, D. V. Matyushov, and A. V. Gorodyskii, *Electron transfer in media with local fluctuations*, Chem. Phys. **142** (1990) pp. 1-15.
4. 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.
5. D. V. Matyushov, *Electron transfer induced by liquid defect motion. Exact solution*, Chem. Phys. **155** (1991) pp. 331-344.
6. D. V. Matyushov, *Donor-acceptor vibrations in nonadiabatic electron transfer reactions*, Chem. Phys. **164** (1992) pp. 31-46.

¹Graduate students are underlined, postdocs are listed in bold

7. D. V. Matyushov, *Electron transfer in molecules with conformational transitions*, Chem. Phys. Lett. **203** (1993) pp. 131-136.
8. A. V. Gorodyskii, A. I. Karasevskii, and D. V. Matyushov, *Electrochemical impedance under nonequilibrium electrode polarization*, Electrochim. Acta **38** (1993) pp. 1671-1678.
9. D. V. Matyushov, *A molecular theory of electron transfer reactions in polar liquids*, Mol. Phys. **79** (1993) pp. 795-808.
10. 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.
11. D. V. Matyushov, *Potential-step transient response of an electrochemical system*, J. Electroanal. Chem. **367** (1994) pp. 1-6.
12. D. V. Matyushov and R. Schmid, *Stationary points in the temperature dependence of electron transfer rates*, Chem. Phys. Lett. **220** (1994) pp. 359-364.
13. D. V. Matyushov and R. Schmid, *A molecular treatment of solvent effects on intervalence electron transfer*, J. Phys. Chem. **98** (1994) pp. 5152-5159.
14. D. V. Matyushov and R. Schmid, *Properties of Liquids at the Boiling Point: Equation of State, Internal Pressure and Vaporization Entropy*, Ber. Bunsenges. Phys. Chem. **98** (1994) pp.1590-1595.
15. D. V. Matyushov and R. Schmid, *Liquid molecularity: the effect of solvent on chemical reactivity*, Current Topics in Solution Chemistry, review, Research Trends, 1994.
16. 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.
17. D. V. Matyushov and R. Schmid, *Charge separation/recombination reactions in nonpolar fluids: a molecular description*, Mol. Phys. **84** (1995) pp. 533-552.
18. 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.
19. D. V. Matyushov and R. Schmid, *Calculation of Lennard-Jones energies of molecular fluids*, J. Chem. Phys. **104** (1996) pp. 8627-8638.
20. D. V. Matyushov and R. Schmid, *A thermodynamic analysis of solvation in dipolar liquids*, J. Chem. Phys. **105** (1996) pp. 4729-4741.
21. D. V. Matyushov, *Solvent reorganization energy of electron transfer in weakly polar solvents*, Chem. Phys. **211** (1996) pp. 47-71.
22. 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.
23. D. V. Matyushov and B. M. Ladanyi, *Nonlinear effects in dipole solvation: I. Thermodynamics*, J. Chem. Phys. **107** (1997) pp. 1362-1374.

24. 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.
25. 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.
26. 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.
27. D. V. Matyushov and B. M. Ladanyi, *Spontaneous emission and electron transfer rates in condensed phases*, J. Phys. Chem. **102** (1998) pp. 5027-5039.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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.
37. 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).
38. D. V. Matyushov, *Time-resolved fluorescence of polarizable chromophores*, J. Chem. Phys. **115** (2001) pp. 8933-8941 (9 pages).
39. [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).

40. 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).
41. 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).
42. 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).
43. **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).
44. **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).
45. 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).
46. 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).
47. D. V. Matyushov, *Dipole solvation in dielectrics*, J. Chem. Phys. **120** (2004) pp. 1375-1382 (8 pages).
48. D. V. Matyushov, *Solvent reorganization energy of electron transfer reactions in polar solvents*, J. Chem. Phys. **120** (2004) pp. 7532-7556 (25 pages).
49. D. V. Matyushov, *On the microscopic theory of polar solvation dynamics*, J. Chem. Phys. **122** (2005) 044502 (11 pages).
50. 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).
51. D. V. Matyushov and **A. Okhrimovskyy**, *Paraelectric and ferroelectric order in two-state dipolar fluids*, J. Chem. Phys. **122** (2005) 191101 (communication, 4 pages).
52. D. V. Matyushov and C. A. Angell, *Two-Gaussian excitations model for the glass transition*, J. Chem. Phys. **123** (2005) 034506 (12 pages).
53. A. Milischuk and D. V. Matyushov, *Equilibrium solvation in quadrupolar solvents*, J. Chem. Phys. **123** (2005) 044501 (20 pages).
54. **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).
55. **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.
56. **P. K. Ghorai** and D. V. Matyushov, *Solvent reorganization of electron transfer in viscous solvents*, J. Chem. Phys. **124** (2006) No. 144510 (18 pages).

57. **V. Kapko** and D. V. Matyushov, *Theory of solvation in polar nematics*, J. Chem. Phys. **124** (2006) No. 114904 (13 pages).
58. A. A. Milischuk, D. V. Matyushov and M. D. Newton, *Activation entropy of electron transfer reactions*, Chem. Phys. (**invited**) **324** (2006) pp. 172-194.
59. **P. K. Ghorai** and D. V. Matyushov, *Reorganization entropy of electron transfer in polar solvents*, J. Phys. Chem. A **110** (2006) pp. 8857-8863.
60. 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.
61. **V. Kapko** and D. V. Matyushov, *Dynamical arrest of electron transfer in liquid crystalline solvents*, J. Phys. Chem. B **110** (2006) pp. 13184-13194.
62. **A. A. Milischuk** and D. V. Matyushov, *Quadrupolar solvatochromism: 4-amino-phthalimide in toluene*, J. Chem. Phys. **124** (2006) No. 204502 (6 pages).
63. 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).
64. D. V. Matyushov and C. A. Angell *Gaussian excitations model of glass-former dynamics and thermodynamics*, J. Chem. Phys. **126** (2007) 094501 (19 pages).
65. D. V. Matyushov, *Energetics of electron transfer in soft condensed media*, (**invited review**) Acc. Chem. Res. **40** (2007) pp. 294-301.
66. D. V. Matyushov, *Model energy landscapes of low-temperature fluids: Dipolar hard spheres*, Phys. Rev. E **76** (2007) 011511 (7 pages).
67. D. V. Matyushov, *Dielectric response of one-dimensional polar chains*, J. Chem. Phys. **127** (2007) 054702 (5 pages).
68. D. R. Martin and D. V. Matyushov, *Cavity field in liquid dielectrics*, Europhys. Lett. **82** (2008) 16003 (6 pages).
69. **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).
70. 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.
71. 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).
72. 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.
73. D. V. Matyushov, *Non-Gaussian statistics of binding/unbinding events and the energetics of electron transfer reactions*, Chem. Phys. **351** (2008) pp. 46-50.
74. 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).

75. D. R. Martin and D. V. Matyushov, *Microscopic fields in liquid dielectrics*, J. Chem. Phys. **129** (2008) 174508 (14 pp).
76. 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).
77. D. N. LeBard and D. V. Matyushov, *Energetics of bacterial photosynthesis*, J. Phys. Chem. B **113** (2009) pp. 12424-12437.
78. D. V. Matyushov, *Standard electrode potential, Tafel equation, and the solvation thermodynamics*, J. Chem. Phys. **130** (2009) 234704 (10 pp).
79. D. V. Matyushov, *Nonergodic activated kinetics in polar media*, J. Chem. Phys. **130** (2009) 164522 (8 pp).
80. 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).
81. 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. 92469258.
82. 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.
83. 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.
84. 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.
85. 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.
86. A. D. Friesen and D. V. Matyushov, *Non-Gaussian statistics of electrostatic fluctuations of hydration shells*, J. Chem. Phys. **135** (2011) 104501 (7 pp).
87. **D. R. Martin**, A. D. Friesen and D. V. Matyushov, *Electric field inside a "Rosky cavity" in uniformly polarized water*, J. Chem. Phys. **135** (2011) 084514 (8 pp).
88. D. V. Matyushov, *Dipolar response of hydrated proteins*, J. Chem. Phys. **136** (2012) 085102 (15 pp).
89. D. V. Matyushov, *Non-Ergodic Electron Transfer in Mixed-Valence Charge-Transfer Complexes*, J. Phys. Chem. Lett. **3** (2012) pp. 1644-1648.
90. **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).
91. D. V. Matyushov, *On the theory of dielectric response of protein solutions*, J. Phys.: Condense Mat. **24** (2012) 325105 (8 pp).

92. **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.
93. **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*).
94. M. Heyden, D. Tobias, and D. V. Matyushov, *Terahertz absorption of dilute aqueous solutions*, J. Chem. Phys. **137** (2012) 235103 (9 pp).
95. **A. D. Friesen** and D. V. Matyushov, *Surface Polarity and Nanoscale Solvation* J. Phys. Chem. Lett. **3** (2012) pp. 3685–3689.
96. V. Kapko, Z. Zhao, D. V. Matyushov, and C. A. Angell, *“Ideal glassformers” vs “ideal glasses”: Studies of crystal-free routes to the glassy state by “potential tuning” molecular dynamics, and laboratory calorimetry*, J. Chem. Phys. **138** (2013) 12A549 (7 pp).
97. D. V. Matyushov, *Protein electron transfer: Dynamics and statistics*, J. Chem. Phys. **139** (2013) 025102 (12 pp).
98. D. N. LeBard, D. R. Martin, S. Lin, N. W. Woodbury, and D. V. Matyushov, *Protein dynamics to optimize and control bacterial photosynthesis*, Chem. Sci. **4** (2013) 4127–4136.
99. D. N. LeBard, D. R. Martin, and D. V. Matyushov, *Coulomb Soup of Bioenergetics: Electron Transfer in a Bacterial bc1 Complex*, J. Phys. Chem. Lett. **4** (2013) 3602–3606.
100. D. R. Martin, D. Fioretto, and D. V. Matyushov, *Depolarized light scattering and dielectric response of a peptide dissolved in water*, J. Chem. Phys. **140** (2014) 035101 (11 pp).
101. D. V. Matyushov, *Electrophoretic mobility without charge driven by polarization of the nanoparticle-water interface* Mol. Phys. **112** (2014) 20292039.
102. D. V. Matyushov, *Electrostatics of liquid interfaces* J. Chem. Phys. **140** (2014) 224506 (10 pp).
103. M. Dinpajoo and D. V. Matyushov, *Non-Gaussian Lineshapes and Dynamics of Time-Resolved Linear and Nonlinear (Correlation) Spectra*, J. Phys. Chem. B **118** (2014) 7925-7936.
104. D. R. Martin and D. V. Matyushov, *Hydration shells of proteins probed by depolarized light scattering and dielectric spectroscopy: Orientational structure is significant, positional structure is not*, J. Chem. Phys. **141** (2014) 22D501 (8 pp).
105. D. R. Martin and D. V. Matyushov, *Photosynthetic diode: electron transport rectification by wetting the quinone cofactor*, Phys. Chem. Chem. Phys. **17** (2015) 22523–22528.
106. D. R. Martin and D. V. Matyushov, *Dipolar Nanodomains in Protein Hydration Shells*, J. Phys. Chem. Lett. **6** (2015) pp. 407-412.
107. D. R. Martin and D. V. Matyushov, *Communication: Microsecond dynamics of the protein and water affect electron transfer in a bacterial bc(1) complex*, J. Chem. Phys. **142** (2015) 161101.
108. M. Dinpajoo and D. V. Matyushov, *Interfacial Structural Transition in Hydration Shells of a Polarizable Solute*, Phys. Rev. Lett. **114** (2015) 207801.

109. D. V. Matyushov, *Nonlinear dielectric response of polar liquids* J. Chem. Phys. **143** (2015) 244502.
110. D. V. Matyushov, *Kubo's Line Shape Function for a Linear-Quadratic Chromophore-Solvent Coupling*, J. Phys. Chem. B **119** (2015) pp. 9006-9008.
111. M. Dinpajoo and D. V. Matyushov, *Free energy of ion hydration: Interface susceptibility and scaling with the ion size*, J. Chem. Phys. **143** (2015) 044511.
112. D. V. Matyushov, *Protein electron transfer: is biology (thermo)dynamic?* J. Phys. Condens. Matter **27** (2015) 473001 (*invited Perspective Article*).
113. D. V. Matyushov and R. Richert, *Communication: Temperature derivative of the dielectric constant gives access to multipoint correlations in polar liquids*, J. Chem. Phys. **144** (2016) 041102.
114. D. V. Matyushov, *Response to "Comment on Nonlinear dielectric response of polar liquids" [J. Chem. Phys. 144, 087101 (2016)]*, J. Chem. Phys. **144** (2016) 087102.
115. M. Dinpajoo, D. Martin, and D. V. Matyushov, *Polarizability of the active site of cytochrome c reduces the activation barrier for electron transfer*, Sci. Rep. **6** (2016) 28152.
116. S. Seyedi, D. Martin, and D. V. Matyushov, *Dynamical and orientational structural crossovers in low-temperature glycerol*, Phys. Rev. E **94** (2016) 012616.
117. M. Dinpajoo and D. V. Matyushov, *Mobility of nanometer-size solutes in water driven by electric field*, Physica A **463** (2016) pp. 366-375.
118. M. Dinpajoo and D. V. Matyushov, *Dielectric constant of water in the interface*, J. Chem. Phys. **145** (2016) 014504.
119. D. V. Matyushov, *Configurational entropy of polar glass formers and the effect of electric field on glass transition*, J. Chem. Phys. **145** (2016) 034504 (*JCP Editors' Choice 2016*).
120. M. M. Waskasi, G. Kodis, A. L. Moore, T. A. Moore, D. Gust, and D. V. Matyushov, *Marcus Bell-Shaped Electron Transfer Kinetics Observed in an Arrhenius Plot*, J. Am. Chem. Soc. **138** (2016) pp. 9251-9257.
121. D. V. Matyushov, *Activated kinetics in a nonequilibrium thermal bath*, Proc. Nat. Acad. Sci. **113** (2016) pp. 9401-9403.

Non-refereed Reviews and Book Chapters

122. 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.
123. D. V. Matyushov, *Electron transfer reactions: Theory*, Encyclopedia of Inorganic Chemistry, 2nd Edition, Wiley, 2005.

INVITED TALKS

- “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.