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Education

1966 A.B. Harvard College (*summa cum laude* in Chemistry and Physics)
1967 Diploma Oxford University (advanced mathematics, with C.A. Coulson)
1968 M.A. Harvard University (Chemistry)
1971 Ph.D. Harvard University (Chemical Physics, with W.N. Lipscomb)
1971 NATO Postdoctoral Fellow at Cavendish Laboratory, Cambridge University (with M. Cooper)

Professional Experience

1971-75 Assistant Professor of Chemistry, Brandeis University
1975-81 Associate Professor of Chemistry, Brandeis University
1977-78 NSF Faculty Professional Development Fellow at Max-Planck-Institut for Biophysical Chemistry, Göttingen, W. Germany (with M. Eigen)
1981- Professor of Chemistry, Brandeis University
1983-87 Chair, Chemistry Department, Brandeis University
1987-88 Guggenheim Fellow, Center for Rhythmic Studies, Boston University, and Mathematical Research Branch, NIDDK, NIH
1989-94 Helena Rubinstein Professor, Brandeis University
1992-94 Dean of Arts and Sciences, Brandeis University
1994-2001 Provost and Senior Vice President for Academic Affairs, Brandeis U.
2002-2003 Visiting Scholar, Harvard University
2006- Howard Hughes Medical Institute Professor, Brandeis University
2006- Henry F. Fischbach Professor of Chemistry, Brandeis University
2007-2010 Chair, Chemistry Department, Brandeis University
2011-2104 Senior Advisor to the Provost, Brandeis University
2012-2013 Interim Executive Director, Office of Technology Licensing, Brandeis U.
2013-2015 Interim Vice Provost for Research, Brandeis University
2015- Interim Provost and Senior Vice President for Academic Affairs, Brandeis U.

Honors and Awards

1962 Liebmann Award (N.Y. Section, American Chemical Society)
1965 Phi Beta Kappa
1966 Marshall Scholar
1973 Dreyfus Foundation Teacher-Scholar
1977 Guggenheim Fellowship (declined)
1977 Humboldt Fellowship (declined)
1987 Guggenheim Fellowship
2006 Howard Hughes Medical Institute Professorship
2009 Honorary Professorship, China University of Mining and Technology

2010 Grass Fellow, Radcliffe Institute for Advanced Study, Harvard University
2012 Fellow, Massachusetts Academy of Sciences

Other Professional Activities

1982 Founding Chair, Gordon Research Conference on Chemical Oscillations
1982-89 Editorial Advisory Board, *Journal of Physical Chemistry*
1984-88 Faculty Representative, Brandeis University Board of Trustees
1984-1990 Consultant, E.I. du Pont & Co.
1985- Science Council, New England Region, Weizmann Institute
1990- Visiting Associate, Committee on Professional Training, American Chemical Society
1991- Associate Editor, *Chaos*
1992 NSF-NATO Postdoctoral Fellowship Review Panel
1992 National Institute on Alcohol Abuse - Biochemistry, Physiology and Medicine Subcommittee, *ad hoc* member
1992 NSF Chemistry Division Triennial Oversight Review Panel
1996- Board of Directors, New England Complex Systems Institute
1997 NEASC Reaccreditation Visiting Team, Smith College
1998 Review Committee, Georgetown University Science Division
1999 Review Committee, Chemistry Ph.D. Program, CUNY Graduate Center
2000-2006 Science and Technology Advisory Board, Flaschner Judicial Institute
2004 Chair, NSF Workshop on "Models of Thought Processes: Insights toward Chemical Systems"
2005-2012 Chair, Board of Directors, New England Complex Systems Institute
2007 Steering Committee, NSF Workshop on Complexity and Emergence
2009- Editorial Board, *Journal of Systems Chemistry*
2010 NEASC Reaccreditation Visiting Team, MGH Institute of Health Professions
2012- Board of Trustees, Mathematical Biosciences Institute, Ohio State University

Publications

1. I. R. Epstein, "1-4 Bond Orders -- A Static Reactivity Index for Diels-Alder Reactions," *Trans. Faraday Soc.* 63, 2085-2092 (1967).
2. I. R. Epstein, "Time-Dependent Coupled Hartree-Fock Calculation of Some Optical Properties of H₂," *Chem. Phys. Lett.* 4, 479-481 (1970).
3. I. R. Epstein, "Electronic Momentum Distributions and Compton Profiles of Polyatomic Molecules," *J. Chem. Phys.* 52, 3838-3840 (1970).
4. E. Switkes, I. R. Epstein, J. A. Tossell, R. M. Stevens and W. N. Lipscomb, "Studies of Polyatomic Molecules Using Self-Consistent Field Wave Functions. B₄H₁₀, B₅H₉, B₅H₁₁," *J. Am. Chem. Soc.* 92, 3837-3846 (1970).
5. I. R. Epstein, "Optical Properties of Atoms and Diatomic Molecules Calculated by a Time-Dependent Coupled Hartree-Fock Perturbation Method," *J. Chem. Phys.* 53, 1881-1890 (1970).
6. I. R. Epstein and W. N. Lipscomb, "Comments on the Barrier to Internal Rotation in Ethane," *J. Am. Chem. Soc.* 92, 6094-6095 (1970).

7. I. R. Epstein, T. F. Koetzle, R. M. Stevens and W. N. Lipscomb, "Self-Consistent Field Wave Functions for 1,2-B₄C₂H₆ and 1,6-B₄C₂H₆," J. Am. Chem. Soc. 92, 7019-7024 (1970).
8. I. R. Epstein and W. N. Lipscomb, "Molecular Momentum Distributions and Compton Profiles. I. General Theory and Boron Hydrides," J. Chem. Phys. 53, 4418-4424 (1970).
9. I. R. Epstein, "Molecular Momentum Distributions and Compton Profiles. II. Localized Orbital Transferability and Hydrocarbons," J. Chem. Phys. 53, 4425-4436 (1970).
10. I. R. Epstein, J. A. Tossell, E. Switkes, R. M. Stevens and W. N. Lipscomb, "Hexaborane(10): Self-Consistent Field Wave Function, Localized Orbitals and Relationships to Chemical Properties," Inorg. Chem. 10, 171-179 (1971).
11. I. R. Epstein, "Calculation of Molecular Integrals in Momentum Space," Chem. Phys. Lett. 9, 9-12 (1971).
12. I. R. Epstein and W. N. Lipscomb, "Boron Hydride Valence Structures: A Topological Approach," Inorg. Chem. 10, 1921-1928 (1971).
13. M. Roux and I. R. Epstein, "Molecular Momentum Distributions and Compton Profiles. Effects of Bonding on Some Small Molecules," Chem. Phys. Lett. 18, 18-23 (1973).
14. I. R. Epstein and B. G. Williams, "Studies in Molecular Compton Scattering. I. A Statistical Test for the Comparison of Line Profiles," Phil. Mag. 27, 311-328 (1973).
15. I. R. Epstein, "A Topological Approach to Boron Hydride Reactivities. Electrophilic and Nucleophilic Substitution," Inorg. Chem. 12, 709-712 (1973).
16. J. H. Hall, I. R. Epstein and W. N. Lipscomb, "Optimized Self-Consistent-Field and Localized Molecular Orbital Studies of Tetraborane(4)," Inorg. Chem. 12, 915-920 (1973).
17. I. R. Epstein, D. S. Marynick and W. N. Lipscomb, "Localized Molecular Orbitals for 1,2- and 1,6-Dicarbahexaborane(6). The Open Three-Center Bond and Implications for Carborane Topology," J. Am. Chem. Soc. 95, 1760-1766 (1973).
18. I. R. Epstein, "Compton Scattering and the Chemistry of Momentum Space," Acc. Chem. Res. 6, 145-152 (1973).
19. I. R. Epstein, B. G. Williams and M. J. Cooper, "Studies in Molecular Compton Scattering. II. The Compton Profile of C₄H₈O₂ - Dioxane, Isobutyric and n-Butyric Acids," J. Chem. Phys. 58, 4098-4103 (1973).
20. I. R. Epstein, "Calculation of Atomic and Molecular Momentum Expectation Values and Total Energies from Compton-Scattering Data," Phys. Rev. A 8, 160-168 (1973).
21. A. C. Tanner and I. R. Epstein, "Calculation of Molecular Momentum Distributions Using Gaussian Expansions of Slater-Type Orbitals," Chem. Phys. Lett. 25, 143-148 (1974).
22. S. Leibowitz, I. R. Epstein and D. Kleitman, "Enumeration and Generation of Three-Center Valence Structures," J. Am. Chem. Soc. 96, 2704-2708 (1974).
23. I. R. Epstein and M. Roux, "Remarques sur les valeurs moyennes de l'impulsion des electrons, dans les atomes et les molecules," C. R. Acad. Sci. Paris 278, 77-79 (1974).
24. S. Golden and I. R. Epstein, "Binding of Positrons to Atoms," Phys. Rev. A 10, 761-768 (1974).
25. A. C. Tanner and I. R. Epstein, "Compton Profile and Electron Momentum Distribution of Water," J. Chem. Phys. 61, 4251-4257 (1974).
26. I. R. Epstein, P. Pattison, M. G. H. Wallbridge and M. J. Cooper, "Theoretical and Experimental Compton Profiles of Decaborane(14)," J. Chem. Soc. Chem. Commun. 567-568 (1975).

27. I. R. Epstein, "Electron Momentum Distributions in Atoms, Molecules and Solids," in *MTP International Review of Science, Physical Chemistry, Series II, Theoretical Chemistry*. Vol 1, A. D. Buckingham and C. A. Coulson, eds., Butterworths, London, 1975, pp. 107-161.
28. A. C. Tanner and I. R. Epstein, "Multiple Scattering in the Compton Effect. I. Analytic Treatment of Angular Distributions and Total Scattering Probabilities," *Phys. Rev. A* 13, 335-348 (1976).
29. S. S. Jacobs and I. R. Epstein, "Effects of Chloride Ion on Oscillations in the Bromate-Cerium-Malonic Acid System," *J. Am. Chem. Soc.* 98, 1721-1724 (1976).
30. E. Braun-Keller and I. R. Epstein, "Vibrational Corrections to the Charge and Momentum Densities of H₂," *Chem. Phys. Lett.* 40, 215-219 (1976).
31. A. C. Tanner and I. R. Epstein, "Multiple Scattering in the Compton Effect. II. Analytic and Numerical Treatment of Energy Profiles," *Phys. Rev. A* 14, 313-327 (1976).
32. A. C. Tanner and I. R. Epstein, "Multiple Scattering in the Compton Effect. III. Monte Carlo Calculations," *Phys. Rev. A* 14, 328-340 (1976).
33. R. N. Camp, I. R. Epstein and C. Steel, "Theoretical Studies of the Photochemistry of Acyclic Azoalkanes," *J. Am. Chem. Soc.* 99, 2453-2459 (1977).
34. V. Halonen, I. R. Epstein, A. C. Tanner and B. G. Williams, "Multiple Scattering," in *Compton Scattering*, B. G. Williams, ed., McGraw-Hill, New York, 1977, pp. 79-101.
35. I. R. Epstein and A. C. Tanner, "Chemistry," in *Compton Scattering*, B. G. Williams, ed., McGraw-Hill, New York, 1977, pp. 209-233.
36. A. Farazdel and I. R. Epstein, "Monte Carlo Studies of Positrons in Matter. Method and Application to Annihilation Spectra in Helium Gas," *Phys. Rev. A* 16, 518-524 (1977).
37. E. Braun-Keller and I. R. Epstein, "Multiple Scattering in the Compton Effect. IV. Operator Formalism for Nonstationary Electrons," *Phys. Rev. A* 16, 1146-1153 (1977).
38. E. Braun-Keller and I. R. Epstein, "Multiple Scattering in the Compton Effect. V. Bounds on Errors Associated with Multiple-Scattering Corrections," *Phys. Rev. A* 16, 1154-1160 (1977).
39. R. N. Camp, I. R. Epstein and R. J. Weiss, "Non-additivity of Elastic and Inelastic X-Ray Scattering from Water, Methanol and a Mixture," *Phil. Mag.* 37, 43-47 (1978).
40. A. Farazdel and I. R. Epstein, "Monte Carlo Studies of Positrons in Matter. Temperature and Electric Field Effects on Lifetime Spectra in Low-Temperature, High-Density Helium Gas," *Phys. Rev. A* 17, 577-586 (1978).
41. R. J. Kaner and I. R. Epstein, "Induction and Inhibition of Chemical Oscillations by Iodide Ion in the Belousov-Zhabotinskii Reaction," *J. Am. Chem. Soc.* 100, 4073-4079 (1978).
42. I. R. Epstein, "Cooperative and Non-Cooperative Binding of Large Ligands to a Finite One-Dimensional Lattice. A Model for Ligand-Oligonucleotide Interactions," *Biophys. Chem.* 8, 327-339 (1978).
43. I. R. Epstein, "Kinetics of Large-Ligand Binding to One-Dimensional Lattices: Theory of Irreversible Binding," *Biopolymers* 18, 765-778 (1979).
44. I. R. Epstein, "Coexistence, Competition and Hypercyclic Interaction in Some Systems of Biological Interest," *Biophys. Chem.* 9, 245-250 (1979).
45. E. J. Heilweil and I. R. Epstein, "Chemical Oscillation and 'Chaos' in a Single System," *J. Phys. Chem.* 83, 1359-1361 (1979).
46. E. J. Heilweil, M. J. Henchman and I. R. Epstein, "Sequential Oscillations in Mixed-Substrate Belousov-Zhabotinskii Systems," *J. Am. Chem. Soc.* 101, 3698-3700 (1979).

47. I. R. Epstein, "Competitive Coexistence of Self-Reproducing Macromolecules," *J. Theor. Biol.* 78, 271-298 (1979).
48. K. Schulten and I. R. Epstein, "Recombination of Radical Pairs in High Magnetic Fields: A Path Integral - Monte Carlo Treatment," *J. Chem. Phys.* 71, 309-316 (1979).
49. I. R. Epstein, "Kinetics of Nucleic Acid-Large Ligand Interactions: Exact Monte Carlo Treatment and Limiting Cases of Reversible Binding," *Biopolymers* 18, 2037-2050 (1979).
50. I. R. Epstein and M. Eigen, "Selection and Self-Organization of Self-Reproducing Macromolecules under the Constraint of Constant Flux," *Biophys. Chem.* 10, 153-160 (1979).
51. I. R. Epstein, K. Kustin and L. J. Warshaw, "A Kinetics Study of the Oxidation of Iron(II) by Nitric Acid," *J. Am. Chem. Soc.* 102, 3751-3758 (1980).
52. P. De Kepper, K. Kustin and I. R. Epstein, "A Systematically Designed Homogeneous Oscillating Reaction: The Arsenite-Iodate-Chlorite System," *J. Am. Chem. Soc.* 103, 2133-2134 (1981).
53. M. Orbán and I. R. Epstein, "Oscillations and Bistability in Hydrogen-Platinum-Oxyhalogen Systems," *J. Am. Chem. Soc.* 103, 3723-3727 (1981).
54. C. Dateo and I. R. Epstein, "Kinetics of Nucleic Acid-Large Ligand Interactions: Multiplet-Closure Approximations and Matrix-Iteration Techniques," *Biopolymers* 20, 1651-1669 (1981).
55. T. A. Gribschaw, K. Showalter, D. Banville and I. R. Epstein, "Chemical Waves in the Acidic Iodate Oxidation of Arsenite," *J. Phys. Chem.* 85, 2152-2155 (1981).
56. M. Orbán, P. De Kepper, I. R. Epstein and K. Kustin, "New Family of Homogeneous Chemical Oscillators: Chlorite-Iodate-Substrate," *Nature* 292, 816-818 (1981).
57. P. De Kepper, I. R. Epstein and K. Kustin, "Bistability in the Oxidation of Arsenite by Iodate in a Stirred Flow Reactor," *J. Am. Chem. Soc.* 103, 6121-6127 (1981).
58. I. R. Epstein, C. E. Dateo, P. De Kepper, K. Kustin and M. Orbán, "Bistability in a C.S.T.R.: New Experimental Examples and Mathematical Modeling," in *Nonlinear Phenomena in Chemical Dynamics*, C. Vidal and A. Pacault, eds., Springer-Verlag, Berlin, 1981, pp. 188-191.
59. M. Orbán and I. R. Epstein, "A New Type of Chemical Oscillator: Potential Oscillation and Bistability on a Platinum Electrode in some Aqueous Hydrogen-Halogen(ate) Pumped Systems," in *Nonlinear Phenomena in Chemical Dynamics*, C. Vidal and A. Pacault, eds., Springer-Verlag, Berlin, 1981, pp. 197-200.
60. P. De Kepper and I. R. Epstein, "Mechanistic Study of the Briggs-Rauscher Reaction," in *Nonlinear Phenomena in Chemical Dynamics*, C. Vidal and A. Pacault, eds., Springer-Verlag, Berlin, 1981, p. 265.
61. P. De Kepper and I. R. Epstein, "A Mechanistic Study of Oscillations and Bistability in the Briggs-Rauscher Reaction," *J. Am. Chem. Soc.* 104, 49-55 (1982).
62. P. De Kepper, I. R. Epstein, M. Orbán and K. Kustin, "Batch Oscillations and Spatial Wave Patterns in Chlorite Oscillating Systems," *J. Phys. Chem.* 86, 170-171 (1982).
63. C. E. Dateo, M. Orbán, P. De Kepper and I. R. Epstein, "Bistability and Oscillations in the Autocatalytic Chlorite-Iodide Reaction in a Stirred-Flow Reactor," *J. Am. Chem. Soc.* 104, 504-509 (1982).
64. W. N. Lipscomb and I. R. Epstein, "Boron Hydride Valence Structures. A Topological Approach," *Inorg. Chem.* 21, 846 (1982).

65. I. R. Epstein, K. Kustin and R. H. Simoyi, "Nitrous Acid Decomposition Catalyzed by an Iron(II) Complex: Tris(3,4,7,8-tetramethyl-1,10-phenanthroline)iron(II)," *J. Am. Chem. Soc.* 104, 712-717 (1982).
66. M. Orbán, P. De Kepper and I. R. Epstein, "An Iodine-Free Chlorite-Based Oscillator. The Chlorite-Thiosulfate Reaction in a Continuous Flow Stirred Tank Reactor," *J. Phys. Chem.* 86, 431-433 (1982).
67. M. Orbán, P. De Kepper and I. R. Epstein, "Minimal Bromate Oscillator: Bromate-Bromide-Catalyst," *J. Am. Chem. Soc.* 104, 2657-2658 (1982).
68. J. L. Grant, P. De Kepper, I. R. Epstein, K. Kustin and M. Orbán, "Kinetics and Mechanism of the Oxidation of Iodine by Chlorite Ion," *Inorg. Chem.* 21, 2192-2196 (1982).
69. M. Orbán and I. R. Epstein, "Complex Periodic and Aperiodic Oscillation in the Chlorite-Thiosulfate Reaction," *J. Phys. Chem.* 86, 3907-3910 (1982).
70. M. Orbán, C. Dateo, P. De Kepper and I. R. Epstein, "Chlorite Oscillators: New Experimental Examples, Tristability and Preliminary Classification," *J. Am. Chem. Soc.* 104, 5911-5918 (1982).
71. M. Orbán and I. R. Epstein, "Bistability in the Oxidation of Iron(II) by Nitric Acid," *J. Am. Chem. Soc.* 104, 5918-5922 (1982).
72. I. R. Epstein, K. Kustin, P. De Kepper and M. Orbán, "Oscillating Chemical Reactions," *Sci. Amer.* 248(3), 112-123 (1983).
73. M. Alamgir and I. R. Epstein, "Birhythmicity and Compound Oscillation in Coupled Chemical Oscillators: Chlorite-Bromate-Iodide System," *J. Am. Chem. Soc.* 105, 2500-2502 (1983).
74. M. Alamgir, P. De Kepper, M. Orbán and I. R. Epstein, "A New Type of Bromate Oscillator: The Bromate-Iodide Reaction in a Stirred-Flow Reactor," *J. Am. Chem. Soc.* 105, 2641-2643 (1983).
75. I. R. Epstein, "Traveling Waves in the Arsenite-Iodate System," *J. Chem. Ed.* 60, 494-496 (1983).
76. R. M. Noyes and I. R. Epstein, "Comparative Behavior in Open and Closed Systems of a Reaction with Unique Stoichiometry," *J. Phys. Chem.* 87, 2700-2704 (1983).
77. M. Orbán and I. R. Epstein, "Inorganic Bromate Oscillators. Bromate-Chlorite-Reductant," *J. Phys. Chem.* 87, 3212-3219 (1983).
78. I. R. Epstein, "Oscillations and Chaos in Chemical Systems," *Physica* 7D, 47-56 (1983).
79. M. Alamgir, M. Orbán and I. R. Epstein, "Inorganic Bromate Oscillators. Bromate-Manganous-Reductant," *J. Phys. Chem.* 87, 3725-3738 (1983).
80. I. R. Epstein, M. Morgan, C. Steel and O. Valdés-Aguilera, "Biacetyl-Oxygen and Other Photochemical Oscillators: The Role of Hydrodynamically Induced Instability," *J. Phys. Chem.* 87, 3955-3958 (1983).
81. I. R. Epstein, "Oscillations and Chaos in Chemical Systems," in *Order in Chaos*, D. Campbell and H. Rose, eds., North Holland, Amsterdam, 1983, pp. 47-56.
82. A. C. Balazs and I. R. Epstein, "Kinetic Model for the Interaction of Myosin Subfragment-1 with Regulated Actin," *Biophys. J.* 44, 145-151 (1983).
83. I. R. Epstein, "The Search for New Chemical Oscillators," in *Chemical Instabilities*, G. Nicolis and F. Baras eds., D. Reidel, Dordrecht, Holland, 1984, pp. 3-18.
84. I. R. Epstein, "Chemically Generated Spatial Structures," *Nature* 307, 692 (1984).
85. I. R. Epstein, "Complex Dynamical Behavior in 'Simple' Chemical Systems," *J. Phys. Chem.* 88, 187-198 (1984).

86. I. R. Epstein and K. Kustin, "Design of Inorganic Chemical Oscillators," *Structure and Bonding* 56, 1-33 (1984).
87. J. Maselko and I. R. Epstein, "Chemical Chaos in the Chlorite-Thiosulfate Reaction," *J. Chem. Phys.* 80, 3175-3178 (1984).
88. M. Alamgir and I. R. Epstein, "Experimental Study of Complex Dynamical Behavior in Coupled Chemical Oscillators," *J. Phys. Chem.* 88, 2848-2851 (1984).
89. C. Ahlstrom, D. W. Boyd, I. R. Epstein, K. Kustin and J. H. Romanow, "Reaction between Permanganate Ion and Chlorine(III): Kinetics and Mechanism of the Initial Reaction and Dissociation of Chlorous Acid," *Inorg Chem.* 23, 2185-2188 (1984).
90. A. C. Balazs and I. R. Epstein, "Kinetics of Irreversible Dissociation for Proteins Bound Cooperatively to DNA," *Biopolymers* 23, 1249-1255 (1984).
91. D. M. Weitz and I. R. Epstein, "Spatial Waves in the Reaction of Chlorite with Iodide," *J. Phys. Chem.* 88, 5300-5304 (1984).
92. J. Maselko and I. R. Epstein, "Dynamical Behavior of Coupled Chemical Oscillators: Chlorite-Thiosulfate-Iodide-Iodine," *J. Phys. Chem.* 88, 5305-5308 (1984).
93. I. R. Epstein, "New Chemical Oscillators," in *Non-Equilibrium Dynamics in Chemical Systems*, C. Vidal and A. Pacault, eds., Springer-Verlag, Berlin, 1984, pp. 24-34.
94. D. W. Boyd, I. R. Epstein, K. Kustin and O. Valdes-Aguilera, "Analysis of Elementary Steps in Oscillating Chemical Reactions," in *Non-Equilibrium Dynamics in Chemical Systems*, C. Vidal and A. Pacault, eds., Springer-Verlag, Berlin, 1984, pp. 39-43.
95. I. R. Epstein and M. Orbán, "Halogen-Based Oscillators in a Flow Reactor," in *Oscillations and Traveling Waves in Chemical Systems*, R. J. Field and M. Burger, eds., Wiley, New York, 1985, pp. 257-286.
96. E. Kumpinsky and I. R. Epstein, "Effects of Temperature on Oscillatory Behavior in the Bromate-Bromide-Manganous System," *J. Phys. Chem.* 89, 688-692 (1985).
97. E. Kumpinsky and I. R. Epstein, "A Model for Stirring Effects on Transitions in Bistable Chemical Systems," *J. Chem. Phys.* 82, 53-57 (1985).
98. E. Kumpinsky, I. R. Epstein and P. De Kepper, "Model Study of Synchronization and Other Phenomena in Light Perturbation of the Briggs-Rauscher Reaction," *Int. J. Chem. Kinet.* 17, 345-354 (1985).
99. M. Orbán and I. R. Epstein, "A New Halogen-Free Chemical Oscillator: The Reaction between Sulfide Ion and Hydrogen Peroxide in a CSTR," *J. Am. Chem. Soc.* 107, 2302-2305 (1985).
100. M. Alamgir and I. R. Epstein, "Complex Dynamical Behavior in a New Chemical Oscillator: The Chlorite-Thiourea Reaction in a CSTR," *Int. J. Chem. Kinet.* 17, 429-439 (1985).
101. G. Bazsa and I. R. Epstein, "Autocatalysis and Bistability in the Reaction between Nitric Acid and Thiocyanate," *Int. J. Chem. Kinet.* 17, 601-612 (1985).
102. I. R. Epstein and K. Kustin, "A Mechanism for Dynamical Behavior in the Oscillatory Chlorite-Iodide Reaction," *J. Phys. Chem.* 89, 2275-2282 (1985).
103. I. R. Epstein, "Pendulums in the Test Tube," in *1986 Yearbook of Science and the Future*, Encyclopedia Britannica, Chicago, 1985, pp. 142-159.
104. G. Bazsa and I. R. Epstein, "Traveling Waves in the Nitric Acid-Iron(II) Reaction," *J. Phys. Chem.* 89, 3050-3053 (1985).
105. M. Alamgir and I. R. Epstein, "New Chlorite Oscillators: Chlorite-Bromide and Chlorite-Thiocyanate in a CSTR," *J. Phys. Chem.* 89, 3611-3614 (1985).

106. A. C. Balazs, I. C. Sanchez, I. R. Epstein, F. E. Karasz and W. J. MacKnight, "Effect of Sequence Distribution on the Miscibility of Polymer/Copolymer Blends," *Macromolecules* 18, 2188-2191 (1985).
107. O. Citri and I. R. Epstein, "Mechanism for the Oscillatory Bromate-Iodide Reaction," *J. Am. Chem. Soc.* 108, 357-363 (1986).
108. G. Bazsa and I. R. Epstein, "Kinetics and Mechanism of Autocatalytic Nitric Acid Oxidations," *Comm. Inorg. Chem.* 5, 57-87 (1986).
109. R. H. Simoyi, P. De Kepper, I. R. Epstein and K. Kustin, "Reaction between Permanganate Ion and Hydrogen Peroxide: Kinetics and Mechanism of the Initial Phase of the Reaction," *Inorg. Chem.* 25, 538-542 (1986).
110. I. Nagypál, I. R. Epstein, and K. Kustin, "Kinetics and Mechanism of the Reaction between Thiosulfate and Chlorite Ions at 90° C," *Int. J. Chem. Kinet.* 18, 345-353 (1986).
111. J. Maselko, M. Alamgir and I. R. Epstein, "Bifurcation Analysis of a System of Coupled Chemical Oscillators: Bromate-Chlorite-Iodide," *Physica* 19D, 153-161 (1986).
112. E. C. Edblom, M. Orbán and I. R. Epstein, "A New Iodate Oscillator: The Landolt Reaction with Ferrocyanide in a CSTR," *J. Am. Chem. Soc.* 108, 2826-2830 (1986).
113. I. Nagypál, G. Bazsa and I. R. Epstein, "Gravity-Induced Anisotropies in Chemical Waves," *J. Am. Chem. Soc.* 108, 3635-3640 (1986).
114. W. P. Huskey and I. R. Epstein, "Comment on Bistability in a CSTR Explodator Model," *J. Phys. Chem.* 90, 4699 (1986).
115. I. Nagypál and I. R. Epstein, "Fluctuations and Stirring Rate Effects in the Chlorite-Thiosulfate Reaction," *J. Phys. Chem.* 90, 6285-6292 (1986).
116. Y. Luo and I. R. Epstein, "Stirring and Premixing Effects in the Oscillatory Chlorite-Iodide Reaction," *J. Chem. Phys.* 85, 5733-5740 (1986).
117. O. Valdés-Aguilera, D. W. Boyd, I. R. Epstein and K. Kustin, "Kinetics and Mechanism of the Reaction between Chlorine(III) and Molecular Bromine," *J. Phys. Chem.* 90, 6696-6702 (1986).
118. O. Valdés-Aguilera, D. W. Boyd, I. R. Epstein and K. Kustin, "Kinetics and Mechanism of the Reaction between Chlorine(III) and Bromide Ion," *J. Phys. Chem.* 90, 6702-6708 (1986).
119. M. Orbán and I. R. Epstein, "Chemical Oscillators in Group VI A: The Cu(II)-Catalyzed Reaction between Hydrogen Peroxide and Thiosulfate Ion," *J. Am. Chem. Soc.* 109, 101-106 (1987).
120. W. Klonowski and I. R. Epstein, "Kinetics of Actin-Myosin Binding. I. An Exactly Soluble One-Variable Model," *Biophys. J.* 51, 245-248 (1987).
121. W. Klonowski and I. R. Epstein, "Kinetics of Actin-Myosin Binding. II. Two-Variable Model and Actin Gelation," *Biophys. J.* 51, 249-253 (1987).
122. I. R. Epstein, "Patterns in Time and Space - Generated by Chemistry," *Chem. Eng. News*. (Special Report) 65(13), 24-36 (1987) (cover article).
123. E. Edblom, L Györgyi, M. Orbán and I. R. Epstein, "A Mechanism for Dynamical Behavior in the Landolt Reaction with Ferrocyanide," *J. Am. Chem. Soc.* 109, 4876-4880 (1987).
124. J. Reiter and I. R. Epstein, "Bimodality in the Cooperative Binding of Ligands to Molecules with Multiple Binding Sites," *J. Phys. Chem.* 91, 4813-4820 (1987).
125. R. H. Simoyi and I. R. Epstein, "Oxidation of Thiourea by Aqueous Bromine: Autocatalysis by Bromide," *J. Phys. Chem.* 91, 5124-5128 (1987).

126. O. Citri and I. R. Epstein, "Dynamical Behavior in the Chlorite-Iodide Reaction: A Simplified Mechanism," *J. Phys. Chem.* 91, 6034-6040 (1987).
127. I. R. Epstein, "Oscillatory Chemical Reactions," in *Complex Chemical Reaction Systems. Mathematical Modelling and Simulation*, J. Warnatz and W. Jäger, eds., Springer, Berlin. Springer Ser. Chem. Phys. 47, 116-132 (1987).
128. W. Klonowski and I. R. Epstein, "Kinetics of Actin-Myosin Binding. Myosin Cooperativity and Mixed Single-Headed and Two-Headed Binding," *BioSystems* 21, 85-93 (1988).
129. O. Citri and I. R. Epstein, "Mechanistic Study of a Coupled Chemical Oscillator: The Bromate-Chlorite-Iodide Reaction," *J. Phys. Chem.* 92, 1865-1871 (1988).
130. Y. Luo, K. Kustin and I. R. Epstein, "Kinetics and Mechanism of H₂O₂ Decomposition Catalyzed by Cu²⁺ in Alkaline Solution," *Inorg. Chem.* 27, 2489-2496 (1988).
131. I. R. Epstein, "Pattern Formation and Wave Propagation in Chemical Systems," in *Thermodynamics and Pattern Formation in Biology*, I. Lamprecht and A. I. Zotin, eds., de Gruyter, Berlin, 1988, pp. 105-126.
132. I. Nagypál and I. R. Epstein, "Stochastic Behavior and Stirring Rate Effects in the Chlorite-Iodide Reaction," *J. Chem. Phys.* 89, 6925-6928 (1988).
133. G. Rábai and I. R. Epstein, "Kinetics and Mechanism of the Oxidation of Hexacyanoferrate(II) by Bromate," *Inorg. Chem.* 28, 732-736 (1989).
134. Y. Luo and I. R. Epstein, "Alternative Feedback Pathway in the Mixed Landolt Chemical Oscillator," *J. Phys. Chem.* 93, 1398-1401 (1989).
135. R. H. Simoyi, I. R. Epstein and K. Kustin, "Complex Dynamical Behavior in the Oxidation of Thiocyanate by Iodate," *J. Phys. Chem.* 93, 1689-1691 (1989).
136. C. G. Hocker and I. R. Epstein, "Analysis of a Four-Variable Model of Coupled Chemical Oscillators," *J. Chem. Phys.* 90, 3071-3080 (1989).
137. I. R. Epstein, "The Role of Flow Systems in Far-from-Equilibrium Dynamics," *J. Chem. Ed.* 66, 191-195 (1989).
138. M. F. Crowley and I. R. Epstein, "Experimental and Theoretical Studies of a Coupled Chemical Oscillator: Phase Death, Multistability and In- and Out-of-Phase Entrainment," *J. Phys. Chem.* 93, 2496-2502 (1989).
139. E. C. Edblom, Y. Luo, M. Orbán, K. Kustin and I. R. Epstein, "Kinetics and Mechanism of the Oscillatory Bromate-Sulfite-Ferrocyanide Reaction," *J. Phys. Chem.* 93, 2722-2727 (1989).
140. R. H. Simoyi, I. R. Epstein and K. Kustin, "Kinetics and Mechanism of the Autoinhibitory Iodine-Thiocyanate Reaction," *J. Phys. Chem.* 93, 2792-2795 (1989).
141. G. Rábai, M. T. Beck, K. Kustin and I. R. Epstein, "Sustained and Damped pH Oscillation in the Periodate-Thiosulfate Reaction in a Continuous-Flow Stirred Tank Reactor," *J. Phys. Chem.* 93, 2853-2858 (1989).
142. M. Orbán and I. R. Epstein, "Chemical Oscillators in Group VIA: The Cu(II)-Catalyzed Reaction between Thiosulfate and Peroxodisulfate Ions," *J. Am. Chem. Soc.* 111, 2891-2896 (1989).
143. W. P. Huskey and I. R. Epstein, "Autocatalysis and Apparent Bistability in the Formose Reaction," *J. Am. Chem. Soc.* 111, 3157-3163 (1989).
144. J. Reiter and I. R. Epstein, "Cooperative Ligand-Lattice Binding: Approximate Gaussian Binding Distribution," *Biophys. Chem.* 33, 1-9 (1989).

145. G. Rábai, K. Kustin and I. R. Epstein, "A Systematically Designed pH Oscillator: The Hydrogen Peroxide-Sulfite-Ferrocyanide Reaction in a Continuous-Flow Stirred Tank Reactor," *J. Am. Chem. Soc.* 111, 3870-3874 (1989).
146. W. M. Song, K. Kustin and I. R. Epstein, "Stopped-Flow Study of the Reaction between Cl(III) and I at Low pH," *J. Phys. Chem.* 93, 4698-4700 (1989).
147. Y. Luo, M. Orbán, K. Kustin and I. R. Epstein, "Mechanistic Study of Oscillations and Bistability in the Cu(II)-Catalyzed Reaction between H₂O₂ and KSCN," *J. Am. Chem. Soc.* 111, 4541-4548 (1989).
148. G. Rábai, K. Kustin and I. R. Epstein, "Light Sensitive Oscillations in the Hydrogen Peroxide Oxidation of Ferrocyanide," *J. Am. Chem. Soc.* 111, 8271-8273 (1989).
149. M. Orbán and I. R. Epstein, "Minimal Permanganate Oscillator: The Guyard Reaction in a CSTR," *J. Am. Chem. Soc.* 111, 8543-8544 (1989).
150. G. Rábai and I. R. Epstein, "Oxidation of Hydroxylamine by Periodate in a CSTR: A New pH Oscillator," *J. Phys. Chem.* 93, 7556-7559 (1989).
151. S. Sattar and I. R. Epstein, "Interaction of Luminol with the Oscillating System H₂O₂-KSCN-CuSO₄-NaOH," *J. Phys. Chem.* 94, 275-277 (1990).
152. I. R. Epstein, "Differential Delay Equations in Chemical Kinetics: Some Simple Linear Model Systems," *J. Chem. Phys.* 92, 1702-1712 (1990).
153. J. Reiter and I. R. Epstein, "Kinetics of Cooperative Ligand-Lattice Binding: Fast Monte Carlo Integration," *Biopolymers* 29, 543-547 (1990).
154. M. Orbán and I. R. Epstein, "The Minimal Permanganate Oscillator and Some Derivatives: Oscillatory Oxidation of S₂O₃²⁻, SO₃²⁻ and S²⁻ by Permanganate in a CSTR," *J. Am. Chem. Soc.* 112, 1812-1817 (1990).
155. K. Kustin, I.R. Epstein and R. H. Simoyi, "Kinetics and Mechanism of the Oxidation of Hexacyanoferrate(II) by Aqueous Bromine," *J. Chem. Soc. Dalton*, 971-975 (1990).
156. G. Peintler, I. Nagypál and I. R. Epstein, "Kinetics and Mechanism of the Reaction between Chlorite Ion and Hypochlorous Acid," *J. Phys. Chem.* 94, 2954-2958 (1990).
157. I. Lengyel, G. Rábai and I. R. Epstein, "Batch Oscillation in the Reaction of Chlorine Dioxide with Iodine and Malonic Acid," *J. Am. Chem. Soc.* 112, 4606-4607 (1990).
158. I.R. Epstein and E. Marder, "Multiple Modes of a Conditional Neural Oscillator," *Biol. Cybernetics* 63, 25-34 (1990).
159. M.F. Schumaker and I.R. Epstein, "The Irreversible Binding of 2-Site Ligands to Heterogeneous Polymers," *Biopolymers* 29, 1331-1349 (1990).
160. J.A. Pojman and I.R. Epstein, "Convective Effects on Chemical Waves. 1. Mechanisms and Stability Criteria," *J. Phys Chem.* 94, 4966-4972 (1990).
161. I.R. Epstein, "Coupled Oscillators in Chemistry and Biology," *Comm. Mol. Cell. Biophys.* 6, 299-327 (1990).
162. I.R. Epstein, "Shaken, Stirred -- but not Mixed," *Nature* 346, 16-17 (1990).
163. I.R. Epstein, "Chemical Oscillators and Nonlinear Chemical Dynamics," in *1989 Lectures in Complex Systems*, E. Jen, ed., Addison Wesley, Reading, MA, 1990, pp. 213-269.
164. G. Rábai and I.R. Epstein, "Large Amplitude pH Oscillation in the Oxidation of Hydroxylamine by Iodate in a CSTR," *J. Phys. Chem.* 94, 6361-6365 (1990).
165. G. Rábai, M. Orbán and I.R. Epstein, "Design of pH-Regulated Oscillators," *Acc. Chem. Res.* 23, 258-263 (1990).

166. P. De Kepper, J. Boissonade and I.R. Epstein, "Chlorite-Iodide Reaction: A Versatile System for the Study of Nonlinear Dynamical Behavior," *J. Phys. Chem.* 94, 6525-6536 (1990).
167. I.R. Epstein, "Experimental and Theoretical Studies of Coupled Chemical Oscillators," *React. Kinet. Catal. Lett.* 42, 241-252 (1990).
168. I.R. Epstein and I. Nagypál, "Stochastic Behavior in Macroscopic Chemical Systems," in *Spatial Inhomogeneities and Transient Behavior in Chemical Kinetics*, P. Gray, G. Nicolis, F. Baras, P. Borckmans and S. K. Scott, eds., Manchester Univ. Press, Manchester, 1990, pp. 461-478.
169. I. Nagypál, G. Bazsa and I.R. Epstein, "Gravity Induced Anisotropies in Chemical Waves," in *Spatial Inhomogeneities and Transient Behavior in Chemical Kinetics*, P. Gray, G. Nicolis, F. Baras, P. Borckmans and S. K. Scott, eds., Manchester Univ. Press, Manchester, 1990, pp. 660-661.
170. Y. Luo and I.R. Epstein, "Feedback Analysis of Mechanisms for Chemical Oscillators," *Adv. Chem. Phys.* 79, 269-299 (1990).
171. M.F. Schumaker and I. R. Epstein, "Simulation of a Simple Model for Aggregating Telechelic Ionomers," *Can. J. Phys.* 68, 1099-1104 (1990).
172. I. Lengyel, G. Rábai and I. R. Epstein, "Experimental and Modeling Study of Oscillations in the Chlorine Dioxide-Iodine-Malonic Acid Reaction," *J. Am. Chem. Soc.* 112, 9104-9110 (1990).
173. R. H. Simoyi, M. Manyonda, J. Masere, M. Mtambo, I. Ncube, H. Patel, I. R. Epstein and K. Kustin, "Kinetics and Mechanism of the Oxidation of Thiocyanate by Iodate," *J. Phys. Chem.* 95, 770-774 (1991).
174. M.L. Kagan, T.B. Kepler and I.R. Epstein, "Geometric Phase Shifts in Chemical Oscillators," *Nature* 349, 506-508 (1991).
175. J. A. Pojman, I. R. Epstein, T. J. McManus and K. Showalter, "Convective Effects on Chemical Waves. 2. Simple Convection in the Iodate-Arsenous Acid System," *J. Phys. Chem.* 95, 1299-1306 (1991).
176. J. A. Pojman, I. P. Nagy and I. R. Epstein, "Convective Effects on Chemical Waves. 3. Multicomponent Convection in the Iron(II)-Nitric Acid System," *J. Phys. Chem.* 95, 1306-1311 (1991).
177. I. Lengyel and I.R. Epstein, "Modeling of Turing Structures in the Chlorite-Iodide-Malonic Acid-Starch Reaction System," *Science* 251, 650-652 (1991).
178. R.J. Olsen and I.R. Epstein, "Bifurcation Analysis of Chemical Reaction Mechanisms. I. Steady State Bifurcation Structure," *J. Chem. Phys.* 94, 3083-3095 (1991).
179. Y. Luo and I.R. Epstein, "A General Model for pH Oscillators," *J. Am. Chem. Soc.* 113, 1518-1522 (1991).
180. I.R. Epstein, "Chemical Chaos," *Chem. & Ind.* 157-162 (1991). (cover article)
181. M. Orbán, I. Lengyel and I.R. Epstein, "A Transition Metal Oscillator: Oscillatory Oxidation of Manganese(II) by Periodate in a CSTR," *J. Am. Chem. Soc.* 113, 1978-1982 (1991).
182. I.R. Epstein, "Spiral Waves in Chemistry and Biology," *Science* 252, 67 (1991).
183. J.A. Pojman, I. R. Epstein, Y. Karni and E. Bar-Ziv, "Stochastic Coalescence-Redispersion Model for Molecular Diffusion and Chemical Reaction. II. Chemical Waves," *J. Phys. Chem.* 95, 3017-21 (1991).

184. I.R. Epstein and Y. Luo, "Differential Delay Equations in Chemical Kinetics. Nonlinear Models: The Cross-Shaped Phase Diagram and the Oregonator," *J. Chem. Phys.* 95, 244-254 (1991).
185. I. Lengyel and I.R. Epstein, "Diffusion Induced Instability in Chemically Reacting Systems: Steady State Multiplicity, Oscillation and Chaos," *Chaos* 1, 69-76 (1991).
186. C.J. Doona, K. Kustin, M. Orbán and I.R. Epstein, "Newly Designed Permanganate- Reductant Chemical Oscillators," *J. Am. Chem. Soc.* 113, 7484-7489 (1991).
187. I.R. Epstein, "Nonlinear Oscillations in Chemical and Biological Systems," *Physica D* 51, 152-160 (1991).
188. T.B. Kepler, M.L. Kagan and I.R. Epstein, "Geometric Phases in Dissipative Systems," *Chaos* 1, 455-461 (1991).
189. F. Buchholtz, J. Golowasch, I.R. Epstein and E. Marder, "Mathematical Model of an Identified Stomatogastric Ganglion Neuron," *J. Neurophysiol.* 67, 332-340 (1992).
190. J. Golowasch, F. Buchholtz, I.R. Epstein and E. Marder, "Contribution of Individual Ionic Currents to the Activity of a Model Stomatogastric Ganglion Neuron," *J. Neurophysiol.* 67, 341-349 (1992).
191. M. Orbán and I.R. Epstein, "A New Type of Oxyhalogen Oscillator: The Bromite-Iodide Reaction in a Continuous Flow Reactor," *J. Am. Chem. Soc.* 114, 1252-1256 (1992).
192. G. Rábai and I.R. Epstein, "pH Oscillations in a Semibatch Reactor," *J. Am. Chem. Soc.* 114, 1529-1530 (1992).
193. M. Dolnik, M. Marek and I.R. Epstein, "Resonances in Periodically Forced Excitable Systems," *J. Phys. Chem.* 96, 3218-3224 (1992).
194. I. Lengyel and I.R. Epstein, "A Chemical Approach to Designing Turing Patterns in Reaction-Diffusion Systems," *Proc. Natl. Acad. Sci. USA.* 89, 3977-3979 (1992).
195. I.R. Epstein, "Delay Effects and Differential Delay Equations in Chemical Kinetics," *Int. Rev. Phys. Chem.* 11, 135-160 (1992).
196. G. Rábai, M. Orbán and I.R. Epstein, "A Model for the pH-Regulated Oscillatory Reaction between Hydrogen Peroxide and Sulfide Ion," *J. Phys. Chem.* 96, 5414-5419 (1992).
197. I.R. Epstein, K. Kustin and R.H. Simoyi, "Kinetics and Mechanism of the Chlorite-Thiourea Reaction in Acidic Medium," *J. Phys. Chem.* 96, 5852-5856 (1992).
198. G. Rábai and I.R. Epstein, "Equilibria and Kinetics of the Fast Interaction between Copper(II) and Thiosulfate Ions in Aqueous Solution," *Inorg. Chem.* 31, 3239-3242 (1992).
199. I.R. Epstein, K. Kustin and R.H. Simoyi, "Kinetics and Mechanism of the Reaction of Bromine with Thiocyanate," *J. Phys. Chem.* 96, 6326-6331 (1992).
200. I. Lengyel, J. Li and I.R. Epstein, "Dynamical Study of the Chlorine Dioxide-Iodide Open System Oscillator," *J. Phys. Chem.* 96, 7032-7037 (1992).
201. M. Dolnik and I.R. Epstein, "Excitability and Bursting in the Chlorine Dioxide-Iodide Reaction in a Forced CSTR," *J. Chem. Phys.* 97, 3265-3273 (1992).
202. R.B. Faria, I.R. Epstein and K. Kustin, "The Bromite-Iodide Clock Reaction," *J. Am. Chem. Soc.* 114, 7164-7171 (1992).
203. R.B. Faria, I.R. Epstein and K. Kustin, "Determination of the pK_a of Bromous Acid," *J. Phys. Chem.* 96, 6861-6863 (1992).
204. I.R. Epstein, I. Lengyel, S. Kádár, M. Kagan and M. Yokoyama, "New Systems for Pattern Formation Studies," *Physica A* 188, 26-33 (1992).

205. I. Lengyel, S. Kádár and I.R. Epstein, "Quasi-Two-Dimensional Turing Patterns in an Imposed Gradient," *Phys. Rev. Lett.* 69, 2729-2731 (1992).
206. I. Lengyel, S. Kádár and I.R. Epstein, "Transient Turing Structures in a Gradient-Free Closed System," *Science* 259, 493-495 (1993).
207. M. Dolnik and I.R. Epstein, "A Coupled Chemical Burster: The Chlorine Dioxide-Iodine Reaction in Two Flow Reactors," *J. Chem. Phys.* 98, 1149-1155 (1993).
208. R.J. Olsen and I.R. Epstein, "Bifurcation Analysis of Chemical Reaction Mechanisms. II. Hopf Bifurcation Analysis," *J. Chem. Phys.* 98, 2805-2822 (1993).
209. R.B. Faria, I.R. Epstein and K. Kustin, "Combined Mechanism Explaining Nonlinear Dynamics in Bromine(III) and (V) Oxidations of Iodide Ion," *J. Phys. Chem.* 97, 1164-1171 (1993).
210. I.R. Epstein and M. Golubitsky, "Symmetric Patterns in Linear Arrays of Coupled Cells," *Chaos* 3, 1-5 (1993).
211. E. Marder, L.F. Abbott, F. Buchholtz, I.R. Epstein, J. Golowasch, S.L. Hooper and T. Kepler, "Physiological Insights from Cellular and Network Models of the Stomatogastric Nervous System of Lobsters and Crabs," *Am. Zool.* 33, 23-39 (1993).
212. I. Lengyel and I.R. Epstein, "Turing Structures in Simple Chemical Reactions," *Accts. Chem. Res.* 26, 235-240 (1993).
213. A.M. Zhabotinsky, F. Buchholtz, A. Kiyatkin and I.R. Epstein, "Oscillations and Waves in Metal-Ion-Catalyzed Bromate Oscillating Reactions in Highly Oxidized States," *J. Phys. Chem.* 97, 7578-7584 (1993).
214. A.M. Zhabotinsky, M.D. Eager and I.R. Epstein, "Refraction and Reflection of Chemical Waves," *Phys. Rev. Lett.* 71, 1526-1529 (1993).
215. I. Lengyel, I.R. Epstein and K. Kustin, "Kinetics of Iodine Hydrolysis," *Inorg. Chem.* 32, 5880-5882 (1993).
216. R.B. Faria, I.R. Epstein and K. Kustin, "Kinetics of Disproportionation and pKa of Bromous Acid," *J. Phys. Chem.* 98, 1363-1367 (1994).
217. R.H. Simoyi, I.R. Epstein and K. Kustin, "Kinetics and Mechanism of the Oxidation of Thiourea by Bromate in Acidic Solution," *J. Phys. Chem.* 98, 551-557 (1994).
218. M. Orbán and I.R. Epstein, "Simple and Complex pH Oscillations and Bistability in the Phenol-Perturbed Bromite-Hydroxylamine Reaction," *J. Phys. Chem.* 98, 2930-2935 (1994).
219. C.G. Hocker, I.R. Epstein, K. Kustin and K. Tornheim, "Glycolytic pH Oscillations in a Flow Reactor," *Biophys. Chem.* 51, 21-35 (1994).
220. A.M. Zhabotinsky, L. Györgyi, M. Dolnik and I.R. Epstein, "Stratification in a Thin-Layered Excitable Reaction-Diffusion System with Transverse Concentration Gradients," *J. Phys. Chem.* 98, 7981-7990 (1994).
221. M. Dolnik, L.F. Abbott and I.R. Epstein, "Concentration-Dependent Regulation of Flow Rate in a Chemical Oscillator," *J. Phys. Chem.* 98, 10124-10130 (1994).
222. M.D. Eager, M. Santos, M. Dolnik, A.M. Zhabotinsky, K. Kustin and I.R. Epstein, "Dependence of Wave Speed on Acidity and Initial Bromate Concentration in the Belousov-Zhabotinsky Reaction-Diffusion System," *J. Phys. Chem.* 98, 10750-10755 (1994).
223. I. Lengyel and I.R. Epstein, "The Chemistry behind the First Experimental Examples of Turing Patterns," in *Chemical Waves and Patterns*, R. Kapral and K. Showalter, eds., Kluwer, Dordrecht, Holland, 1995, pp. 297-322.
224. M. Orbán and I.R. Epstein, "A New Bromite Oscillator. Large Amplitude pH Oscillations in the Bromite-Thiosulfate Flow System," *J. Phys. Chem.* 99, 2358-2362 (1995).

225. S. Kádár, I. Lengyel and I.R. Epstein, "Modeling of Transient Turing-Type Patterns in the Closed Chlorine Dioxide-Iodine-Malonic Acid-Starch Reaction System," *J. Phys. Chem.* 99, 4054-4058 (1995).
226. I.R. Epstein, "The Consequences of Imperfect Mixing in Autocatalytic Chemical and Biological Systems," *Nature* 374, 321-327 (1995).
227. I.R. Epstein and I. Lengyel, "Turing Structures. Progress toward a Room Temperature, Closed System," *Physica D* 84, 1-11 (1995).
228. A. Bugrim, A.M. Zhabotinsky and I.R. Epstein, "Interference of Crossing Trigger Waves in Multilayer Reaction-Diffusion Systems," *Phys. Rev. Lett.* 75, 1206-1209 (1995).
229. I. Lengyel, L. Györgyi and I.R. Epstein, "Analysis of a Proposed Model of Chlorite- Based Chaotic Chemical Oscillators," *J. Phys. Chem.* 99, 12804-12808 (1995).
230. F. Buchholtz, M. Dolnik and I.R. Epstein, "Diffusion-Induced Instabilities near a Canard," *J. Phys. Chem.* 99, 15093-15101 (1995).
231. A.M. Zhabotinsky, M. Dolnik and I.R. Epstein, "Pattern Formation Arising from Wave Instability in a Simple Reaction-Diffusion System," *J. Chem. Phys.* 103, 10306-10314 (1995).
232. A.E. Bugrim, A.M. Zhabotinsky and I.R. Epstein, "Mechanism for Spontaneous Formation of Crossing Chemical Waves in a Stratified Reaction-Diffusion System," *J. Phys. Chem.* 99, 15930-15933 (1995).
233. K. Kurin-Csörgei, A.M. Zhabotinsky, M. Orbán and I.R. Epstein, "Bromate-1,4-Cyclohexanedione-Ferrous Gas-free Oscillating Reaction. I. Basic Features and Crossing Wave Patterns in a Reaction Diffusion System without Gel," *J. Phys. Chem.* 100, 5393-5397 (1996).
234. I. Lengyel, J. Li, K. Kustin and I.R. Epstein, "Rate Constants for Reactions between Iodine- and Chlorine-Containing Species: A Detailed Mechanism of the Chlorine Dioxide/Chlorite-Iodide Reaction," *J. Am. Chem. Soc.* 118, 3708-3719 (1996).
235. M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Modulated Standing Waves in a Short Reaction-Diffusion System," *J. Phys. Chem.* 100, 6604-6607 (1996).
236. I.R. Epstein and K. Showalter, "Nonlinear Chemical Dynamics: Oscillations, Patterns and Chaos," *J. Phys. Chem.* 100, 13132-13147 (1996).
237. M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Modulated and Alternating Waves in a Reaction-Diffusion Model with the Wave Instability," *J. Chem. Soc. Faraday Trans.* 2919-2925 (1996).
238. K. Kurin-Csörgei, M. Orbán, G. Rábai and I.R. Epstein, "Model for the Oscillatory Reaction between Hydrogen Peroxide and Thiosulfate Catalyzed by Copper(II) Ions," *J. Chem. Soc. Faraday Trans.* 2851-2855 (1996).
239. M. Orbán, M. Dolnik and I.R. Epstein, "Reply to 'Mechanism of the Oscillatory Bromate Oxidation of Sulfite and Ferrocyanide in a CSTR'" *J. Phys. Chem.* 100, 16443 (1996).
240. M. Dolnik and I.R. Epstein, "Coupled Chaotic Chemical Oscillators," *Phys. Rev. E.* 54, 3361-3368 (1996).
241. A.E. Bugrim, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Heterogeneous Sources of Target Patterns in Reaction-Diffusion Systems," *J. Phys. Chem.* 100, 19017-19022 (1996).

242. I.R. Epstein, K. Kustin and I. Lengyel, "Taube's Influence on the Design of Oscillating Reactions. ClO_2 -Driven ClO_2^- -I Oscillator and Turing Structures," in *Taube Insights: From Electron Transfer Reactions to Modern Inorganic Chemistry*, S. Isied, ed., ACS Advances in Chemistry Series, 253, 285-295 (1997).
243. M. Dolnik, A.S. Banks and I.R. Epstein, "Oscillatory Chemical Reaction in a CSTR with Feedback Control of Flow Rate," *J. Phys. Chem. A* 101, 5148-5154 (1997).
244. K. Kurin-Csörgei, A.M. Zhabotinsky, M. Orbán and I.R. Epstein, "Photosensitive, Bubble-Free Bromate-1,4-Cyclohexanedione Oscillating Reactions. Illumination Control of Pattern Formation," *J. Phys. Chem. A* 101, 6827-6829 (1997).
245. A. Rovinsky, A.M. Zhabotinsky and I.R. Epstein, "Target Patterns Arising from the Short-Wave Instability in Near-Critical Regimes of Reaction-Diffusion Systems," *Phys. Rev. E* 56, 2412-2417 (1997).
246. G. Peintler, I. Nagypál, A. Jancsó, I.R. Epstein and K. Kustin, "Extracting Experimental Information from Large Matrices. Part I: A New Algorithm for the Application of Matrix Rank Analysis," *J. Phys. Chem. A* 101, 8013-8020 (1997).
247. A.E. Bugrim, A.M. Zhabotinsky and I.R. Epstein, "Calcium Waves in a Model with a Random Spatially Discrete Distribution of Ca^{2+} Release Sites," *Biophys. J.* 73, 2897-2906 (1997).
248. M. Orbán, K. Kurin-Csörgei, A.M. Zhabotinsky and I.R. Epstein, "New Indicators for Visualizing Pattern Formation in Uncatalyzed Bromate Oscillatory Systems," *J. Am. Chem. Soc.* 120, 1146-1150 (1998).
249. I.R. Epstein and J.A. Pojman, *Introduction to Nonlinear Chemical Dynamics. Oscillations, Waves, Patterns and Chaos*, Oxford University Press, New York, 1998, 392 pp.
250. K. Kurin-Csörgei, M. Orbán, A.M. Zhabotinsky and I.R. Epstein, "On the Nature of Patterns Arising during Polymerization of Acrylamide in the Presence of the Methylene Blue-Sulfide-Oxygen Oscillating Reaction," *Chem. Phys. Lett.* 295, 70-74 (1998).
251. A.B. Rovinsky, A.M. Zhabotinsky and I.R. Epstein, "Stability of Planar Reactive Fronts in External Fields," *Phys. Rev. E* 58, 5541-5547 (1998).
252. M. Dolnik, T.S. Gardner, I.R. Epstein and J.J. Collins, "Frequency Control of the Ferrocyanide-Iodate-Sulfite Oscillatory Reaction by Reversible Binding of an Autocatalyst," *Phys. Rev. Lett.* 82, 1582-1585 (1999).
253. M. Orbán, K. Kurin-Csörgei, A.M. Zhabotinsky and I.R. Epstein, "Pattern Formation during Polymerization of Acrylamide in the Presence of Sulfide Ions," *J. Phys. Chem. B* 103, 36-40 (1999).
254. M. Dolnik, A.B. Rovinsky, A.M. Zhabotinsky and I.R. Epstein, "Standing Waves in a Two-Dimensional Reaction-Diffusion Model with the Short-Wave Instability," *J. Phys. Chem. A* 103, 38-45 (1999).
255. I.R. Epstein and J.A. Pojman, "Overview: Nonlinear Dynamics Related to Polymer Systems," *Chaos* 9, 255-259 (1999).
256. K. Kurin-Csörgei, M. Orbán, A.M. Zhabotinsky and I.R. Epstein, "Reply to Comment on: On the Nature of Patterns Arising during Polymerization of Acrylamide in the Presence of the Methylene Blue-Sulfide-Oxygen Oscillating Reaction," *Chem. Phys. Lett.* 311, 105-107 (1999).

257. A.P. Muñuzuri, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Control of the Chlorine Dioxide-Iodine-Malonic Acid Oscillating Reaction by Illumination," *J. Am. Chem. Soc.* 121, 8065-8069 (1999).
258. A.K. Horváth, M. Dolnik, A. Muñuzuri, A.M. Zhabotinsky and I.R. Epstein, "Control of Turing Structures by Periodic Illumination," *Phys. Rev. Lett.* 83, 2950-2952 (1999).
259. M. Dolnik, A.M. Zhabotinsky, A.B. Rovinsky and I.R. Epstein, "Spatio-Temporal Patterns in a Reaction-Diffusion System with Wave Instability," *Chem. Eng. Sci.* 55, 223-231 (2000).
260. M. Orbán, K. Kurin-Csörgei, G. Rábái and I.R. Epstein, "Mechanistic Studies of Oscillatory Copper(II) Catalyzed Oxidation Reactions of Sulfur Compounds," *Chem. Eng. Sci.* 55, 267-273 (2000).
261. A.K. Horváth, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Kinetics of Photoresponse of the Chlorine Dioxide-Iodine-Malonic Acid Reaction," *J. Phys. Chem. A* 104, 5766-5769 (2000).
262. V.K. Vanag, L. Yang, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Oscillatory Cluster Patterns in a Homogeneous Chemical System with Global Feedback," *Nature* 406, 389-391 (2000).
263. V.K. Vanag, A.M. Zhabotinsky and I.R. Epstein, "Role of Dibromomalonic Acid in the Photosensitivity of the $\text{Ru}(\text{bpy})_3^{2+}$ -Catalyzed Belousov-Zhabotinsky Reaction," *J. Phys. Chem. A* 104, 8207-8215 (2000).
264. V.K. Vanag, A.M. Zhabotinsky and I.R. Epstein, "Pattern Formation in the Belousov-Zhabotinsky Reaction with Photochemical Global Feedback," *J. Phys. Chem. A* 104, 11566-11577 (2000).
265. L. Yang, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Oscillatory Clusters in a Model of the Photosensitive Belousov-Zhabotinsky Reaction-Diffusion System with Global Feedback," *Phys. Rev. E* 62, 6414-6420 (2000).
266. V. K. Vanag, A. M. Zhabotinsky and I.R. Epstein, "Oscillatory Clusters in the Periodically Illuminated, Spatially Extended Belousov-Zhabotinsky Reaction," *Phys. Rev. Lett.* 86, 552-555 (2001).
267. M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Resonant Suppression of Turing Patterns by Periodic Illumination," *Phys. Rev. E* 63, 026101-1-10 (2001).
268. A. Sanz-Anchelergues, A.M. Zhabotinsky, I. R. Epstein and A. P. Muñuzuri, "Turing Pattern Formation Induced by Spatially Correlated Noise," *Phys. Rev. E.* 63, 056124-1-5 (2001).
269. H.G. Rotstein, I. Mitkov, A.M. Zhabotinsky and I.R. Epstein, "Dynamics of Kinks in One- and Two-Dimensional Hyperbolic Models with Quasi-Discrete Nonlinearities," *Phys. Rev. E* 63, 066613-1-7 (2001).
270. V.K. Vanag and I.R. Epstein, "Inwardly Rotating Spiral Waves in a Reaction-Diffusion System," *Science* 294, 835-837 (2001).
271. V.K. Vanag and I.R. Epstein, "Pattern Formation in a Tunable Reaction-Diffusion Medium: The BZ Reaction in an Aerosol OT Microemulsion," *Phys. Rev. Lett.* 87, 228301-1-4 (2001).

272. H.G. Rotstein, A.M. Zhabotinsky and I.R. Epstein, "Dynamics of One- and Two-Dimensional Kinks in Bistable Reaction-Diffusion Equations with Quasi-Discrete Sources of Reaction," *Chaos* 11, 833-842 (2001).
273. M. Dolnik, I. Berenstein, A.M. Zhabotinsky and I.R. Epstein, "Spatial Periodic Forcing of Turing Structures," *Phys. Rev. Lett.* 87, 238301-1-4 (2001).
274. M. Orbán, K. Kurin-Csörgei, A.M. Zhabotinsky, and I.R. Epstein, "A New Chemical System for Studying Pattern Formation: Bromate - Hypophosphite - Acetone - Dual Catalyst," *Faraday Disc.* 120, 11-19 (2001).
275. I.R. Epstein, "Nonlinear Chemical Kinetics: Past, Present and Future. Concluding Remarks," *Faraday Disc.* 120, 421-425 (2001).
276. V.K. Vanag and I.R. Epstein, "Packet Waves in a Reaction-Diffusion System," *Phys. Rev. Lett.* 88, 088303-1-4 (2002).
277. G. Peintler, I. Nagypál, I.R. Epstein and K. Kustin, "Extracting Experimental Information from Large Matrices. Part II. Model-Free Resolution of Absorbance Matrices: M3," *J. Phys. Chem. A* 106, 3899-3904 (2002).
278. L. Yang, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Spatial Resonances and Superposition Patterns in a Reaction-Diffusion Model with Interacting Turing Modes," *Phys. Rev. Lett.* 88, segmented spiral wa-1-4 (2002).
279. A.K. Horváth, I. Nagypál and I.R. Epstein, "Oscillatory Photochemical Decomposition of Tetrathionate Ion," *J. Am. Chem. Soc.* 124, 10956-10957 (2002).
280. I.R. Epstein, "Oscillations, Waves and Patterns in Chemistry and Biology," in *Structures and Mechanisms: From Ashes to Enzymes*, G.R. Eaton, D.C. Wiley and O. Jardetzky, eds., ACS Symp. Ser. Vol. 827, Oxford University Press, 2002, pp. 103-116.
281. L. Yang, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Pattern Formation Arising from Interactions between Turing and Wave Instabilities," *J. Chem. Phys.* 117, 7259-7265 (2002).
282. V.K. Vanag and I.R. Epstein, "Front Velocity in Models with Quadratic Autocatalysis," *J. Chem. Phys.* 117, 8508-8514 (2002).
283. V.K. Vanag and I.R. Epstein, "Comparative Analysis of Packet and Trigger Waves Originating from a Finite Wavelength Instability," *J. Phys. Chem. A* 106, 11394-11399 (2002).
284. L. Yang and I.R. Epstein, "Chemical Wave Packet Propagation, Reflection and Spreading," *J. Phys. Chem. A* 106, 11676-11682 (2002).
285. B. Shargel, H. Sayama, I. R. Epstein and Y. Bar-Yam, "Optimization of Robustness and Connectivity in Complex Networks," *Phys. Rev. Lett.* 90, 068701-1-4 (2003).
286. V.K. Vanag and I.R. Epstein, "Dash-waves in a Reaction Diffusion System," *Phys. Rev. Lett.* 90, 098301-1-4 (2003).
287. F. Sagués and I. R. Epstein, "Nonlinear Chemical Dynamics," *Dalton Trans.* 1201-1217 (2003) (cover article).
288. L. Yang and I.R. Epstein, "Oscillatory Turing Patterns in Reaction-Diffusion Systems with Two Coupled Layers," *Phys. Rev. Lett.* 90, 178303-1-4 (2003).
289. I. Berenstein, M. Dolnik, A. M. Zhabotinsky and I. R. Epstein, "Spatial Periodic Perturbation of Turing Pattern Development Using a Striped Mask," *J. Phys. Chem. A* 107, 4428-4435 (2003).
290. V.K. Vanag and I.R. Epstein, "Translational and Non-Translational Motion of Perturbed Turing Patterns," *Phys. Rev. E* 67, 066219-1-8 (2003).

291. I. Berenstein, L. Yang, M. Dolnik, A.M. Zhabotinsky and I.R. Epstein, "Superlattice Turing Structures in a Photosensitive Reaction-Diffusion System," *Phys. Rev. Lett.* 91, 058302-1-4 (2003).
292. I. R. Epstein and V. K. Vanag, "Spatiotemporal Pattern Formation and Chaos in the Belousov-Zhabotinsky Reaction in a Reverse Microemulsion," in *Experimental Chaos: 7th Experimental Chaos Conference*, V. In, L. Kocarev, B.J. Gluckman, S. Boccaletti and J. Kurths, eds. AIP Conf. Proc. 676, New York: American Institute of Physics, pp. 265-274 (2003).
293. A.K. Horváth, I. Nagypál, G. Peintler, I.R. Epstein and K. Kustin, "Kinetics and Mechanism of the Decomposition of Chlorous Acid," *J. Phys. Chem. A* 107, 6966-6973 (2003).
294. H.G. Rotstein, N. Kopell, A. Zhabotinsky and I.R. Epstein, "A Canard Mechanism for Localization in Systems of Globally Coupled Oscillators," *SIAM J. Appl. Math.* 63, 1998-2019 (2003).
295. V.K. Vanag and I.R. Epstein, "Diffusive Instabilities in Heterogeneous Systems," *J. Chem. Phys.* 119, 7297-7307 (2003).
296. H.G. Rotstein, N. Kopell, A.M. Zhabotinsky and I.R. Epstein, "Canard Phenomenon and Localization of Oscillations in the Belousov-Zhabotinsky Reaction with Global Feedback," *J. Chem. Phys.* 119, 8824-8832 (2003).
297. A.K Horváth, I. Nagypál and I.R. Epstein, "Kinetics and Mechanism of the Chlorine Dioxide-Tetrathionate Reaction," *J. Phys. Chem. A* 107, 10063-10068 (2003).
298. I. Szalai, K. Kurin-Csörgei, I.R. Epstein and M. Orbán, "Dynamics and Mechanism of Bromate Oscillators with 1,4-Cyclohexanedione," *J. Phys. Chem. A* 107, 10074-10081 (2003).
299. V.K. Vanag and I.R. Epstein, "Segmented Spiral Waves in a Reaction-Diffusion System," *Proc. Nat. Acad. Sci. USA* 100, 14635-14638 (2003) (cover article).
300. I.R. Epstein, J.A. Pojman and Q. Tran-Cong-Miyata, "Nonlinear Dynamics and Polymeric Systems: An Overview," in *Nonlinear Dynamics in Polymeric Systems*, ACS Symp. Ser. 869, J.A. Pojman and Q. Tran-Cong-Miyata, eds., Am. Chem. Soc., Washington, DC, pp 2-15 (2004).
301. L. Yang and I.R. Epstein, "Symmetric, Asymmetric and Antiphase Turing Patterns in a Model System with Two Identical Coupled Layers," *Phys. Rev. E* 69, 026211-1-6 (2004).
302. Y. Bar-Yam and I.R. Epstein, "Response of Complex Networks to Stimuli," *Proc. Natl. Acad. Sci.* 101, 4341-4345 (2004).
303. V. K. Vanag and I. R. Epstein, "Stationary and Oscillatory Localized Patterns, and Subcritical Bifurcations," *Phys. Rev. Lett.* 92, 128301-1-4 (2004).
304. L. Yang, A.M. Zhabotinsky and I.R. Epstein, "Stable Squares and other Oscillatory Turing Patterns in a Reaction-Diffusion Model," *Phys. Rev. Lett.* 92, 198303-1-4 (2004).
305. V.K. Vanag and I.R. Epstein, "Subcritical Wave Instability in Reaction-Diffusion Systems," *J. Chem. Phys.* 121, 890-894 (2004).
306. A.K. Horváth, I. Nagypál, G. Peintler and I.R. Epstein, "Autocatalysis and Selfinhibition: Coupled Kinetic Phenomena in the Chlorite-Tetrathionate Reaction," *J. Am. Chem. Soc.* 126, 6246-6247 (2004).
307. K. Kurin-Csörgei, I.R. Epstein and M. Orbán, "New Heterogeneous Chemical Oscillators: Reduction of Manganese Species by Hypophosphite on a Pt Surface," *J. Phys. Chem. B* 108, 7352-7358 (2004).

308. I. Berenstein, M. Dolnik, L. Yang, A.M. Zhabotinsky and I.R. Epstein, "Turing Pattern Formation in a Two-Layer System: Superposition and Superlattice Patterns," *Phys. Rev. E* **70**, 046219-1-5 (2004).
309. K. Kurin-Csörgei, M. Orbán and I. R. Epstein, "Systematic Design of Chemical Oscillators Using Complexation and Precipitation Equilibria," *Nature* **433**, 139-142 (2005).
310. A. Kaminaga, V. K. Vanag, and I.R. Epstein, "'Black spots' in a surfactant-rich Belousov-Zhabotinsky reaction dispersed in a water-in-oil microemulsion system," *J. Chem. Phys.* **122**, 174706-1-11 (2005).
311. L. Yang, I. Berenstein and I.R. Epstein, "Segmented Waves from a Spatiotemporal Transverse Wave Instability," *Phys. Rev. Lett.* **95**, 038303-1-4 (2005).
312. V.K. Vanag and I.R. Epstein, "Out-of-Phase Oscillatory Turing Patterns in a Bistable Reaction-Diffusion System," *Phys. Rev. E* **71**, 066212-1-7 (2005).
313. I. Berenstein, L. Yang, M. Dolnik, A. M. Zhabotinsky and I. R. Epstein, "Dynamic mechanism of photochemical induction of Turing superlattices in the chlorine dioxide-iodine-malonic acid reaction-diffusion system," *J. Phys. Chem. A* **109**, 5382-5387 (2005).
314. A. Kaminaga, V.K. Vanag, and I.R. Epstein, "Wavelength Halving in a Standing Wave-Traveling Wave Transition," *Phys. Rev. Lett.* **95**, 058302-1-4 (2005).
315. M.A.M. de Aguiar, I.R. Epstein and Y. Bar-Yam, "Analytically Solvable Model of Probabilistic Network Dynamics," *Phys. Rev. E* **72**, 067102-1-4 (2005).
316. T. Yamaguchi, I.R. Epstein, M. Shimomura and T. Kunitake, "Introduction: Engineering of Self-Organized Nanostructures," *Chaos* **15**, 047501-1-3 (2005).
317. I.R. Epstein and V.K. Vanag, "Complex patterns in reactive microemulsions: self-organized nanostructures?" *Chaos* **15**, 047510-1-7 (2005).
318. V.K. Vanag and I. R. Epstein, "Resonance-Induced Oscillons in a Reaction-Diffusion System," *Phys. Rev. E* **73**, 016201-1-7 (2006).
319. A. Kaminaga, V. K. Vanag, and I. R. Epstein, "A reaction-diffusion memory device," *Angew. Chem. Int. Ed.* **45**, 3087-3089 (2006).
320. K. Kurin-Csörgei, I.R. Epstein and M. Orbán, "Periodic Pulses of Calcium Ions in a Chemical System," *J. Phys. Chem. A* **110**, 7588-7592 (2006).
321. A. M. Zhabotinsky, R. N. Camp, I. R. Epstein and J. E. Lisman, "Role of the Neurogranin Concentrated in Spines in the Induction of Long-term Potentiation," *J. Neurosci.* **26**, 7337-7447 (2006).
322. H.G. Rotstein, A.M. Zhabotinsky and I.R. Epstein, "Localized Structures in a Nonlinear Wave Equation: Propagation Failure of One-Dimensional and Quasi-Two-Dimensional Kinks," *Phys. Rev. E* **74**, 016612-1-8 (2006).
323. I.R. Epstein, J.A. Pojman and O. Steinbock, "Introduction: Self-organization in nonequilibrium chemical systems," *Chaos* **16**, 037101-1-7 (2006).
324. L. Yang, M. Dolnik, A. M. Zhabotinsky, and I.R. Epstein, "Turing patterns beyond hexagons and stripes," *Chaos* **16**, 037114-1-9 (2006).
325. L. Yang, A.M. Zhabotinsky and I.R. Epstein, "Jumping solitary waves in an autonomous reaction-diffusion system with subcritical wave instability," *PhysChemChemPhys.* **8**, 4647-4651 (2006) (cover article).
326. I.R. Epstein, "Predicting complex biology with simple chemistry," *Proc. Nat. Acad. Sci. USA* **103**, 15727-15728 (2006).

327. V.K. Vanag, D.G. Míguez and I.R. Epstein, "Designing an enzymatic oscillator: bistability and feedback controlled oscillations with glucose oxidase in a continuous flow stirred tank reactor," *J. Chem. Phys.* **125**, 194515-1-12 (2006).
328. A.K. Horváth, I. Nagypál and I.R. Epstein, "Three Autocatalysts and Self-Inhibition in a Single Reaction: A Detailed Mechanism of the Chlorite-Tetrathionate Reaction," *Inorg. Chem.* **45**, 9877-9883 (2006).
329. I.R. Epstein, "Can Droplets and Bubbles Think?" *Science* **315**, 775-776 (2007).
330. D.G. Míguez, V.K. Vanag and I.R. Epstein, "Fronts and pulses in an enzymatic reaction catalyzed by glucose oxidase," *Proc. Nat. Acad. Sci. USA* **104**, 6992-6997 (2007).
331. I.R. Epstein, "Diversity in chemistry: catalyzing change," *Nature Chem. Biol.* **3**, 299-302 (2007).
332. R. Zhang, L. Yang, A.M. Zhabotinsky and I.R. Epstein, "Propagation and refraction of chemical waves generated by local periodic forcing in a reaction-diffusion model," *Phys. Rev. E* **76**, 016201-1-5 (2007).
333. V.K. Vanag and I.R. Epstein, "Localized patterns in reaction-diffusion systems," *Chaos* **17**, 037110-1-11 (2007).
334. V.K. Vanag and I.R. Epstein, "Patterns of Nanodroplets: The BZ-AOT Microemulsion System," in *Self-Organized Morphology in Nanostructured Materials*, K. Al-Shamery and J. Parisi, eds., Springer, Berlin, 2008, pp. 89-113 .
335. I. R. Epstein, I. B. Berenstein, M. Dolnik, V. K. Vanag, L. Yang and A. M. Zhabotinsky, "Coupled and Forced Patterns in Reaction-Diffusion Systems," *Phil. Trans. Roy. Soc. A* **366**, 397-408 (2008).
336. J. Carballido-Landeira, I. Berenstein, P. Taboada, V. Mosquera, V. K. Vanag, I. R. Epstein, V. Pérez-Villar and A. P. Muñuzuri, "Long-lasting dashed waves in a reactive microemulsion," *Phys. Chem. Chem. Phys.* **10**, 1094-1096 (2008).
337. V. Horváth, K. Kurin-Csörgei, I. R. Epstein and M. Orbán, "Oscillations in the Concentration of Fluoride Ions Induced by a pH-Oscillator," *J. Phys. Chem. A*, **112**, 4271-4276 (2008).
338. R. Nagao, I. R. Epstein, E. R. Gonzalez and H. Varela, "Temperature (over)compensation in an oscillatory surface reaction," *J. Phys. Chem. A* **112**, 4617-4624 (2008).
339. M. Sajewicz, M. Gontarska, Ł. Wojtal, D. Kronenbach, M. Leda, I. R. Epstein, and T. Kowalska, "Experimental and Model Investigation of the Oscillatory Transenantiomerization of *L*- α -Phenylalanine," *J. Liq. Chrom. Relat. Technol.* **31**, 1986-2005 (2008).
340. V. K. Vanag and I. R. Epstein, "Design and Control of Patterns in Reaction-Diffusion Systems," *Chaos* **18**, 026107-1-11 (2008).
341. V.K. Vanag, F. Rossi, A. Cherkashin, and I.R. Epstein, "Cross-Diffusion in a Water-in-Oil Microemulsion Loaded with Malonic Acid or Ferroin. Taylor Dispersion Method for Four-Component Systems," *J. Phys. Chem. B* **112**, 9058-9070 (2008).
342. Q. Gao, G. Wang, Y. Sun and I. R. Epstein, "Simultaneous tracking of sulfur species in the oxidation of thiourea by hydrogen peroxide," *J. Phys. Chem. A* **112**, 5771-5773 (2008).
343. A. Cherkashin, V.K. Vanag and I.R. Epstein, "Discontinuously propagating waves in the bathoferroin-catalyzed Belousov-Zhabotinsky reaction incorporated into a microemulsion," *J. Chem. Phys.* **128**, 204508-1-6 (2008).

344. I. Berenstein, A. P. Muñuzuri, L. Yang, M. Dolnik, A. M. Zhabotinsky and I. R. Epstein, "Breathing spiral waves in the CDIMA reaction-diffusion system," *Phys. Rev. E* **78**, 025101-1-3 (2008).
345. J. Feng, Q. Gao, X. Lv and I.R. Epstein, "Dynamic Complexity in the Electrochemical Oxidation of Thiourea," *J. Phys. Chem. A* **112**, 6578-6585 (2008)
346. M. Toiya, V.K. Vanag and I.R. Epstein, "Diffusively Coupled Chemical Oscillators in a Microfluidic Assembly," *Angew. Chem. Int. Ed.* **47**, 7753-7755 (2008).
347. I.R. Epstein, "Anatol Zhabotinsky (1938-2008)," *Nature* **455**, 1053 (2008).
348. V.K. Vanag and I.R. Epstein, "Cross-diffusion and pattern formation in reaction-diffusion systems," *Phys. Chem. Chem. Phys.* **11**, 897 – 912 (2009).
349. R.E. McIlwaine, V. K. Vanag and I. R. Epstein, "Temperature control of pattern formation in the Ru(bpy)₃²⁺-catalyzed BZ-AOT system," *Phys. Chem. Chem. Phys.* **11**, 1581–1587 (2009).
350. Q. Gao, L. Zhang, Q. Wang and I.R. Epstein, "Arm-splitting and Back-firing of Spiral Waves in Media Displaying Local Mixed-Mode Oscillations," *Chaos* **19**, 013135-1-6 (2009).
351. K. Kovacs, M. Leda, V. K. Vanag and I. R. Epstein, "Small amplitude and mixed mode pH oscillations in the bromate-sulfite-ferrocyanide-aluminum(III) system," *J. Phys. Chem. A* **113**, 146–156 (2009).
352. S. Mao, Q. Gao, H. Wang, J. Zheng and I.R. Epstein, "Oscillations and Mechanistic Analysis of the Chlorite-Sulfide Reaction in a Continuous-Flow Stirred Tank Reactor," *J. Phys. Chem. A* **113**, 1231-1234 (2009).
353. M. Sajewicz, R. Wrzalik, M. Gontarska, D. Kronenbach, M. Leda, I.R. Epstein and T. Kowalska, "*In vitro* Chiral Conversion, Phase Separation and Wave Propagation in Aged Profen Solutions," *J. Liq. Chrom. Relat. Technol.* **32**, 1359-1372 (2009).
354. T. Bánsági Jr., M. Leda, M. Toiya, A. M. Zhabotinsky, and I. R. Epstein, "High-frequency oscillations in the Belousov-Zhabotinsky reaction," *J. Phys. Chem. A* **113**, 5644-5648 (2009).
355. V.K. Vanag and I.R. Epstein, "Pattern Formation Mechanisms in Reaction-Diffusion Systems," *Int. J. Devel. Biol.* **53**, 673-681 (2009).
356. Q. Gao, J. Li, K. Zhang and I. R. Epstein, "Spiral instabilities in media supporting complex oscillations under periodic forcing," *Chaos* **19**, 033134 (2009) (6 pages).
357. A. C. Balazs and I. R. Epstein, "Emergent, or Just Complex?," *Science*, **325**, 1632-1634 (2009).
358. V.K. Vanag and I.R. Epstein, "A Model for Jumping and Bubble Waves in the BZ-AOT System," *J. Chem. Phys.* **131**, 104512 (2009) (7 pages).
359. C. Pan, Q. Gao, J. Xie, Y. Xia and I. R. Epstein, "Precipitation patterns with polygonal boundaries between electrolytes," *Phys. Chem. Chem. Phys.* **11**, 11033-11039 (2009).
360. M. Leda, V. K. Vanag and I. R. Epstein, "Instabilities of a three-dimensional localized spot," *Phys. Rev. E* **80**, 066204-1-8 (2009).
361. V. Horváth, K. Kurin-Csörgei, I. R. Epstein, and M. Orbán, "Oscillatory concentration pulses of some divalent metal ions induced by a redox oscillator," *Phys. Chem. Chem. Phys.* **12**, 1248–1252 (2010).
362. K. Kovacs, M. Leda, V. K. Vanag, and I. R. Epstein, "Front propagation in the bromate-sulfite-ferrocyanide-aluminum(III) system: Autocatalytic front in a buffer system," *Physica D* **239**, 757-765 (2010).

363. M. Toiya, H.O. González-Ochoa, V. K. Vanag, S. Fraden, and I.R. Epstein, "Synchronization of Chemical Micro-oscillators," *J. Phys. Chem. Lett.* **1**, 1241-1246 (2010).
364. J. Carballido-Landeira, V. K. Vanag, and I. R. Epstein, "Patterns in the Belousov-Zhabotinsky reaction in water-in-oil microemulsion induced by a temperature gradient," *Phys. Chem. Chem. Phys.* **12**, 3656-3665 (2010).
365. T. Bánsági, Jr., S. Ansari, I. R. Epstein and M. Dolnik, "Rearrangement Dynamics of Fishbonelike Turing Patterns Generated by Spatial Periodic Forcing," *Phys. Rev. E* **81**, 066207 (2010) (7 pages).
366. F. Rossi, V. K. Vanag, E. Tiezzi, and I. R. Epstein, "Quaternary Cross-Diffusion in Water-in-oil Microemulsion Loaded with a component of the Belousov-Zhabotinsky reaction. Taylor Dispersion Method," *J. Phys. Chem. B*, **114**, 8140-8146 (2010).
367. Y. Lu, Q. Gao, L Xu, Y. Zhao and I. R Epstein, "Oxygen-sulfur species distribution and kinetic analysis in the hydrogen peroxide – thiosulfate system," *Inorg. Chem.* **49**, 6026–6034 (2010).
368. L. Yuan, Q. Gao, Y. Zhao, X. Tang and I. R Epstein, "Temperature-induced bifurcations in the Cu(II)-catalyzed and catalyst-free hydrogen peroxide-thiosulfate oscillating reaction," *J. Phys. Chem. A* **114**, 7014-7020 (2010).
369. E.P. Zemskov and I.R. Epstein, "Wave propagation in a FitzHugh-Nagumo-type model with modified excitability," *Phys. Rev. E* **82**, 026207-1-6 (2010)
370. M. Sajewicz, M. Gontarska, D. Kronenbach, M. Leda, T. Kowalska and I.R. Epstein, "Condensation oscillations in the peptidization of phenylglycine," *J. Syst. Chem.* **1**, 7 (2010) (16 pages).
371. V.K. Vanag and I.R. Epstein, "Periodic perturbation of one of two identical chemical oscillators coupled via inhibition," *Phys. Rev. E* **81**, 066213 (2010) (10 pages).
372. I. R. Epstein, J. A. Pojman and Q. Tran-Cong-Miyata, "What is Nonlinear Dynamics and How Does It Relate to Polymers?," in J. A. Pojman and Q. Tran-Cong-Miyata, Eds., "Nonlinear Dynamics with Polymers," Wiley-VCH, Weinheim, 2010, pp. 5-20.
373. M. Sajewicz, M. Matlengiewicz, M. Leda, M. Gontarska, D. Kronenbach, T. Kowalska, and I. R. Epstein, "Spontaneous Oscillatory *in vitro* Chiral Conversion of Simple Carboxylic Acids and Its Possible Mechanism," *J. Phys. Org. Chem.* **23**, 1066-1073 (2010).
374. W.A. Anderson, U. Banerjee, C.L. Drennan, S.C.R. Elgin, I.R. Epstein, J. Handelsman, G.F. Hatfull, R. Losick, D.K. O'Dowd, B.M. Olivera, S.A. Strobel, G.C. Walker and I.M. Warner, "Changing the Culture of Science Education at Research Universities," *Science*, **331**, 152-153 (2011).
375. F. Rossi, V.K. Vanag, and I. R. Epstein, "Pentamary Cross-Diffusion in Water-in-Oil Microemulsions Loaded with Two Components of the Belousov-Zhabotinsky Reaction," *Chem. Eur. J.* **17**, 2138-2145 (2011).
376. T. Bánsági, Jr., V.K. Vanag and I.R. Epstein, "Tomography of Reaction-Diffusion Microemulsions Reveals Three-dimensional Turing Patterns" *Science* **331**, 1309-1312 (2011).
377. J. Delgado, N. Li, M. Leda, H.O. González-Ochoa, S. Fraden and I.R. Epstein, "Coupled Oscillators in a 1D Emulsion of Belousov-Zhabotinsky Droplets," *Soft Matter* **7**, 3155-3167 (2011).
378. E.P. Zemskov, K. Kassner, M.A. Tsyganov and I.R. Epstein, "Speed of traveling fronts in a sigmoidal reaction-diffusion system," *Chaos* **21**, 013115-1-5 (2011).

379. J. Delgado, Y. Zhang, B. Xu and I. R. Epstein, "Terpyridine- and bipyridine-based ruthenium complexes as catalysts for the Belousov-Zhabotinsky reaction," *J. Phys. Chem. A* **115**, 2208-2215 (2011).
380. E. Poros, V. Horváth, K. Kurin-Csörgei, I.R. Epstein and M.Orbán, "Generation of pH-oscillations in Closed Chemical Systems: Method and Applications," *J. Am. Chem. Soc.* **133**, 7174-7179 (2011).
381. M. Dolnik, T. Bánsági Jr., S. Ansari, I. Valent and I.R. Epstein, "Locking of Turing Patterns in the Chlorine-Dioxide-Iodine-Malonic Acid Reaction with One-dimensional Spatial Periodic Forcing," *Phys. Chem. Chem. Phys.* **13**, 12578-12583 (2011).
382. E.P. Zemskov, A. Muntean and I.R. Epstein, "Oscillatory pulses in FitzHugh-Nagumo type systems with cross-diffusion," *Math. Med. Biol.* **28**, 217-226 (2011).
383. Y. Zhao, S. Wang, H. Varela, Q. Gao, X. Hu, J Yang and I. R. Epstein, "Spatiotemporal Pattern Formation in the Oscillatory Electro-Oxidation of Sulfide on a Platinum Disk," *J. Phys. Chem. C* **115**, 12965-12971 (2011).
384. E.P. Zemskov, V.K. Vanag and I. R. Epstein, "Amplitude Equations for Reaction-Diffusion Systems with Cross Diffusion," *Phys. Rev. E* **84**, 036216-1-13 (2011)
385. D.G. Míguez, M. Dolnik, I.R. Epstein and A.P Muñozuri, "Interaction of Chemical Patterns in Coupled Layers," *Phys Rev. E* **84**, 046210-1-6 (2011).
386. V.K. Vanag and I. R. Epstein, "Excitatory and inhibitory coupling in a one-dimensional array of Belousov-Zhabotinsky micro-oscillators. Theory," *Phys Rev. E* **84**, 066209-1-15 (2011).
387. M. Sajewicz, M. Dolnik, D. Kronenbach, M. Gontarska, T. Kowalska and I. R. Epstein, "Oligomerization Oscillations of *L*-Lactic Acid in Solution," *J. Phys. Chem. A* **115**, 14331-14339 (2011).
388. W. A. Anderson, R. M. Amasino, M. Ares Jr., U. Banerjee, B. Bartel, V. G. Corces, C. L. Drennan, S. C. R. Elgin, I. R. Epstein, E. Fanning, L. J. Guillette Jr., J. Handelsman, G. F. Hatfull, R. R. Hoy, D. Kelley, L. A. Leinwand, R. Losick, Y. Lu, D. G. Lynn, C. Neuhauser, D. K. O'Dowd, T. Olivera, P. Pevzner, R. R. Richards-Kortum, J. Rine, R. L. Sah, S. A. Strobel, G. C. Walker, D. R. Walt, I. M. Warner, S. Wessler, H. F. Willard and R. N. Zare, "Competencies: A Cure for Pre-Med Curriculum," *Science* **334**, 6057 760-761 (2011).
389. Y. Zhang, N. Li, J. Delgado, Y. Gao, Y. Kuang, S. Fraden, I. R. Epstein and B. Xu, "Post-Self-Assembly Crosslinking of Molecular Nanofibers for Oscillatory Hydrogels," *Langmuir* **28**, 3063-3066 (2012).
390. D. Feldman, R. Nagao, T. Bánsági, Jr., I. R. Epstein and M. Dolnik, "Turing Patterns in the Chlorine-Dioxide-Iodine-Malonic Acid Reaction with Square Spatial Periodic Forcing," *Phys. Chem. Chem. Phys.* **14**, 6570 - 6576 (2012).
391. P. L. Gentili, V. Horvath, V. K. Vanag and I. R. Epstein, "Belousov-Zhabotinsky 'chemical neuron' as a binary and fuzzy logic processor," *Int. J. Unconv. Comput.* **8**, 177-192 (2012).
392. Y. Zhang, N. Li, J. Delgado, N. Zhou, R. Yoshida, S. Fraden, I. R. Epstein and B. Xu, "Structural modulation of self-oscillating gels: changing the proximity of the catalyst to the polymer backbone to tailor chemomechanical oscillation," *Soft Matter* **8**, 3056-3061 (2012).
393. V. Horvath, P. L. Gentili, V. K. Vanag and I. R. Epstein, "Pulse-Coupled Chemical Oscillators with Time Delay," *Angew. Chem. Int. Ed.* **51**, 6878-6881 (2012).

394. T. Bánsági Jr., V. K. Vanag, and I. R. Epstein, "Two- and Three-Dimensional Standing Waves in a Reaction-Diffusion System," *Phys. Rev. E* **86**, 045202-1-4 (2012) doi: 10.1103/PhysRevE.86.045202.
395. X. Tang, Q. Gao, S. Gong, Y. Zhao and I. R. Epstein, "Spiral waves with superstructures in a mixed-mode oscillatory medium," *J. Chem. Phys.* **137**, 214303-1-7 (2012) doi: 10.1063/1.4768895.
396. I. R. Epstein, V. K. Vanag, A. C. Balazs, O. Kuksenok, P. Dayal and A. Bhattacharya, "Chemical Oscillators in Structured Media," *Acc. Chem. Res* **45**, 2160-2168 (2012) doi: 10.1021/ar200251j.
397. J. Yang, Y. Song, H. Varela, I. R. Epstein, W. Bi, H. Yu, Y. Zhao and Q. Gao, "The Effect of Chloride on Spatiotemporal Dynamics in the Electro-oxidation of Sulfide on Platinum," *Electrochim. Acta* **98**, 116-122 (2013). doi: 10.1016/j.electacta.2013.03.042
398. Y. Zhang, R. Zhou, J. Shi, Y. Kuang, I. R. Epstein and B. Xu, "Post Self-Assembly Cross-Linking to Integrate Molecular Nanofibers with Copolymers for the Generation of Chemical Oscillatory Hydrogels," *J. Phys. Chem. B* **117**, 6566–6573 (2013). doi: 10.1021/jp401353e
399. X. Lu, L. Ren, Q. Gao, Y. Zhao, S. Wang, J. Yang and I.R. Epstein, "Photophobic and phototropic movement of a self-oscillating gel," *Chem. Commun.* **49**, 7690-7692 (2013). doi: 10.1039/C3CC44480E
400. R. Nagao, I.R. Epstein and M. Dolnik, "Forcing of Turing patterns in the chlorine dioxide – iodine-malonic acid reaction with strong visible light," *J. Phys. Chem. A* **117**, 9120-9126 (2013). doi: 10.1021/jp4073069
401. Y. Zhang, N. Zhou, S. Akella, Y. Kuang, D. Kim, A. Schwartz, M. Bezpalko, B. M. Foxman, S. Fraden, I. R. Epstein and B. Xu, "Active Cross-Linkers that Lead to Active Gels," *Angew. Chem. Int. Ed.* **52**, 11494-11498 (2013). DOI: 10.1002/anie.201304437.
402. X. Lu, L. Ren, Q. Gao, Y. Yang, Y. Zhao, J. Huang, X. Lv and I. R. Epstein "Multiple Length Scale Instabilities of Unidirectional Pulse Propagation in a Diffusion-fed Gel," *J. Phys. Chem. Lett.* **4**, 3891-3896 (2013). doi: 10.1021/jz402117m
403. P.L. Gentili, M. Dolnik and I.R. Epstein "A 'Photochemical Oscillator': Colored Hydrodynamic Oscillations and Waves in a Photochromic System," *J. Phys. Chem. C* **118**, 598-608 (2014). doi: 10.1021/jp407393h
404. M. Sajewicz, M. Dolnik, T. Kowalska and I. R. Epstein, "Condensation dynamics of *L*-proline and *L*-hydroxyproline in solution," *RSC Adv.* **4**, 7330-7339 (2014). DOI: 10.1039/c3ra46921b
405. N. Tompkins, N. Li, C. Girabawe, M. Heymann, G. B. Ermentrout, I. R. Epstein and S. Fraden, "Testing Turing's theory of morphogenesis in chemical cells," *Proc. Nat. Acad. Sci. USA* **111**, 4397-4402 (2014). DOI: 10.1073/pnas.1322005111
406. N. Li, J. Delgado, H. O. González-Ochoa, I. R. Epstein and S. Fraden, "Combined excitatory and inhibitory coupling in a 1D array of Belousov-Zhabotinsky droplets," *Phys. Chem. Chem. Phys.* **16**, 10965–10978 (2014). DOI: 10.1039/c4cp00957f
407. N. Perini, B. C. Batista, A. C. D. Angelo, I. R. Epstein and H. Varela, "Long-Lasting Oscillations in the Electro-Oxidation of Formic Acid on PtSn Intermetallic Surfaces," *ChemPhysChem* **15**, 1753-1760 (2014). DOI: 10.1002/cphc.201301186 (cover article).
408. A.P. Steinberg, M. Dolnik and I.R. Epstein, "Target Turing patterns and growth dynamics in the chlorine dioxide-iodine-malonic acid reaction, *J. Phys. Chem. A* **118**, 2393-2400 (2014) DOI: 10.1021/jp500432t

409. X. Tang, Y. He, I. R. Epstein, Q. Wang, S. Wang and Q. Gao, "Diffusion-induced periodic transition between oscillatory modes in amplitude-modulated patterns," *Chaos* 24, 023109-1-6 (2014). DOI:10.1063/1.4872215
410. Y. Zhang, N. Zhou, N. Li, M. Sun, D. Kim, S. Fraden, I. R. Epstein and B. Xu, "Giant Volume Change of Active Gels under Continuous Flow," *J. Am. Chem. Soc.* 136, 7341-7347 (2014). DOI: 10.1021/ja503665t
411. X. Tang, T. Yang, I.R. Epstein, Y. Liu, Y. Zhao and Q. Gao, "Novel type of chimera spiral waves arising from decoupling of a diffusible component," *J. Chem. Phys.* 141, 024110-1-7 (2014) DOI: 10.1063/1.4886395
412. I.R. Epstein, "Coupled Chemical Oscillators and Emergent System Properties," *Chem. Commun.* 50, 10758-10767 (2014) DOI:10.1039/C4CC00290C (cover article)
413. I. Epstein, K. Godsoe and M. Kosinski-Collins, "The Brandeis Science Posse: Using the Group Model to Retain Students in the Sciences," Athens: ATINER'S Conference Paper Series, No: EDU2014-1133 (2014).
414. L. Haim, A. Hagberg, R. Nagao, A.P. Steinberg, M. Dolnik, I.R. Epstein and E. Meron, "Fronts and patterns in a spatially forced CDIMA reaction," *Phys. Chem. Chem. Phys.* 16, 26137-26143 (2014).
415. P. L. Gentili, H. Gotoda, M. Dolnik and I. R. Epstein, "Analysis and Prediction of Aperiodic Hydrodynamic Oscillatory Time Series by Feed-Forward Neural Networks, Fuzzy Logic and a Local Nonlinear Predictor," *Chaos*, 25, 013104-1-14 (2015).
416. J. Shi, X. Du, Y. Huang, J. Zhou, D. Yuan, D. Wu, Y. Zhang, R. Haburcak, I. R. Epstein and B. Xu, "Ligand-Receptor Interaction Catalyzes the Aggregation of Small Molecules to Induce Cell Necroptosis," *J. Am. Chem Soc.* 137, 26-29 (2015).
417. V. Horvath, D. Kutner, J.T. Chavis III and I.R. Epstein, "Pulse-coupled BZ oscillators with unequal coupling strengths," *Phys. Chem. Chem. Phys.* 17, 4664-4676 (2015). DOI: 10.1039/c4cp05416d
418. I.R. Epstein, "Viewpoint: Making Waves with DNA," *Physics* 8, 12. (2015) DOI:10.1103/Physics.8.12
419. D.D. Chinellato, I.R. Epstein, D. Braha, Y. Bar-Yam and M.A.M. de Aguiar, "Dynamical Response of Networks under External Perturbations: Exact Results," *J. Stat. Phys.* 159, 221-230 (2015). DOI: 10.1007/s10955-015-1189-x
420. K. Showalter and I. R. Epstein, "From Chemical Systems to Systems Chemistry: Patterns in Space and Time," *Chaos* 25, 097613-1-13 (2015) DOI: 10.1063/1.4918601
421. L. Ren, B. Van, Q. Gao, Y. Zhao, H. Luo, Y. Xia, X. Lu and I. R. Epstein, "Experimental, numerical, and mechanistic analysis of the nonmonotonic relationship between oscillatory frequency and photointensity for the photosensitive Belousov–Zhabotinsky oscillator," *Chaos* 25, 064607-1-10 (2015). DOI: 10.1063/1.4921693
422. M. Orbán, K. Kurin-Csörgei and I.R. Epstein, "pH-Regulated Chemical Oscillators," *Acc. Chem. Res.* 48, 593-601 (2015). DOI: 10.1021/ar5004237