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Education

Ph.D. Polymer Science & Engineering, University of Massachusetts, Amherst, MA February 1984

M.S. Polymer Science & Engineering, University of Massachusetts, Amherst, MA September 1981

B.S. Materials Science & Engineering, Cornell University, Ithaca, NY May 1979

Employment Experience

7/2015 to present **Associate Dean for Research**, A. James Clark School of Engineering
Professor, Dept. of Materials Science and Engineering
University of Maryland, College Park, MD

7/2003 to 6/2015 **Professor and Chair**, Department of Materials Science and Eng.
University of Maryland, College Park, MD

7/1997 to 7/2003 **Associate Professor**, Department of Materials and Nuclear Eng.,
University of Maryland, College Park, MD

1/1992 to 6/1997 **Assistant Professor**, Department of Materials and Nuclear Eng.,
University of Maryland, College Park, MD

10/1985 to 1/1992 **Research Scientist** in the Institute for Materials Science &
Engineering, Polymers Division, National Institute of Standards and Technology,
Gaithersburg, MD

1/1984 to 10/1985 **National Research Council Postdoctoral Fellow** at the
National Bureau of Standards, Gaithersburg, MD

9/1979 to 1/1984 **Graduate Research Assistant**, Department of Polymer Science &
Engineering, University of Massachusetts, Amherst, MA

Summer 1979 **Summer Research Associate**, B.F. Goodrich Co., Brecksville, OH.

Summer 1978 **Materials Research Laboratory Summer Fellowship**, University of
Massachusetts, Amherst, MA.

Publications

As of 8/2019 *Web of Science*: Total Number of Citations: 3335 h-index: 32

Google Scholar: Total Number of Citations: 5040 h-index: 37

Books Edited

1. "Morphological Control of Multiphase Polymer Mixtures", edited by R.M. Briber, C.C. Han and D.G. Peiffer, MRS Symposium Proceedings Series, volume 461, Fall 1996 meeting, Boston, MA ISBN: 1-55899-365-7

Book Chapters

superscript key: *: students under my direction; †: students not under my direction but with whom I worked closely; ‡: post-docs under my direction or with whom I worked closely; all other authors: collaborators.

5. R.M. Briber, "Linear Chains in Networks", article for the *Encyclopedia of Materials: Science and Technology*, Edited by K.H. Juren, R.W. Cahn, M.C. Flemings, B. Ilshner, E.J. Kramer and S. Mahajan, 2001, p. 7227-7231 published by Elsevier Science Ltd., ISBN: 0-08-0431526

4. D. L. Ho[‡], R.M. Briber, and C. J. Glinka; "Studies of Organically Modified Clays by Scattering Techniques", "ACS Symposium Series 804: Polymer Nanocomposites: Synthesis, Characterization and Modeling" edited by R. Krishnamoorti and R. Vaia, 2001, p 127-140, published by the American Chemical Society, ISBN 0-8412-3768-9

3. "Introduction to Engineering Design" Text for ENES 100, T.M. Regan, R.M. Briber, J.W. Dally, W.W. Destler, J.M. Fines, W.L. Fourny, L.L. Gasner, W.G. Lawson, P.A. Minderman, Jr., F.W. Mowrer, C.C. Stevens, C.D. Striffler, R. Windblade, McGraw-Hill, NY, 1996, 1995, 1994, ISBN: 0-07-052198-0

2. B.J. Bauer, R.M. Briber, B. Dickens, "Studies of Grafted Interpenetrating Polymer Networks", Interpenetrating Polymer Networks, Advances in Chemistry Series 239, D. Klemperer, L.H. Sperling, L.A. Utracki, editors, American Chemical Society, 179-204, 1995

1. B.J. Bauer, R.M. Briber, "The Effect of Crosslink Density on Phase Separation in Interpenetrating Polymer Networks", Advances in Interpenetrating Polymer Networks, volume 4, edited by H. Frisch and D. Klemperer, Technomic Publishing, Lancaster, PA, 1994

Articles in Refereed Journals

superscript key: *: students under my direction; †: students not under my direction but with whom I worked closely; ‡: post-docs under my direction or with whom I worked closely; all other authors: collaborators.

107. Cesar Torres-Luna[†], Abdollah Koolivand, Xin Fan, Niti R. Agrawal, Naiping Hu, Yuli Zhu, Roman Domszy, R. M. Briber, Nam Sun Wang, Arthur Yang, "Formation of drug-participating catanionic aggregates for extended delivery of non-steroidal anti-inflammatory drugs from contact lenses", accepted *Biomolecules*, 09/2019

106. Feng Jiang[‡], Xin Zhang[‡], Wonseok Hwang[‡], Robert M. Briber, Yanxiong Fang, Howard Wang, “Supramolecular luminescent triblock copolymer thermoplastic elastomer via metal-ligand coordination”, *Polymer Testing*, **2019**, 78, 105956 DOI: 10.1016/j.polymertesting.2019.105956

105. Xin Zhang[‡], Yimin Mao[‡], Madhusudan Tyagi, Feng Jiang[‡], Doug Henderson*, Bo Jiang, Zhiwei Lina, Ronald L. Jones, Liangbing Hu, R. M. Briber, Howard Wang, “Molecular partitioning in ternary solutions of cellulose”, *Carbohydrate Polymers*, **2019**, 220, 157–162 DOI: 10.1016/j.carbpol.2019.05.054

104. Li, T.; Li, S. X.; Kong, W. Q.; Chen, C. J.; Hitz, E.; Jia, C.; Dai, J. Q.; Zhang, X. [‡]; Briber, R.M.; Siwy, Z.; Reed, M.; Hu, L. B., "A Nanofluidic Ion Regulation Membrane with Aligned Cellulose Nanofibers", *Science Advances* **2019**, 5, 2, 6, 10.1126/sciadv.aau4238

103. Li, T.; Zhang, X. [‡]; Lacey, S. D.; Mi, R. Y.; Zhao, X. P.; Jiang, F.; Song, J. W.; Liu, Z. Q.; Chen, G.; Dai, J. Q.; Yao, Y. G.; Das, S.; Yang, R. G.; Briber, R. M.; Hu, L. B., "Cellulose Ionic Conductors with High Differential Thermal Voltage for Low-Grade Heat Harvesting", *Nature Materials* **2019**, 18, 6, 608+, 10.1038/s41563-019-0315-6

102. Rana Ashkar, Hassina Z. Bilheux, Heliosa N. Bordallo, Robert M. Briber, David J.E. Callaway, Xiaolin Cheng, Xiang-Qiang Chu, Joseph E. Curtis, Mark Dadmun, Paul W. Fenimore, David Fushman, Frank Gabel, Kushol Gupta, Frederick A. Heberle, Frank Heinrich, Liang Hong, John Katsaras, Zvi Kelman, Eugenia Kharlampieva, Gerald R. Kneller, Andrey Kovalevsky, Susan Krueger, Paul Langan, Raquel L. Liberman, Yun Liu, Mathias Losche, Edward Lyman, Yimin Mao, John P. Marino, Carla Mattos, Flora Meilleur, Peter C. E. Moody, Jon D. Nickels, Hugh O'Neill, Ursula Perez-Salas, Judith Peters, Loukas Petridis, Alexei P. Sokolov, Norman J. Wagner, Michael Weinrich, Troy Wymore, Yang Zhang and Jeremy C. Smith, “Progress and Prospects for Neutron Scattering in the Biological Sciences”, *Neutron Scattering in the Biological Sciences: Progress and Prospects*, *Acta Crystallographica D, Structural Biology*, **2018**, 74(12), 1129-1168 DOI: 10.1107/S2059798318017503

101. Joon Ho Roh[‡], Duncan Kilburn[‡], Reza Behrouzi, Wokyung Sung, R. M. Briber, Sarah A. Woodson, “Effects of Preferential Counterion Interactions on the Specificity of RNA Folding”, *J. of Phys. Chem. Lett.*, **2018**, 9, 5726–5732 DOI: 10.1021/acs.jpcllett.8b02086

100. Yimin Mao[‡], Markus Bleuel, Yadong Lyu, Xin Zhang[‡], Doug Henderson*, Howard Wang, R.M. Briber, “Phase Separation and Stack Alignment in Aqueous Cellulose Nanocrystal Suspension under Weak Magnetic Field”, *Langmuir*, **2018**, 34, 8042–8051, DOI: 10.1021/acs.langmuir.8b01452

99. Vural, M.; Behrens, A. M.; Hwang, W.; Ayoub, J. J.; Chasser, D.; Cresce, A. V.; Ayyub, O. B.; Briber, R. M.; Kofinas, P., "Spray-Processed Composites with High Conductivity and Elasticity", *ACS Applied Materials & Interfaces*, **2018**, 10(16), 13953-13962, DOI: 10.1021/acsami.8b00068

98. Duncan Kilburn[‡], Reza Behrouzi, Hui-Ting Lee, Krishnarjun Sarkar, R.M. Briber, Sarah A. Woodson; “Entropic stabilization of folded RNA in crowded solutions measured by SAXS”, *Nucleic Acids Research*, **2016**, doi: 10.1093/nar/gkw597
97. Joon Ho Roh[‡]; Madhu Tyagi; Pulakesh Aich; Kimoon Kim; R.M. Briber; Sarah A. Woodson, “Charge screening in RNA: an integral route for dynamical enhancements”, *Soft Matter*, **2015**, 11(45), 8741-8745, DOI: 10.1039/C5SM02084K
96. Hui-Ting Lee, Duncan Kilburn[‡], Reza Behrouzi[†], Robert M. Briber, Sarah A. Woodson “Molecular crowding overcomes the destabilizing effects of mutations in a bacterial ribozyme”, *Nucleic Acids Research*, **2015**, 43(2) 1170-1176, DOI: 10.1093/nar/gku1335
95. B. Cipriano, S. Banik, R. Sharma, D. Rumore, W. Hwang^{*}, R.M. Briber, S. Raghavan, “Superabsorbent Hydrogels that are Robust and Highly Stretchable”, *Macromolecules*, **2014**, (47)13, 4445-4452, DOI 10.1021/ma500882n
94. Ruiliang Bai^{*}, Peter J. Basser, R.M. Briber and Ferenc Horkay, “NMR Water Self-Diffusion and Relaxation Studies on Sodium Polyacrylate Solutions and Gels in Physiologic Ionic Solutions”, *J. of Applied Polymer Science* **2014**, 131(6), DOI: 10.1002/app.40001
93. Bergstrom[†], R., Jr.; Wuttig, M.; Cullen, J.; Zavalij, P.; Briber, R.; Dennis, C.; Garlea, V. O.; Laver, M., "Morphotropic Phase Boundaries in Ferromagnets: Tb_{1-x}Dy_x Fe₂ Alloys", *Physical Review Letters* **2013**, 111, (1), 017203 DOI: 10.1103
92. J. Duncan Kilburn[‡], Joon Ho Roh[‡], Behrouzi, Reza, R.M. Briber, Sarah A. Woodson, “Crowders perturb the entropy of RNA energy landscapes to favor folding”, *JACS* **2013**, 135, 10055
91. Omar Ayyub[†], M. B. Ibrahim, R.M. Briber, P. Kofinas, "Self-Assembled Block Copolymer Photonic Crystal for Selective Fructose Detection", *Biosens Bioelectron* **2013**, 46, 124-129, Doi 10.1016/J.Bios.2013.02.025.
90. Wonjoo Lee^{*}, Seung Yong Lee, X. Zhang[‡], R.M. Briber and Oded Rabin “Hexagonally ordered nanoparticles templated using a block copolymer film”, *Nanotechnology*, **2013**, 24, 045305
89. B.J. Watson[†], B. Hammouda, R.M. Briber, and S.W. Hutcheson; “Influence of Organic Liquids on the Nanostructure of Precipitated Cellulose”, *J. of Applied Polym. Sci.* **2013**, 127(4), 2620-2627 DOI: 10.1002/app.37540
88. Wonjoo Lee^{*}, Peter Kofinas, R.M. Briber; “Structure investigation of poly((2-dimethylamino)ethyl methacrylate)/sodium dodecylsulfate complexes in concentrated poly((2-dimethylamino)ethyl methacrylate) solutions using small angle neutron scattering”, *Polymer*, **2012**, 53(14), 2942-2948 DOI: 10.1016/j.polymer.2012.04.052
87. Xin Zhang[‡], Andrei B. Sushkov, Christopher J. Metting^{*}, Sean Fackler, H. Dennis Drew, R.

M. Briber; “Silicon patterning using self-assembled PS-b-PAA diblock copolymer masks for black silicon fabrication via plasma etching” *Plasma Processes and Polymers*, **2012**, 9(10), 968-974, Doi 10.1002/Ppap.201100198

86. Reza Behrouzi[†], Joon Ho Roh[‡], Duncan Kilburn[‡], R. M. Briber, Sarah A. Woodson, “Native architecture encodes cooperativity and specificity in RNA folding intermediates”, *Cell* **2012**, 149, 348–357

85. Joon Ho Roh[‡], Madhu Tyagi, R. M. Briber, Sarah A. Woodson, Alexei P. Sokolov, “The dynamics of unfolded versus folded tRNA: The role of electrostatic interactions”, *JACS*, 2011, 133, 16406–16409 dx.doi.org/10.1021/ja207667u

84. Sangcheol Kim[‡], Jack F. Douglas, Christopher L. Soles, Alamgir Karim, and R. M. Briber; “Using Block Copolymer Self-Assembly to Imprint the Crystallization of Polymer Dendrites”, *Soft Matter*, 2011, 7, 8969-8976. DOI: 10.1039/C1SM05768E

83. Omar Ayyub[†], Jennifer W. Sekowski, Ta-I Yang, Xin Zhang[‡], R. M. Briber, Peter Kofinas; “Color Changing Block Copolymer Films for Chemical Sensing of Simple Sugars”, *Biosensors and Bioelectronics*, **2011**, 28, 349– 354 doi:10.1016/j.bios.2011.07.043

82. K. L. Krycka, A. J. Jackson, J. A. Borchers, J. Shih^{*}, R.M. Briber, R. Ivkov, C. Gruttner, and C. L. Dennis; “Internal magnetic structure of dextran coated magnetite nanoparticles in solution using small angle neutron scattering with polarization analysis”, *J. of Applied Physics* 109, 07B513 (2011)

81. Xin Zhang[‡], Christopher Metting^{*}, R. M. Briber, Florian Weilmboeck, Sang Hak Shin^{*}, Benjamin Jones^{*} and Gottlieb Oehrlein, Poly(2-vinyl naphthalene-b-acrylic acid) block copolymer self-assembled pattern formation, alignment and transfer” *Macromolecular Chemistry & Physics* 2011, 212(16), 1735–1741 DOI: 10.1002/macp.201100232

80. Wonjoo Lee^{*}, Seung Yong Lee, R. M. Briber and Oded Rabin, “Fully Self-Assembled SERS Substrate with Tunable Surface Plasmon Resonances”, *Advanced Functional Materials*, 2011, 21, 3424–3429 DOI: 10.1002/adfm.201101218

79. Sunil K. Sinha, Henry Glyde, R.M. Briber, Masaki Takata, “Access to Major International Facilities”, *Synchrotron Radiation News*, 23(2), 33-38, (2010)

78. Joon Ho Roh[‡], Liang Guo, J. Duncan Kilburn[‡], R.M. Briber, Thomas Irving, Sarah A. Woodson, “Multistage collapse of a bacterial ribozyme observed by time-resolved SAXS”, *JACS*, 132(29), 10148–10154, (2010) 10.1021/ja103867p

77. Wonjoo Lee^{*}, P. Kofinas, R.M. Briber, “Small angle neutron scattering study of deuterated sodium dodecylsulfate micellization in dilute poly((2-dimethylamino)ethyl methacrylate) solutions” *Polymer* 51(13), 2872-2878, (2010) 10.1016/j.polymer.2010.04.018

76. J. Duncan Kilburn[‡], Joon Ho Roh[‡], Liang Guo, R.M. Briber, Sarah A. Woodson, “Molecular crowding stabilizes folded RNA structure by the excluded volume effect”, *JACS*, 132(25), 8690–

8696, (2010), 10.1021/ja101500g

75. Wonjoo Lee*, Xin Zhang*, and R.M. Briber, “A Simple Method for Creating Nanoporous Block-Copolymer Thin Films”, *Polymer* 51(11), 2376-2382, (2010), 10.1016 / j.polymer.2010.03.023

74. S. Khodadadi, J.H. Roh[‡] Biological Macromolecules: Not a Simple “Slaving” by Hydration Water”, *Biophysical Journal* 98, (2010) 1321–1326, doi:10.1016/j.bpj.2009.12.4284

73. Sarvin Moghaddam[‡], Gokhan Caliskan[‡], Seema Chauhan, Changbong Hyeon, R.M. Briber, D. Thirumalai, Sarah A. Woodson; “Metal Ion Dependence of Cooperative Collapse Transitions in RNA”, *Journal of Molecular Biology*, 393(3), 753-7648 (2009)
doi:10.1016/j.jmb.2009.08.044

72. Shenqiang Ren[†], R.M. Briber, and Manfred Wuttig, “Self-Organized Two-Dimensional Onions” *Applied Physics Letters*, 94(11), 113507 (2009) DOI: 10.1063/1.3101373

71. Pinar Akcora[†], R.M. Briber, and Peter Kofinas; “Oxidation Effect on Templating of Metal Oxide Nanoparticles within Block Copolymers”, *Polymer*, 50, 1223-1227 (2009)

70. J. H. Roh[‡], R.M. Briber, A. Damjanovic, D. Thirumalai, S. A. Woodson, and A. P. Sokolov; “Dynamics of tRNA at Different Levels of Hydration”, *Biophysical Journal*, 96, 2755–2762 (2009)

69. Ramesh Dandu, Arthur Von Cresce[‡], R.M. Briber, Paul Dowell, Joseph Cappello, Hamidreza Ghandehari; “Silk-Elastinlike Hydrogels: Influence of Monomer Sequence on Physicochemical Properties”, *Polymer*, 50(2), 366-374 (2009)

68. Shenqiang Ren[†], R.M. Briber, and Manfred Wuttig, “Diblock copolymer based self-assembled nanomagnetolectric”, *Applied Physics Letters*, 93(17), 173507 (2008)
DOI:10.1063/1.3005558

67. Seok Il Yun*, Kai-Chi Lai*, R.M. Briber, S.J. Teertstra, M. Gauthier, B.J. Bauer, “Conformation of Arborescent Polymers in Solution by Small-Angle Neutron Scattering: Segment Density and Core-Shell Morphology”, *Macromolecules*, 41(1) 175-183 (2008)

66. Sangcheol Kim[‡], R.M. Briber, Alamgir Karim, Ronald L. Jones, and Ho-Cheol Kim; “Environment-Controlled Spin Coating to Orient Microdomains in Thin Block Copolymer Films”, *Macromolecules*, 40(12), 4102-4105 (2007)

65. P. Akcora[†], R.M. Briber, P. Kofinas; “TEM characterization of diblock copolymer templated iron oxide nanoparticles: Bulk solution and thin film surface doping approach”; *Polymer*, 47(6), 2018-2022 (2006)

64. S.I. Yun[‡], R.M. Briber, R.A. Kee, M. Gauthier; “Dilute-solution structure of charged arborescent graft polymer”, *Polymer*, 47(8), 2750-2759 (2006)

63. G. Caliskan[‡], R.M. Briber, D. Thirumalai, V. Garcia-Sakai, S.A. Woodson, A.P. Sokolov, “Dynamic Transition in tRNA is Solvent Induced”, *JACS Communications*, 128, 32-33 (2006)
62. T. Magbitang, V.Y. Lee, R.D. Miller, M.F. Toney, Z.L. Lin^{*}, R.M. Briber, H.C. Kim, J.L. Hedrick; “Templating organosilicate vitrification using unimolecular self-organizing polymers: Evolution of morphology and nanoporosity development with network formation”, *Advanced Materials*, 17(8), 1031-1035 (2005)
61. P. Akcora[‡], X. Zhang^{*}, B. Varughese, R.M. Briber, P. Kofinas; “Structural and Magnetic Characterization of Norbornene-Deuterated Norbornene Dicarboxylic Acid Diblock Copolymers Doped with Iron Oxide Nanoparticles”, *Polymer*, 46(14), 5194-5201 (2005)
60. G. Caliskan[‡], C. Hyeon, U. Perez-Salas[‡], R.M. Briber, S.A. Woodson and D. Thirumalai; “Persistence Length Changes Dramatically as RNA Folds”, *Phys. Rev. Lett.* 95, 268303 (2005)
59. S. Chauhan, G. Caliskan[‡], Robert M. Briber, U. Perez-Salas[‡], P. Rangan, D. Thirumalai and S.A. Woodson; “RNA Tertiary Interactions Mediate Native Collapse of a Bacterial Group I Ribozyme”, *J. of Molecular Biology*, 353(5), 1199-1209 (2005)
58. P. Lazzeri, L. Vanzetti, M. Anderle, M. Bersani, J.J. Park, Z. Lin, R.M. Briber, G.W. Rubloff, H.C. Kim, R.D. Miller, “Thin-Film Transformations and Volatile Products in the Formation of Nanoporous Low-k Polymethylsilsesquioxane-Based Dielectric”, *J. of Vac. Sci. and Tech. B*, 23(3), 908-917 (2005)
57. T. Kashiwagi, R.H. Harris Jr., X. Zhang^{*}, R.M. Briber, B.H. Cipriano, S.R. Raghavan, W.H. Awada, J.R. Shields, “Flame retardant mechanism of polyamide 6–clay nanocomposites”, *Polymer* 45, 881–891 (2004)
56. P. Lazzeri, G.W. Rubloff, L. Vanzetti, R.M. Briber, M. Anderle, M. Bersani, J.J. Park, H.-C. Kim, W. Volksen, R.D. Miller, Z. Lin^{*}, “ToF-SIMS Studies of Nanoporous PMSSQ Materials: Kinetics and Reactions in the Processing of Low-K Dielectrics for ULSI Applications”, *Surface and Interface Analysis*, 36(4), 304-310 (2004)
55. M. K. McDermott^{*}, LeRoy W. Schroeder, Shay L. Balsis, N. A. Paradiso, M. L. Byrne, R.M. Briber; “Mechanical Properties of Polyurethane Film Exposed to Solutions of Nonoxynol-9 Surfactant and Poly(ethylene glycol)”, *J. of Applied Polymer Science*, 91(2), 1086-1096 (2004)
54. U.A. Perez-Salas[‡], P. Rangan, S. Krueger, R.M. Briber, D. Thirumalai, S.A. Woodson, “Compaction of a Bacterial Group I Ribozyme Coincides with the Assembly of Core Helices”, *Biochemistry*, 43, 1746–1753 (2004)
53. G. Voge, K. Fosser, and D. Waldow, R.M. Briber, A. Halasa, “Effect of Random and Block Copolymer Additives on a Homopolymer Blend Studied by Small Angle Neutron Scattering”, *J. of Polymer Science –Polymer Physics Edition*, 42(17), 3191-3203, (2004)

52. H.-C. Kim, W. Volksen, R. D. Miller, E. Huang, G. Yang, R.M. Briber, K. Shin, S. K. Satija, "Neutron Reflectivity on Nanoporous Poly(methylsilsesquioxane) Thin Films" *Chemistry of Materials* 15(3), 609(2003)
51. M.P. Nieh, S. Kumar, D. L. Ho, R.M. Briber, "Neutron Scattering Study of Chain Conformations in the Energetically Neutral Pores of Vycor Glass", *Macromolecules*, 35, 6384-6391(2002)
50. U. Perez-Salas*, R.M. Briber, M.H. Rafailovich, J.Sokolov, "Interfacial Fracture Toughness Between Glassy Polymer Networks", *J. Polymer Sci –Polymer Physics Ed.*, 41(16), 1902-1908(2003)
49. U. Perez-Salas, L. Nasser, R.M. Briber, W.A. Hamilton, M.H. Rafailovich, J.Sokolov, "Polystyrene Network-Network Interdiffusion", *Macromolecules* 35, 6638-6644(2002)
48. N. Gilra†, C. Cohen, R.M. Briber, B.J. Bauer, R. Hedden, A.Z. Panagiotopoulos; "A SANS Study in Strained and Unstrained End-linked Elastomers"; *Macromolecules*, 34(22); 7773-7782(2001)
47. D.L. Ho‡, R.M. Briber, C.J. Glinka; "Characterization of Modified Clays using Scattering and Microscopy Techniques", *Chemistry of Materials*; 13(5); 1923-1931(2001)
46. R.L. Jones†, S.K. Kumar, D.L. Ho*, R.M. Briber, T.P. Russell; "Chain Conformation in Ultrathin Films using Small Angle Neutron Scattering", *Macromolecules*, 34(3), 559-567(2001)
45. S. Choi*, R.M. Briber, B.J. Bauer, D.-W. Liu, M. Gauthier; "Small Angle Neutron Scattering of Blends of Arborescent Polystyrenes", *Macromolecules*, 33(17), 6495-6501(2000)
44. J. Gao*, G.C. Walsh, D.I. Bigio, R.M. Briber, M.D. Wetzl, "Mean Residence Time Analysis for Twin Screw Extruders", *Polymer Engineering and Science*, 40, 227(2000)
43. J. Gao†, G.C. Walsh, D.I. Bigio, R.M. Briber, M.D. Wetzl, "A Residence Time Distribution Model for Screw Extruders", *AIChE Journal* , 45(12), 2541-2549(1999)
42. S. Choi*, R.M. Briber, A. Topp, B.J. Bauer, M. Gauthier, L. Tichagwa, "Small Angle Neutron Scattering of Solutions of Arborescent Graft Polystyrenes", *Macromolecules*, 32(23), 7879-7886(1999)
41. R.L. Jones†, S.K. Kumar, D.L. Ho*, R.M. Briber, T.P. Russell, "Chain Conformation in Ultrathin Polymer Films", *Nature*, 400, 146-149(1999)
40. D. L. Ho*, R.M. Briber, R. L. Jones†, S. K. Kumar, T.P. Russell, "Small Angle Neutron Scattering Studies on Thin Films of Isotopic Polystyrene Blends", *Macromolecules*, 31(26), 9247-9252(1998)

39. J.S. Fodor[‡], R.M. Briber, T.P. Russell, K.R. Carter, J.L. Hedrick, R.D. Miller, "Non-Uniform Composition Profiles in Thin Film Polymeric Nanofoams", *Polymer*, 40:10, (2547)1999
38. J.L. Hedrick, K.R. Carter, J.W. Labadie, R.D. Miller, W. Volksen, C.J. Hawker, D.Y. Yoon, T.P. Russell, J.E. McGrath, R.M. Briber, "Nanoporous Polyimides", *Progress in Polyimide Chemistry II*, 141, (1)1999
37. S. Choi*, X. Liu, R.M. Briber; "Small Angle Scattering of Polymer Blends of Polyvinylmethylether at Dilute Concentration in Deuterated Polystyrene", *J. of Polymer Science, Polymer Physics Edition*, 36, 1(1998)
36. J.Y. Cheng[‡], Y. Xie, D.I. Bigio, R.M. Briber; "Slip Flow in a Partially Filled Screw Channel" *Journal of Reinforced Plastics and Composites*, 17(8), 712(1998)
35. J.Y. Cheng[‡], D.I. Bigio, R.M. Briber; "Shear Effect on the Devolatilization of Filled Polymers", *J. of Vinyl & Additive Technology*, 4(1), 45(1998)
34. J.S. Fodor*, R.M. Briber, T.P. Russell, K.R. Carter, J.L. Hedrick, R.D. Miller, "Transmission Electron Microscopy of 3F/PMDA Polyimide-Polypropylene Oxide Triblock Copolymer Based Nanofoams", *J. of Polymer Science: Polymer Physics Edition*, 35, 1067(1997)
33. X. Liu*, B.J. Bauer, R.M. Briber; "The Conformation of Free Linear Polymer Chains in a Polymer Network", *Macromolecules*, 30(16), 4704(1997)
32. M. Benmouna, R.M. Briber, B. Hammouda; "Polymer Blends, Copolymers and Networks. Scattering Properties and Phase Behavior", *Macromolecular Theory and Simulations*, 6, 197(1997)
31. N.C. Beck-Tan*, S.K. Tai, R.M. Briber; "Morphology Control and Interfacial Reinforcement in Reactive Polystyrene/Amorphous Polyamide Blends", *Polymer*, 37(16), 3509(1996)
30. N.C. Beck-Tan*, D.G. Peiffer, R.M. Briber; "Reactive Reinforcement of Polystyrene/Poly(2-vinyl pyridine) Interfaces", *Macromolecules*, 29(14), 4969-4975(1996)
29. R.M. Briber, X. Liu*, B.J. Bauer; "The Collapse of Free Polymer Chains in a Network", *Science*, 268, 395-399(1995)
28. E.A. Di Marzio, R.M. Briber; "Collapse of a Polymer in a Polymeric Solvent", *Macromolecules* 28, 4020-4023(1995)
27. N.C. Beck Tan*, X. Liu, D.G. Peiffer, R.M. Briber; "A Study of Compatibility In the System Polystyrene/Sulfonated Polystyrene", *Polymer*, 36(10), 1969(1995)
26. R.M. Briber, B.J. Bauer, B. Hammouda, "Small Angle Neutron Scattering from Dilute Blends of Deuterated Polystyrene in Polyvinylmethylether and Protonated Polystyrene)", *J. Chem. Phys.*, 101(3), 2592(1994)

25. X. Liu*, R.M. Briber, B.J. Bauer, "Electron Beam Crosslinking of Polyvinylmethylether, *J. Polymer Science: Polymer Physics Edition*, 32, 811(1994)
24. N.C. Beck Tan*, R.M. Aiken, R.M. Briber; "Fracture Toughness of Discontinuously Reinforced Al-4Cu-1.5Mg/TiB₂ Composites", *Metall. and Materials Trans. A*, 25A, 2461(1994)
23. X. Zheng, Z. Zhao, M.H. Rafailovich, J. Sokolov, R.M. Briber, S.A. Schwarz, "Diffusion of Linear Deuterated Polystyrene Chains In Crosslinked Polystyrene Networks", *Macromolecules*, 26, 6431(1993)
22. H. Jinnai†, H. Hasegawa, T. Hashimoto, R.M. Briber, C.C. Han, "Effect of Crosslinks on the Miscibility of a Deuterated Polybutadiene and Protonated Polybutadiene Blend", *Macromolecules*, 26, 182(1993)
21. R.M. Briber, F. Khoury, "The Morphology of PVF₂ Crystallized from Blends of PVF₂ and PEA", *Journal of Polymer Science, Physics Edition*, 31, 1253(1993)
20. B. Hammouda, R.M. Briber, B.J. Bauer, "Small Angle Neutron Scattering from Deuterated Polystyrene / Protonated Polystyrene / Poly(vinylmethylether) Blends", *Polymer Communications*, 33, 1785(1992)
19. D.L. Vanderhart, G.C. Campbell, R.M. Briber, "Phase Separation Behavior Blends of Polybenzimidazole and Polyetherimide", *Macromolecules*, 25, 4734(1992)
18. R.M. Briber, B.J. Bauer, "Small Angle Neutron Scattering of Blends of Crosslinked and Linear Polystyrene", *Macromolecules*, 24, 1899(1991)
17. R.M. Briber, "Small Angle Neutron Scattering Studies of Blends of Protonated Linear Polystyrene with Crosslinked Deuterated Polystyrene", in Molecular Based Polymer Composites, edited by D.W. Schaefer and J.E. Mark, *Materials Research Society Symposium Proceedings, Volume 171*, Materials Research Society, Pittsburgh, PA, 1990
16. R.M. Briber, B.J. Bauer, "The Effect of Crosslinks on the Phase Separation Behavior of a Compatible Polymer Blend", *Macromolecules*, 21, 3296(1988)
15. B.J. Bauer, R.M. Briber, C.C. Han, "SANS Studies of Compatible Blends of Poly(vinylmethylether) and Crosslinked Deuterated Polystyrene", *Macromolecules*, 22, 940(1989)
14. J.R. Quay, Z. Sun, J. Blackwell, R.M. Briber, E.L. Thomas, "The Hard Segment Unit Cell for MDI-BDO Based Polyurethane Elastomers", *Polymer*, 31, 1003(1990)
13. R.M. Briber, P. Sung, J.D. Barnes, "Small Angle X-Ray Study of the Deformation of MDI/BDO Based Polyurethanes", *National Institute of Standards and Technology Internal Report (NISTIR 88-3873)*, October 1988

12. N. Ding, E.J. Amis, R. Salovey, R.M. Briber, "Preparation of Homogeneous Polymer Nuclei", *J. Polym. Sci., Lett. Ed.*, 27, 489(1989)
11. R.M. Briber, F. Khoury, "The Phase Diagram and Morphology of PVF₂/PEA Blends", *Polymer*, 28, 38(1987)
10. R.M. Briber, F. Khoury, "Applications of Electron Energy Loss Spectroscopy to Polymers", *J. Polym. Sci., Polym. Phys. Ed.*, 26, 621(1986)
9. R.M. Briber, P. Sung, "WAXS Study of the Deformation MDI/BDO Based Polyurethanes", *Polymer Communications*, 28(6), 161(1987)
8. C.K. Chiang, B.J. Bauer, R.M. Briber, G.T. Davis, "Synthesis of Ionic Conducting Interpenetrating Polymer Networks", *Polymer Communications*, 28, 34(1987)
7. R.M. Briber, E.L. Thomas, "The Crystal Habit and Morphology of Polybutylene Terephthalate and Related Copolymers", *Polymer*, 27, 66(1986)
6. R.M. Briber, E.L. Thomas, "The Structure of MDI/BDO Based Polyurethanes: Diffraction Studies on Model Compounds and Oriented Thin Films", *J. Polym. Sci., Polym. Phys. Ed.* 23, 1915(1985)
5. R.M. Briber, E.L. Thomas, "The Crystallization Behavior of Random Block Copolymers of Polybutylene Terephthalate and Polytetramethylene Ether Glycol", *Polymer*, 26, 8(1985)
4. W.W. Adams, R.M. Briber, E.S. Sherman, R.S. Porter, E.L. Thomas, J.S. Lin, "Microstructure of High Modulus Solid State Extruded Polyethylene II: X-ray Scattering Studies", *Polymer*, 26, 17(1985)
3. R.M. Briber, E.L. Thomas, "The Investigation of Two Crystal Forms in MDI/BDO Based Polyurethanes", *J. Macromol. Sci.-Physics*, 22(4), 509(1983)
2. C.H.Y. Chen, R.M. Briber, E.L. Thomas, M. Xu, W.J. MacKnight, "Structure and Morphology of Segmented Polyurethanes II: Influence of Reactant Incompatibility", *Polymer*, 24, 1333(1983)
1. A.L. Chang, R.M. Briber, E.L. Thomas, R.J. Zdrahala, F.E. Critchfield, "A Morphological Study of the Structure Developed During the Polymerization of a Series of Segmented Polyurethanes", *Polymer*, 23, 1060(1982)

Reports and other Articles

superscript key: *: students under my direction; †: students not under my direction but with whom I worked closely; ‡: post-docs under my direction or with whom I worked closely; all other authors: collaborators.

6. Banerjee, P.; Briber, R. M., "Materials Science and Engineering Graduate Core Courses in the United States", *MRS Bulletin* **2019**, 44, 1, 7-9, DOI:10.1557/mrs.2019.2

5. Joon Ho Roh[‡], Madhu Tyagi, R.M. Briber, Sarah A. Woodson, Alexei P. Sokolov, “The role of electrostatic interactions in the local dynamics of biological and synthetic polyelectrolytes”, *2012 NIST Center for Neutron Research Annual Report: Accomplishments and Opportunities*, 14-15; based on the publication: “The dynamics of unfolded versus folded tRNA: The role of electrostatic interactions”, *JACS*, 2011, 133, 16406–16409 x.doi.org/10.1021/ja207667u
4. Parag Banerjee and R. M. Briber, “Survey reveals interdisciplinarity of MSE faculty”, *MRS Bulletin*, 37(6) June 541-542(2012) doi:10.1557/mrs.2012.128
3. Joon Ho Roh[‡], Liang Guo, J. Duncan Kilburn[‡], R.M. Briber, Thomas Irving, Sarah A. Woodson, APS Science 2010 Annual Report, “It’s Magic: Folding in Ribozymes” based on the publication: “Multistage collapse of a bacterial ribozyme observed by time-resolved SAXS”, *JACS*, 132(29), 10148–10154, (2010)
2. APS Committee on International Scientific Affairs report on “Access to Major International X-Ray & Neutron Facilities” by Henry Glyde (Chair), University of Delaware; R.M. Briber, University of Maryland; Sunil Sinha, University of California, San Diego; Approved by the APS Executive Board, 30 April 2009
<http://www.aps.org/programs/international/resources/facilities.cfm>
1. G. Caliskan[‡], R.M. Briber, D. Thirumalai, V. Garcia-Sakai, S.A. Woodson, A.P. Sokolov, “Dynamic Transition in tRNA is Solvent Induced”, *2006 NIST Center for Neutron Research Annual Report: Accomplishments and Opportunities*, 34-35; based on the publication: G. Caliskan, R.M. Briber, D. Thirumalai, V. Garcia-Sakai, S.A. Woodson, A.P. Sokolov, “Dynamic Transition in tRNA is Solvent Induced”, *JACS Communications*, 128, 32-33 (2006)

Conference Proceedings and Talks

superscript key: *: students under my direction; †: students not under my direction but with whom I worked closely; ‡: post-docs under my direction or with whom I worked closely; all other authors: collaborators.

Refereed Conference Proceedings

12. R.M. Briber, R.D. Gomez, “Teaching Engineering in the General Education Program at the University of Maryland”, 2017 ASEE Annual Conference, Columbus, OH, Paper ID #20059
11. Seung Yong Lee, Wonjoo Lee*, R.M. Briber, Oded Rabin; “High-throughput nanostructured SERS substrates by self-assembly”, in *Proceedings of the SPIE Defense, Security, and Sensing Conference*, Baltimore, MD, **2012**.
10. Sangcheol Kim[‡], R.M. Briber, Alamgir Karim, Ronald L. Jones, and Ho-Cheol Kim; “Fabrication of Thin Block Copolymer Films under Controlled Atmosphere”, MRS Symposium Proceedings Series, volume XXX, Fall 2006 Meeting, Boston, MA
9. R.M. Briber, J.S. Fodor[‡], T.P. Russell, R.D. Miller, K.R. Carter and J.L. Hedrick; “Characterization of Thin Polymeric Nanofoam Films by Transmission Electron Microscopy and

Small Angle Neutron Scattering” in “Morphological Control of Multiphase Polymer Mixtures”, edited by R.M. Briber, C.C. Han and D.G. Peiffer, MRS Symposium Proceedings Series, volume 461, Fall 1996 Meeting, Boston, MA

8. R.M. Briber, D.I. Bigio, J. Lochary; “Integration of Manufacturing into the Undergraduate Polymer Engineering Curriculum”, *Proceedings of the 1996 ABET Annual Conference on Innovation in Engineering Education*
7. J. Cheng[‡], D.I. Bigio, R.M. Briber; "Devolatilization of Filled Polymeric Materials: I- Batch Study" *Proceedings of SPE ANTEC 1996*, page 365-369.
6. R.M. Briber, D.I. Bigio, J. Lochary; “Integration of a Manufacturing Experience into the Undergraduate Curriculum in Polymer Engineering”, *Proceedings of 1996 American Society of Engineering Education*
5. J.G. Barker, A.M. Mayes, R.M. Briber, B. Orts[‡]; “Scaling of The Radius of Gyration with Concentration”, *Proceedings of the Materials Research Society*, Vol. 376, Neutron Scattering in Materials Science, 1994
4. X. Liu^{*}, B.J. Bauer, R.M. Briber, “Collapse of Isolated Chains in a Network”, *Proceedings of the Materials Research Society*, 1994
3. P. Sung, R.M. Briber, Characterization of the Morphology of MDI/BDO Based Polyurethanes, *Proceedings of the Fourth World Biomaterials Congress*, Berlin, Germany, 4/92
2. B.J. Bauer, R.M. Briber, S. Malone, C. Cohen, "Small Angle Neutron Scattering Studies of Single Phase IPNS", *Proceedings of the Materials Research Society, Symposium on Submicron Multiphase Materials*, 1992
1. X. Zhao, W. Zhao, J. Sokolov, M.H. Rafailovich, H.D. Gafney, R.M. Briber, B.J. Wilkins, "Diffusion of Polymers in Crosslinked Networks", *Proceeding of the Materials Research Society, Symposium on the Dynamics of Small Confining Systems*, 1990

Unrefereed Conference Proceedings

42. O. Rabin, X. Zhang, K. Zhang, R.M. Briber, H. von Bredow, C. Metting, G. Atanasoff , “Integrated Surface-Enhanced Raman Spectroscopy Sensors for Process Monitoring”, TechConnect World Innovation Conference, Washington, DC 2017
41. Karim, A.; Berry, B.; Zhang, X.; Yager, K.; Kim, S.; Bosse, A.; Douglas, J. F.; Jones, R. L.; Briber, R.M.; Kim, H. C., "Directed Assembly of Block Copolymer Films", *PMSE Prepr.* 2009, 100, 733-734.
40. Hsieh, P. Y.; Liu, Y.; Zajdel, P.; Beek, W. V.; Zavalij, P. Y.; Briber, R. M.; Green, M. A., "Lanthanide Metal-Organic Framework Materials (Mofs): Structure and Properties", *Abstracts of Papers of the American Chemical Society* **2009**, 238.

39. Lee, W.; Kofinas, P.; Briber, R.M., "Growth of Anionic Micelles in Polymer Solutions and Hydrogels", *PMSE Prepr.* **2009**, 101, 1413-1414.
38. Shin, S. H.; Briber, R.M., "Small Angle Neutron Scattering of Poly(Ethylene Oxide) in Ethyl Alcohol/Water Mixtures: Clustering and Solvation", *PMSE Prepr.* **2009**, 101, 802-803.
37. Karim, A.; Berry, B.; Kim, S.; Bosse, A.; Douglas, J. F.; Jones, R. L.; Briber, R.M.; Kim, H. C., "Guided Self-Assembly of Block-Copolymer Nanostructures", *NSTI Nanotech, Nanotechnol. Conf. Trade Show, Tech. Proc.* **2008**, 1, 875-876.
36. Karim, A.; Berry, B.; Zhang, X.; Lacerda, S.; Kim, S.; Bosse, A.; Douglas, J. F.; Jones, R. L.; Briber, R.M.; Kim, H. C., "Templated Directed Assembly of Block Copolymer Films", *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)* 2008, 49, (2), 903.
35. Kim, S.; Berry, B. C.; Jones, R. L.; Karim, A.; Briber, R.M.; Kim, H. C., "Unconventional Processing for Defect Control in Block-Copolymer Thin Films", *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)* 2007, 48, (1), 939.
34. Kim, S.; Briber, R.M.; Karim, A.; Jones, R. L.; Kim, H.-C., "Directed Self-Assembly of Thin Block Copolymer Films under Controlled Atmosphere", *Mater. Res. Soc. Symp. Proc.* 2007, 961E, (Nanostructured and Patterned Materials for Information Storage), No pp given, Paper #: 0961-O0917-0903.
33. Zhang, X.; Briber, R.M.; Kashiwagi, T., "Experimental Observations of Pmma/Layered Silicate Nanocomposite Flammability", *SAMPE Conf. Proc.* 2007, 52, 215/211-215/215.
32. Jones, R. L.; Kim, S.; Karim, A.; Briber, R.M.; Kim, H.-c., "Orientation of Block Copolymer Phases within Confined Environments", *PMSE Prepr.* 2006, 94, 171.
31. Zhang X., Briber R.M., Kashiwagi T., "Molecular weight and filler dispersion on the flammability of PMMA/layered silicate nanocomposites", *Abstracts of Papers of the American Chemical Society*, 230: U3666 - U3667 341, *PMSE*, Aug. 28, 2005
30. Akcora P., Briber R.M., Kofinas P., "Incorporation of iron oxide nanoparticles into microphase separated poly(norbornene)-block-poly(deuterated norbornene dicarboxylic acid) diblock copolymers", *Abstracts of Papers of the American Chemical Society*, 230, U3725 - U3726, 466-*PMSE* Aug. 28, 2005
29. Zhang X., Briber R.M., Kashiwagi T., "Microstructure and flammability of PMMA/layered silicate nanocomposite", *Abstracts of Papers of the American Chemical Society*, 228, U423-U423, 51, *PMSE Part 2*, Aug. 22, 2004
28. Kim H.C., Volksen W., Magbitang T., Lee V.Y., Brock P.J., Dubois G., Hedrick H.L., Hawker C., Miller R.D., Huang E., Toney M.F., Lin Z.L., Briber R.M. "Effect of molecular architecture of sacrificial porogens on the pore structures of nanoporous organosilicates: A small angle scattering study", *Abstracts of Papers of the American Chemical Society*, 227: U554 - U554, 422, *PMSE Part 2*, Mar. 28, 2004

27. Xin Zhang, R.M. Briber, Richard H. Harris Jr. and Takashi Kashiwagi, "Characterization of Changes in the Clay Platelet Distribution in Polyamide 6/Clay Nanocomposites During Combustion by TEM and X-Ray Diffraction", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, (2003), New York Meeting
26. Hongxia Feng, R.M. Briber, Victor Y. Lee, Robert D. Miller, Ho-Cheol Kim, "Suppression of Dewetting in Polystyrene Thin Films by Using Nanoparticles" *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, (2003), New York Meeting
25. P. Lazzeri, L. Vanzetti, E. Iacob, M. Bersani, M. Anderle, J.J. Park, Z. Lin, R.M. Briber, G.W. Rubloff, R.D. Miller, "Material Characterization and the Formation of Nanoporous PMSSQ Low-K Dielectric", 2003 International Conference on Characterization and Metrology for ULSI Technology, March 24-28, 2003, Austin, TX, USA
24. G.Y. Yang[‡], R.M. Briber, E.Huang, P.M. Rice, W. Volksen, R.D. Miller, "Formation and Characterization of Ultra-low Dielectric Materials Using TEM and SANS", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 85, 18-19 (2001)
23. S.I.Yun^{*}, R.M. Briber, R.A. Kee, M. Gauthier, "Small Angle Neutron Scattering of Arborescent Graft Poly(styrene)-Poly(2-vinylpyridine) Polymers", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 85, 224-225 (2001)
22. D.L. Ho[‡], R.M. Briber, C.J. Glinka, "Studies on Organically Modified Clays using Scattering Techniques", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, Spring 2000, San Francisco, 82, 268-9 (2000)
21. Kumar S.K., Jones R.L.[†], Ho D.L.^{*}, Briber R.M., Russell T.P., "Phase Behavior of Thin Film Polymer Blends", *Abstracts of Papers of the American Chemical Society*, 216, 213 (1998)
20. J. Cheng[‡], D.I. Bigio and R.M. Briber, "Devolatilization of Solid Filled Polymeric Materials: Batch Experiments with Newtonian and Viscoelastic Matrices," *24th Soc. of ABM Conference*, Philadelphia, PA, Oct, 1-2 (1995)
- 19 J. Cheng[‡], D.I. Bigio and R.M. Briber, "Devolatilization of Filled Polymeric Materials," *Polymer Processing Society Conference*, Akron, Ohio, Nov. 14-16 (1995)
18. B.J. Bauer, B. Hammouda, J.D. Barnes, R.M. Briber, D.A. Tomalia, "SANS and SAXS from Solutions of Large Dendrimer Molecules", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 74, 706(1994)
17. X. Liu^{*}, B.J. Bauer, R.M. Briber, "Conformation of Linear Chains Trapped in a Network", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 74, 576(1994)

16. B.J. Bauer, B. Hammouda, R.M. Briber, D.A. Tomalia, "Small Angle Neutron Scattering from Solutions of Large Dendrimer Molecules", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 69, (1993)
15. R.M. Briber, B.J. Bauer, B. Hammouda, D.A. Tomalia, "SANS from Solutions of Dendrimer Molecules: Intermolecular Interactions", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 67, (1992)
14. B.J. Bauer, R.M. Briber, B. Hammouda, D.A. Tomalia, "SANS from Solutions for Dendrimer Molecules: Intramolecular Interactions", *Proceedings of the American Chemical Society, Polymeric Materials: Science and Engineering*, 67, (1992)
13. R.M. Briber, E. Gholz, S. Wu, "Image Analysis of the Late Stages of Phase Separation in Polymer Blends", *Proceedings of the American Chemical Society, Polymer Preprints*, 33(1), 775(1992)
12. R.M. Briber, B.J. Bauer, "Thermodynamics and Small Angle Scattering of Crosslinked Polymer Mixtures", *Proceedings of the American Chemical Society, Polymer Preprints*, 33(1), 344(1992)
11. R.M. Briber, B.J. Bauer, "Thermodynamics of Complex Polymer Systems", *Physics News* 1991, published by the American Institute of Physics
10. B.J. Bauer, R.M. Briber, B. Dickens, "Studies of Grafted Interpenetrating Polymer Networks", *Proceedings of the American Chemical Society, Polymer Preprints*, Sept. 1991
9. R.M. Briber, "Small Angle Neutron Scattering Studies of Crosslinked Polymer Blends", *Proceedings of the Polymer Science Society of Japan*, Fall meeting 1990
8. B.J. Bauer, R.M. Briber, "Small Angle Neutron Scattering of Studies of Grafted Interpenetrating Polymer Networks", *Proceedings of the American Chemical Society, Polymer Preprints*, 31, 578(1990)
7. M.A. Schen, R.M. Briber, J. Cline, "X-ray Analysis of a Liquid Crystal Phase Diacetylene Polymerization", *Proceedings of the American Chemical Society, Polymer Preprints*, 32, 290(1990)
6. R.M. Briber, "Microanalysis and Electron Energy Loss Spectroscopy of Polymers", *Proceedings of the Annual Meeting of the Electron Microscope Society of America*, 1987
5. R.M. Briber, "Electron Microscopy of Polymer Blends", *Proceedings of the Annual Meeting of the Electron Microscope Society of America*, 1987
4. B.J. Bauer, R.M. Briber, C.C. Han, "Small Angle Neutron Scattering Studies of Single Phase Interpenetrating Polymer Networks", *Proceedings of the American Chemical Society, Polymer Preprints*, 28(2), 169(1987)

3. R.M. Briber, F. Khoury, "The Phase Diagram and Morphology of Blends of PVF₂ and PEA, *Proceedings of the American Chemical Society, Polymer Preprints*, 26(2), 310(1985)
2. R.M. Briber, "The Identification and Characterization of Two Crystal Forms in MDI/BDO Based Polyurethanes by STEM, TEM and Microdiffraction", *Proceedings of the Electron Microscope Society of America*, 1982, p. 674, Presidential Scholarship Award Winning Paper
1. A.L. Chang, R.M. Briber, E.L. Thomas, "Morphological Studies of PPO-EO/MDI/BDO Based Segmented Urethanes", *Proceedings of the American Chemical Society, Polymer Preprints*, 22(2), 301(1980)

Invited Talks

- NIST, SURF Seminar, June 2018
- University of Massachusetts, Department of Polymer Science and Engineering, February 2016
- University of Delaware, Department of Materials Science and Engineering, October 2014
- Montgomery County CC, Germantown, MD November 2013
- 2013 NIST SURF Seminar Series, NIST, Gaithersburg, MD June 2013
- University of Connecticut, Department of Materials Science and Engineering February 2013
- Carnegie Mellon University, Institute of Materials Science and Engineering March 2013
- University of Maryland Distinguished Scholar-Teacher Lecture November 2012
- ACS National Meeting, San Diego, CA March 2012
- Naval Research Lab, Washington, DC October 2011
- 2011 NIST SURF Seminar Series, NIST, Gaithersburg, MD June 2011
- Joint Institute for Neutron Scattering Workshop, Oak Ridge National Lab, ORNL, May 2011
- GaTech MSE Department Seminar, Atlanta, GA November 2010
- Symposium Honoring Dr. F. Khoury, Univ. Akron, Akron, OH September 2010
- 2010 NIST SURF Seminar Series, NIST, Gaithersburg, MD June 2010
- Annual Meeting of the American Crystallographic Association, Knoxville, TN June 2008
- Plenary Talk, American Conference on Neutron Scattering, Santa Fe, NM May 2008
- NIST/Japan Workshop, NIST, Gaithersburg, MD, December 2007
- Materials Research Society, Boston, MA, November 2007
- National Institutes of Health, NICHD/NIH, Bethesda, MD, October 2006
- International Conference on Small Angle Scattering, Kyoto, Japan, July 2006
- International Conference on Neutron Scattering, Sydney, Australia, November 2005
- Advanced Photon Source Colloquium, Argonne National Lab, October 2005
- Small Angle Scattering Workshop, Army Research Lab, Aberdeen, MD, July 2005
- The Alan Lawley Seminar, Department of Materials Science and Engineering, Drexel University, January 2005
- NIST/University of Maryland Joint Symposium on Biotechnology, College Park, MD October 2004
- American Conference on Neutron Scattering, College Park, MD June 2004
- Princeton University, Department of Chemical Engineering, Princeton, NJ November 2003
- Naval Research Laboratory, Workshop on National User Facilities, Washington, DC October 2003

- NC State University, Department of Chemical Engineering, Raleigh, NC, January 2002
- American Chemical Society Local Chapter, North Carolina Polymer Group Raleigh, NC, January 2002
- Materials Research Society, Boston, Massachusetts, November 2001
- American Chemical Society, Chicago, IL, August 2002
- Advanced Metallization Conference Workshop, Montreal, Canada, September 2001
- IUPAC Macro2000, Warsaw, Poland, July 2000
- Virginia Tech, Dept. of Materials Science and Eng., Blacksburg, VA, March 2000
- Army Research Lab, Aberdeen, MD April 1999
- Institute for Physical Sciences, University of Maryland, December 1998
- National Academy of Sciences/National Research Council Committee on Developing a Federal Materials Facilities Strategy, Irvine CA, November 1998
- Howard University, Department of Chemistry, Washington, DC October 1998
- American Chemical Society Meeting in Nashville, TN September 1998
- NIST Center for Neutron Research Gaithersburg, MD, Short Course on Applications of Cold Neutrons, June 1998
- Materials Research Society Meeting, San Francisco, CA, March 1997
- Department of Chemical Engineering, Columbia University, New York, NY, September 1996
- Cold Neutron Research Facility, NIST, Gaithersburg, MD, Short Course on Applications of Cold Neutrons, June 1996
- University of Delaware, Department of Chemical Engineering, Newark, DE April 1996
- IBM Almaden Research Center, San Jose, CA February 1996
- Cold Neutron Research Facility, NIST, Gaithersburg, MD, Short Course on Applications of Cold Neutrons, August 1995
- American Physical Society, San Jose, CA March 1995
- Army Office of Research, Dendrimer Technology Workshop Research Triangle, North Carolina March 1995
- Materials Research Society, Boston, MA, November 1994
- Intense Pulsed Neutron Source, Argonne National Lab, Argonne, IL September 1994
- Exxon Research and Engineering, Annadale, NJ May 1994
- Reactor Radiation Division, National Institute of Standards and Technology, Gaithersburg, MD April 1994
- Chemical Physics Program, University of Maryland, College Park, MD January 1994
- Chemical Engineering Department, University of Maryland, College Park, MD February 1994
- Sandia National Laboratory, Albuquerque, NM September 1993
- Du Pont, Central Research, Wilmington, DE, October 1992
- American Chemical Society, Washington, D.C., August 1992
- NSF/CNRS U.S. France Workshop on High Performance Polymers, Annecy, France, June 1992
- American Chemical Society, San Francisco, CA, April 1992
- Queens College, Department of Physics, Flushing, NY, February, 1992
- North Carolina State University, Department of Materials Science and Engineering, Raleigh, NC, April 1991
- American Physical Society, Cincinnati, OH, March 1991
- Polymer Science Society of Japan, Nagoya, Japan, October 1990

- Cornell University, Department of Materials Science and Engineering, October 1990.
- Materials Research Society Meeting, Boston, MA, December 1989
- University of Chicago, James Franck Institute Colloquium, Chicago, IL, October 1989
- The Goodyear Tire and Rubber Company, Akron, OH, May 1989 PolymersWest Gordon Research Conference, Ventura, CA, January 1989
- University of Illinois, Department of Materials Science and Engineering, UrbanaChampaign, IL, September 1988
- Northwestern University, Department of Materials Science and Engineering, Evanston, IL, May 1988
- Electron Microscope Society of America, Annual Meeting, Baltimore, MD, August 1987
- Polymers West Gordon Research Conference, Santa Barbara, CA, January 1986
- American Chemical Society, Chicago, IL, September 1985
- Eastman Kodak Company, Rochester, NY, May 1985
- Electron Microscopy Workshop on Polymers, Sponsored by the Univ. of Mass. and JEOL USA, Boston, MA, June 1985
- Case Western Reserve University, Department of Macromolecular Science, Cleveland OH, May 1985
- Brown University, Department of Engineering, Providence RI, April 1985
- University of Minnesota, Department of Chemical Engineering and Materials Science, Minneapolis, MN, February 1985
- The Johns Hopkins University, Department of Materials Science, Baltimore, MD, February 1985
- Du Pont, Central Research, Wilmington, DE, November 1984
- Princeton University, Department of Chemical Engineering, Princeton, NJ, November 1984
- Rutgers University, Department of Mechanics and Materials Engineering, New Brunswick, NJ, October 1984

Contributed Talks

Approximately 2-3 contributed talks per year at national and international meetings.

Patents

superscript key: *: students under my direction; †: students not under my direction but with whom I worked closely; ‡: post-docs under my direction or with whom I worked closely; all other authors: collaborators.

“Nanoparticle Array with Tunable Nanoparticle Size and Separation”

Inventors: Woonjoo Lee*, Seung Yong Lee, Oded Rabin, Robert M. Briber, Xin Zhang†

Assignee University of Maryland

Patent No.: US 9,279,759 B2

Date of Patent: Mar.8, 2016

Fellowships, Prizes and Awards

Neutron Scattering Society of America, Award for Exceptional Service Award, June 2018

Neutron Scattering Society of America, Fellow (elected 2014)

University of Maryland Distinguished Scholar-Teacher AY2012-13

American Physical Society, Fellow (elected 1995)

Department of Commerce Bronze Medal for “Contributions to the Understanding of Crosslinked Polymer Blends”, December 1990
Electron Microscope Society of America Presidential Student Scholarship, 1982

Editorships, Editorial Boards, and Reviewing Activities for Journals

Editorial Board Member, *Emergent Materials* (10/2018 to present)

The journal *Emergent Materials* is a multidisciplinary peer-reviewed journal published by Springer, which publishes reviews, mini reviews, communications, progress reports, research news and original research articles at the forefront of physics, chemistry, biology, and engineering of advanced materials.

Editor, *Journal of Polymer Science –Polymer Physics Edition* (1/99-01/07)

The *Journal of Polymer Science –Polymer Physics Edition* is one of the top 3 archival polymer journals for publication of high quality research results. The editorial office at The University of Maryland run by R.M. Briber processes about 150 manuscripts per year. There are 3 other editorial offices for the journal. This involves receiving the initial manuscripts, sending the manuscripts out for review (generally 2 independent reviews), evaluating the reviews, requesting and evaluating author responses to the review, re-review if necessary, acceptance of the articles and forwarding on to the publisher (Wiley Interscience).

Reviewer for the archival journals: *Macromolecules*, *Physical Review Letters*, *Science*, *Journal of Chemical Physics*, *Polymer*, *Polymer Engineering and Science*. Typically I review 10-12 papers per year for these journals.

Conferences Organized

Local Organizer, *8th Design and Engineering of Neutron Instruments Meeting (DENIM VIII)*
Bethesda, Maryland September 2019. This is a 4-day workshop with about 100 participants

Co-Organizer, ASEE Engineering Research Council Annual Meeting, 2017, 2018, 2019 in Washington DC, March each year. This is an annual workshop organized by the Board of Directors of the ASEE Engineering Research Council with about 100 participants

Local Organizer, *American Conference on Neutron Scattering*, College Park, MD, June 2018. This is an international conference with about 400 participants

Co-Organizer, *19th Mid-Atlantic Soft Matter Workshop* at the University of Maryland, February 2018. This is 1-day workshop with about 100 participants

Co-Organizer, *ASEE Engineering Research Council Annual Meeting*, Arlington, VA, March 2018. This is a 3-day meeting for Engineering Research Deans with about 100 participants

Co-Organizer, *International Workshop on Sample Environment at Scattering Facilities* in Gettysburg, PA, September 2016, Organizing Committee, This is a 4-day workshop with about 80 participants

15th Mid-Atlantic Soft Matter Workshop at the University of Maryland, July 2015. 1-day workshop with about 100 participants

University of Maryland / NIST Center for Neutron Research *Workshop on Neutron Measurements for Materials Design and Characterization* in Potomac, MD, August 2014. This is 2-day workshop with 100 participants

University of Maryland / NIST Center for Neutron Research Neutron Day at the University of Maryland, October 2014. This is ½-day workshop with about 100 participants held

9th Mid-Atlantic Soft Matter Workshop at the University of Maryland, July 2012. This is a 1-day workshop with about 100 participants

International Organizing Committee, *9th meeting of the Ionizing Radiation and Polymers Symposium*, (IRaP 2010) at the University of Maryland, October 2010

International Advisory Committee, *International Conference on Neutron Scattering*, Knoxville, TN May 2009

General Chair, *American Conference on Neutron Scattering*, College Park, MD June 2004. This is an international conference with about 500 participants.

First American Conference on Neutron Scattering, Knoxville, TN, June 2002. This is an international conference which had ~400 participants. It was the first time the conference was run and it is now run every two years.

Soft Materials and Structural Biology Breakout Session at the SNS Users Meeting, May 2000, Washington, DC

SNS LWTS Polymers, Colloids & Biology Workshop, April 2000 at University of Maryland, College Park, MD

Morphological Control of Multiphase Polymer Mixtures, MRS Fall 1996 meeting, Boston, MA

Session Chair at 2-3 conferences per year, typically APS, ACS, MRS and Gordon Conferences

Professional Elected Offices

Member of the ASEE Engineering Research Council Board of Directors 2017-2021

Neutron Scattering Society of America, President 2002-2005

Neutron Scattering Society of America, Vice President 1999-2002

Member-at-Large to the Executive Committee of the Division of Polymer Physics, American Physical Society, 1999-2002

Professional Memberships

American Physical Society (Fellow of the APS)

Neutron Scattering Society of America (Fellow of the NSSA)

Materials Research Society
American Chemical Society
Biophysical Society

Professional Committee Memberships

- Review of the Instrument Suite for SANS/Reflectometry at the Spallation Neutron Source (SNS) and High Flux Isotope Reactor (HFIR) January 2017
- DOE BESAC Subcommittee on Facility Upgrades April 2016
- NIST Center for Neutron Research Program Advisory Committee, member 2014-2017
- DOE-BES Review Panel at the LBNL Materials Science Division 2014
- Oak Ridge National Lab Neutron Scattering Science Review Committee Member 2007 to 2014
- DOE UTenn/ORNL EPSCoR Review Committee 11/2009
- NIST Center for Neutron Research Program Advisory Committee, member 1999 to 2004
- University of Chicago Review Committee for the Intense Pulsed Neutron Source at Argonne National Laboratory 1997, 1999, 2001
- Large Length Scales Working Group, Spallation Neutron Source, Oak Ridge National Lab, Dept. of Energy, November 1998
- Basic Energy Science Advisory Committee Review of the High Flux Isotope Reactor at Oak Ridge National Lab, October 1998
- Scheduling Committee, American Physical Society, Division of High Polymer Physics March Meeting, 1994-1998
- Los Alamos -Argonne National Laboratory Pulsed Neutron Source Program Advisory Committee 1993-1997 (Chair 1996-97)
- Society of Plastics Engineers (SPE) Research Award Committee, 1994-1997
- American Physical Society Division of High Polymer Physics Nominations Committee
- NASA Microgravity Research Review Panel for Polymers, 1995, 1997

Grants and Contracts

PI or Co-PI	Project Title	Funding Source	Inclusive Dates	Total Funding	Fraction RMB Responsible
PI w/I. Takeuchi, J. Paglione, E. Rodriguez (co-PIs)	University of Maryland / NIST Center for Neutron Research Joint Program for the Advancement of Neutron Scattering and Spectroscopy	NIST	9/1/2015 – 8/31/2020	\$11,497,655	85%
PI w/I. Takeuchi, J. Paglione, S. Raghavan (co-PIs)	NIST Center for Neutron Research / University of Maryland Center for the Advancement of Neutron Scattering	NIST	7/1/2012 - 6/30/2017	\$11,287,704	97% (3% in subcontract with JHU)
Co-PI (Dr. Tim Foecke PI)	Integrated Computational Materials Engineering Development of Carbon Fiber Composites for Lightweight Vehicles	Ford	06/01/2014 to 05/31/2018	\$800,000	3%
PI	Neutron Spectroscopy and Scattering for Applications in Materials Science, Condensed Matter Physics and Chemistry	NIST	10/1/2010 – 9/30/2015	\$14,999,059	97% (3% in subcontract with JHU)
PI w/ S. Raghavan, P. Kofinas, D. Fushman, M. Ouyang (co-PIs)	MRI: Acquisition of a Small Angle X-Ray Scattering System for the Characterization of Nanoscale Structures (funding is 70% NSF, other 30% is matching from UMD)	NSF	9/01/2012 - 8/31/2014	\$345,800	20% (RMB is responsible for final purchase decision)
PI	Characterization of Material Properties Related to Service Life for Polymer Based Systems Used in the Infrastructure Industry	NIST	10/1/2012-9/30/2014	\$324,501	100%
Co-PI w/ E. Williams (co-PI) & D. Lathrop (PI)	ARRA: NIST Measurement Science and Engineering Fellowship Program	NIST (Recovery Funds)	1/1/2010 - 12/31/2012	\$15,000,000	33%
PI	Research and Scattering using Cold Neutrons for Macromolecular Science, Condensed Matter Physics, Chemistry and Nanoscience	NIST	9/01/2007 - 8/31/2012	\$10,000,135	94% (6% in subcontract with JHU)
PI	Defect Control for Self-Assembly of Block Copolymer Nanostructures for Nanomanufacturing	NIST	8/1/2007 - 7/31/2011	\$361,100	100%
PI (with S. Hutcheson co-PI)	Understanding the Influence of Solvent Systems on the Crystallinity of Cellulose	MIPS	2/1/2010 - 1/31/2011	\$47,054	50%
PI	IPA Assignment of Dr. Richard Ibberson to NIST - NCNR	NIST	7/20/2009 - 7/19/2011	\$200,115	0% - all funds to support Assoc. Research Sci. Dr. R. Ibberson
co-PI with I. Lloyd	Ultra Small Scale Mechanical Properties Measurement	NIST	10/1/2006 - 12/31/2009	\$90,000	50%
Co-PI with L. Martinez-Miranda, H. Bruck, R. Bonenberger, J.	NSF CCLI Course, Curriculum and Laboratory Improvement Award for Microscale Mechanical Properties	NSF	9/1/2004 - 8/31/2006	\$167,307	10%

PI or Co-PI	Project Title	Funding Source	Inclusive Dates	Total Funding	Fraction RMB Responsible
Cardenas (PI)					
PI	Spectroscopy and Scattering using Cold Neutrons for Applications in Materials Science, Condensed Matter Physics and Chemistry	NIST	7/1/2005 - 6/30/2010	\$15,277,743	100%
Co-PI, Subcontract from CalTech	NMR IMR-MIP: DANSE - Distributed Data Analysis for Neutron Scattering	NSF	6/26/2006 - 5/31/2011	\$1,239,873	100% (funds are subcontract at UMD)
PI	High Resolution Cold Neutron Spectroscopy and Scattering for Applications in Materials Science and Chemical Physics	NIST	9/1/2000- 8/31/2005	\$9,806,417	93% (7% in subcontracts with JHU and Notre Dame)
Co-PI with G. Oehrlein, main PI, (UMD)	Characterization of Surface and Structure Modification of Nanoporous Low K Materials	SRC	2/1/2002- 8/31/2005	\$375,000	20%
PI	Structural Characterization of Ultra-low Dielectric Constant Materials	IBM	4/01/1999 - 3/31/2002	\$186,000	100%
Co-PI with J. Quintiere, main PI, (UMD) & T. Kashiwagi, (NIST)	Flame Retardancy of Polymer Nanocomposites	FAA	6/1/2002- 5/31/2005	\$428,000	21%
Co-PI w/ Taner Yildirim, NIST	Investigation of Novel Electronic and Structural Properties of Cubane	NSF	3/15/1998- 2/29/02	\$28,332	5%
PI	Characterizing Microstructure of Coating Materials	NIST	7/15/2000- 6/14/2001	\$99,288	100%
PI	High Resolution Cold Neutron Spectroscopy and Scattering for Applications in Materials Science and Chemical Physics	NIST	9/01/1997- 8/31/2001	\$3,413,536	100%
PI	Characterization of Roughness and Defects in Model Systems and Thin Dielectric Films Using Optical Scattering Metrology	NIST	7/15/1998- 7/14/1999	\$90,090	100%
PI	Interfacial Phenomena of Thin Film of Crosslinked Polymers	Exxon Foundation	12/15/1995 - 10/31/1997	\$20,000	100%
Co-PI with L. Martinez (UMD)	Acquisition & Dev of X-Ray Instrumentation for Characterization of Nanostructured Materials	NSF	9/1/1996- 8/31/1997	\$202,000	35%
Co-PI with D. Bigio, PI, (UMD)	Continuous Processing of Composite Propellants	NSWC	12/15/1995- 3/15/1998	\$201,000	25%
PI	Phase Separation in Crosslinked Polymer Blends	PRF -ACS	1/1/1996- 8/31/1996	\$20,000	100%
Co-PI with E. Magrab, main PI, (UMD)	Preparing Engineers for Manufacturing in the 21st Century	NSF	1/1/1995- 12/31/1995	\$1,000,000	5%

PI or Co-PI	Project Title	Funding Source	Inclusive Dates	Total Funding	Fraction RMB Responsible
PI	High Resolution Neutron Scattering and Advanced Materials Characterization	NIST	9/1/1994-8/31/1997	\$2,425,536	100%
PI	Characterization of Low Dielectric Foams for Microelectronics	IBM	3/01/1995-2/29/1996	\$48,000	100%
PI	Control of Phase Separation in Polymer Blends	Sandia Nat. Lab	05/30/1995-05/31/1996	\$38,000	100%
PI	Small angle Neutron and X-ray Scattering	NIST	1/15/1993-5/14/1995	\$214,436	100%
Co-PI w/ N. Beck-Tan (student)	NDSEG Student Fellowship Program (grad student support)	Army	6/1/93-5/31/94	\$46,091	100%

Teaching and Advising

Recent Courses and Evaluations

Calendar Year	Spring Semester			Fall Semester		
	Course Title	# of Students	Eval	Course Title	# of Students	Eval
2015	ENMA499 Senior Laboratory Project*	3	NA*	ENMA150 Materials of Civilization (An I-Series Course)	73	3.21
2014	ENMA620 Polymer Physics	12	3.45/ 4.00	ENMA150 Materials of Civilization (An I-Series Course)	78	3.44/ 4.00
2013	ENMA620 Polymer Physics	21	3.46/ 4.00	ENMA150 Materials of Civilization (An I-Series Course)	80	3.37/ 4.00
2012	Not teaching			ENMA150 Materials of Civilization (An I-Series Course)	80	3.18/ 4.00
				ENMA688 Seminar in Materials Science and Engineering**	15	3.26/ 4.00
2011	ENMA620 Polymer Physics	7	3.85 / 4.00	ENMA150 Materials of Civilization (A Marquee Course in Sci and Tech)	65	3.11/ 4.00
2010	ENMA499 Senior Laboratory Project*	3	N/A*	ENMA150 Materials of Civilization (A Marquee Course in Sci and Tech)	60	3.30 / 4.00
2009	Not teaching			ENMA150 Materials of Civilization (A Marquee Course in Sci and Tech)	79	3.07 / 4.00
2008	ENMA620 Polymer Physics	12	3.72 / 4.00	ENMA150 Materials of Civilization (A Marquee Course in Sci and Tech)	58	3.29 / 4.00
2007	ENMA620 Polymer Physics	15	3.23 / 4.00	ENMA150 Materials of Civilization (A Marquee Course in Sci and Tech)	54	3.21 / 4.00
2006	ENMA688 Seminar in MSE**		N/A**	ENMA423 Manufacturing with Polymers	12	3.25 / 4.0
	ENMA499 Senior Laboratory Project*	2	N/A*	ENMA499 Senior Laboratory Project*	2	N/A

*ENMA499 Senior Laboratory Project is an independent study lab project course by permission and does not get student evaluations

**ENMA688 Seminar in MSE is the general weekly Department Colloquium required of all graduate students for 3 semesters

Course Information

ENMA150 *Materials of Civilization*

Materials have played such an important role that scholars have named periods of history after them, including the Stone Age, the Bronze Age and the Iron Age. This course covers the basic concepts of the field of materials science and outline the role materials have played through history from the earliest uses of metals to advanced materials for nanotechnology. The course has a range of take-home materials projects on shape memory alloys, super-absorbent polymers, emphasizes group work with a class-wide poster presentation at the end of the semester and uses guest lecturers with expertise in areas such as materials for implants, forensic metallurgy of the Titanic, materials science in the collapse of the World Trade Towers and materials science issues in art conservation at the Smithsonian. The importance of advances in materials to the development of civilization can be summarized in a pair of quotes:

“Those who dominate materials, dominate technology.” - Tadahiro Sekimoto, Past President of NEC

“A civilization is both developed and limited by the materials at its disposal.” - Sir George Paget Thomson, FRS, Nobel Laureate 1937

ENMA150 was one of the original courses developed as part of the Marquee Courses in Science and Technology (<http://www.marqueecourses.umd.edu/>) that was used as the model for developing the I-Series courses for the current General Education program at the University.

ENMA620 *Polymer Physics*

This is a graduate level course that I have developed and taught approximately once a year since I have been at the University. Over the course of the past 10 years the course has evolved through 3 textbooks and a more integrated use of the web. Currently all course materials are distributed on-line through www.ajconline.umd.edu. This course has also moved from being an elective within the graduate curriculum to a core course (core courses are classes which are a required part of the graduate curriculum). Currently Materials graduate students are required to complete 4 of 5 core courses with a GPA of 3.5 or better.

ENMA661 *Kinetics of Reactions in Materials*

This is a core course in the graduate curriculum in the Materials Science program. The course covers the fundamentals of nucleation, phase separation and diffusion. All course materials are distributed through www.ajconline.umd.edu.

ENES100 *Introduction to Engineering Design*

This is a well established course in the College and required of all freshmen in the College of Engineering. I was involved for a number of years when the course was first being introduced at the College wide level and worked with Prof. Regan (Chemical Engineering) in planning projects and developing course materials. I was a co-author on a number of the early editions of the textbook used:

“Introduction to Engineering Design” Text for ENES 100, T.M. Regan, R. M. Briber, J.W. Dally, W.W. Destler, J.M. Fines, W.L. Fournay, L.L. Gasner, W.G. Lawson, P.A. Minderman, Jr., F.W. Mowrer, C.C. Stevens, C.D. Striffler, R. Windblade, McGraw-Hill, NY, 1996, 1995, 1994, ISBN: 0-07-052198-0

ENES230/ENMA300 *Introduction to Materials Science*

This a course which is required by students in Materials Science and Chemical Engineering programs. It is generally taken at the sophomore level but many students defer the course till later

years. I have only taught this course once but I strove to keep the course lively with alternating chalkboard lecturing and overhead transparency. The students often complain that this course is boring with too much time spent on details and not enough on “the big picture”. To counter this I worked hard to balance the textbook material with examples from engineering on why the concepts being presented (in a rather abstract manner) were relevant. I also made extensive use of demonstrations and the world wide web through www.ajconline.umd.edu. Finally I used guest lecturers in this course to reinforce the concept of engineering ethics. Ethics, although required by ABET, are not routinely covered in most curriculum and ENES 230 was a logical course to address the topics for sophomore level students.

Honors289J *Understanding Materials Science*

This is a course I organized for the University Honors Program. I took responsibility for the course and taught about 70%. The other 30% of the course was taught by Professors Wuttig and Christou. The course was designed to present the world of engineering materials to non-science majors. The course focused on the impact of the materials on the development of society throughout history. It also included 3 field trips, one to Bethlehem Steel (steel making), one to Northrup Grumman (advanced materials/ceramics) and one to Adell Plastics (plastics processing).

ENMA310 *Experimental Methods in Materials Science*

This is the first of a 2 sequence undergraduate lab course which is required of all Materials Science and Engineering students. I taught this course 1 semester when Professor Martinez-Miraranda became ill. I took over the course 1 day before the start of the semester. I added 1 new lab and revamped 2 others in the course as well as utilizing the web site www.ajconline.umd.edu distribution of course materials.

ENMA423 *Manufacturing with Polymers*

This course was developed in conjunction with Prof. Bigio (Mechanical Eng.) and funded under a NSF grant from the Technology Reinvestment Program (PI: Prof. Magrab, Mechanical Engineering) with the goal of providing students with a manufacturing experience outside of the normal University environment and to introduce the concepts of polymer engineering using the techniques of anchor teaching and just-in-time learning in response to needs identified by both the instructor and by students. The course draws on advanced topics (often first treated at the graduate level) which include non-Newtonian fluid dynamics, polymer processing, laminar mixing theory, polymer characterization, polymer blends, etc. The students are expected to take aspects of the course which interest them and which are not formally presented and develop insight through outside reading, additional experiments, etc. under faculty guidance. The course is taught in collaboration with the engineering staff at Adell Plastics in Baltimore, MD and culminates in a the running of 2-3 day experiment at the Adell pilot plant using student developed design parameters. The layout of the course has been presented and published at the 1996 annual meeting of the American Society of Engineering Education (ASEE).

R.M. Briber, D.I. Bigio, J. Lochary; “Integration of Manufacturing into the Undergraduate Polymer Engineering Curriculum”, *Proceedings of the 1996 ABET Annual Conference on Innovation in Engineering Education*

ENMA499 *Senior Research Project*

This is an undergraduate research course where undergraduate students (generally junior and senior level) receive credit for working in the lab.

ENMA698E *Polymer Characterization Lab*

This is an advanced lab course I developed when I first came to the University. It covered the fundamentals polymer characterization through 5-6 labs. The initial teaching of this course took considerable effort due to the development of all the lab procedures and assembling of the materials and apparatus. It has not been taught in a number of years because of commitments to other required graduate courses (ENMA 620 and 661).

Graduate Students

Ph.D.

Ruiliang Bai, “Quantitative Study of Water Dynamics in Biomimetic Models and Living Tissue by NMR and MRI: Perspectives on Neuronal Activity”, Ph.D., Biophysics, co-advised with Dr. Peter Bassar (NIH), 2015

Slavica Grdanovska, “Characterization of Radiation Damage to a Novel Photonic Crystal Sensor”, Ph.D., Nuclear Engineering, co-advised with Dr. Tim Koeth and Dr. Eric Burgett (University of Idaho) 2015

Chanel Tissot, “Radiation-Grafted Fabrics for the Extraction of Uranium from Seawater”, Ph.D., Nuclear Engineering Graduate Program, co-advised with Dr. Mohamad Al-Sheikhly 2014

Chris Metting, “Characterization and Modeling of Off-Specular Neutron Scattering for Analysis of Two Dimensionally Ordered Structures”, Ph.D., Dept. of Materials Science and Engineering, 2011

Sang Hak Shin, “Thermodynamics and Structure of Polyethylene Oxide in Ethanol and Water Mixtures”, Ph.D., Dept. of Materials Science and Engineering, 2011, co-advised with Dr. Boualem Hammouda (NIST)

Brian Watson, “Processing of Cellulose for the Advancement of Biofuels”, Ph.D., Dept. of Materials Science and Engineering, 2011, co-advised with Profs. Steven Hutcheson and Isabel Lloyd

Ping-Yen Hsieh, “Lanthanide metal-Organic Framework Materials: Structure and Properties”, Ph.D., Dept. of Materials Science and Engineering, 2011, co-advised with Dr. Mark Green

Xin Zhang, “Synthesis and Characterization of Low Flammability Polymer/Layered Silicate Nanocomposites”, Ph.D., Dept. of Materials Science and Engineering, 2009

Wonjoo Lee, “Nanostructure Investigation In Polymer Solutions, Polymer Gels And Polymer Thin Films”, Ph.D., Dept. of Materials Science and Engineering, 2009

Hongxia Feng, “Suppression of Dewetting in Polymer Thin Films by Nanoparticles”, Ph.D., Dept. of Materials Science and Engineering, 2005

Seok-II Yun, “Characterization of Arborescent Polystyrene-graft-Poly (2-vinylpyridine) copolymers”, Ph.D., Dept. of Materials and Nuclear Engineering, 2002

Ken McDermott, "Mechanical Properties of Polyurethane Film Exposed to Solutions of Nonoxynol-9 Surfactant and Polyethylene Glycol", Ph.D., Dept. of Materials and Nuclear Engineering, Univ. of Maryland, 2002

Perez-Salas, Ursula, "Polystyrene Network-Network Interfaces: Adhesion and Interdiffusion", Chemical Physics Program, University of Maryland, 2000.

Choi, Sangwook, "Small Angle Neutron Scattering of Polymer Solutions and Blends", Ph.D., Dept. of Materials and Nuclear Engineering, University of Maryland, 1999.

Ho, Li-Te; "Polymer Chain Conformation and Thermodynamics in Confined Geometries", Ph.D., Dept. of Materials and Nuclear Engineering, University of Maryland, 1998

Liu, Xiaodu; "Phase Separation and Chain Conformation in Crosslinked Polymer Blends", Ph.D., Dept. of Materials and Nuclear Engineering, University of Maryland, 1995

Beck-Tan, Nora; "Reactive Compatibilization in Immiscible Polymer Blends", Ph.D., Dept. of Materials and Nuclear Engineering, University of Maryland, 1994

M.S.

Biswas, Saswati; "Morphology Study of Block Copolymer/Homopolymer Blends", M.S., Dept. of Materials and Nuclear Engineering, University of Maryland, 1995

Kai-Chi Lai, "Small Angle Neutron Scattering of Arborescent Graft Polymer in Solutions", M.S., Dept. of Materials Science and Engineering, 2004

Jennifer Shih; "Characterization of Iron Oxide Nanoparticles in Structural Silk-Elastin-like Protein Polymer", Department of Materials Science and Engineering, 2012