Chinedum Osuji

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Professional Preparation

• Cornell University, U.S.A.	Materials Science & Engineering	B.S. 1996
• M.I.T., U.S.A	Materials Science & Engineering	Ph.D. 2003
• Harvard University, U.S.A	Applied Physics	Postdoc 2005 –2007

Appointments

2012-present	Associate Professor of Chemical Engineering, Yale University
2007-2012	Assistant Professor of Chemical Engineering, Yale University
2006-2007	Research Scientist, Chemical Engineering, Yale University
2002-2005	Senior Research Scientist, Surface Logix Inc., Brighton MA

Research Interests

Polymer Science and Soft Matter : Structure, dynamics and functional properties of soft materials and complex fluids. Self-assembly of soft materials and nano-structures. Processing polymers to create functional materials and structures. Pattern formation in soft matter by novel application of external fields such as chemical surface forces, magnetic fields and periodic pressure gradients. Scattering methods to study structure and properties of soft matter. Rheological investigation of dynamics in complex fluids.

HONORS/AWARDS

- 2016 Yale Graduate School of Arts and Sciences Graduate Mentor Award
- 2016 YSEA Award for Advancement of Basic and Applied Science
- 2015 Hendrick C. Van Ness Award
- 2015 American Physical Society John H. Dillon Medal
- Lange Lectureship, Materials Department, UCSB, Feb. 2013
- 2015 National Academy of Engineering/von Humboldt Frontiers of Engineering Speaker
- Polymer Physics Gordon Research Conference, Invited Speaker, July 2014
- Polymers Gordon Research Conference, Invited Speaker, June 2013
- Office of Naval Research Young Investigator Award, 2012
- 3M Nontenured Faculty Award, 2012
- ACS PMSE Young Investigator Symposium Speaker, Aug. 2012
- AIChE Emerging Areas in Polymer Science Speaker, Oct 2012
- Dow Distinguished Lectureship, UCSB Materials Research Lab, Feb. 2011
- Macromolecular Materials Gordon Research Conference Invited Speaker, Ventura CA, Jan. 2011
- Yale Science and Engineering Association "Advancement of Basic Science" Award, 2016
- Yale College Arthur Greer Memorial Prize 2010
- National Science Foundation CAREER award, 2008.
- American Physical Society – 2001 Padden Award Finalist
- Omnova Polymer Science Award – MIT 2000
- PPST Fellowship - MIT 1996

PUBLICATIONS

108. "Aligned Molecules and Nanostructures for Efficient Organic and Hybrid Solar Cells." S. Huang, C. O. Osuji. *Submitted*.
107. "Directed Assembly of Hybrid Nanomaterials and Nanocomposites." S. Zhang, C. I. Pelligra, X. Feng, C. O. Osuji. *Accepted, Advanced Materials* (2017).
106. "Pathway-engineering for Highly-aligned Block Copolymer Arrays." Y. Choo, P. W. Majewski, M. Fukuto, C. O. Osuji, K. G. Yager. *Submitted*.
105. "Enhanced Antibacterial Activity Through the Controlled Alignment of Graphene Oxide Nanosheets." X. Lu, X. Feng, J. R. Werber, C. Chu, I. Zucker, J-H. Kim, C. O. Osuji, M. Elimelech. *Proceedings of the National Academy of Sciences*, **114** (46) E9793–E9801 (2017). doi:10.1073/pnas.1710996114
104. "Hexagonally Ordered Arrays of α-Helical Bundles Formed from Peptide-Dendron Hybrids." D. A. Barkley,Y. Rokhlenko, J. E. Marine, R. David, D. Sahoo, M. D. Watson, T. Koga, C. O. Osuji, J. G. Rudick. *Journal of the American Chemical Society*, **139** (44), 15977-15983 (2017). doi: 10.1021/jacs.7b09737.
103. "Photoresponsive and Magnetoresponsive Graphene Oxide Microcapsules Fabricated by Droplet Microfluidics." G. Kaufman, K. A. Montejo, A. Michaut, P. W. Majewski, C. O. Osuji. *ACS Applied Materials and Interfaces* doi: 10.1021/acsami.7b14448 (2017).
102. "Directing Block Copolymer Self-Assembly with Permanent Magnets: Photopatterning Microdomain Alignment and Generating Oriented Nanopores." M. Gopinadhan, Y. Choo, L. H. Mahajan, G. Kaufman, D. Ndaya, Y. Rokhlenko, R. M. Kasi, C. O. Osuji. *Molecular Systems Design & Engineering*, *In Press* (2017) doi:10.1039/C7ME00070G.
101. "Single crystals of a supramolecular discotic mesophase by directed self-assembly under orthogonal forces." X. Feng, K. Kawabata, M. G. Cowan, G. Dwulet, D. L. Gin, C. O. Osuji. *In preparation*.
100. "Improved Evaluation of Dispersant Efficacy in Colloidal Gels by Combined Surface Activity and Rheological Measurements." F. Khalkhal, A. Negi, J. Harrison, C. Stokes, D. Morgan, C. O. Osuji. *Langmuir* (2017). doi:10.1021/acs.langmuir.7b03343
99. "Elastic Sheets and Microcapsules Formed by Interfacial Assembly of a Bacterial Biofilm Protein." G. Kaufman, W. Liu, D. M. Williams, Y. Choo, M. Gopinadhan, N. Samudrala, E. Yan, L. Regan, C. O. Osuji. *Langmuir* (2017). doi: 10.1021/acs.langmuir.7b03226.
98. "Loss of Phospholipid Membrane Integrity Induced by Two-Dimensional Nanomaterials." I. Zucker, J. R. Werber, Z. S. Fishman, S. M. Hashmi, U. R. Gabinet, X. Lu, C. O. Osuji, L. D. Pfefferle, M. Elimelech. *Environmental Science & Technolgy Letters* **4** (10), 404–409 (2017) . doi: 10.1021/acs.estlett.7b00358
97. "Controlling Orientational Order in Block Copolymers Using Low Intensity Magnetic Fields." M. Gopinadhan, Y. Choo, K. Kawabata, G. Kaufman, X. Feng, X. Di, Y. Rokhlenko, L. H. Mahajan, D. Ndaya, R. M. Kasi, C. O. Osuji. *Proceedings of the National Academy of Sciences*, **114** (45), E9437–E9444 (2017). doi:10.1073/pnas.1712631114.
96. "Polymer nanosheets from supramolecular assemblies of conjugated linoleic acid - high surface area adsorbents from renewable materials." X. Feng, K. Kawabata, D. Whang, C. O. Osuji. *Langmuir* **33** (40), 10690–10697 (2017). doi: 10.1021/acs.langmuir.7b02467
95. "Optically Active Elastomers from Liquid Crystalline Comb Copolymers with Dual Physical and Chemical Crosslinks." L. Mahajan, D. Ndaya, M. Gopinadhan, P. Deshmukh, X. Peng, C. O. Osuji, R. Kasi. *Macromolecules*, **50** (15), 5929-5939 (2017). doi: 10.1021/acs.macromol.7b01157
94. "Smart cellulose nanofluids produced by tunable hydrophobic association of polymer grafted cellulose nanocrystals." Y-R. Lee, D. Park, S-K. Choi, M. Kim, H-S. Baek, J. Nam, C-B. Chung, C. O. Osuji, J-K. Kim. *ACS Applied Materials and Interfaces* **9** (36), 31095–31101 (2017). doi:10.1021/acsami.7b08783

93. "Highly Stiff Yet Elastic Microcapsules Incorporating Cellulose Nanofibrils." G. Kaufman, S. Mukhopadhyay, Y. Rokhlenko, S. Nejati, R. Boltyanskiy, Y. Choo, M. Loewenberg, C. O. Osuji. *Soft Matter*, **13**, 2733-2737 (2017). doi:10.1039/C7SM00092H
92. "Implications of Grain Size Variation in Magnetic Field Alignment of Block Copolymer Blends." Y. Rokhlenko, P. W. Majewski, S. R. Larson, P. Gopalan, K. G. Yager, C. O. Osuji. *ACS Macro Letters*, **6**, 404-408 (2017). doi: 10.1021/acsmacrolett.7b00036
91. "Highly Selective Vertically Aligned Nanopores in Sustainably Derived Polymer Membranes by Molecular Templating" X. Feng, K. Kawabata, G. Kaufman, M. Elimelech, C. O. Osuji. *ACS Nano*, **11** (4), pp 3911–3921 (2017). doi:10.1021/acsnano.7b00304
90. "Post-Fabrication Modification of Electrospun Nanofiber Mats with Polymer Coating for Membrane Distillation Applications". E. Shaulskya, S. Nejati, C. Boo, F. Perreaulta, C. O. Osuji, M. Elimelech. *Journal of Membrane Science*, **530**, 158-165 (2017). doi:10.1016/j.memsci.2017.02.025
89. "Multi-Scale Assembly of Polythiophene-Surfactant Supramolecular Complexes for Charge Transport Anisotropy." D. Bilger, A. Sarkar, C. Danesh, M. Gopinadhan, G. Braggin, J. Figueroa, T. Pham, D. Chun, Y. Rao, C. O. Osuji, M. Stefik, S. Zhang. *Macromolecules* **50** (3), 1047 (2017). doi:10.1021/acs.macromol.6b02416.
88. "Dual-Functionality Fullerene and Silver Nanoparticle Antimicrobial Composites via Block Copolymers Templates." K. Moor, C. O. Osuji, J. Kim, *ACS Applied Materials and Interfaces* **8** (49), 33583–33591 (2016). doi: 10.1021/acsami.6b10674
87. "Effect of Final Monomer Deposition Steps on Molecular Layer-by-Layer Polyamide Surface Properties." M. E. Tousley, D. L. Shaffer, J.-H. Lee, C. O. Osuji, M. Elimelech. *Langmuir*, **32** 10815-10823 (2016). doi:10.1021/acs.langmuir.6b02746
86. "Fabrication of modularly functionalizable microcapsules using novel protein-based technologies." A. C. Schloss, W. Liu, D. M. Williams, G. Kaufman, H. P. Hendrickson, B. Rudshteyn, L. Fu, H. Wang, V. S. Batista, C. O. Osuji, E. C. Y. Yan, L. Regan. *ACS Biomaterials Science and Engineering* **2** (11), 1856–1861 (2016) doi:10.1021/acsbiomaterials.6b00447
85. "Isomeric Effect Enabled Thermally Driven Self-Assembly of Hydroxystyrene-Based Block Copolymers." M. Kim, C. Kanimozhi, S. Larson, J. Choi, Y. Choo, D. Sweat, C. O. Osuji, P. Gopalan. *ACS Macro Letters* **5**, 833-838 (2016). doi:10.1021/acsmacrolett.6b00376
84. "Materials for Next-Generation Desalination and Water Purification Membranes." J. Weber, C. O. Osuji, M. Elimelech. *Nature Reviews Materials* 16018 (2016).doi:10.1038/natrevmats.2016.18
83. "Rapid fabrication of ZnO nanorod arrays with controlled spacing by micelle-templated solvothermal growth." C. Pelligra, K. Toth, H. Hu, C. O. Osuji. *Nanoscale* **8**, 149-156 (2016). doi:10.1039/C5NR07914D
82. Guided Evolution of Bulk Metallic Glass Nanostructures: A Platform for Designing 3D Electrocatalytic Surfaces. G. Doubek, R. C. Sekol, J. Li, E. Moy, S. Nejati, W. C. Reid, M. Carmo, M. Linardi, E. Kinser,Y. Liu, C. O. Osuji, J. Schroers, S. Mukherjee, A. D. Taylor. *Advanced Materials* (2016) doi:10.1002/adma.201504504
81. "Strong orientational coupling of block copolymer microdomains to smectic layering revealed by magnetic field alignment." M. Gopinadhan, Y. Choo, C. O. Osuji. *ACS Macro Letters*, **5**, (3) 292-296 (2016). doi:10.1021/acsmacrolett.5b00924 . [pre-print arXiv:1509.02961]
80. "Rheology of cellulose nanofibrils in the presence of surfactants." N. Quennouz, S. Hashmi, H-S. Choi, J. W. Kim, C. O. Osuji. *Soft Matter* **12**, 157-164 (2016). doi:10.1039/C5SM01803J
79. "Thin polymer films with continuous vertically aligned 1-nm pores fabricated by soft confinement." X. Feng, S. Nejati, M. G. Cowan, M. E. Tousley, B. R. Wiesenauer, R. D. Noble, M. Elimelech, D. L. Gin, C. O. Osuji. *ACS Nano* (2016). doi:10.1021/acsnano.5b06130
78. "Sequential deposition of block copolymer thin films and formation of lamellar heterolattices by electrospray deposition." Y. Choo, H. Hu, K. Toth, C. O. Osuji. *Journal of Polymer Science Part B: Polymer Physics* **54** (2) 247-253 (2016). doi:10.1002/polb.23913

77. "Magnetic alignment of block copolymer microdomains by intrinsic chain anisotropy." Y. Rokhlenko, K. Zhang, M. Gopinadhan, S. R. Larson, P. W. Majewski, K. G. Yager, P. Gopalan, C. S. O'Hern, C. O. Osuji. *Physical Review Letters*, **115**, 258302 (2015). doi:10.1103/PhysRevLett.115.258302
76. "Phase Behavior of Polylactide Based Liquid Crystalline Brush-Like Block Copolymers." Y. Choo, L. H. Mahajan, M. Gopinadhan, D. Ndaya, . Deshmukh, R. M. Kasi, C. O. Osuji. *Macromolecules*, **48** (22), 8315–8322 (2015). doi:10.1021/acs.macromol.5b02009
75. "Multiscale Patterning of a Metallic Glass using Sacrificial Imprint Lithography." J. P. Singer, C. I. Pelligra, N. Kornblum, Y. Choo, M. Gopinadhan, P. Bordeenithikasem, J. Ketkaew, S. F. Liew, H. Cao, J. Schroers, C. O. Osuji . Microsystems and Nanoengineering **1**, 15040 (2015). doi:10.1038/micronano.2015.40
74. "Selectivity and Mass Transfer Limitations in Pressure-Retarded Osmosis at High Concentrations and Increased Operating Pressures." A. P. Straub, C. O. Osuji, T. Y. Cath, M. Elimelech. *Environmental Science and Technology*, **49** (20), 12551-12559 (2015). doi:10.1021/10.1021/acs.est.5b01317
73. "Soft Microcapsules with Highly Plastic Shells Formed by Interfacial Polyelectrolyte-Nanoparticle Complexation." G. Kaufman, S. Nejati, R. Sarfati, R. Boltyanskiy, M. Loewenberg, E. R. Dufresne, C. O. Osuji. *Soft Matter* **11** 7478-7482 (2015). DOI:10.1039/C5SM00973A
72. "Experimental evidence for proposed transformation pathway from inverse hexagonal to inverse diamond cubic phase from oriented lipid samples." A. M. Squires, S. Akbar, M. Tousley, Y. Rokhlenko, J. P. Singer, and C. O. Osuji. *Langmuir* **31** (28), pp 7707–7711 (2015). doi:10.1021/acs.langmuir.5b01676
71. "Structural Diversity of Arthropod Biophotonic Nanostructures Spans Amphiphilic Phase-Space." V. Saranathan, A. Seago, A. Sandy, S. Narayanan, S. G. J. Mochrie, E. R. Dufresne, H. Cao, C. O. Osuji, R. Prum. *Nano Letters* **15** (6), 3735-3742, (2015). DOI:10.1021/acs.nanolett.5b00201
70. "Engineering flat sheet microporous PVDF films for membrane distillation." S. Nejati, C. Boo , C. O. Osuji, M. Elimelech. *Journal of Membrane Science* **492**, 355-363 (2015). DOI:10.1016/j.memsci.2015.05.033
69. "Continuous and Patterned Deposition of Functional Block Copolymer Thin Films Using Electrospray." H. Hu, K. Toth, M. Kim, P. Gopalan, C. O. Osuji. *MRS Communications* **5**, 235-242, (2015). DOI: 10.1557/mrc.2015.37
68. "The microfluidic nebulator: Production of amorphous nanoparticles by supersonic spray drying." E. Amstad, M. Gopinadhan, C. Holtze, C. O. Osuji, M. P. Brenner, F. Spaepen, D. A. Weitz. *Science* **349** (6251), 956-960, (2015). doi:10.1126/science.aac9582
67. "Elements Give a Clue: Nanoscale Characterization of Thin-Film Composite Polyamide Membranes." X. Lu, S. Nejati, Y. Choo, C. O. Osuji, J. Ma, M. Elimelech. *ACS Applied Materials & Interfaces* **7** (31), 16917-16922 (2015). DOI: 10.1021/acsami.5b05478
66. "Nanoscale Size Effects in Crystallization of Metallic Glasses." Y. Jung, S-W. Sohn, C. O. Osuji, J. Schroers, J. Cha. *Nature Communications* **6**, 8157 (2015). DOI:10.1038/ncomms9157
65. "Physical Continuity and Vertical Alignment of Block Copolymer Domains by Kinetically Controlled Electrospray Deposition." H. Hu, Y. Choo, X. Feng, C. O. Osuji. *Macromolecular Rapid Communications* **36**, 1290-1296 (2015). DOI: 10.1002/marc.201500099
64. "Domain Orientation in Bulk Block Copolymers." M. Gopinadhan, C. O. Osuji. Encyclopedia of Polymeric Nanomaterials (Springer-Verlag Berlin Heidelberg) *Encyclopedia of Polymeric Nanomaterials (Springer-Verlag Berlin Heidelberg).* (2015). DOI: 10.1007/978-3-642-36199-9_81-1
63. "Shear accelerated crystallization in a supercooled atomic liquid." Z. Shao, J. P. Singer, Y. Liu, Z. Liu, H. Li, M. Gopinadhan, C. S. O'Hern, J. Schroers, C. O. Osuji. *Physical Review E* **91**, 020301(R) (2015). DOI: 10.1103/PhysRevE.91.020301

62. "Nanoimprinting Sub-100 nm Features in a Photovoltaic Nanocomposite using Durable Bulk Metallic Glass Molds." J. P. Singer, M. Gopinadhan, Z. Shao, A. D. Taylor, J. Schroers, C. O. Osuji. *ACS Applied Materials and Interfaces* **7** (6), 3456–3461 (2015). DOI: 10.1021/am507368g
61. "Mesenchymal Stromal Cells form Vascular Tubes when Placed in Fibrin Sealant and Accelerate Wound Healing in Vivo."J. J. Mendez, M. Ghaedi, A. Sivarapatna, S. Dimitrievska, Z. Shao, C. O. Osuji, D. M. Steinbacher, D. J. Leffell, L. Niklason. *Biomaterials* **40**, 61-71 (2015). DOI: 10.1016/j.biomaterials.2014.11.011
60. "Use of the Gabor Filter for Edge Detection in the Analysis of Zinc Oxide Nanowire Images." B. E. Scanley, T. E. Sadowski, C. I. Pelligra, M. E. Kreider, C. O. Osuji. *Microscopy and Microanalysis* **20** (S3), 830-831 (2014). DOI: 10.1017/S143192761400587X
59. "Scalable Fabrication of Polymer Membranes with Vertically Aligned 1-nm Pores by Magnetic Field Directed Self-Assembly." X. Feng, M. E. Tousley, M. G. Cowan, B. R. Wiesenauer, S. Nejati, Y. Choo, R. D. Noble, M. Elimelech, D. L. Gin, C. O. Osuji. *ACS Nano* **8** (12), 11977–11986 (2014). DOI: 10.1021/nn505037b
58. "Omniphobic Membrane for Robust Membrane Distillation." S. Lin, S. Nejati, C. Boo, Y. Hu, C. O. Osuji, M. Elimelech. *Environmental Science & Technology Letters* **1** (11), 443-447 (2014). DOI: 10.1021/ez500267p
57. "Aligned Nanostructured Polymers by Magnetic Field Directed Self-Assembly of a Polymerizable Lyotropic Mesophase." M. E. Tousley, X. Feng, M. Elimelech, C. O. Osuji. *ACS Applied Materials and Interfaces* **6** (22), 19710-19717 (2014). DOI: 10.1021/am504730b
56. "The Role of HF in Oxygen Removal from Carbon Nanotubes: Implications for High Performance Carbon Electronics." X. Li, J-S. Huang, S. Nejati, S. Huang, C. O. Osuji, N. Hazari, A. Taylor. *Nano Letters* **14** (11), 6179–6184 (2014) DOI: 10.1021/nl502401c (2014).
55. "Rational Design of a Block Copolymer with a High Interaction Parameter." D. P. Sweat, M. Kim, S. R. Larson, J. W. Choi. Y. Choo, C. O. Osuji, P. Gopalan, *Macromolecules* **47** (19) 6687-6696 (2014). DOI: 10.1021/ma501597g
54. "Single-step microfluidic fabrication of soft monodisperse polyelectrolyte microcapsules by interfacial complexation." G. Kaufman, R. Boltyanskiy, S. Nejati, A. R. Thiam, M. Loewenberg, E. R. Dufresne, C. O. Osuji, *Lab on a Chip* **14** (18), 3494-3497 (2014). DOI: 10.1039/C4LC00482E.
53. "Morphology Development in Thin Films of a Lamellar Block Copolymer Deposited by Electrospray." H. Hu, J. P. Singer, C. O. Osuji. *Macromolecules* **47** (16), 5703–5710 (2014). DOI: 10.1021/ma500376n
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51. "Thermally Switchable Aligned Nanopores by Magnetic-Field Directed Self-Assembly of Block Copolymer Domains." M. Gopinadhan, P. Deshmukh, Y. Choo, P. W. Majewski, O. Bakajin, M. Elimelech, R. M. Kasi, C. O. Osuji. *Advanced Materials* **26** (30), 5148-5154 (2014). DOI: 10.1002/adma.201401569.
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49. "Scalable high-fidelity growth of semiconductor nanorod arrays with controlled geometry for photovoltaic devices using block copolymers." C. I. Pelligra, S. Huang, J. P. Singer, A. T. Mayo, R. R. Mu, C. O. Osuji. *Small* **10** (21), 4304-4309 (2014). DOI: 10.1002/smll.201400956
48. "Molecular Design of Liquid Crystalline Brush Block Copolymers for Magnetic Field Directed Self-Assembly: A Platform for Functional Materials." P. Deshmukh, M. Gopinadhan, Y. Choo, S. Ahn, P. W. Majewski, S. Y. Yoon, O. Bakajin, M. Elimelech, C. O. Osuji, R. M. Kasi. *ACS Macro Letters* **3**, 462-466 (2014). doi:10.1021/mz500161k.

47. "Directed Self-Assembly of Block Copolymers: A Tutorial Review of Strategies for Enabling Nanotechnology with Soft Matter." H. Hu, M. Gopinadhan, C. O. Osuji. *Soft Matter*, **10** (22), 3867-3889 (2014). doi:10.1039/C3SM52607K
46. "Hybrid Pressure Retarded Osmosis – Membrane Distillation System for Power Generation from Low-Grade Heat: Thermodynamic Analysis and Energy Efficiency." S. Lin, N. Y. Yip, T. Y. Cath, C. O. Osuji, M. Elimelech. *Environmental Science & Technology* **48** (9), 5306-5313 (2014). doi:10.1021/es405173b.
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43. "Monoliths of Semiconducting Block Copolymers by Magnetic Alignment." H. Tran, M. Gopinadhan, P. W. Majewski, R. Shade, V. Sheffes, C. O. Osuji, L. M. Campos. *ACS Nano* **7** (6), p. 5514-5521 (2013). doi:10.1021/nn401725a.
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41. "Large Area Vertical Alignment of ZnO Nanowires in Semiconducting Polymer Thin Films Directed by Magnetic Fields." C. I. Pelligra, P. W. Majewski, C. O. Osuji. *Nanoscale* **5** 10511-10517 (2013). doi:10.1039/C3NR03119E.
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39. "Understanding anisotropic transport in self-assembled membranes and maximizing ionic conductivity by microstructure alignment" P. Majewski, M. Gopinadhan, C. O. Osuji. *Soft Matter* 9 (29), p. 7106-7116 (2013). doi:10.1039/C3SM50320H.
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19. "Structure, Function, and Self-Assembly of Single Network Gyroid (I4132) Photonic Crystals in Butterfly Wing Scales". V. Saranathan, C. O. Osuji, S. G. J. Mochrie, H. Noh, S. Narayanan, A. Sandy, E. R. Dufresne, and R. Prum. *Proceedings of the National Academy of Sciences* **107**, 11676 (2010). DOI:10.1073/pnas.0909616107
18. "Dynamics of a colloidal glass during stress-mediated structural arrest." A. S. Negi, C. O. Osuji. *Europhysics Letters*, **90**, 28003 (2010). DOI:10.1209/0295-5075/90/28003
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16. "Alignment of Self-Assembled Structures in Block Copolymer Films by Solvent Vapor Permeation." C. O. Osuji. *Macromolecules* **43** p. 3132-3135 (2010). DOI: 10.1021/ma100066e.
15. "Facile Alignment of Amorphous Poly(ethylene oxide) Microdomains in a Liquid Crystalline Block Copolymer Using Magnetic Fields: Towards Ordered Electrolyte Membranes." M. Gopinadhan, P. W. Majewski, C. O. Osuji., *Macromolecules* **43** p.3286-3293 (2010). DOI:10.1021/ma9026349
14. "Controlled Alignment of Lamellar Lyotropic Mesophases by Rotation in a Magnetic Field." P. W. Majewski, C. O. Osuji. *Langmuir* **26** 8737-8742 (2010). DOI:10.1021/la100285j

13. "Dynamics of Internal Stresses and Scaling of Strain Recovery in an Aging Colloidal Gel." A. Negi and C. O. Osuji. *Phys. Rev. E.* **80**, 010404(R) (2009). DOI: 10.1103/PhysRevE.80.010404
12. "Non-degenerate magnetic alignment of self-assembled mesophases." P. W. Majewski, C. O. Osuji. *Soft Matter*. **5**, 3414 (2009). DOI:10.1039/b910705c
11. "New Insights on Fumed Colloidal Rheology – Shear Thickening and Vorticity Aligned Structures in Flocculating Dispersions" A. S. Negi and C. O. Osuji, *Rheol. Acta* **48**, 8, 871-881 (2009). DOI: 10.1007/s00397-008-0341-9.
10. "Shear Thickening and Gel Elasticity in a Colloidal System with Attractive Interactions." C. O. Osuji, C. Kim, D. A. Weitz. *Phys. Rev. E.* **77** 060402 (2008). DOI:10.1103/PhysRevE.77.060402
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8. "Supramolecular Microphase Separation in a Hydrogen Bonded Liquid Crystalline Comb Copolymer in the Melt State." C. O. Osuji, C. Y. Chao, C. K. Ober and E. L. Thomas. *Macromolecules* **39**, 3114-3117, 2006. DOI: 10.1021/ma052547+
7. "Alignment of Self-Assembled Hierarchical Microstructure in Liquid Crystalline Diblock Copolymers Using High Magnetic Fields." C. O. Osuji, P. Ferreira, G. Mao, C. K. Ober, J. B. Vander Sande and E. L. Thomas. *Macromolecules* **37**, 9903-9908, 2004. DOI: 10.1021/ma0483064
6. "Orientational switching of mesogens and microdomains in hydrogen-bonded side-chain liquid-crystalline block copolymers using AC electric fields." C-Y Chao, C. O. Osuji, X-F Li, C. K. Ober and E. L. Thomas. *Advanced Functional Materials*, **14** (4), 364-370, 2004. DOI: 10.1002/adfm.200305159
5. "Temperature Dependent Photonic Bandgap in a Self-Assembled Hydrogen Bonded Liquid Crystalline Diblock Copolymer." C. O. Osuji, C-Y. Chao, I. Bita, C. K. Ober and E. L. Thomas. *Advanced Functional Materials*,**12**, 753-758, 2002. DOI: 10.1002/adfm.200290003
4. "Understanding and controlling the morphology of styrene-isoprene side group liquid crystalline diblock copolymers." C. O. Osuji, J. T. Chen, G. P. Mao, C. K. Ober and E. L. Thomas. *Polymer*, **41**, 8897-8907, 2000. DOI: 10.1016/S0032-3861(00)00233-0
3. "Structure development in side group liquid crystalline diblock copolymers." C. O. Osuji, J. T. Chen, G. P. Mao, C. K. Ober and E. L. Thomas. In Morishima Y, Norisuye T, Tashiro K, editors. *Molecular Interactions and Time-Space Organization in Macromolecular Systems*, Berlin: Springer, 1999. P. 9-28.
2. "Transverse cylindrical microdomain orientation in an LC diblock copolymer under oscillatory shear." C. O. Osuji, Y. M. Zhang, G. P. Mao, C. K. Ober and E. L. Thomas. *Macromolecules* **32**, 7703-7706, 1999. DOI: 10.1021/ma991155y
1. "Effect of the monomer ratio on the strengthening of polymer phase boundaries by random copolymers." C. A. Dai, C. O. Osuji, K. D. Jandt, B. J. Dair, C. K. Ober, E. J. Kramer and C. Y. Hui. *Macromolecules* **30**, 6727-6736, 1997. DOI: doi:10.1021/ma960543m

PATENTS

1. "Polymeric Composites Having Oriented Nanomaterials and Methods of Making the Same." USPTO Patent# 8,748,504.

PRESENTATIONS

"Structure and Properties of Smectic Mesophases Confined to Block Copolymer Microdomains." Chinedum Osuji, Christopher K. Ober (Cornell University), Edwin L. Thomas (MIT). American Physical Society Meeting, Division of High Polymer Physics. Los Angeles, March 1998.

"Structure Development in Side Group Liquid Crystalline Diblock Copolymers." Chinedum Osuji, Christopher K. Ober (Cornell University), Edwin L. Thomas (MIT). American Physical Society Meeting, Division of High Polymer Physics. Atlanta, March 1999.

"Hydrogen-bonded Side-chain Liquid Crystalline Block Copolymers: Tunable PBG Materials." Chinedum O. Osuji (MIT), Chiyang Chao (Cornell University), Christopher K. Ober (Cornell University), Edwin L. Thomas (MIT). Ski-hut Seminar on Self Assembled Polymers. Ithaca NY, January 2000.

"Morphology of Covalent and Hydrogen Bonded Side Group Liquid Crystalline Block Copolymers: Orientation by Oscillatory Shear and Device Applications." Chinedum O. Osuji (MIT), Chiyang Chao (Cornell University), Christopher K. Ober (Cornell University), Edwin L. Thomas (MIT) American Physical Society Meeting, Division of High Polymer Physics. Minneapolis, March 2000.

"Covalent and Hydrogen Bonded Liquid Crystalline Mesophases in Block Copolymer Microdomains - Controlling Hierarchical Structures for Photonic Applications." Chinedum O. Osuji (MIT), Chiyang Chao (Cornell University), Christopher K. Ober (Cornell University), Edwin L. Thomas (MIT) American Physical Society Meeting, Division of Polymer Physics. Seattle, March 2001.

"Periodic Stresses and Shear Thickening in an Attractive Colloidal Gel." Chinedum O. Osuji (Harvard) and David A. Weitz (Harvard). American Physical Society Meeting, Division of Fluid Dynamics, Denver March 2007.

"Shear thickening and gel elasticity in a colloidal system with attractive interactions." Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). International Soft Matter Conference, Aachen, Germany Oct 2007

"Shear Thickening in an Attractive Colloidal System - Gel Elasticity, Internal Stresses and Shear Induced
Structures." **(invited)** Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). Rheophysics Meeting, ESPCI, Paris France, January 2008.

"Shear Thickening, Gel Elasticity and Internal Stresses in a Colloidal System with Attractive Interactions." Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). American Physical Society Meeting, Division of Fluid Dynamics, New Orleans March 2008.

"Shear thickening in an attractive colloidal system - scaling of the gel elasticity and dynamics of shear induced structures " **(invited)** Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). National Institute of Standards and Technology, Gaithersburg MD, May2008.

"Shear Thickening in An Attractive Colloidal System - Gel Elasticity, Internal Stresses and Shear Induced Structures" Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). American Chemical Society, Colloids and Surface Science Symposium, Raleigh NC, June 2008

"Dynamics of transient vorticity-aligned structures and internal stresses in shear thickening colloidal gels" Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). Society of Rheology/International Congress on Rheology, Monterey CA, August 2008

"Shear Thickening in Fumed Colloidal Suspensions - Scaling of the Gel Elasticity and Dynamics of Shear Induced Structures" **(invited)** Chinedum O. Osuji (Yale) and David A. Weitz (Harvard). North American Thermal Analysis Society, Atlanta GA, August 2008.

"Shear Thickening and Shear Induced Structures in Colloidal Dispersions - New Insights on Attractively Interacting Systems" **(invited)**. Chinedum O. Osuji, Ajay S. Negi. Department Seminar, Dep't. of Chemical Engineering, Colombia University, New York, NY., October 2008.

"Influence of Binding Strength on the Structure of Supramolecular Polymer-Surfactant Complexes" AIChE meeting, Philadelphia PA. November 2008.

"Influence of Flow Quench Rate on the Internal Stress and Aging Dynamics of a Repulsive Colloidal Glass" American Physical Society, Pittsburgh PA. March 2009.

"Rheology of Attractive Colloidal Gels and Repulsive Colloidal Glasses: New Insights on Shear Thickening Behavior and Internal Stress Dynamics" Department Seminar, Physics, Georgetown University, Washington D.C. April 2009. **(invited)**

"Rheology of Colloidal Gels and Glasses." Chevron-Oronite Research Center, Richmond CA. May 2009.

"Facile Alignment of Non-Ionic Lyotropic Lamellar and Hexagonal Mesophases Using Magnetic Fields." ACS Colloids and Surface Science Symposium, New York, June 2009.

"Making Single Crystals of Mesostructured Soft Materials". National Organization of Black Chemists and Chemical Engineers Northeast Regional Meeting, MIT, Cambridge MA. October 2009

"Aging dynamics of a flow-quenched colloidal glass." Society of Rheology, Madison WI. October 2009

"Non-degenerate magnetic alignment of block copolymer and surfactant mesophases." Materials Research Society, Boston MA. December 2009.

"Stress Mediated Structural Arrest and Frequency Dependent Aging of Colloidal Suspensions." (poster) Gordon Research Conference on Colloids, Macromolecules and Polyelectrolytes in Solution, Ventura, Feb 2010.

"Facile Alignment of Amorphous Poly(ethylene oxide) Microdomains in a Liquid Crystalline Block Copolymer Using Magnetic Fields." American Physical Society, Portland OR, March 2010.

"Novel Nanomaterials and Mathematical Analysis for Ultra-High Efficiency Photovoltaic Systems: A New Paradigm in Solar Cells" (**invited**). MRS Panel discussion and presentation, San Francisco, April 2010.

"Evolution of Dynamic Viscoelastic Properties during Structural Arrest and Aging of Colloidal Glasses" (**invited**). ACS Colloids and Surface Science Symposium, Akron OH June 2010.

"Evolution of Dynamic Viscoelastic Properties during Structural Arrest and Aging of Colloidal Glasses" (**invited**). The Levich Institute, City College of New York, October 2010.

"Time resolved viscoelastic properties during structural arrest and aging of a colloidal glass." 82nd Meeting of the Society of Rheology, Santa Fe NM October 2010

"Directed Self-Assembly and Slow Dynamics in Soft Matter." (**invited**). Cabot Corp., Billerica MA, November 2010

"Magnetic Field Directed Self-Assembly of Soft Mesophases" (**invited**). Gordon Research Conference on Macromolecular Materials, Ventura Jan 2011.

"Magnetic Field Directed Self-Assembly of Soft Mesophases" (Dow **Distinguished Lecture, invited**). Materials Research Lab, UCSB Feb 2011.

"Rheological investigation of structural arrest and aging in repulsive colloidal glasses" (**invited**). ACS Colloids and Surface Science Symposium, Montreal Canada, June 2011.

"New Directions in Directed Self-Assembly of Block Copolymers and Polymer Nanocomposites." (**invited**) Department of Chemical Engineering Seminar, UMass-Amherst. September 2011.

"Rheological Studies of Kinetic Arrest and Aging in Colloidal Glasses." (**invited**). Lubrizol Corp., Cleveland OH, September 2011.

Department seminar: Polymer Program of the Institute of Materials Science, University of Connecticut-Storrs, Storrs CT, October 2011. (**invited**)

3M Corporation, Minneapolis MN, October 2011. (**invited**)

Polymer Advanced Materials Seminar Series, Polymer Science/Polymer Engineering at University of Akron, Akron OH November 2011. (**invited**)

49th New England Complex Fluids Workshop, Harvard University. Cambridge MA. Dec 4th, 2011 (**invited**).

Department seminar: Mechanical Engineering and Materials Science. Rice University, Houston TX. Jan 18th, 2012 (**invited**)

"In-situ SAXS observation of magnetic field effects on block copolymer ordering and alignment". American Physical Society, March 2012, Boston MA.

Department seminar, Chemical & Biomolecular Engineernig/ Center for Molecular & Engineering Thermodynamics, University of Delaware, Newark DE. March 8th, 2012 (**invited**)

Department seminar: Chemistry. Clark University, Worcester MA. March 15th, 2012. (**invited**)

ACS National Meeting, PMSE Polymer Award Session, San Diego CA. March 25th 2012 (**invited**)

Rigaku SAXS Users Workshop, Zurich Switzerland. June 13-14th 2012 (**invited**).

ACS National Meeting, PMSE Young Investigator's Symposium, Philadelphia PA. August 20th, 2012 (**invited**).

Department seminar: Physics, Tufts University. September 21st 2012 (**invited**)

AIChE National Meeting, Emerging Areas in Polymer Science & Engineering Plenary session. October 29th 2012. (**invited**).

AIChE National Meeting, Structure and Properties in Polymers. October 31st 2012. (**invited**).

Department seminar: Physics, Mt. Holyoke College, October 4th 2012 (**invited**).

Department seminar: Chemical and Biological Engineering, Princeton University, October 24th 2012 (**invited**).

Department seminar: Materials Science Program, University of Wisconsin-Madison.. November 8th 2012 (**invited**)

Department seminar: Chemical Engineering, University of Rochester, Rochester NY, December 4th 2012 (**invited**)

Polymer Science and Technology Seminar, Massachusetts Inst. Of Tech., Cambridge MA February 6th 2013 (**invited**).

Department seminar: Chemistry, University of Wisconsin-Madison. March 12th 2013 (**invited**).

Renewable and Sustainable Energy Institute/Department of Physics Condensed Matter Seminar Series:University of Colorado-Boulder. March 14th 2013 (**invited**).

American Physical Society, Invited session on Polymer Membranes for Clean Energy and Water, Baltimore, Maryland, March 18th 2013 (**invited**).

American Physical Society, Dillon Medal Symposium, Baltimore, Maryland, March 19th 2013.

Department seminar: Chemical and Biomolecular Engineering, University of California-Berkeley, Berkeley CA, April 10th 2013 (**invited**).

Department seminar: Materials Science and Engineering, Drexel University, Philadelphia PA, April 24th 2013 (**invited**).

Invited Speaker – Polymers ("Polymers East") Gordon Research Conference, June 2013

Invited speaker - Symposium on Particles, Colloids and Drops, ACS National Meeting, Indianapolis IN, September 2013.

Department seminar – Materials Science and Engineering, University of Michigan, Ann Arbor, MI, Sep 13th 2013

Department seminar – Physics, Fisk University, Nashville TN, October 21st 2013

Department seminar – Liquid Crystal Institute/Department of Chemical Physics, Kent State University, Kent OH, October 30th 2013

Department seminar – Materials Science and Engineering, University of Pennsylvania, Philadelphia PA, Nov 30th 2013

Invited speaker/participant – Telluride Science Research Conference on "Interfacial Phenomena in Nanostructured Materials and Devices." Telluride CO February 2-5, 2014.

Department seminar, Department of Chemical and Biomedical Engineering, FAMU-FSU College of Engineering, Tallahassee FL, April 16th 2014.

Invited speaker – University of Minnesota IPrime Workshop, May 27th 2014.

"Viscoelasticity of a colloidal gel during dynamical arrest: evolution through a critical gel state and comparison with a soft colloidal glass". 88th ACS Colloids and Surface Science Symposium, University of Pennsylvania, Philadelphia PA. June 22-25th 2014.

Invited speaker – Polymer Physics Gordon Research Conference, July 2014.

Department seminar, Department of Materials Science and Engineering, Renssalaer Polytechnic Institute, Troy NY. November 5th, 2014.

Division seminar (Materials Science and Engineering), National Institute of Standards and Technology, November 7th, 2014.

Department seminar, Polymer Science and Engineering, University of Massachusetts-Amherst, November 14th, 2014.

Department seminar, Department of Chemistry, University of Texas-Dallas, December 5th, 2014.

Department seminar, Chemical Engineering, California Institute of Technology, February 26th, 2015

Invited speaker – National Academy of Engineering and Alexander von Humboldt Foundation 2015 16th German-American Frontiers of Engineering Meeting, Potsdam, Germany, April 2015

Invited speaker – Telluride Science Research Center Workshop on Polymer Physics, June 2015

Department Seminar – Army Research Lab, Aberdeen MD, July 9th 2015

Van Ness Award Lecture – Rensselaer Polytechnic Institute, October 7th-8th 2015

Department Seminar – Department of Chemical Engineering, Clemson University. October 22nd 2015.

Invited speaker, Composites at Lake Louise, Alberta, Canada, November 10th 2015

Department Seminar – North Carolina State University MRSEC, November 19th 2015.

Invited speaker – 14th Pacific Polymer Conference, Kauai, HI, December 11th 2015

Department Seminar, Chemical and Biomolecular Engineering, University of Pennsylvania, January 27th 2016

Invited Participant, NSF Workshop on Grand Challenges in Soft Matter Experiment, Arlington VA, Jan 30-31st 2016

Department Seminar, Chemical and Biochemical Engineering, Brown University, April 12th, 2016

RISE Program Seminar, University of Puerto Rico, San Piedras. April 21-23rd 2016

Department Seminar, Center for Nanoscale Science and Technology, NIST, Gaithersburg MD. May 9th 2016

Squishy Physics Seminar, Weitz Research Group, Harvard University. May 11th 2016.

Department Seminars, Chemistry, School of Science, Xi'an Jiaotong University, Xi'an China. May 18th-25th 2016.

Department Seminar, Chemistry, Hanyang University, Korea. May 26th 2016.

Invited speaker – 7th Workshop on Materials Processing in Magnetic Fields, Brown University, June 15th 2016

Invited speaker, 90th ACS Colloid and Surface Science Symposium, Harvard University, Cambridge MA. June 5-8th 2016

Department Seminar, Chemical Engineering, Penn State University, State College, PA. September 8th 2016

Department Seminar, Chemical and Biological Engineering, University of Colorado-Boulder, Boulder, CO. September 15th 2016

Department Seminar, Chemical Engineering, Columbia University, New York NY, September 20th 2016

Department Seminar, Physics, New York University, New York NY, October 19th 2016

Department Seminar, Chemical Engineering, Louisiana State University, Baton Rouge LA October 21st 2016

Invited speaker, AIChE Annual Meeting, San Francisco CA, November 17th 2016

Department Seminar, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis MN, December 6th 2016.

NIST Workshop on Electron Microscopy, Gaithersburg MD. March 9th 2017

American Physical Society, New Orleans LA. March 14th, 2017

Department Seminar, Department of Chemical Engineering, University of Texas at Austin, Austin TX, April 11th 2017

Department Seminar, Department of Chemical Engineering and Materials Science, University of California-Irvine, Irvine, CA, April 21st, 2017

Department Seminar, Institute Nanoscience & Croygenics (INAC), CEA-Grenoble, France. June 19th 2017.

Invited Speaker, CECAM Rheology Workshop, Lyon, France. June 21st 2017.

ACS Colloids and Surface Science Symposium, CCNY New York, NY. July 12th 2017.

Invited seminar, Corning Inc., Corning NY. July 24th 2017

Plenary Lecture, Trends in Bio/Nanosciences: Energy, Environment, and Medicine (BINAEEM17) University of Puerto Rico, Rio-Piedras, October 2017 (cancelled).

Invited lecture, AIChE Meeting, Minneapolis MN, October 30th 2017: Plenary lecture in "Emerging Areas in Polymer Science and Engineering," Area 08A (Polymers), Materials Engineering & Sciences Division.

Invited lecture, AIChE Meeting, Minneapolis MN, October 31st 2017: Keynote lecture in "Particulate and Multiphase Flows: Colloidal and Granular Systems," Area 01J (Fluid Mechanics), Engineering Sciences and Fundamentals.