

## Igal Szleifer Curriculum Vitae

### Address

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### Education

B.Sc.	<u>Hebrew University of Jerusalem</u> , Chemistry ( <i>cum laude</i> )	1984
Ph.D.	<u>Hebrew University of Jerusalem</u> ( <i>summa cum laude</i> )	1989
	Thesis Advisor: Professor Avinoam Ben-Shaul	
	Thesis Topic: "Statistical Thermodynamics of Amphiphilic Aggregates"	

### Professional Experience

Visiting Scientist, Department of Chemistry, <u>Cornell University</u> (with Prof. B. Widom)	1988-89
Postdoctoral Associate, Department of Chemistry, <u>Cornell University</u> (with Prof. B. Widom)	1989-91
Assistant Professor, Department of Chemistry, <u>Purdue University</u>	1991-97
Associate Professor, Department of Chemistry, <u>Purdue University</u>	1997-00
Professor, Department of Chemistry, <u>Purdue University</u>	2000-07
Head Division of Physical Chemistry, <u>Purdue University</u>	2002-07
Christina Enroth-Cugell Professor of Biomedical Engineering, <u>Northwestern University</u>	2007-
Professor, Department of Chemistry, <u>Northwestern University</u>	2007-
Professor, Department of Chemical and Biological Engineering, <u>Northwestern University</u>	2008-
Associate Director, EFRC-NERC Center, <u>Northwestern University</u>	2009-
IRG 2 Leader MRSEC, <u>Northwestern University</u>	2009-

### Awards and Honors

Raices-Cesar Milstein Fellowship	2009
Raices-Cesar Milstein Fellowship	2007
Fellow American Physical Society	2005
American Chemical Society Akron Section Award	2005
University Faculty Scholar	2004-2009
Camille Dreyfus Teacher-Scholar Award	1997
NSF Career Award	1996
Camille and Henry Dreyfus New Faculty Award.	1991
Wolf Foundation Award for Ph.D . candidates.	1985-86
Farkash Award, Department of Chemistry, Hebrew University	1984

### Consultant

KSLA Shell Research BV (Amsterdam)	1991-1994
International Advisory Committee, Instituto Mexicano del Petroleo,	

Molecular Simulation Program	1999-
Computer Research Institute Faculty Advisory Committee (PU)	2001-2007
Editorial Board: Journal of Polymer Science Part B: Polymer Physics	2004-
Co-Editor: Biointerphases	2007-

### Societal Affiliations

American Chemical Society  
 American Physical Society  
 Division of High Polymer Physics (APS)  
 Foreign Member: Mexican Society of Molecular Engineering  
 American Association for the Advancement of Science (AAAS)  
 Materials Research Society  
 Biomedical Engineering Society  
 American Institute of Chemical Engineers

### Institute Memberships

Robert H. Lurie Comprehensive Cancer Center (Northwestern University)  
 Institute for BioNanotechnology in Medicine (Northwestern University)

### Invited positions

Visiting Professor Physics, Universidad Nacional de San Luis, San Luis, Argentina	1993
Visiting Scientist, Advanced Studies Institute, The Hebrew University of Jerusalem	1993
Visiting Professor Chemistry, Department of Polymer Chemistry and Materials Science Center, University of Groningen, The Netherlands.	1994
Visiting Professor Chemical Engineering, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain.	1996
Visiting Professor Physics, Department of Physics, Laboratoire de Physique Statistique, Ecole Normal Supérieure, Paris, France.	1996-97
Visiting Professor Chemical Engineering, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain.	1997
Visiting Scholar, James Franck Institute, University of Chicago, Chicago, IL	1999
Visiting Professor Chemical Engineering, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain	1999
Visiting Professor Chemical Engineering, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain	2001
Visiting Professor Chemical Engineering, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain	2004
Visiting Professor Chemical Engineering, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain	2005

### Research Interests

Statistical mechanics of complex fluids, phase behavior and interfacial properties of polymers, polymer dynamics, packing of chain molecules in aggregates and interfaces, critical behavior, structure and dynamics of membranes, elastic properties of complex films, Monte Carlo simulation methods, computer simulations of chain molecules, phase behavior and structure of polymers grafted or adsorbed at interfaces. Adsorption of proteins at surfaces. Liposome structure and behavior for drug delivery. Biophysics of cell membranes and

their interactions with proteins. Dynamics in complex systems. Development of systematic theoretical methodologies that bridge from atomistic time and length scales to the macro/mesoscopic regime.

## Publications

1. "Statistical Thermodynamics of Amphiphile Chains in Micelles", A. Ben-Shaul, I. Szleifer and W.M. Gelbart, Proc. Natl. Acad. Sci., U.S.A., **81**, 4601-4605 (1984).
2. "Amphiphile Chain Organization in Micelles of Different Geometries", A. Ben-Shaul, I. Szleifer and W.M. Gelbart in Physics of Amphiphiles: Micelles, Vesicles and Microemulsions, V. Degiorgio and M. Corti, eds. (North-Holland, Amsterdam, 1985), pp. 404-426.
3. "Chain Organization and Thermodynamics in Micelles and Bilayers: I. Theory", A. Ben-Shaul, I. Szleifer and W.M. Gelbart, J. Chem. Phys., **83**, 3597-3611 (1985).
4. "Chain Organization and Thermodynamics in Micelles and Bilayers: II. Model Calculations", I. Szleifer, A. Ben-Shaul and W.M. Gelbart, J. Chem. Phys., **83**, 3612-3620 (1985).
5. "Statistical Thermodynamic Theory of Surfactant Organization in Micelles and Bilayers", A. Ben-Shaul, I. Szleifer and W.M. Gelbart in Surfactants in Solution, K.L. Mittal and P. Bothorel, eds. (1986), Vol. 4, page 35.
6. "Chain Statistics in Micelles: Effects of Surface Roughness and Internal Energy", I. Szleifer, A. Ben-Shaul and W.M. Gelbart, J. Chem. Phys., **85**, 5345-5358 (1986).
7. "Statistical Thermodynamics of Molecular Organization in Mixed Micelles and Bilayers", I. Szleifer, A. Ben-Shaul and W.M. Gelbart, J. Chem. Phys., **86**, 7094-7110 (1987).
8. "Statistical Thermodynamics of Pure and Mixed Amphiphilic Aggregates", I. Szleifer, A. Ben-Shaul and W.M. Gelbart, in Physicochemical Hydrodynamics: Interfacial Phenomena, M. Velarde, ed. NATO ASI Series B, Vol. 174, pp. 843-855 (1988).
9. "Molecular Theory for Amphiphilic Packing and Elastic Properties of Monolayers and Bilayers", A. Ben-Shaul, I. Szleifer and W.M. Gelbart, in Physics of Amphiphiles, C. Langevin and J. Meunier, eds. (Springer-Verlag, 1987), pp 1-10.
10. "Curvature Elasticity of Pure and Mixed Surfactant Films", I. Szleifer, D. Kramer, A. Ben-Shaul, D. Roux and W.M. Gelbart, Phys. Rev. Lett., **60**, 1966-1969 (1988).
11. "Statistical Thermodynamics of Amphiphilic Aggregates", I. Szleifer, Ph.D. Thesis, Hebrew University of Jerusalem, September 1988.
12. "Structure and Tension of the Interface Between Dilute Polymer Solutions", I. Szleifer and B. Widom, J. Chem. Phys., **90**, 7524-7534 (1989).
13. "Chain Packing Statistics and Thermodynamics in Amphiphilic Monolayers", I. Szleifer, A. Ben-Shaul and W.M. Gelbart, J. Phys. Chem., **94**, 5081-5089 (1990).
14. "Molecular Theory of Curvature Elasticity in Surfactant Films", I. Szleifer, D. Kramer, A. Ben-Shaul, W.M. Gelbart and S. Safran, J. Chem. Phys., **92**, 6800-6817 (1990).

15. "A New Mean-Field Theory for Dilute Polymer Solutions: Phase Diagram, Conformational Behavior and Interfacial Properties", I. Szleifer, J. Chem. Phys., **92**, 6940-6952 (1990).
16. "Determination of the Chemical Potential of Polymeric Systems from Monte Carlo Simulations", S. Kumar, I. Szleifer and A.Z. Panagiotopoulos, Phys. Rev. Lett., **66**, 2935-2938 (1991).
17. Reply to comment on "Determination of the Chemical Potential of Polymeric Systems from Monte Carlo Simulations", S. Kumar, I. Szleifer and A.Z. Panagiotopoulos, Phys. Rev. Lett., **68**, 3658 (1992).
18. "A Unified Theory of the Dynamics of Linear Chain Macromolecules: From Unentangled to Entangled Melts", I. Szleifer and R.F. Loring, J. Chem. Phys., **95**, 2080-2096 (1991).
19. "Self-Consistent Theory of Polymer Dynamics in Melts", I. Szleifer, J.D. Wilson and R.F. Loring, J. Chem. Phys., **95**, 8474-8485 (1991).
20. Reply to comment on "Self-Consistent Theory of Polymer Dynamics in Melts", I. Szleifer, J.D. Wilson and R.F. Loring, J. Chem. Phys., **97**, 3875-3876 (1992).
21. "Surface Tension, Line Tension, and Wetting", I. Szleifer and B. Widom, Mol. Phys., **75**, 925-943 (1992).
22. "Monte Carlo Simulation of the Collapse-Coil Transition in Homopolymers", I. Szleifer, E.M. O'Toole and A.Z. Panagiotopoulos, J. Chem. Phys., **97**, 6802-6808 (1992).
23. "Molecular Simulation of Phase Equilibria in Polymer Systems", A.Z. Panagiotopoulos and I. Szleifer, Polymer Preprints, **33** (1), 547-548 (1992).
24. "Chain Length and Density Dependence of the Chemical Potential of Lattice Polymers", I. Szleifer and A.Z. Panagiotopoulos, J. Chem. Phys., **97**, 6666-6673 (1992).
25. "Computer Simulations of Surfactant Self-Assembly", B. Smit, K. Esselink, P.A.J. Hilbers, N.M. van Os, L.A.M. Rupert and I. Szleifer, Langmuir, **9**, 9-11 (1993).
26. "Statistical Thermodynamic Theory of Grafted Polymeric Layers", M.A. Carignano and I. Szleifer, J. Chem. Phys., **98**, 5006-5018 (1993).
27. "Structure and Tension of the Boundary Between Surface Phases", S. Perkovic, I. Szleifer and B. Widom, Mol. Phys., **80**, 729-739 (1993).
28. "Monte Carlo Calculation of the Phase Coexistence Envelope for a Bead-Spring Polymeric Model", Y-J Sheng, A. Z. Panagiotopoulos, S. Kumar and I. Szleifer, Polymer Preprints, **69**, 55-56 (1993).
29. "Statistical Mechanics of Solvent Induced Forces and Vibrational Frequency Shifts: Low Density Expansions and Monte Carlo Simulations", L. Souza, C. Guerin, D. Ben-Amotz, and I. Szleifer, J. Chem. Phys., **99**, 9954-9961, (1993).
30. "Second Virial Coefficients of Chain Molecules: A Monte Carlo Study", V. Harismiadis and I. Szleifer, Mol. Phys., **81**, 851-866 (1994).

31. "Phase Transitions in Thin Films of Symmetric Binary Polymer Mixtures", S. Kumar, H. Tang, and I. Szleifer, Mol. Phys., **81**, 867-872 (1994).
32. "Structure and Thermodynamics of Grafted 3-Arm Branched Polymer Layers", M.A. Carignano and I. Szleifer, Macromolecules, **27**, 702-710 (1994).
33. "Monte Carlo Calculations of the Phase Coexistence Envelope for a Bead-Spring Polymeric Model", Y-J. Sheng, A.Z. Panagiotopoulos, S. Kumar, and I. Szleifer, Macromolecules, **27**, 400-406 (1994).
34. "Pressure Isotherms, Phase Transition, Instability and Structure of Tethered Polymers in Good,  $\Theta$ , and Poor Solvents", M. Carignano and I. Szleifer, J. Chem. Phys., **100**, 3210-3223 (1994).
35. "Critical Temperature Shifts in Thin Polymer Blend Films", H. Tang, I. Szleifer, and S. Kumar, J. Chem. Phys., **100**, 5367-5371 (1994).
36. "Phase Behavior of Grafted Polymers in Poor Solvents", H. Tang and I. Szleifer, Europhys. Lett., **28**, 19-24 (1994).
37. "Phase Behavior of Polymer Fluids in Bulk and Constrained Environments", I. Szleifer, H. Tang, and S. Kumar, SPE/ANTEC '94 Proceedings, 2101-2104 (1994).
38. "Phase Behavior of Tethered Polymers with Lateral Mobility in Poor Solvents", H. Tang, M. A. Carignano and I. Szleifer, J. Chem. Phys., **102**, 3404-3413 (1995).
39. "On the Structure and Pressures of Tethered Polymers in Good Solvent", M. A. Carignano and I. Szleifer, Macromolecules **28**, 3197-3204 (1995).
40. "Liquid-Liquid Phase Separation in Polydisperse Polymer Solutions: The Distribution Coefficient", Gerrit ten Brinke and I. Szleifer, Macromolecules **28**, 5434-5439 (1995).
41. "Surface Segregation in Diblock Copolymers and Polymer Blend Thin Films", M. A. Carignano and I. Szleifer, Europhys. Lett. **30**, 525-530 (1995).
42. "Structural and Thermodynamic Properties of End-Grafted Polymers on Curved Surfaces", M. A. Carignano and I. Szleifer, J. Chem. Phys. **102**, 8662-8669 (1995).
43. "Size Dependence of Transfer Free Energies. I A Flory Huggins Approach", S. Kumar, I. Szleifer, K. Sharp, P. Rosky, P. Friedman and B. Honig, J. Phys. Chem. **99**, 8382-8391 (1995).
44. "Monte Carlo Simulations of Chain Molecules in Confined Environments", A. E. vanGiessen and I. Szleifer, J. Chem. Phys. **102**, 9069-9076 (1995).
45. "Analysis on the Prevention of Protein Adsorption to Solid Surfaces", T. McPherson, M. A. Carignano, I. Szleifer and K. Park, Proceed. Intern. Symp. Control Rel. Bioact. Mater., **22**, 57-58 (1995).
46. "The Effects of Chain Conformations on the Thermodynamics of Polymeric Systems: A Mean-Field Theory", J. D. Weinhold, S. K. Kumar and I. Szleifer, Europhys. Lett. **35**, 695-700 (1996).
47. "Computer Simulation Study of the Approximations Associated with Generalized Flory Theories", S. K. Kumar, I. Szleifer, C. K. Hall and J. M. Wichert, J. Chem. Phys. **104**, 9100-9110 (1996).

48. "Tricritical Points in Bimodal Polymer Solutions", I. Szleifer and G. ten Brinke, J. Chem. Phys. **104**, 6343-6347 (1996).
49. "Tethered Polymer Layers", I. Szleifer and M. A. Carignano, Adv. Chem. Phys., Vol. XCIV, Chapter 3, pages 165-260, I. Prigogine and S. A. Rice Eds., John Wiley and Sons, New York, NY (1996).
50. "Statistical Thermodynamics of Polymers near Surfaces", I. Szleifer, Current Opinion in Colloidal and Interface Science, **1**, 416-423 (1996).
51. "Protein Adsorption on Surfaces with Grafted Polymers: A Theoretical Approach", I. Szleifer, Biophysical J., **72**, 595-612 (1997).
52. "Lyotropic Behavior of Molecular Bottle-Brushes: A Monte-Carlo Computer Simulation Study", M. Saariaho, I. Szleifer, O. Ikkala, and Gerrit ten Brinke, J. Chem. Phys., **107**, 3267-3273 (1997).
53. "Aggregation behavior of a lattice model for amphiphiles," A. D. Mackie, A. Z. Panagiotopoulos, I. Szleifer, Langmuir, **13**, 5022-5031 (1997).
54. "Protein Adsorption on Tethered Polymer Layers: Effect of Polymer Chain Architecture and Composition", I. Szleifer, Physica A, **244**, 370-388 (1997).
55. "Polymers and Proteins: Interactions at Interfaces," I. Szleifer, Current Opinion in Solid State and Materials Science, **2**, 337-344 (1997).
56. "Protein adsorption on PEO-grafted surfaces: Theoretical analysis and experimental observations," A. Kidane, T.B. McPherson, I. Szleifer, K. Park, Polymer Preprint, (in press).
57. "Spontaneous Liposome Formation Induced by Grafted Poly(ethylene oxide) Layers: Theoretical Prediction and Experimental Verification", I. Szleifer, O. V. Gerasimov and D. H. Thompson, Proc. Nat. Acad. Sci., **95**, 1032-1037 (1998).
58. "Monolayers of Diblock Copolymer at the Air-Water Interface: The Attractive Monomer-Surface Case", M.C. Faure, P. Bassereau, M.A. Carignano, I. Szleifer, Y. Gallot, D. Andelman, Eur. Phys. J.B **3**, 365-375 (1998).
59. "Prevention of Protein Adsorption by Tethered PEO Layers: Experiments and Single Chain Mean Field Analysis", T. McPherson, A. Kidane, I. Szleifer, K. Park, Langmuir, **14**, 176-186 (1998).
60. "Extended Conformations of Isolated Molecular Bottle-Brushes: Influence of the Side-Chain Topology", M. Saariaho, I. Szleifer, O. Ikkala, and G. ten Brinke, Macromol. Theory and Simul. **7**, 211-216 (1998).
61. "Flow Induced Phase Separation in Polymer Solutions" Karin de Moel, Igal Szleifer and Gerrit ten Brinke, Europhys. Lett. **42**, 407-412 (1998).
62. "Pancake to Brush Transition in Block Copolymer", I. Szleifer, Europhys. Lett. **44**, (6) 721-727 (1998).
63. "Polymer Brushes", I. Szleifer, Encyclopedia of Computational Chemistry, 2114-2119 (1998).

64. "Self-Assembly of Model Nonionic Amphiphilic Molecules", Claudia B. E. Guerin and Igal Szleifer, Langmuir **23**, 7901-7911 (1999).
65. "Effect of Side Chain Rigidity on the Elasticity of Comb Copolymer Cylindrical Brushes: A Monte Carlo Simulation Study", M. Saariaho, A. subbotin, I. Szleifer, O. Ikkala, and G. ten Brinke, Macromolecules **13**, 4439-4443 (1999).
66. "Tethered Polymer Layers: Phase Transitions and Reduction of Protein Adsorption", I. Szleifer and M. A. Carignano, **Feature Article** in: Macromolecular Rapid Communications. **21**, 423-448 (2000).
67. "Kinetic and Thermodynamic Control of Protein Adsorption", J. Satulovsky, M. A. Carignano and I. Szleifer, Proc. Nat. Acad. Sci. **97**, 9037-9041 (2000).
68. "Correspondence Between the Pressure Expressions and the van der Waals Theory for curved Surface", E. M. Blokhuis, H. N. K. Lekkerkerker and I. Szleifer, J. Chem. Phys., **112**, 6023-6030 (2000).
69. "Prevention of Protein Adsorption by Flexible and Rigid Chain Molecules", M. A. Carignano and I. Szleifer, Colloids and Surfaces B: Biointerfaces, **18**, 169-182 (2000).
70. "Thermodynamic Properties of Lattice Polymers. Monte Carlo simulations and Mean-Field Theories", D. Buta, K. F. Freed and I. Szleifer, J. Chem. Phys., **112**, 6040-6048 (2000).
71. "Polymer Melts and Polymer Solutions near Patterned Surfaces", C. Seok, K. F. Freed and I. Szleifer, J. Chem. Phys., **112**, 6443-6451 (2000).
72. "Polymer Blends near Patterned Surfaces", C. Seok, K. F. Freed and I. Szleifer, J. Chem. Phys., **112**, 6452-6460 (2000).
73. "Monte Carlo test of the lattice cluster theory: thermodynamic properties of binary polymer blends", D. Buta, K.F. Freed and I. Szleifer, J. Chem. Phys., **114**, 1424-1431 (2001).
74. "Gel-Gel Adhesion by Tethered Polymers", Y. Huang, I. Szleifer, and N.A. Peppas, J. Chem. Phys., **114**, 3809-3816 (2001).
75. "Kinetics of Protein Adsorption: A Generalized Diffusion Theoretical Approach", Fang Fang and I. Szleifer, Biophys. J., **80**, 2568-2589 (2001).
76. "Adsorption of Model Charged Proteins on Charged Surfaces with Grafted Polymers", M.A. Carignano and I. Szleifer, Mol. Phys., **100**, 2993-3003 (2002).
77. "A Molecular Theory of Polymer Gels", Y. Huang, I. Szleifer and N. A. Peppas, Macromolecules, **35**, 1373-1380 (2002)
78. "Effect of Molecular Structure on the Adsorption of Protein on Surfaces with Grafted Polymers", Fang Fang and I. Szleifer, Langmuir, **18**, 5497-5510 (2002).
79. "Size and structure of spontaneous forming liposomes in lipid:PEG-lipid mixtures", Montse Rovira-Bru, David H. Thompson and Igal Szleifer, Biophys. J., **83**, 2419-2439 (2002).

80. "Controlling Surface Interactions with Grafted Polymers", M. A. Carignano and I. Szleifer, Interface Science **11**, 187-197 (2003).
81. "Competitive Adsorption in Model Charged Protein Mixtures: Equilibrium Isotherms and Kinetics Behavior", Fang Fang and I. Szleifer, J. Chem. Phys., **119**, 1053-1065 (2003).
82. "Behavior of surface-anchored poly(acrylic acid) brushes with grafting density gradients on solid substrates", T. Wu, J. Genzer, P. Gong, I. Szleifer, P. Vlcek, and V. Subr, in: Polymer Brushes, Chapter 15, pages 287-315, Brittain B., Advincula R., Caster K. (eds), Wiley & Sons (2004).
83. "Enveloping of charged proteins by lipid bilayers", D. Harries, A. Ben-Shaul and I. Szleifer, J. Phys. Chem. B, **108**, 1491-1496 (2004).
84. "Analytic density functional-self-consistent field theory of diblock copolymers near patterned surfaces", C. Seok, Karl F. Freed and I. Szleifer, J. Chem. Phys., **120**, 7174-7182 (2004).
85. "Competitive Adsorption of Model Charged Proteins: The Effect of Total Charge and Charge Distribution", P. Gong and I. Szleifer, J. Coll. Int. Sci., **278**, 81-90 (2004).
86. "Crystallization of PDMS from the melt and the glassy state in the presence of micro-particles", Jenny Zeroni, Dongsheng Zhang, Moshe Gottlieb, Hendrik Meyer, Igal Szleifer and Rachel Yerushalmi-Rozen, Eur. Phys. J. B (submitted).
87. "Selective dispersion of Single Walled Carbon Nanotubes in the presence of polymers: the role of molecular and colloidal length scales", Rina Shvartzman-Cohen, Einat Nativ-Roth, Ezhil Baskaran, Yael Levi-Kalisman, Igal Szleifer, and Rachel Yerushalmi-Rozen, J. Amer. Chem. Soc., **126**, 14850-14857 (2004).
88. "Phase Separation of Saturated and Mono-unsaturated Lipids as determined from a Microscopic Model", R. Elliott, K. Katsov, M. Schick and I. Szleifer, J. Chem. Phys. **122**, 044904 (1-11) (2005).
89. "Critical Properties of Polymer Solutions' Thin Films", M. Rizzotto and I. Szleifer, J. Polym. Sci., Part B: Polym. Phys., **43**, 1849-1853 (2005).
90. "Structural Behavior and Self-Assembly of Lennard-Jones Clusters on Rigid Surfaces", Irina Paci, Igal Szleifer, and Mark A. Ratner, J. Phys. Chem. B, **109**, 12935-12945 (2005).
91. "Molecular Dynamics Simulations of Ice Growth from Supercooled Water", M. A. Carignano, P. B. Shpson and I. Szleifer, Mol. Phys., **103**, 2957-2967 (2005).
92. "Polymers and carbon nanotubes – dimensionality, interactions and nanotechnology", I. Szleifer and R. Yerushalmi-Rozen, **Feature article in: Polymer**, **46**, 7803-7818 (2005).
93. "Kinetics of Protein Adsorption and Desorption on Surfaces with Grafted Polymers", Fang Fang, J. Satulovsky and I. Szleifer, Biophys. J. **89**, 1516-1533 (2005).
94. "Ligand-receptor interactions in tethered polymer layers", Gabriel Longo and I. Szleifer, Langmuir, **21**, 11342-11351 (2005).



95. "Control of carbon nanotube-surface interactions: the role of grafted polymers", Rikkert Nap and I. Szleifer, Langmuir **21**, 12072-12075 (2005).
96. "Adsorption of non-fouling polymers functionalized with mussel adhesive protein mimetic peptides: computational predictions and experimental observations", Simonida Grubjesic, Jeffrey L. Dalsin, Fang Fang, Igal Szleifer and Phillip B. Messersmith, Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.), **46**, 116-117 (2005).
97. "Cluster structure and corraling effect driven by interaction mismatch in two dimensional mixtures", Dongsheng Zhang, M. A. Carignano and I. Szleifer, Phys. Rev. Lett., **96**, 028701 (1-4), (2006).
98. "Phase diagram of a ternary mixture of cholesterol and saturated and unsaturated lipids calculated from a microscopic model", R. Elliott, I. Szleifer, M. Schick, Phys. Rev. Lett. **96**, 098101 (1-4), (2006).
99. "Utilizing polymers for shaping the interfacial behavior of carbon nanotubes", Rachel Yerushalmi–Rozen and Igal Szleifer, **Highlight paper: Soft Matter**, **2**, 24-28 (2006).
100. "Interactions between charged surfaces and functionalized grafted polymer layers", Peng Gong and I. Szleifer, Ind. and Eng. Chem. Res., **45**, 5466-5476 (2006).
101. "Molecular dynamics simulation of ice growth from pure water and brine", M. A. Carignano, E. Baskaran, P. Shepson and I. Szleifer, Annals of Glaciology, **44**, 113-117 (2006).
102. "Salt-induced depression of lower critical solution temperature in surface-grafted neutral thermoresponsive polymer", Young K. Jhon, Rajendra R. Bhat, Changwoo Jeong, Orlando J. Rojas, Igal Szleifer and Jan Genzer, Macromol. Rapid. Commun. **27**, 697-701 (2006).
103. "Controlled Release of Proteins from Polymer Modified Surfaces", Fang Fang and I. Szleifer, Proc. Nat. Acad. Sci. **103**, 5769-5774 (2006).
104. "Weak polyelectrolytes tethered to surfaces: effect of geometry, acid-base equilibrium and electrical permittivity", Rikkert Nap, Peng Gong and I. Szleifer, J. Polym. Sci., Part B: Polym. Phys., **44**, 2638-2662 (2006).
105. "Stability and phase separation in mixed self-assembled monolayers", S.N. Yaliraki, Gabriel Longo, Ella Gale I. Szleifer, and Mark Ratner, J. Chem. Phys., **125**, 074708 (1-7) (2006).
106. "Nanoscale memory provided by thermoreversible stochastically structured polymer aggregates on mica", Avishay Pelah, Silvio J. Ludueña, Elizabeth A. Jares-Erijman, Igal Szleifer, Lía I. Pietrasanta, and Thomas M. Jovin, Langmuir, **22**, 9682-9686 (2006).
107. "A microscopic model calculation of the phase diagram of ternary mixtures of cholesterol and saturated and unsaturated lipids", R. Elliott, I. Szleifer, and M. Schick (to appear in "Lipid Rafts", a volume in the series "Methods in Molecular Biology", Humana Press, Totowa N.J.)
108. "Interactions of polymers with carbon nanotubes", Rachel Yerushalmi-Rozen, Celine Bounioux and I. Szleifer, "Chemistry of Carbon Nanotubes", V.A. Basiuk and E.V. Basiuk, Eds., (in press).
109. "Diverse Two-Dimensional Arrays of PNIPAM Beads Formed by Spin-Coating", Avishay Pelah, Thomas M. Jovin, and Igal Szleifer, Colloids and Surfaces A, **299**, 1-7 (2007).

110. "Phase behavior and charge regulation of weak polyelectrolyte grafted layers", Peng Gong, Jan Genzer and I. Szleifer, Phys. Rev. Lett. **98**, 018302(1-4) (2007).
111. "Ions at the air/ice interface", M. A. Carignano, P. Shepson and I. Szleifer, Chem. Phys. Lett. **436**, 99-103 (2007).
112. "The role of interfacial diffuseness on surface segregation from polymer blends", S. Kumar and I. Szleifer, Soft Materials, **5**, 75-85 (2007).
113. "Chiral resolution in two-dimensional racemic systems", Irina Paci, I. Szleifer and Mark Ratner, J. Amer. Chem. Soc., **129**, 3545-3555 (2007).
114. "Physical adsorption of Block-copolymers to SWNT and MWNT – a non-wrapping mechanism", Einat Nativ-Roth, Rina Shvartzman-Cohen, Céline Bounioux, Marc Florent, Dongsheng Zhang, Igal Szleifer, and Rachel Yerushalmi – Rozen, Macromolecules, **40**, 3676-3685 (2007).
115. "Stability and phase separation in mixed monopolar lipid:bolalipid layers", Gabriel S. Longo, David H. Thompson and I. Szleifer, Biophys. J., **93**, 2609-2621 (2007).
116. "Effects of block copolymer's architecture on its association with lipid membranes: Experiments and simulations", Shelli L. Frey, Dongsheng Zhang, Marcelo A. Carignano, Igal Szleifer and Ka Yee C. Lee, J. Chem. Phys., **127**, 114904 (12 pages) (2007). (Selected by the editors for: Virtual Journal of Biological Physics Research).
117. "Monte Carlo simulation and molecular theory of tethered polyelectrolytes", Owen J. Hehmeyer, Gaurav Arya, Athanassios Z. Panagiotopoulos and Igal Szleifer, J. Chem. Phys., **126**, 244902 (11 pages) (2007). (Selected by the Editors for JCP: BioChemical Physics).
118. "Behavior of surface-anchored poly(acrylic acid) brushes with grafting density gradients on solid substrates: 1. Experiment", Tao Wu, Peng Gong, Igal Szleifer, Petr Vlček, Vladimír Šubr, and Jan Genzer, Macromolecules, **40**, 8756-8764 (2007).
119. "Behavior of surface-anchored poly(acrylic acid) brushes with grafting density gradients on solid substrates: 2. Theory", Peng Gong, Tao Wu, Jan Genzer and Igal Szleifer, Macromolecules, **40**, 8765-8773 (2007).
120. "Chirality of surfaces: Modeling and behaviour", Irina Paci, I. Szleifer and Mark Ratner, Chemistry Today, **25**, 18-22 (2007).
121. "Molecular Theory of Chemically Modified Electrodes by Redox Polyelectrolytes under Reversible Conditions: Comparison with Experiment", Mario Tagliacuzzi, Ernesto J. Calvo, Igal Szleifer, J. Phys Chem. C, **112**, 458-471 (2008).
122. "Redox and Acid-Base Coupling in Ultrathin Polyelectrolyte Films", Mario Tagliacuzzi, Ernesto J. Calvo, Igal Szleifer, Langmuir, **24**, 2869-2877 (2008).
123. "Drop Shape Analysis of Receptor-Ligand Interactions at the Oil/Water Interface", Chi-Yang Chao, Daniel Carvajal, Igal Szleifer and Kenneth R. Shull, Langmuir, **24**, 2472-2478 (2008).

124. "Aggregation and self-assembly of amphiphilic block copolymers in aqueous dispersions of carbon nanotubes", Rachel Yerushalmi-Rozen, Rina Shvartzman-Cohen, Daniella Goldfarb, Marc Florent, and Igal Szleifer, Langmuir, **24**, 4625-4632 (2008).
125. "A Molecular Theory of Chemically Modified Electrodes with Self-Assembled Redox Polyelectrolyte Thin Films: Reversible Cyclic Voltammetry", Mario Tagliacozzi, Ernesto J. Calvo, Igal Szleifer, Electrochimica Acta, **53**, 6740-6752 (2008).
126. "Quantitatively Modeling the Equilibrium Properties of Thiol-Decorated Gold Nanoparticles", Michael Tambasco, Sanat K. Kumar, and Igal Szleifer, Langmuir **24**, 8448-8451 (2008).
127. "Ligand-receptor interactions between surfaces: the role of binary polymer spacers", Gabriel Longo, David Thompson and Igal Szleifer, Langmuir **24**, 10324-10333 (2008).
128. "Structure and Interactions of Aggrecans: Statistical Thermodynamic Approach", R. J. Nap and I. Szleifer, Biophys. J. **95**, 4570–4583 (2008).
129. "The role of hydrogen bonding in tethered polymer layers", Chunlai Ren, Rikkert Nap and I. Szleifer, J. Phys. Chem. B **112**, 16238-16248 (2008).
130. "Analytical Theory and Monte Carlo Simulations of Gel formation of Charged Chains", M. Olvera de la Cruz, A. V. Ermoshkin, M. A. Carignano and I. Szleifer, Soft Matter **5**, 629-636 (2009).
131. "Stability and liquid-liquid phase separation in mixed saturated lipid bilayers", Gabriel S. Longo, Michael Schick and I. Szleifer, Biophys. J., **96**, 3977–3986 (2009).
132. "Experimental and Theoretical Investigation of Chain Length and Surface Coverage on Fouling of Surface Grafted Polypeptoids", Andrea R. Statz, Jinghao Kuang, Chunlai Ren, Annelise E. Barron, Igal Szleifer and Phillip B. Messersmith, Biointerfaces, **4**, FA22-FA32, (2009).
133. "<sup>2</sup>H NMR Spectroscopy, Small Angle X-ray Scattering, and Computational Evidence for Phase Separation in Binary Mixtures of Bipolar and Monopolar Lipid Dispersions", David P. Brownholland, Gabriel Longo, Andrey V. Struts, Matt Justice, Igal Szleifer, Horia Petrache, Michael F. Brown, David H. Thompson, Biophys. J. (in press).
134. "Role of kinesin light chain-2 of kinesin-1 in the traffick of Na,K-ATPase-containing vesicles in alveolar epithelial cells", Humberto E. Trejo, Emilia Lecuona, Doris Grillo, Igal Szleifer, Oksana E. Nekrasova, Vladimir I. Gelfand and Jacob I. Sznajder, FASEB J. (in press).
135. "Myosin Va restrains Na,K-ATPase-containing vesicles traffic in alveolar epithelial cells", Emilia Lecuona, Alexander Minin, Humberto E Trejo, Jiwang Chen, Alejandro P Comellas, Haiying Sun, Doris Grillo, Oxana E Nekrasova, Lynn C. Welch, Igal Szleifer, Vladimir Gelfand, and Jacob I Sznajder. J. of Cell Science (in press).
136. "Streptavidin–Biotin Binding in the Presence of a Polymer Spacer. A Theoretical Description", Chun-lai Ren, Daniel Carvajal, Kenneth R. Shull and Igal Szleifer, Langmuir, **25**, 12283-12292 (2009).
137. "Isotopic effect in self-assembly of amphiphilic block copolymers: the role of hydrogen bonds", Rina Shvartzman-Cohen, Chun-lai Ren, Igal Szleifer and Rachel Yerushalmi-Rozen, Soft Matter (in press).

## Invited Review Articles (peer reviewed)

1. "Tethered Polymer Layers", I. Szleifer and M. A. Carignano, Adv. Chem. Phys., Vol. XCIV, Chapter 3, pages 165-260, I. Prigogine and S. A. Rice Eds., John Wiley and Sons, New York, NY (1996).
2. "Statistical Thermodynamics of Polymers near Surfaces", I. Szleifer, Current Opinion in Colloidal and Interface Science, **1**, 416-423 (1996).
3. "Polymers and Proteins: Interactions at Interfaces", I. Szleifer, Current Opinion in Solid State and Materials Science, **2**, 337-344 (1997).
4. "Polymer Brushes", I. Szleifer, Encyclopedia of Computational Chemistry, 2114-2119 (1998).
5. "Tethered Polymer Layers: Phase Transitions and Reduction of Protein Adsorption", I. Szleifer and M. A. Carignano, **Feature Article** in: Macromolecular Rapid Communications, **21**, 423-448 (2000).
6. "Polymers and carbon nanotubes – dimensionality, interactions and nanotechnology", I. Szleifer and R. Yerushalmi-Rozen, **Feature article in:** Polymer, **46**, 7803-7818 (2005).

## Patents

1. Device and bioanalytical method utilizing asymmetric biofunctionalized membrane, Pub. No. US 2005/0175501 A1, 08/11/2005. (with D. Thompson, C. Hrycyna, G. Lee, O. Basaran and K. Park).

## Funding

### Current Proposals Funded

1. *Development of an ICMT Supported Membrane Sensor*, (with D. Thompson and C. Hrycyna Purdue Univ.), National Institute of Health (NIH), total cost \$ 2,754,669 (12/01/05-11/30/10)
2. *Polymer induced ordered nanoparticles phases*, (with R. Yerushalmi-Rosen and M. Gottlieb Ben-Gurion University of the Negev, Israel), US-Israel Binational Science Foundation, total cost \$116,380 (Northwestern part) 09/01/07-08/31/11.
3. *Antifouling Peptide Mimetic Polymers*, (with P. Messersmith and A. Baron). National Institute of Health (NIH), total cost \$1,198,856 (4/1/08-3/31/12).
4. *Control of Interfacial Behavior Through Lipid Domain Formation, Ligand-Receptor Binding and their Synergetic Effect*, NSF-CBET, total cost \$300,000, 8/1/08-7/31/11.
5. *Development of Bioresponsive Lipids for Intracellular Delivery*, (with David Thompson, Purdue University) National Institute of Health (NIH), total cost (Szleifer part) \$515,000, 5/1/09-4/30/14.
6. *Magnetic, Sub-Pore Scale Metal Oxide Particles for Enhanced Magnetic Resonance and Optical Characterization of Rock Pore Structure and Fluid Composition in Reservoir Rocks*, (with Linda Doerrer and Joyce Wong, Boston University) Advanced Energy Consortium (AEC), total cost (Szleifer part) \$256,808, 3/1/09-2/28/12.

7. *Center for Integrated Training in Far-from-equilibrium and Adaptive Materials, DOE EFRC*, (Bartosz A. Grzybowski Director, I. Szleifer co-Director), Department of Energy (DOE), total cost (Szleifer part) \$1,075,000, 9/1/09-8/31/14.
8. *EFRI-BSBA: Photonic technique for sensing and understanding subcellular structures at nanoscale* (with Vadim Backman and Hemant Roy), National Science Foundation (NSF), total cost (Szleifer part) \$666,666, 9/1/09-8/31/13.
9. *Oxide and Metal Nanoparticles-The Interface between Life Sciences and Physical Sciences*, PREM-DMR with University of Texas El Paso, National Science Foundation, I. Szleifer is Northwestern University co-PI, total cost (Szleifer part) \$250,000, 9/1/09-8/31/14.

#### Previous Proposals Funded

1. *Camille and Henry Dreyfus New Faculty Award*, \$25,000, 7/91-6/96
2. *Theoretical Studies of the Phase Behavior of Polymeric Systems*, Shell Research BV (Amsterdam), \$75,000 (1993-1995).
3. *Theoretical Understanding of Complex Fluids*, Summer Faculty Grant, Purdue Research Foundation, \$5,000, 6/1/93-9/1/93
4. *Statistical Thermodynamic Theory of Polymer Fluids: Molecular Organization and Phase Behavior*, Summer Faculty Grant, Purdue Research Foundation, \$5,000, 6/1/94-9/1/94
5. *Molecular Organization, Thermodynamic Behavior and Solubilization in Block Copolymer Aggregates*, Purdue Research Foundation, \$23,600. 6/5/95-6/5/97
6. *Platelet Behavior at Polymer-Blood Interfaces*, (with Prof. Kinam Park, Pharmacy Department), NIH, total cost \$365,228.
7. *Polymer Surface Groups to Promote Liposome-Cell Fusion*, Sequus Pharmaceuticals, Inc. \$50,000 4/1/96-3/31/98.
8. *Molecular Design of Surface Modified Vesicles and Liposomes: A Theoretical Study*, NSF Career Award, total cost \$300,000. 6/1/96-5/31/00
9. *Stability and Targeting of Polymer Coated Liposomes; A Theoretical Approach*, Purdue Research Foundation, \$11,666, 6/16/97-6/5/98
10. *Camille Dreyfus Teacher-Scholar Award*, \$60,000, 6/97-5/02
11. *Theoretical Studies of Stability and targeting of Liposomes with Grafted Polymers*, PRF ACS type AC total cost \$50,000, 6/1/97-5/31/99.
12. James A. Shannon Award, NIH (with Prof. D. Thompson), \$100,000 8/97-7/99.
13. *Synthesis of Triggerable Fusogens for Membrane Bilayers* (with Prof. D. Thompson), NIH, \$507,081 7/98-6/02.

14. *Thermodynamic vs. Kinetic Control of Protein Adsorption*, Purdue Research Foundation, total cost \$24,000, 6/1/00-5/31/02.
15. *Thermodynamic and Kinetic Control of Adsorption in Complex Fluids*, NSF, total cost \$285,000. 7/1/00-6/31/03.
16. *Entropic Effects in Surface-Induced Polymer Crystallization*, (with Dr. Rachel Yerushalmi-Rozen), United States-Israel Binational Science Foundation, \$175,000, 7/31/01-9/1/04.
17. *Technologies Based on Biofunctional Asymmetric Membranes for Select Active Transport (BAMSAT)*, (5 researchers) Indiana 21<sup>st</sup> Century Fund, total cost \$1,320,000 2/01/03-01/31/05.
18. *Molecular design of responsive polymer layers*, Purdue Research Foundation, \$27,552. 7/1/05-6/30/07.
19. *Responsive Tethered Polymer Layers: Protein Adsorption, Phase Transitions and Interactions*, National Science Foundation (NSF), \$300,000, 12/15/03-12/14/06. (Non-cost extension up to 12/2007).
20. *Nanomolecular Interactions of Novel Biological and Synthetic Polyelectrolyte Brushes*, (with Allan Grodzinsky and Christine Ortiz MIT and Jan Genzer NCSU), NSF-NIRT, total cost (Szeleifer part) \$367,500, 9/1/04-31/8/09.
21. *Multiscale Modeling of Nanostructured Interfaces for Biological Sensors*, (with J.J. de Pablo University of Wisconsin, M. Olvera de la Cruz Northwestern University, Manuel Laso Universidad Politecnica de Madrid, Spain, Hans Christian Ottinger ETH Zurich, Switzerland and Doros Theodoros National Technical University of Athens, Greece). National Science Foundation (NSF-EC), 8/1/05-7/31/09, total cost \$222,435 (Szeleifer part).

## Lectures

1. *Packing of Chain Molecules in Amphiphilic Aggregates*, Fritz Haber Research Center for Molecular Dynamics, Hebrew University of Jerusalem, July 1985 (invited).
2. *Statistical Thermodynamics of Pure and Mixed Amphiphilic Aggregates*, “Physicochemical Hydrodynamics: Interfacial Phenomena”, La Rabida, Spain, July 1986.
3. *Elastic Properties of Amphiphilic Films*, Polymer Department, Weitzman Institute of Sciences, April 1988 (invited).
4. *Critical Behavior of the Interface in Dilute Polymer Solutions*, 60<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1988.
5. *Conformational and Elastic Properties of Amphiphilic Films*, AT&T Bell Laboratories, January 1989 (invited).
6. *Elastic Properties of Amphiphilic Monolayers and Bilayers*, Kodak Research Laboratory, March 1989 (invited).
7. *Structure and Tension of the Interface in Dilute Polymer Solutions*, Massachusetts Institute of Technology, Polymer Series Seminar, March 1989 (invited).

8. *Critical Behavior, Structure and Tension of the Interface in Dilute Polymer Solutions*, Les Houches Summer School on Theoretical Physics, July 1989.
9. *A New Theoretical Approach to Understand Polymer Solutions*, 62<sup>nd</sup> Statistical Mechanics Meeting, Rutgers University, December 1989.
10. *A New Mean Field Theory for Dilute Polymer Solutions: Phase Diagram, Conformational Behavior and Interfacial Properties*, Department of Chemistry, Oregon Graduate Center, January 1990 (invited).
11. *Elastic Constants in Amphiphilic Films*, Department of Chemistry, Oregon Graduate Center, January 1990 (invited).
12. *Theoretical Studies of the Conformational and Thermodynamic Behavior of Polymeric Systems*, SUNY at Stony Brook, February 1990 (invited).
13. *Conformational and Thermodynamic Properties of Dilute Polymer Solutions*, Department of Chemistry, University of Illinois at Urbana-Champaign, February 1990 (invited).
14. *A New Mean Field Theory for Dilute Polymer Solutions: Phase Diagram, Conformational Behavior and Interfacial Properties*, Department of Chemical Engineering, Rice University, February 1990 (invited).
15. *Statistical Thermodynamics of Polymer Solutions: Bulk and Interfacial Properties*, Department of Chemistry, Massachusetts Institute of Technology, March 1990 (invited).
16. *Theoretical Studies of the Conformational and Thermodynamic Behavior of Polymeric Systems*, KSLA Shell Laboratorium BV (Amsterdam), June 1990 (invited).
17. *A Unified Theory of the Dynamics of Linear Chain Macromolecules*, 64<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1990.
18. *Statistical Thermodynamic Studies of the Molecular Organization and Equilibrium Properties of Amphiphilic Aggregates*, KSLA Shell Laboratorium (Amsterdam), January 1991 (invited).
19. *A New Mean Field Theory for Dilute Polymer Solutions: Phase Diagram, Conformational Behavior and Interfacial Properties*, Department of Chemical Engineering, California Institute of Technology, February 1991 (invited).
20. *Statistical Thermodynamics of Polymer Solutions : Bulk Behavior and Interfacial Properties*, Department of Chemistry, Purdue University, February 1991.
21. *Molecular Theory of Curvature Elasticity in Surfactant Films*, 201<sup>st</sup> Annual ACS Meeting, "Complex Fluids" Symposium, Atlanta 1991 (invited).
22. *Monte Carlo Simulations of the Collapse-Coil Transition in Homopolymers*, KSLA Shell Laboratorium Amsterdam), July 1991 (invited).
23. *Elastic Properties and Stability of Amphiphilic Vesicles*, Department of Chemical Engineering, Cornell University, March 1992 (invited).

24. *Determination of the Chemical Potential of Chain Molecules by Monte Carlo Simulations*, APS March Meeting, Polymer Symposium, Indianapolis, March 1992.
25. *The Repton Model of Electrophoresis*, KSLA Shell Laboratorium (Amsterdam), July 1992 (invited).
26. *A New Approach for the Determination of the Chemical Potentials of Polymers by Monte Carlo Simulations*, FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands, July 1992 (invited).
27. *Equilibrium Properties of Amphiphilic Vesicles: A Theoretical Approach*, American Institute of Chemical Engineering Annual Meeting, Miami November 1992.
28. *Thermodynamic and Structural Properties of Grafted Polymeric Films*, Department of Chemistry SUNY at Stony Brook, December 1992 (invited).
29. *Statistical Thermodynamic Theory of Grafted Polymeric Layers*, 68<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1992 (invited).
30. *Molecular Organization and Thermodynamic Properties of Grafted Polymer Layers - A Theoretical Approach*, Department of Chemical Engineering, Cornell University March 1993 (invited).
31. *Statistical Thermodynamic Theory of Grafted Polymeric Layers*, APS March Meeting, Polymer Symposium, Seattle, Washington 1993.
32. *Statistical Thermodynamic Theory of Grafted Polymeric Layers*, ACS Annual Meeting, "Modeling of Self-Assembled Monolayers and Thin Films" Symposium, Denver, Colorado 1993.
33. *Structure and Thermodynamics of Polymeric Fluids: From Single Chain to Dense Fluids*, Advanced Studies Institute: "Simulations in Chemical Physics", The Hebrew University of Jerusalem (Israel), May 1993 (invited).
34. *Conformational and Thermodynamical Properties of Grafted Polymer Layers*, "Complex Fluids" Seminar Series, Weizmann Institute of Science, Rehovot (Israel), May 1993 (invited).
35. *Structure and Thermodynamics of Grafted Polymer Chains*, Van't Hoff Laboratory, Utrecht University, The Netherlands, June 1990 (invited).
36. *Phase Behavior of Polymeric Systems*, KSLA Shell Laboratorium (Amsterdam), June 1993 (invited).
37. *Grafted Polymer Layers*, Department of Polymer Chemistry, Groningen University, The Netherlands, June 1993 (invited).
38. *Theoretical Studies of the Conformational and Thermodynamic Behavior of Polymeric Fluids*, Gordon Conference on "Physics and Chemistry of Liquids", New Hampshire August 1993 (invited).
39. *Conformational and Thermodynamic Properties of Grafted Polymer Layers*, American Institute of Chemical Engineering Annual Meeting, St. Louis, MO, November 1993.



40. Short Course on *"Theoretical Approaches in Polymeric Systems"*, Institute for Applied Mathematics, National University of San Luis, San Luis, Argentina, November 1993 (invited).
41. Lecture 1: *Theoretical Studies of the Conformational and Thermodynamic Behavior of Grafted Polymer Layers.*
42. Lecture 2: *What can we learn About Polymer Molecules from Computer Simulations?: Collapsed Transition and Phase Behavior in Polymer Solutions*
43. Lecture 3: *Thin Films of Polymer Blends: Theory and Simulations*
44. Lecture 4: *Wetting, Pre-Wetting, Surface Tension and Line Tension in Three-Phase Equilibrium*
45. *Statistical Thermodynamic Theory of Grafted Polymeric Layers*, Polymers near Surfaces Symposium, American Physical Society Annual Meeting, Pittsburgh, PA, March 1994 (invited).
46. *Molecular Organization and Thermodynamic Behavior of Tethered Polymer Layer*, Department of Chemistry, Northwestern University, April 1994 (invited).
47. *Phase Behavior of Polymer Fluids in Bulk and Constrained Environments*, Modeling of Polymer Blends and Thermoplastics Symposium, Society of Plastics Engineers ANTEC 94, San Francisco May 1994 (invited).
48. *Thermodynamic and Conformational Properties of Polymeric Fluids*, Midwest Thermodynamic Symposium, Purdue University, May 1994.
49. Short Course on *"Statistical Thermodynamics of Polymeric Fluids"*, Department of Polymer Chemistry and Materials Science Center, University of Groningen, The Netherlands, May 1994 (invited).
50. Lecture 1: *Molecular Organization and Thermodynamic Properties of Tethered Polymeric Layers*
51. Lecture 2: *Phase Behavior and Structure of Polymer Blends Thin Films*
52. Lecture 3: *Monte Carlo Simulations of Chain Molecules I: Collapse Transition and Second Virial Coefficients*
53. Lecture 4: *Monte Carlo Simulations of Chain Molecules II: Chemical Potentials and Phase Behavior of Polymer Solutions*
54. *Polymer Blends Thin Films: Molecular Organization and Phase Behavior.* The Fritz Haber Research Center for Molecular Dynamics, The Hebrew University of Jerusalem, Israel, June 1994 (invited).
55. *Theoretical Approaches for Fluid-Fluid Interfaces: From Simple to Complex Fluids*, Intevp, Caracas Venezuela, July 1994 (invited).
56. *Understanding Interfaces in Complex Fluids*, Universidad Nacional de San Luis, San Luis Argentina, August 1994 (invited).
57. *Thermodynamics of Tethered Polymer Layers in Good, Theta and Poor Solvents*, AIChE meeting, San Francisco, CA, November 1994.

58. *Conformational and Thermodynamic Behavior of Tethered Chain Molecules: from Surfactants to Long Chain Polymers*, "Recontres de Moriond, Condensed Matter Physics Meeting" Symposium on "Short and Long Chains at Interfaces", Villars-sur-Ollon, Switzerland, January 1995 (invited).
59. *Molecular Organization and Thermodynamic Behavior of Polymer Fluids in Constrained Environments*, Department Of Chemistry, Tel Aviv University, Tel Aviv Israel, February 1995 (invited).
60. *Single-Chain Mean-Field Theory for Polymer Fluids in Constrained Geometries*, Materials Science Center, University of Groningen, The Netherlands, February 1995 (invited).
61. *Polymer Fluids Near Walls*, Department of Polymer Chemistry, University of Groningen, The Netherlands, February 1995 (invited).
62. *Molecular Organization and Thermodynamic Behavior of Tethered Polymer Layers*, Department of Chemical Engineering, University of Delaware, Newark DE, March 1995 (invited).
63. *Grafted Polymers*, ACS Spring Meeting 1995, "Physical Chemistry of Polymers and Complex Fluids" Symposium, April 1995, Anaheim, California (invited).
64. *Theoretical Modeling of Chain Molecules: From Amphiphilic Packing to Polymers at Surfaces*, Sequus Pharamceutical Co., September 1995, San Francisco, CA (invited).
65. *Molecular Organization and Thermodynamic Behavior of Polymer Fluids in Thin Films*, "Supramolecular Order in Polymer Colloids and Surfaces" Symposium, Pacificchem'95, Honolulu, December 1995 (invited).
66. *Critical Behavior of Polymer Solutions in Thin Films*. APS March Meeting, St. Louis, MO, March 1996 (contributed).
67. *Protein Adsorption on Surfaces with Grafted Polymers*, Midwestern Thermodynamic Conference, Univ. of Wisconsin at Madison, Madison, WI, May 1996 (invited).
68. *Protein Adsorption on Polymer Modified Surfaces and Design of Surface Modified Liposomes*, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain, June 1996 (invited).
69. *Phase Behavior of Polymer Fluids in Constrained Environments*, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain, June 1996 (invited).
70. Short course in: "*Molecular Approaches for Structural and Thermodynamic Properties of Membranes*". Workshop on Protein, Membranes and their Interactions, International Center of Theoretical Physics, Trieste, Italia, 7/22/96-8/2/96. (invited)
71. Lecture 1: *Microscopic theories of chain packing in amphiphilic bilayers and membranes.*
72. Lecture 2: *Molecular organization of grafted polymers: prevention of protein adsorption and surface modified lipsomes.*
73. Lecture 3: *Microscopic determination of the elastic properties of membranes and polymer decorated membranes.*

74. *Protein Adsorption on Grafted Polymer Layers*, Department of Materials Science, Penn State University, College Station, PA October 1996 (invited).
75. *Protein Adsorption on Grafted Polymer Layers*, AIChE Meeting, Chicago, IL, November 1996.
76. *Phase Behavior of Polymer Melts and Solutions in Thin Films*, Department of Physics, Laboratoire de Physique Statistique, Ecole Normale Supérieure, Paris, France, January 1997 (invited).
77. *Molecular design of biocompatible surfaces: prevention of protein adsorption*, Department of Chemical Physics, Institute Curie, Paris, France, January 1997 (invited).
78. *Theoretical Studies of Polymer Layers and Their Applications to Biocompatibility and Drug Delivery*, Molecular Modeling of Polymers, Symposium sponsored by Division of Computers in Chemistry, San Francisco ACS Meeting, April, 1997 (invited).
79. *Molecular Design of Biomaterials*, Department of Materials Sciences, University of California at Santa Barbara, Santa Barbara, CA April 1997 (invited).
80. *Theoretical Design of Biocompatible Materials*, Department of Chemistry, Ohio State University, Columbus, OH May 1997 (invited).
81. *Grafted Polymers Uses in Biocompatibility*, Midwest Thermodynamics and Statistical Mechanics Conference, Lake Geneva, May 1997.
82. Short course on: *Complex Fluids and Interfaces*, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain, May 1997 (invited).
83. Lectures 1-2: *Surface tension: thermodynamics and statistical mechanical approaches*.
84. Lectures 3-4: *Wetting and wetting transitions*.
85. Lectures 5-6 *Surface interactions: van der Waals, electrostatic and steric. Colloidal stabilization*.
86. Lectures 7-8: *Self assembly and surfactant phase behavior*.
87. Lectures 9-10: *Polymers at surfaces and interfaces: steric repulsion and biotechnological applications*.
88. *Grafted Polymers-Protein Interactions*, Polymer-Biological System Interactions Symposium, Brooklyn Polytechnic University, Brooklyn NY June 1997 (invited).
89. *Tethered Polymer Layers*, Polymers at Interfaces, 71<sup>st</sup> Colloid and Surface Science Symposium, University of Delaware, Newark, Delaware, June 29-July 2, 1997 (invited).
90. *Protein Adsorption on Grafted Polymer Layers*, Physics of Proteins at Interfaces, 71<sup>st</sup> Colloid and Surface Science Symposium, University of Delaware, June 29-July 2, 1997.
91. *Theoretical Prediction and Experimental Confirmation of Spontaneous Liposome Formation*, Liposomes and Vesicles Symposium, 1997 AIChE Annual Meeting, Los Angeles, CA, November 1997.

92. *Theoretical Approach of Self-Assembly of Nonionic Surfactant Molecules*, Self-Assembly in Solution II Symposium, 1997 AIChE Annual Meeting, Los Angeles, CA November 1997.
93. *Protein Adsorption on Surfaces with Triblock Copolymers*, Interfacial Phenomena in Biotechnology Symposium, 1997 AIChE Annual Meeting, Los Angeles, CA, November 1997.
94. *Molecular Design of Spontaneous Forming Liposomes*, Polymers in Confined Spaces Symposium, Materials Research Society 1997 Fall meeting, Boston MA December 1997 (invited).
95. *Grafted Polymers and Protein Adsorption*, Complex Fluids and Biomaterials Symposium, Materials Research Society 1997 Fall meeting, Boston MA December 1997 (invited).
96. *Structure and Thermodynamics of Polymers at Interfaces*, Department of Chemistry, University of Cincinnati, Cincinnati OH. January 1998 (invited).
97. *Molecular Design of Biocompatible Materials*, Department of Chemical Engineering, University of Wisconsin at Madison, Madison WI February 1998 (invited).
98. *Theoretical and Experimental Studies of Protein Adsorption on Surfaces with Grafted Polymers*, Department of Chemical Engineering, University of Houston, Houston TX February 1998 (invited).
99. *Polymers in Biocompatible Materials*, Computer Modeling of Materials and Biomaterials Symposium, Great Lakes ACS Regional Meeting, Milwaukee WI June 1998 (invited).
100. *Molecular Design of Biocompatible Materials*, Department of Physics, Universidad Nacional de San Luis, San Luis Argentina, June 1998 (invited).
101. *Molecular Design of Biomaterials: Prevention of protein adsorption by grafted polymer layers*, Physical Properties of Polymeric Materials and Molecular Thin Films Symposium, ACS National meeting, Boston, MA, August 1998 (invited).
102. *Thermodynamic and kinetic control of protein adsorption*, Department of Chemical Engineering, UCLA, Los Angeles, CA, October 1998. (invited).
103. *Molecular Modeling of Nonionic Surfactant Self-Assembly*, American Institute of Chemical Engineering, Miami, FL, November 1998.
104. *Molecular Design of Biomaterials: from surfaces to liposomes*, Institute of Theoretical Physics, University of Maryland, College Park, MD, January 1999. (invited).
105. *Kinetic and Thermodynamic Control of Protein Adsorption*, Fritz Haber Institute, Hebrew University of Jerusalem, Jerusalem, Israel, February 1999. (invited).
106. *Towards a Microscopic Understanding of Protein Adsorption*, Laboratory of Statistical Mechanics, Ecole Normal Supérieure, Paris France, February 1999 (invited).
107. *Thermodynamics, kinetics and phase transitions in block copolymer layers and their ability to prevent protein adsorption*, ACS National Meeting, Anaheim, CA, March 1999. (invited).

108. *Kinetics and Thermodynamics of Protein Adsorption on Surfaces with Grafted Polymers*, Midwestern Thermodynamic Conference, Wayne State University, Detroit, MI May 1999. (invited).
109. Short course on: *Complex Fluids and Interfaces*, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain, June 1999 (invited).
110. Lectures 1-2: *Thermodynamics and statistical mechanical approaches for surfaces and interfaces*.
111. Lectures 3-4: *Interactions between large particles: van der Waals, electrostatic and steric. DLVO theory, grafted polymers. Colloidal stabilization*.
112. Lectures 5-6: *Self assembly and surfactant phase behavior*.
113. Lectures 7-8: *Protein adsorption: control by surface modification*.
114. *Grafted Polymer Layers and Design of Biomaterials*, ACS National Meeting New Orleans, LA, August, (1999). (invited).
115. *Kinetic vs. Thermodynamic Control of Protein Adsorption*, Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL, September (1999) (invited).
116. *Control of Protein Adsorption by Grafted Polymer Layers*, Department of Chemistry, University of Notre Dame, South Bend, IN, November (1999) (invited).
117. *Kinetic vs. Thermodynamic Control of Protein Adsorption by Tethered Polymer Layers*, Materials Research Society National Meeting, Boston, MA, December (1999) (invited).
118. *Kinetic Behavior of Protein Adsorption*, Computer Science and Engineering Seminar Series, Purdue University, November (1999).
119. *Molecular Modeling of Biomaterials*, Department of Industrial Pharmacy, Purdue University, February (2000) (invited).
120. *Molecular Modeling of Biocompatible Materials*, Department of Chemical Engineering and Materials Science, Wayne State University, Detroit, MI, March (2000) (invited).
121. *Molecular Design of Biocompatible Materials*, Structure, Dynamics and Charge Transport in Polymeric Materials Workshop, Argonne National Lab., Argonne, IL, June (2000) (invited).
122. *Protein Adsorption and Spontaneous Liposome Formation*, Department of Chemical Engineering, Ben-Gurion University of the Negev, Beer-Sheva, Israel, July (2000) (invited).
123. *Grafted Polymer Layers and their Interactions with Proteins*, 4th International Biorelated Polymers Symposium", American Chemical Society National Meeting, Washington DC, July (2000) (invited).
124. *Thermodynamics and Kinetics for the Adsorption of Model Proteins*, American Institute of Chemical Engineers National Meeting, Los Angeles, CA, November 2000.
125. *Thermodynamic and Kinetics of Protein Adsorption: A Theoretical Approach*, Department of Chemistry, IUPUI, Indianapolis, IN, January 2001 (invited).
126. *Self-Assembly of Lipid Polymer Mixtures*, Macromolecular Self-Assembly at Surfaces and Interfaces Symposium, American Chemical Society National Meeting, San Diego, CA, April 2001 (invited).

127. *Phase Equilibrium and Optimal Structure of Surface Modified Liposomes*, Department of Chemistry, Imperial College, London, England, March 2001 (invited).
128. *Electrostatic and Kinetics of Protein Adsorption*, Department of Physics, Laboratoire de Physique Statistique, Ecole Normale Supérieure, Paris, France March 2001 (invited).
129. *Theoretical Modeling of Polymer Modified Materials and their Interactions with Proteins*, Whistler Center for Carbohydrate Research Symposium, West Lafayette, IN, May 2001 (invited).
130. Short course on: *Complex Fluids and Interfaces*, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain, June-July 2001 (invited).
131. Lectures 1-2: *Thermodynamics and statistical mechanical approaches for surfaces and interfaces*.
132. Lectures 3-4: *Interactions between large particles: van der Waals, electrostatic and steric. DLVO theory, grafted polymers. Colloidal stabilization*.
133. Lectures 5-6: *Self assembly and surfactant phase behavior*.
134. Lectures 7-8: *Protein adsorption: control by surface modification*.
135. *Molecular Theory of Protein Adsorption: Equilibrium and Kinetic Behavior*, ASTATPHYS-MEX-2001, Cancun, Mexico, July 2001 (invited).
136. *Molecular Theories of Protein Adsorption on Surfaces with Grafted Polymers: Equilibrium vs. Kinetics*, Telluride Workshop on Polymer Theory vs. Polymer Experiment, Telluride, CO, August 2001 (invited).
137. *Adsorption of neutral and charged proteins*, Biomacromolecules at Interfaces Symposium, 2001 American Chemical Society National Meeting, Chicago, IL, August 2001 (invited).
138. *The use of Tethered Polymer Layers in Biocompatible Materials and Drug Carriers: A Theoretical Perspective*, 7<sup>th</sup> Pacific Polymer Conference, Oaxaca, Mexico, December 2001 (invited).
139. *Understanding Protein Adsorption*, Department of Chemistry, Indiana University, Bloomington, IN, February 2002 (invited).
140. *Protein Adsorption: The role of grafted polymers and electrostatic interactions*, Department of Chemical Engineering, Princeton University, Princeton, NJ, February 2002 (invited).
141. *Adsorption of charged proteins on surfaces with grafted polymers*, American Physical Society Annual meeting, Indianapolis, IN March 2002.
142. *Thermodynamic and kinetic control of protein adsorption: a molecular theoretical approach*, Department of Chemistry, Illinois Institute of Technology, Chicago, IL, March 2002.
143. *Protein adsorption: Effect of charge distribution and protein shape*, 223<sup>rd</sup> ACS National Meeting, Proteins at Interfaces Symposium, Orlando, FL, April 2002 (invited).

144. *Understanding protein adsorption on modified surfaces*, Universidad Autonoma de Mexico, Mexico City, Mexico, May 2002 (invited).
145. *Interactions of charged polymers and proteins with surfaces: a theoretical approach*, Instituto Mejjicano del Petroleo, Mexico City, Mexico, May 2002 (invited).
146. *Kinetic and Thermodynamic Control of Protein Adsorption on Surfaces with Grafted Polymers: A Theoretical Perspective*, UWEB 2<sup>nd</sup> Symposium on Non-Fouling Surfaces, University of Washington, Seattle, WA July-August 2002 (invited).
147. *Thermodynamics and kinetics of protein adsorption on surfaces with charged and uncharged grafted polymers*, Symposium: Chain Molecules and Interfaces: SCF theory and experiment (in memory of Jan Scheutjens), Wageningen, The Netherlands, August 2002 (invited).
148. *Equilibrium and Kinetics of Protein Adsorption*, Department of Chemistry, Univeristy of Pittsburgh, Pittsburgh, PA January 2003 (invited).
149. *Molecular Understanding of Protein Adsorption*, Department of Physics, University of Wisconsin at Madison, Madison, WI February 2003 (invited).
150. *Molecular Design of Biocompatible Materials and Liposomes for Drug Delivery*, Department of Materials Science and Engineering, Northwestern University, Evanston, IL February 2003 (invited).
151. *Prevention of Protein Adsorption by Grafted Polymers*, Department of Matcromolecular Science and Engineering, Case Western Reserve University, Cleveland, OH February 2003 (invited).
152. *Particle Adsorption on Surfaces with Grafted Polyelectrolite*, American Physical Society Annual Meeting, Austin, TX March 2003.
153. *Molecular Modeling of Protein Adsorption*, Department of Chemical Engineering, North Carolina State University, Raleigh, NC April 2003 (invited).
154. *Charge Regulation on Grafted Polyelectrolytes*, Telluride Workshop on Polymer: Theory vs. Polymer Experiment, Telluride, CO, August 2003 (invited).
155. *Protein Adsorption on Grafted Polyelectrolyte Layers*, PMSE Division of the American Chemical Society Symposium on: "Self Assembly and Applications for Soft Materials Interfaces". ACS Fall meeting, New York, NY September 2003 (invited).
156. *Multi-scale approach for kinetics of protein adsorption*, Nonlinear Science Series Seminar, Northwestern University, October 2003, (invited).
157. *Molecular Theory of Protein Adsorption*, Plenary Lecture at: Fisica Estadistica 03 (FisEs 03), Pamplona, Spain October 2003 (invited).
158. *Multi-scale approach for kinetics of protein adsorption*, PRISM/PMI Seminar Series, Princeton University, Princeton, NJ February 2004 (invited).
159. *Molecular Understanding of Protein Adsorption*, Physical Chemistry Seminar, Dept of Chemistry, University of Wisconsin at Madison, Madison, Wisconsin, March 2004 (invited).

160. *Structure Thermodynamics and Adsorption on Weak Polyelectrolytes*, American Physical Society Annual Meeting, March 2004, Montreal, Canada (invited).
161. *Tuning protein adsorption with grafted polymer layers*, 2004 Minerva Symposium, Kineret, Israel, May 2004 (invited).
162. *Multi-scale approach for protein adsorption*, Dept of Chemical Engineering, California Institute of Technology, Pasadena, California, May 2004 (invited).
163. *Kinetics and Thermodynamics of Protein Adsorption*, Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain, June 2004 (invited).
164. *Kinetics and Thermodynamics of Protein Adsorption*, Comision Nacional de Energia Atomica, Buenos Aires, Argentina, August 2004 (invited).
165. *Control of Protein Adsorption with Grafted Polymers*, FAMAF, Universidad Nacional de Cordoba, Cordoba, Argentina, August 2004 (invited).
166. *Weak and Strong Polyelectrolyte Layers*, Department of Chemistry, Universidad de Buenos Aires, Buenos Aires, Argentina, August 2004 (invited).
167. *Molecular Design of Controlled Release Devices*, Symposium on: Complex Fluids, American Chemical Society Annual Meeting, Philadelphia, PA, August 2004. (invited).
168. *Molecular modeling of lipid-ploxamers mixtures*, Computations in Science seminar series, James Franck Institute, University of Chicago, Chicago, IL, October 2004 (invited).
169. *Control of Protein Adsorption on Surfaces with Grafted Polymers*, Protein-Surface Interactions Symposium, American Vacuum Society Annual Meeting, Anaheim, CA, November 2004 (invited).
170. *Cartilage inspired studies: How the study of aggrecans leads to stabilization of carbon nanotubes and phase behavior of weak polyelectrolyte tethered layers*, Pan American Advanced Study Institute, PASI-2005: Bioinspired nanoscience and molecular machines, Bariloche, Argentina, March 2005 (invited).
171. *Structure and Phase Behavior of End-Tethered Weak Polyelectrolytes*, Dillon Medal Symposium, American Physical Society Annual Meeting, Los Angeles, CA March 2005.
172. *Molecular design of nanofunctional environments using polymer modifiers*, Department of Chemical Engineering, Purdue University, West Lafayette, IN April 2005 (invited).
173. *Structure of polyacids in confined environments*, 2005 Minerva Symposium, Ohalo, Israel, May 2005 (invited).
174. *Cartilage inspired studies: How the study of aggrecans leads to stabilization of carbon nanotubes and phase behavior of weak polyelectrolyte tethered layers*, "Complex fluids, microstructure and macromolecules forum", Technion University, Haifa, Israel, May 2005 (invited).
175. *Towards the understanding of polysaccharides in cartilage: the effect of geometry and charge regulation*, Department of Chemistry, Imperial College London, London UK, July 2005 (invited).



176. *Bioinspired nanomaterials: How the study of aggrecans leads to stabilization of carbon nanotubes and phase behavior of weak polyelectrolyte tethered layers*, Department of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA, August 2005 (invited).
177. *Tethered Polyelectrolyte Layers: structure, thermodynamics and adsorption*. Department of Polymer Science, University of Akron, Akron, OH, September 2005 (invited).
178. *Sealing of cell membranes and two dimensional clusters of nanoparticles: how the study of lipid-poloxamer interactions teaches us how to control nanoparticle clusters*. Computer Research Institute Seminar Series, Purdue University, West Lafayette, IN, September 2005 (invited).
179. *Chemical Equilibrium in Confined Environments*, Department of Chemistry, University of Akron, Akron, OH, November 2005 (invited).
180. *Understanding Complex Systems with "Simple" Molecular Models*, American Chemical Society Akron Section Award Ceremony, Akron, OH, November 2005 (invited).
181. *Nonequilibrium Phase Separation on Confined Polymer Blends*, Miscible Blend Dynamics Symposium, Pacifichem 2005, Honolulu, Hawaii, December 2005 (invited).
182. *Structural Properties of Weak Polyelectrolyte Layers*, Polymer Surface Structure and Dynamics Symposium, Pacifichem 2005, Honolulu, Hawaii, December 2005 (invited).
183. *Responsive Tethered Polymer Layers: Structure, Thermodynamics, Phase Transitions and Protein Adsorption*, **Keynote Lecture at**: The 4<sup>th</sup> Eastern Mediterranean Chemical Engineering Conference (EMMC4), Dead Sea, Israel, January 2006 (invited).
184. *Cluster structure and corralling effect driven by interaction mismatch in two dimensional mixtures*, Department of Chemical Engineering, Ben-Gurion University, Beer-Sheva, Israel, January 2006 (invited).
185. *Responsive tethered polymers on various geometries*, Assembly, Structure, and Dynamics of Tethered Polymer Systems symposium, Spring 2006 National Meeting American Chemical Society, Atlanta, GA, March 2006 (invited).
186. *Chemical equilibrium in confined environments*, Comision Nacional de Energia Atomica, Buenos Aires, Argentina, July 2006 (invited).
187. *Understanding lipid layers at the molecular level: Structure, Packing and Phase Behavior*, Department of Inorganic and Physical Chemistry, Universidad de Buenos Aires, Buenos Aires, Argentina, July 2006 (invited).
188. *Responsive Tethered Polymer Layers: Structure, Thermodynamics, Phase Transitions and Protein Adsorption*, US-China workshop on the " Fundamentals of Transport, Pollution and Energy Processes", Durham, NH August 2006 (invited).
189. *Theoretical predictions of the phase diagram of ternary mixtures of cholesterol, saturated lipids and unsaturated lipids*, ACS Annual meeting, San Francisco, CA September 2006 (contributed).

190. *Molecular Understanding of Responsive Surfaces*, Department of Chemical Engineering, Columbia University, New York, NY October 2006 (invited).
191. *Kinetic and Thermodynamics of Protein Adsorption on Polymer Modified Surfaces*. Department of Physics Colloquium, University of Illinois at Chicago, Chicago, IL November 2006 (invited).
192. *Responsive Tethered Polymer Layers: Structure, Phase Transitions and Nanoparticle Adsorption*, Materials Research Society Annual Meeting, Symposium: Responsive Materials, Boston, MA November 2006 (invited).
193. *Chemical Equilibrium in Confined Environments*, Department of Chemistry, University of Pennsylvania, Philadelphia, PA, January 2007 (invited).
194. “*Protein Adsorption on Biomaterials: Surface modifications for non-fouling surfaces, specific binding, smart materials and controlled release*”, Department of Biomedical Engineering, Northwestern University, Evanston, IL 2007 (invited).
195. *Ligand-receptor binding in the presence of polymeric spacers*, American Physical Society Annual Meeting, Session on: “Interfaces between synthetic and biological polymers”, Denver, CO March 2007 (invited).
196. *Chemical Equilibrium in Confined Environments*, XV Congreso Argentino de Fisicoquímica y Química Inorgánica, Tandil, Argentina April 2007 (invited).
197. *Modeling of Complex Biomolecular and Surface Interactions*, **Plenary lecture at:** Eleventh International Conference on Properties and Phase Equilibria for Product and Process Design, Crete, Greece May, 2007 (invited).
198. *Thermodynamics and Kinetics of Protein Adsorption on Modified Surfaces*, Gordon Research Conference on Biomaterials: Biocompatibility and Tissue Engineering, Plymouth, NH, July 2007, (invited).
199. *Responsive Polymer Layers: Structure, Phase Transitions and Nanoparticle Adsorption*, Department of Chemical and Biological Engineering, Northwestern University, Evanston, IL October 2007 (invited).
200. *Proteins, lipids and surfaces: molecular modeling of their structure, dynamics and interactions*, Pulmonary and Critical Care Division, Feinberg School of Medicine, Northwestern University, Chicago, IL October 2007 (invited).
201. *Structure, Thermodynamics and Healing of Lipid Layers*, Department of Biomedical Engineering, Northwestern University, Evanston IL October 2007 (invited).
202. *Molecular Modeling of Protein Adsorption on Modified Surfaces*, Department of Biopharmaceutical Sciences, The University of Illinois at Chicago, Chicago IL, November 2007 (invited).
203. *Responsive Polymers at Interfaces*, Workshop on: Structure Formation and Evolution in Soft Matter/Complex Fluid Systems, Beijing International Center for Mathematical Research (BICMR), Beijing, China, December 2007 (invited).

204. *“Protein Adsorption on Biomaterials: Surface modifications for non-fouling surfaces, specific binding, smart materials and controlled release”*, Gordon Research Conference on Colloidal, Macromolecular & Polyelectrolyte Solutions, Ventura, CA February 2008 (invited).
205. *Self Organization of Responsive Polymers at Nanoparticle Surfaces*, PSME symposium on Polymer Surfaces and Interfaces: Loops, Branches and Brushes, ACS National Meeting, New Orleans LA, April 2008 (invited).
206. *Responsive Polymers at Surface and Interfaces*, Keynote lecture at: Soft Matter at Interfaces Symposium, 82<sup>nd</sup> ACS Colloid and Surface Science conference, Raleigh NC June 2008 (invited).
207. *Tethered Weak Polyelectrolytes*, Gordon Research Conference on Polymer Physics, Salve Regina, Newport RI, July 2008 (invited).
208. *Understanding Chemical Equilibrium in Confined Environments*, American Conference on Theoretical Chemistry, Evanston IL, July 2008 (invited).
209. *Generalized Le Chatellier principle for Confined Environments*, INQUIMAE, Universidad de Buenos Aires, Argentina, August 2008 (invited).
210. *Water Molecules in Protein Adsorption*, Symposium: "Water Mediated Interactions", National ACS meeting, Philadelphia PA, Aug. 2008 (invited).
211. *Manipulation Adsorption with Tethered Responsive Polymer Layers*, Symposium : "Responsive and interactive polymer materials and multicomponent systems" , ACS National Meeting, Philadelphia PA, Aug. 2008 (invited).
212. *Protein Adsorption, Binding and Lipid Domains*: Gordon Research Conference on Biointerface Science, Aussois, France, Sept. 2008 (invited).
213. *Ligand-Receptor Binding in Confined Environments*: Laboratoire de Physico-Chimie Théorique, ESPCI, Paris, France, Sept. 2008 (invited).
214. *Optimization of Ligand-Receptor Binding in Confined Environments*: Department of Chemical Engineering, McGill University, Montreal, Canada, Oct. 2008 (invited).
215. *Structure, thermodynamics and healing of lipid layers*, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing, China, October 2008 (invited).
216. *Responsive Tethered Polymer Layers: From Polyelectrolytes to Redox Polymers*, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing, China, October 2008 (invited).
217. *Thermodynamics and Kinetics of Protein Adsorption: Bridging Length and Time Scales*, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing, China, October 2008 (invited).
218. *Ligand-Receptor Binding in Confined Environemnts*, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing, China, October 2008 (invited).
219. *Ligand-Receptor Binding in Confined Environemnts*, Department of Physics, Shanghai Jiaotong University, Shanghai, China, October 2008 (invited).

220. *Thermodynamics and Kinetics of Protein Adsorption: Bridging Length and Time Scales*, Fritz Haber Research Center for Molecular Dynamics, Hebrew University of Jerusalem, Jerusalem, Israel, February 2009 (invited).
221. *Ligand-receptor binding in confined environments: from specific protein adsorption to nanoparticle attachment and drug delivery*, Department of Chemical Engineering and the Ilze Katz Institute for Nanoscale Science & Technology Seminar Series, Ben-Gurion University of the Negev, Beer-Sheva, Israel, February 2009 (invited).
222. *Ligand-receptor binding in confined environments: from specific protein adsorption to nanoparticle attachment and drug delivery*, CamBridgeSens Seminar Series, Department of Chemical Engineering, University of Cambridge, Cambridge, UK February 2009 (invited).
223. *Ligand-receptor binding in confined environments: from specific protein adsorption to nanoparticle attachment and drug delivery*, Big Ten Exchange Seminar, Bioengineering Department, University of Illinois at Urbana-Champaign, Urbana, IL March 2009 (invited).
224. *Controlling morphological changes in complex systems by self-regulating interactions*, Telluride Conference in Polymers, Telluride, CO July 2009 (invited).
225. *Chemical equilibrium regulation in complex fluids at the nanoscale*, Gordon Conference on Chemistry and Physics of Liquids, Holderness, NH August 2009 (invited).
226. *Targeted delivery of lipid agents and nanoparticles to cancer cells: How to combine chemical reaction equilibrium and physical interactions for biological activity*, CNEA, Buenos Aires, Argentina, August 2009 (invited).
227. *Targeted delivery of lipid agents and nanoparticles to cancer cells: How to combine chemical reaction equilibrium and physical interactions for biological activity*, INQUIMAE, Universidad de Buenos Aires, Argentina, August 2009 (invited).
228. *Targeted delivery of lipid agents and nanoparticles to cancer cells: How to combine chemical reaction equilibrium and physical interactions for biological activity*, Instituto Balceiro, Bariloche, Argentina, August 2009 (invited).
229. *Targeted delivery of lipid agents and nanoparticles to cancer cells: How to combine chemical reaction equilibrium and physical interactions for biological activity*, FAMAF, Universidad Nacional de Cordoba, Argentina, August 2009 (invited).
230. *Targeted delivery of lipid agents and nanoparticles to cancer cells: How to combine chemical reaction equilibrium and physical interactions for biological activity*, Department of Chemistry, University of Illinois at Chicago, Chicago IL, September 2009 (invited).

## Meetings Attended

1. International Conference and Summer School: “*Physicochemical Hydrodynamics: Interfacial Phenomena*”, La Rabida, Spain, July 1986.

2. Gordon Conference on Liquids, New Hampshire, July 1987.
3. International Conference on Surface Interactions, Neve Ilan, Israel, 1988.
4. 60<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1988.
5. Les Houches Summer School in Theoretical Physics: "*Liquids, Freezing and the Glass Transition*", Les Houches, France, July 1989.
6. 62<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1989.
7. 64<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1990.
8. Symposium on "Complex Fluids", 201<sup>st</sup> ACS National Meeting, Atlanta, GA, April 1991.
9. "*Tethered Chains I*" A Symposium on the Science of Polymer Surfactants. Minnesota, July 1991.
10. APS March Meeting, Polymer Division, Indianapolis, IN, March 1992.
11. ACS 203<sup>rd</sup> National Meeting. San Francisco, CA, April 1992.
12. Symposium Honoring Prof. B. Widom 65<sup>th</sup> Birthday, Cornell University, September 1992.
13. American Institute of Chemical Engineering Annual Meeting, Miami, FL, November 1992.
14. 68<sup>th</sup> Statistical Mechanics Meeting, Rutgers University, December 1992.
15. APS March Meeting, Polymer Division, Seattle, WA, March 1993.
16. ACS 205<sup>rd</sup> National Meeting. Denver, CO, March 1993.
17. Gordon Conference on Liquids, New Hampshire, July 1993.
18. American Institute of Chemical Engineering Annual Meeting, St. Louis, MO, November 1993.
19. American Physical Society Annual Meeting, Pittsburgh, PA, March 1994
20. Society of Plastics Engineers ANTEC 94, San Francisco May 1994
21. Midwest Thermodynamics Symposium, Purdue University, May 1994.
22. American Institute of Chemical Engineering Annual Meeting, San Francisco, CA, November 1994.
23. "Recontres de Moriond, Condensed Matter Physics Meeting", Villars-sur-Ollon, Switzerland, January 1995.
24. ACS Spring Meeting 1995, April 1995, Anaheim, California.

25. American Institute of Chemical Engineering Annual Meeting, Miami, FL, November 1995.
26. Pacifichem'95, Honolulu, Hawaii, December 1995.
27. American Physical Society Annual Meeting, St. Louis, Mo March 1996.
28. Midwest Thermodynamics Conference, University of Wisconsin at Madison, May 1996.
29. Workshop on: Protein, Membranes and their Interactions. *International Center of Theoretical Physics*, Trieste, Italy July-August 1996.
30. American Institute of Chemical Engineering Annual Meeting, Chicago, Ill., November 1996.
31. American Physical Society Annual Meeting, Kansas City, Missouri, March 1997.
32. American Chemical Society Annual Meeting, San Francisco, CA, April 1997.
33. Midwest Thermodynamics and Statistical Mechanics Conference, Lake Geneva, May 1997.
34. 71<sup>st</sup> ACS Symposium on Colloid and Surface Science, Newark, DE, June-July 1997.
35. Polymer-Biological System Interactions Symposium, Brooklyn Polytechnic University, Brooklyn NY June 1997
36. American Institute of Chemical Engineering Annual Meeting, Los Angeles, CA, November 1997.
37. Workshop: Future directions in molecular modeling and simulation: fundamental and applications. National Science Foundation, Arlington, VA November 1997.
38. Materials Research Society Annual Meeting, Boston, MA, December 1997.
39. Great Lakes ACS Regional Meeting, Milwaukee WI June 1998.
40. ACS National meeting, Boston, MA, August 1998.
41. American Institute of Chemical Engineering Annual Meeting, Los Angeles, CA, November 1998.
42. ACS National meeting, Anaheim, CA, March 1999.
43. ACS National meeting, New Orleans, LA, August 1999.
44. American Institute of Chemical Engineering Annual Meeting, Dallas, TX, November 1999.
45. Materials Research Society National Meeting, Boston, MA, December 1999.
46. Structure, Dynamics and Charge Transport in Polymeric Materials Workshop, Argonne National Lab., Argonne, IL, June 2000.
47. American Chemical Society National Meeting, Washington DC, August 2000.

48. American Institute of Chemical Engineering Annual Meeting, Los Angeles, CA, November 2000.
49. American Chemical Society National Meeting, San Diego, CA, April 2001.
50. Telluride Workshop on Polymer Theory vs Polymer Experiments, Telluride, CO, August 2001.
51. American Chemical Society National Meeting, Chicago, IL, August 2001.
52. American Institute of Chemical Engineering Annual Meeting, Reno, NV, November 2001.
53. 7<sup>th</sup> Pacific Polymer Conference, Oaxaca, Mexico, December 2001.
54. American Physical Society Annual Meeting, Indianapolis, IN March 2002.
55. 223<sup>rd</sup> ACS National Meeting, Orlando, FL, April 2002.
56. 2<sup>nd</sup> Symposium on Non-Fouling Surfaces, University of Washington, Seattle, WA July-August 2002
57. Chain Molecules and Interfaces: SCF theory and experiment (in memory of Jan Scheutjens), Wageningen, The Netherlands, August 2002
58. American Institute of Chemical Engineering Annual Meeting, Indianapolis, IN, November 2002.
59. American Physical Society Annual Meeting, Austin, TX March 2003.
60. Telluride Workshop on Polymer: Theory vs. Polymer Experiment, Telluride, CO, August 2003.
61. ACS Fall meeting, New York, NY September 2003.
62. Fisica Estadística 03 (FisEs 03), Pamplona, Spain October 2003
63. American Physical Society Annual Meeting, March 2004, Montreal, Canada
64. 2004 Minerva Symposium, Kineret, Israel, May 2004
65. American Chemical Society Annual Meeting, August 2004, Philadelphia, PA.
66. American Vacuum Society Annual Meeting, November 2004, Anaheim, CA.
67. Pan American Advanced Study Institute, PASI-2005: Bioinspired nanoscience and molecular machines, Bariloche, Argentina, March 2005
68. American Physical Society Annual Meeting, Los Angeles, CA March 2005.
69. 2005 Minerva Symposium, Ohalo, Israel, May 2005.
70. Gordon Research Conference (GRC) on Biomaterials: Biocompatibility & Tissue Engineering, Plymouth, NH, August 2005.
71. Pacifichem 2005, Honolulu, Hawaii, December 2005.

72. The 4<sup>th</sup> Eastern Mediterranean Chemical Engineering Conference (EMMC4), Dead Sea, Israel, January 2006.
73. American Physical Society Annual Meeting, March 2006, Baltimore, MD.
74. American Chemical Society Annual Meeting, March 2006, Atlanta, GA.
75. US-China workshop on the " Fundamentals of Transport, Pollution and Energy Processes", Durham, NH August 2006.
76. American Chemical Society Annual meeting, San Francisco, CA September 2006.
77. CECAM (Centre Européen de Calcul Atomique et Moléculaire) meeting on Polymers at Surfaces and Interfaces, Lyon, France October 2006.
78. Materials Research Society Annual Meeting, Symposium: Responsive Materials, Boston, MA November 2006.
79. American Physical Society Annual Meeting, Session on: "Interfaces between synthetic and biological polymers", Denver, CO March 2007.
80. XV Congreso Argentino de Fisicoquímica y Química Inorgánica, Tandil, Argentina April 2007.
81. Eleventh International Conference on Properties and Phase Equilibria for Product and Process Design, Crete, Greece May, 2007.
82. Gordon Research Conference on Biomaterials: Biocompatibility and Tissue Engineering, Plymouth, NH, July 2007
83. Workshop on: Structure Formation and Evolution in Soft Matter/Complex Fluid Systems, Beijing International Center for Mathematical Research (BICMR), Beijing, China, December.
84. Gordon Research Conference on Colloidal, Macromolecular & Polyelectrolyte Solutions, Ventura, CA February 2008.
85. ACS National Meeting, New Orleans LA, April 2008.
86. 82<sup>nd</sup> ACS Colloid and Surface Science conference, Raleigh NC June 2008.
87. Gordon Research Conference on Polymer Physics, Salve Regina, Newport RI, July 2008.
88. American Conference on Theoretical Chemistry, Evanston IL, July 2008.
89. National ACS meeting, Philadelphia PA, Aug. 2008.
90. Gordon Research Conference on Biointerface Science, Sept. 2008, Aussois, France.
91. Telluride Conference in Polymers, Telluride, CO July 2009.



92. Gordon Conference on Chemistry and Physics of Liquids, Holderness, NH August 2009.

### NSF Workshops and Panels

1. Future Direction in Molecular Modeling and Simulation: Fundamentals and Applications, Arlington, VA November 1997.
2. NSF Career PI Workshop, Arlington, VA January 1999.
3. Reviewer in the panel “Biosystems at the nanoscale”, NSF Arlington, VA February 2001.
4. Site visit reviewer, University of Washington at Seattle Science and Technology Center, Seattle, WA May 2006.
5. NSF Panel Reviewer, CBET Program, Arlington, VA December 2006.
6. NSF Panel Reviewer, CBET Program, Arlington, VA December 2007.

### Meetings organized

CECAM (Centre Européen de Calcul Atomique et Moléculaire) meeting on: “Polymers at surfaces and interfaces”, with Prof. F. Muller-Plathe, Prof. D. Brown and Dr. S. Neyertz. Lyon, France October 2006

### Teaching Assignments

	<u>Fall</u>	<u>Spring</u>
1991-1992	Research Leave	CHM 373 (Physical Chemistry)
1992-1993	CHM 373 (Physical Chemistry)	CHM 682 (Statistical Mechanics)
1993-1994	CHM 373 (Physical Chemistry)	CHM 682 (Statistical Mechanics)
1994-1995	CHM 373 (Physical Chemistry) CHM 675 (Chemical Kinetics)	CHM 682 (Statistical Mechanics) CHM 695e (Phys. Chem. Seminar)
1995-1996	CHM 373 (Physical Chemistry) CHM 000 (Mathematical Methods for Chemists)	CHM 682 (Statistical Mechanics)
1996-1997	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics)
1997-1998	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics)
1998-1999	CHM 671 (Quantum Mechanics) CHM 695e (Phys. Chem. Seminar)	Sabbatical Leave
1999-2000	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics) CHM 695e (Phys. Chem. Seminar)
2000-2001	CHM 373 (Physical Chemistry)	CHM 682 (Statistical Mechanics)

2001-2002	CHM 696 (Theory of Complex Fluids)	CHM 579 (Computational Chemistry)
2002-2003	CHM 679 (Thermodynamics)	CHM 579 (Computational Chemistry)
2003-2004	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics)
2004-2005	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics)
2005-2006	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics)
2006-2007	CHM 671 (Quantum Mechanics)	CHM 682 (Statistical Mechanics)

1997, 1999, 2001, 2004 and 2005 Teaching at the Department of Chemical Engineering, Universitat Rovira I Virgili, Tarragona, Spain. Courses: “Statistical Mechanics of Complex Fluids and Interfaces” and “Thermodynamics of nanostructures”.

2007-2008 BME 495 “Thermodynamics and Interactions at Biointerfaces”

2008-2009 BME 250 Biothermodynamics; BME 495 Thermodynamics and Interactions at Biointerfaces

### **Professional Activities**

At Northwestern:

Biomedical Engineering Representative: Computer Committee MAC (09/07-).

McCormick Ambassador to Israel (01/09-)

Graduate Studies Committee (09/09-)

At Purdue:

Chemistry Representative: Area Promotions Committee (05-07)

Head Division of Physical Chemistry (7/02-7/07 )

Chemistry Representative to Computer Science and Engineering Graduate Faculty (7/99-7/07)

Computer Research Institute Faculty Advisory Committee (10/01-07)

Colloquium Committee (5/95-5/02)

Development of New Evaluation Form for Teaching Performance (5/95- 7/97)

Major Equipment Proposals Committee (8/94 -07)

Materials Chemistry Committee (8/91-07)

Graduate Studies Committee (8/92 - 8/93)

Development of New Curriculum for Physical Chemistry Graduate Program (5/93 - 1/94)

### **Research Group**

Mrs. Doris Grillo	Graduate Student (jointly with Prof. Monica Olvera de la Cruz)
Mr. German Picasso	Graduate Student
Mr. Julian Gelman Constantin	Graduate Student (jointly with Prof. Horacio Corti, UBA, Argentina)
Mr. Kevin Baler	Graduate Student
Mr. Tyrone Yacoub	Graduate Student
Mr. Mark Anderson	Graduate Student (jointly with Prof. Olvera de la Cruz and Prof. Ratner)
Dr. Rikkert Nap	Postdoctoral Associate
Dr. Sung Hyun Park	Postdoctoral Associate
Dr. Mark Uline	Postdoctoral Associate
Dr. Jun Soo Kim	Postdoctoral Associate
Dr. Marcelo Carignano	Research Associate Professor

### **Former Members of Research Group**

Dr. Hai Tang	Postdoctoral Associate
Mr. Alan vanGiessen	Undergraduate Student
Mr. Adam F. Johnson	Graduate Student, M.Sc.
Mrs. Stephanie Chaney	Undergraduate Student.
Dr. Dimiter Petsev	Postdoctoral Associate
Dr. German Urbilla	Postdoctoral Associate
Dr. Javier Satulovsky	Postdoctoral Associate
Dr. Claudia Guerin	Graduate Student, Ph.D. (12/99)
Dr. Yanbin Huang	Graduate Student, Ph. D. (05/01) (joint with Prof. N. Peppas, Chem. Eng.)
Mrs. Jennifer Stewart	Undergraduate Student

Dr. Montse Rovira	Postdoctoral Associate
Mr. Riaz Abdulla	Graduate Student, M.Sc. (08/03)
Dr. Marcus Rizzotto	Postdoctoral Associate
Dr. Fang Fang	Graduate Student, Ph. D. (08/03)
Dr. Alberto Gonzalez	Graduate Student, Ph. D. (08/04)
Mrs. Ezhil Baskaran	Graduate Student, M.Sc., (05/05) (Civil Engineering)
Dr. Voichita Dardarlat	Research Scientist
Mr. Salomon Turgman	Undergraduate Student (Chemical Engineering)
Mr. Shawn Goldman	Undergraduate Student
Dr. Peng Gong	Graduate Student, Ph. D. (05/06)
Mrs. Adele Walters	Undergraduate Student
Dr. Dongsheng Zhang	Graduate Student, Ph. D. (05/07)
Dr. Jason Green	Graduate Student, Ph. D. (07/07) (joint with Prof. G. Cooks)
Dr. Marcelo A. Carignano	Research Scientist
Dr. Gabriel Longo	Graduate Student, Ph. D. (08/07)
Dr. Shihong Meng	Graduate Student, Ph. D. (08/08)
Mr. Joseph Schwartz	Undergraduate Student (University of Pennsylvania)