

EVANGELOS MANIAS

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Experience / Professional Appointments:

Professor	Materials Sci & Eng Dept	Penn State University	2010-
Associate Professor	Materials Sci & Eng Dept	Penn State University	2004-2010
Councilor	Polymer Sci & Eng Program	Penn State University	2003-2007
Endowed Assist. Prof.	Materials Sci & Eng Dept	Penn State University	2001-2004
Assistant Professor	Materials Sci & Eng Dept	Penn State University	1998-2001

Education / Professional Preparation:

Aristotle Univ of Thessaloniki; Greece	Physics	M.Sc.	17 Oct 1991
University of Groningen; The Netherlands	Chemistry	Ph.D.	17 Nov 1995
Cornell University, Ithaca, NY; USA	Materials Sci & Eng	Postdoc	1995-1998

Synergistic Activities:

- Member of Penn State's CDP (an NSF-U/IRC center: 2 seed and 2 full projects). Past member of PSU's NSF-MRSEC (IRG1), NSF-NSEC (seed), NSF-IGERT (CEMBA, two NSF fellows). PI/coPI in two NSF-NER & one NSF-NUE projects; PI of NSF-MWN.
- Supervised undergraduate students: MatSE senior theses [14], MatSE indep.studies [11]; Diversity & Minority Programs: WISER [7], SROP [3], REU [4].
- Industrial Outreach & Funding: PI of 32 industrial projects, (ca.\$2.8M: Sumitomo Chemical-JAPAN [2 projects]; Kraft Foods Global [11]; Oscar Mayer; Bayer Polymers, Bayer MaterialScience [3]; Coca-Cola; PolyK Tech; Air Products [2]; Saint-Gobain-USA [2]; Carmel Olefins-ISRAEL; International Fuel Cells; UTC; Eaton-Cooper).

Selected Honors & Awards:

- *Polymer Blends Handbook*, 2nd Ed. (Springer), Editor of Volume 2 of 3, 2013-15
- *Materials Letters* (Elsevier), Associate Editor, 2005-11; Editor, 2011-16
- *Materials Technology* (Maney), *Materials* (MDPI), Editorial Board, 2011-
- *J. Polym. Sci. B: Polym. Phys.* (Wiley), Guest Editor & Editorial Board, 2003
- *International Journal of Polymer Science* (Hindawi), Associate Editor, 2007-22
- *J. Functional Biomaterials* (MDPI), Guest Editor & Editorial Board, 2010-
- American Chemical Society, Chemistry of Materials 1k Club, 2015
- Distinguished Faculty Honors Program (DHFP), Schreyer College, PSU, 2013-16
- Distinguished Scholar in Nanotechnology of Materials, Kingdom of Saudi Arabia, 2012
- "Innovations in Nanotechnology" Award, National Academy of Spain & CSIC, 2008
- Amer. Physical Soc. (APS), Polymer Physics Prize, sponsored by JPSB/Wiley, 2006
- Associate Professor of Materials Science & Technology, U of Crete, Greece, 2006-08
- Faculty Fellow (CoBaSE), US National Academy of Engineering, 2005
- Faculty Fellow (SFFP at AFRL), US National Academies of Science, 2004
- "Virginia & Phillip Walker" Endowed Professorship, Penn State University, 2001-04
- Fellow, Dutton e-Education Institute, College of Earth & Mineral Sciences, 2004,'05,'06
- Gladys Snyder Teaching Award, College of Earth & Mineral Sciences, PSU, 2003
- Amer. Soc. of Composites, Div. of Polymer Matrix Composites Award, 2002
- Wilson Research Initiation Award, College of Earth & Mineral Sciences, PSU, 1999
- Invited Lecturer, Les Houches Ecole de Physique Theoretique, France, 1995
- Highest honours (*cum laude*) Ph.D., National Academy of Sciences, Netherlands, 1995
- Research Fellow, Dutch Institute of Technology (NWO-STW), The Netherlands 1991-95

Supervised Graduate Students

1. Jie Chen "Polymer mechanical properties at the nm scale: An AFM study", M.Sc. 2000
2. Sirilak Mennakanit "Inorganic filler development for use in nanocomposites", M.Sc. 2002
3. Kenneth Strawhecker "AFM studies of polymer/inorganic nanocomposites", Ph.D. 2003
4. Zhi-Ming Wang² "Synthesis of functional iPP and sPS and nanocomposites", M.Sc. 2003
5. Vikram Kuppa "Molecular modeling of PEO/inorganic nanocomposites", Ph.D. 2003
6. Zijie Lu³ "The nature of water in Nafion fuel cell H⁺-exchange membranes", Ph.D. 2005
7. Zhiming Wang² "Synthesis of functional PP and PVDF and nanocomposites", Ph.D. 2005
8. Sung-Woo Wee "PE-based nanocomposites: Crystallization behavior & AFM", M.Sc. 2006
9. Argyrios Karatrantos "Classical computer simulations of aqueous PEO solutions", M.Sc. 2006
10. Matt Heidecker "High-performance polymer/layered-silicate nanocomposites", Ph.D. 2007
11. Alexei Kisselev^P "Theoretical insights into stimuli-responsive polymers", Ph.D. 2007
12. Romesh Patel "Fundamental studies of the glass/polycarbonate interface", M.Sc. 2008
13. Theresa Foley "Design & syntheses of regioregular stimuli-responsive copolymers", Ph.D. 2008
14. Ponusa Songtipya⁴ "Antimicrobial functionalities of polymers nanocomposites", Ph.D. 2010
15. Daniel Lentz⁵ "Nanostructured Elastomers: LCs & noble-metal nanocomposites", Ph.D. 2010
16. Vivek Tomer⁶ "Polymer nanocomposites for electrical energy storage", Ph.D. 2010
17. Charles Hogshead "Tunable temperature-responsive tethered polymer gradients", Ph.D. 2010
18. Kiattikhun Manokruang "Tunable dual-stimuli (T- & pH-) responsive copolymers", Ph.D. 2010
19. Felipe Salcedo Galan "High-performance polyolefin-blend/inorganic composites", Ph.D. 2012
20. Bo Li "Nanocomposites with novel dielectric and mechanical behaviors", Ph.D. 2016

Visiting/Collaborating Graduate Students

Emily Hackett (Cornell U, 1998-2001), YK Chan (Cornell U, 1998-2000),
C Manzi-Nshuti (Ecole Nat.Super.Lille, France, 2008,09), C Nyambo (Marquette U, 2008),
MC Costache (Marquette U, 2006,07), S Donadi (U Padua, Italy, 2010-11).

Post-Doctoral Associates & Visiting Scientists

1. Lixin Wu "Mechanical properties polypropylene/clay nanocomposites", 1999-00
2. Vassilios Koutsos^V "AFM determination of Tg in polymers & polymer nanocomposites", 2003
3. Mindaugas Rackaitis "Synthesis and AFM of thermoresponsive polymer coatings", 2001-04
4. Jin Young Huh "Reactive nanofillers for epoxy/inorganic nanocomposites", 2001-04
5. Young-Kyu Chang "Synthesis of novel polymers for H⁺ conducting fuel cells", 2002-03
6. Hiroyoshi Nakajima^V "Synthesis and Properties of polyolefin/clay nanocomposites", 2002-04
7. Yang Jiang "Stretched PET/clay hybrids for bottling applications", 2002-03
8. Valentinas Snitka^V "CoBaSE: EFM studies of polymer nanostructures", 2004
9. George Polizos "Dynamics of nanoscopically confined polymers and liquids", 2004-08
10. Subhendu Chowdhury "PE and PP nanocomposite films for packaging applications", 2005-06
11. Amos Ophir^V "Polymer nanocomposites with a biodegradable character", 2006
12. Jinguo Zhang "Polymer/clay nanocomposites for food-packaging applications", 2006-08
13. Kostas S. Andrikopoulos "Spectroscopy of T- and pH- responsive copolymers", 2007-09
14. Lingbin Lu "Molecular Modeling of polymer/LDH nanocomposites", 2009-10
15. Glenna M. Malcolm⁴ "Antimicrobial functionality of nanoparticles & polymers", 2008-10
16. Charles Hogshead "Flame-retardant optically transparent nanocomposites", 2010-11
17. Panos Xidas "Thermoset/carbon-nanostructures conductive composites", 2011-14
18. Xingqing Su "Antimicrobial functionality of nanoclays and nanocomposites", 2014-15
19. Maryam Sarkarat "High-K polymers for electrical insulation & dielectrics", 2014-16
20. Bo Li "Nanocomposites of PE and EPDM as high-performance dielectrics", 2016-17
21. Yunghoon Park^V "Monte Carlo computer simulations of nanoparticle dispersions", 2017-18

^PPh.D. in Physics. ^VVisiting Scientist.

Co-advised by: ²TC Chung; ³DD Macdonald; ⁴MM Jimenez-Gasco; ⁵R Hedden; and ⁶CA Randall.
Member of 39 more Ph.D. & M.Sc. committees at Penn State.

Selected Publications _____ (from a total of 171; chronologically sorted¹)
Google Scholar (8/30/23) Total Citations: **18412**; h-Index: **57**; m-factor: **2.04**.

105. B. Li, C.A. Randall, E. Manias, "Polarization mechanism underlying strongly enhanced dielectric permittivity in polymer composites with conductive fillers", **Journal of Chemical Physics C**, *126*, 7596–7604 (2022).
104. B. Li, G. Polizos, E. Manias, "Interfacial effects on the dielectric properties of elastomer composites and nanocomposites", **Advances in Dielectrics**, doi:10.1007/978-3-030-89723-9_8, pgs.225-249 (2022).
103. B. Li, M. Sarkarat, A. Baker, C.A. Randall, E. Manias, "Interfacial effects on the dielectric properties of elastomer/carbon-black/ceramic composites", **MRS Advances**, *6*, 247-251 (2021).
102. B. Li, F. Salcedo-Galan, P.I. Xidas, E. Manias "Improving electrical breakdown strength of polymer nanocomposites by tailoring hybrid-filler structure for high-voltage dielectric applications", **ACS Applied Nano Materials**, *1*, 4401-4407 (2018).
101. B. Li, P.I. Xidas, E. Manias "High breakdown strength polymer nanocomposites based on the synergy of nanofiller orientation and crystal orientation for insulation and dielectric applications", **ACS Applied Nano Materials**, *1*, 3520-3530 (2018).
100. B. Li, P.I. Xidas, K.S. Triantafyllidis and E. Manias, "Effect of crystal orientation and nanofiller alignment on dielectric breakdown of polyethylene/montmorillonite nanocomposites", **Applied Physics Letters**, *111*, 082906 (2017).
99. B. Li, C.I. Camilli, P.I. Xidas, K.S. Triantafyllidis, E. Manias, "Structured polyethylene nanocomposites: effects of crystal orientation and nanofiller alignment on high field dielectric properties", **MRS Advances**, *2*, 363-368 (2017).
98. B. Li and E. Manias, "Increased dielectric breakdown strength of polyolefin nanocomposites via nanofiller alignment", **MRS Advances**, *2*, 357-362 (2017).
97. (*, †) E. Manias and L.A. Utracki "Thermodynamics of Polymer Blends", **Polymer Blends Handbook**, *1*, 171–289 (2014).
96. G. Polizos, R.A. Vaia, H. Koerner, E. Manias, "Dynamics of Amphiphilic Surfactants Confined in Montmorillonite Slits with Different Cation Exchange Capacities", **J. Physical Chemistry B**, *117*, 1366-13678 (2013).
95. Z. Matusinovic, R. Shukla, E. Manias, C.G. Hogshead, C.A. Wilkie "Polystyrene/MoS₂ and poly(methyl methacrylate)/MoS₂ nanocomposites with enhanced thermal stability", **Polymer Degradation and Stability**, *97*, 2481-2486 (2012).
94. V. Tomer, E. Manias, C. A. Randall "High field properties and energy storage in nanocomposite dielectrics of poly(vinylidene fluoride-hexafluoropropylene) [PVDF-HFP]" **J. Applied Physics**, *110*, 044107 (2011).
93. C.G. Hogshead, E. Manias, P. Williams, A. Lupinsky, P. Painter, "Studies of Bitumen-Silica and Oil-Silica Interactions in Ionic Liquids", **Energy & Fuels**, *25*, 293-299 (2011).
92. H.S. Muddana, R.R. Gullapalli, E. Manias, P.J. Butler, "Atomistic simulation of lipid and DiI dynamics in membrane bilayers under tension", **Phys. Chem. Chem. Phys.**, *13*, 1368-1378 (2011).
91. V. Tomer, G. Polizos, C. A. Randall*, E. Manias, "Polyethylene Nanocomposite Dielectrics: Implications of nanofiller orientation on high field properties and energy storage", **J. Applied Physics**, *109*, 074113 (2011).
90. X. Wang, R. Rathore, P. Songtipya, M.M. Jimenez Gasco, E. Manias, C.A. Wilkie, "EVA-Layered double hydroxide (nano)composites: Mechanism of fire retardancy", **Polymer Degradation and Stability**, *96*, 301-313 (2011).
89. G. Polizos, V. Tomer, E. Manias, C. A. Randall, "Epoxy-based nanocomposites for electrical energy storage, Part II: Nanocomposites with nanofillers of reactive montmorillonite covalently-bonded with barium titanate", **J. Applied Physics**, *108*, 074117 (2010).
88. V. Tomer, G. Polizos, E. Manias, C. A. Randall, "Epoxy-based nanocomposites for electrical energy storage, Part I: Effects of montmorillonite and barium titanate nanofillers", **J. Applied Physics**, *108*, 074116 (2010).

¹Added notations: * Prestigious or Review; †: Highly Cited Article Ψ: Featured on Cover of Journal.

87. K. Manokruang, E. Manias, "Hollow microspheres and aqueous phase behavior of pH-responsive poly(methyl methacrylate-co-methacrylic acid) copolymers with a blocky comonomer distribution", **Materials Letters**, *63*, 1144-1147 (2009).
86. E. Manias, J. Zhang, J.Y. Huh, K. Manokruang, P. Songtipya, M.M. Jimenez-Gasco, "Polyethylene Nanocomposite Heat-Sealants with a Versatile Peelable Character", **Macromolecular Rapid Communications**, *30*, 17-23 (2009).
85. Z. Lu, M. Lanagan, E. Manias, D.D. Macdonald, "Two-Port Transmission Line Technique for Dielectric Property Characterization of Polymer Electrolyte Membranes", **J. Physical Chemistry B**, *113*, 13551-13559 (2009).
84. Z. Lu, E. Manias, D.D. Macdonald, M. Lanagan, "Dielectric Relaxation in Dimethyl Sulfoxide/Water Mixtures Studied by Microwave Dielectric Relaxation Spectroscopy", **J. Physical Chemistry A**, *113*, 12207-12214 (2009).
83. L. Xu, H. Nakajima, E. Manias, R. Krishnamoorti, "Tailored Nanocomposites of Polypropylene with Layered Silicates", **Macromolecules**, *42*, 3795-3803 (2009).
82. C. Manzi-Nshuti, P. Songtipya, E. Manias, M.M. Jimenez-Gasco, J.M. Hossenlopp, C.A. Wilkie, "Polymer Nanocomposites using Zinc Aluminum and Magnesium Aluminum Oleate Layered Double Hydroxides: Effects of the Polymeric Compatibilizer and of Composition on the Thermal and Fire Properties of PP/LDH Nanocomposites", **Polymer Degradation & Stability**, *94*, 2042-2054 (2009).
81. C. Manzi-Nshuti, P. Songtipya, E. Manias, M.M. Jimenez-Gasco, J.M. Hossenlopp, C.A. Wilkie, "Polymer Nanocomposites using Zinc Aluminum and Magnesium Aluminum Oleate Layered Double Hydroxides: Effects of LDH divalent metals on dispersion, thermal, mechanical and fire performance in various polymers", **Polymer**, *50*, 3564-3574 (2009).
80. W.H. Awad, G. Beyer, D. Benderly, W.L. Ijdo, P. Songtipya, M.M. Jimenez-Gasco, E. Manias*, C.A. Wilkie*, "Material Properties of Nanoclay PVC Composites", **Polymer**, *50*, 1857-1867 (2009).
79. E. Manias*, J. Zhang, J.Y. Huh, K. Manokruang, P. Songtipya, M.M. Jimenez-Gasco, "Polyethylene Nanocomposite Sealants with a Peelable Character", **Macromol. Rapid Commun.**, *30*, 554 (2009).
78. J. Zhang, E. Manias*, G. Polizos, J.Y. Huh, A. Ophir, P. Songtipya, M.M. Jimenez-Gasco, "Tailored polyethylene nanocomposite sealants: Broad-range peelable heat-seals through designed filler/polymer interfaces", **J. Adhesion Sci. & Technology**, *23*, 709-737 (2009).
77. (*, Ψ) J. Zhang, E. Manias, C.A. Wilkie, "Polymerically modified layered silicates: An effective route to nanocomposites", **Journal of Nanoscience and Nanotechnology**, *8*, 1597-1615 (2008) [REVIEW].
76. C. Nyambo, P. Songtipya, E. Manias, M.M. Jimenez-Gasco, C.A. Wilkie, "Effect of MgAl-layered double hydroxide exchanged with linear alkyl carboxylates on fire retardancy of PMMA and PS", **J. Materials Chemistry**, *18*, 4827-4838 (2008).
75. V. Tomer, C. A. Randall, G. Polizos, J. Kostelnick, E. Manias, "High- and low-field dielectric characteristics of dielectrophoretically aligned ceramic/polymer nanocomposites", **J. Applied Physics**, *103*, 034115 (2008).
74. Z. Lu, G. Polizos, D.D. Macdonald, E. Manias, "State of water in perfluorosulfonic ionomer (Nafion 117) proton exchange membranes", **J. Electrochem. Soc.**, *155*, B163-B171 (2008).
73. (*, Ψ) E. Manias, "Nanocomposites: Stiffer by Design", **Nature Materials**, *6*, 9-11 (2007).
72. A.M. Kisselev, E. Manias, "Phase Behavior of Temperature-Responsive Polymers with Tunable LCST: An Equation-of-State Approach", **Fluid Phase Equilibria**, *261*, 69-78 (2007).
71. M.C. Costache, M.J. Heidecker, E. Manias, G. Camino, A. Frache, G. Beyer, R.K. Gupta, C.A. Wilkie, "The influence of carbon nanotubes, organically modified montmorillonites and layered double hydroxides on the thermal degradation and fire retardancy of polyethylene, ethylene-vinyl acetate copolymer and polystyrene", **Polymer**, *48*, 6532-6545 (2007).
70. M.C. Costache, M.J. Heidecker, E. Manias, R.K. Gupta, C.A. Wilkie, "Benzimidazolium Surfactants for Modification of Clays for Use with Styrenic Polymers", **Polym. Degradation & Stability**, *92*, 1753-1762 (2007).
69. M.C. Costache, M.J. Heidecker, E. Manias, C.A. Wilkie, "Preparation and characterization of poly(ethylene terephthalate)/clay nanocomposites by melt blending using thermally stable surfactants", **Polymers for Advanced Technologies**, *17*, 764-771 (2006).

68. M.C. Costache, D. Wang, M.J. Heidecker, E. Manias, C.A. Wilkie, "The thermal degradation of poly(methyl methacrylate) nanocomposites with montmorillonite, layered double hydroxides and carbon nanotubes", **Polymers for Advanced Technologies**, 17, 272-280 (2006).
67. E. Bernardo, P. Colombo, E. Manias, "SiOC glass modified by montmorillonite clays", **Ceramics International**, 32, 679-686 (2006).
66. (★, †) K. Efimenko, M. Rackaitis, E. Manias, A. Vaziri, L. Mahadevan, J. Genzer, "Nested self-similar wrinkling patterns in skins", **Nature Materials**, 4, 293-297 (2005).
65. F.M. Uhl, Q. Yao, H. Nakajima, E. Manias, C.A. Wilkie, "Expandable Graphite/ polyamide-6 nanocomposites." **Polymer Degradation and Stability**, 89, 70-84 (2005).
64. V. Kuppa, E. Manias, "Effect of Cation Exchange Capacity on the Structure and Dynamics of Poly(ethylene oxide) in Li+ Montmorillonite Nanocomposites." **J. Polym. Sci. B: Polym. Phys.**, 43, 3460-3477 (2005).
63. K. Efimenko, J.A. Crowe, E. Manias, D.W. Schwark, D.A. Fischer, J. Genzer, "Rapid formation of soft hydrophilic silicone elastomer surfaces", **Polymer**, 49, 9329-9341 (2005).
62. (†) Z.M. Wang, H. Nakajima, E. Manias, T.C. Chung, "Exfoliated PP/Clay Nanocomposites Using Ammonium-Terminated PP as the Organic Modification for Montmorillonite." **Macromolecules** 36, 8919-8922 (2003).
61. K. Strawhecker, E. Manias, "Crystallization Behavior of Poly(ethylene oxide) in the Presence of Na+ Montmorillonite Fillers" **Chemistry of Materials**, 15, 844-849 (2003).
60. Z.M. Wang, T.C. Chung, J.W. Gilman, and E. Manias, "Melt-Processable syndiotactic-Polystyrene/montmorillonite Nanocomposites." **J. Polym.Sci. B: Polym. Phys.** 41, 3173-3187 (2003).
59. R. Xu, E. Manias, A.J. Snyder, J. Runt, "Low permeability biomedical polyurethane nanocomposites" **J. of Biomedical Materials Research**, 64A, 114-119 (2003).
58. V. Kuppa, T.M.D. Foley, E. Manias "Segmental dynamics of polymers in nanoscopic confinements, as probed by simulations of polymer/layered-silicate nanocomposites" **Eur. Phys. J. E** 12, 159-165 (2003).
57. V. Kuppa, E. Manias "Dynamics of PEO in nanoscale confinements: A computer simulations perspective" **J. Chem. Phys.** 118, 3421-3429 (2003).
56. M. Kanchanasopa, E. Manias, J. Runt "Solid-State Microstructure of Poly(L-lactide) and L-lactide/Meso-lactide Random Copolymers by Atomic Force Microscopy (AFM)" **Biomacromolecules**, 4, 1203-1213 (2003).
55. (★, Ψ) V. Kuppa, S. Menakanit, R. Krishnamoorti, E. Manias "Simulation insights on the structure of nanoscopically confined poly(ethylene oxide)" **J. Polym.Sci. B: Polym. Phys.** 41, 3285-3298 (2003).
54. Z. Liang, M. Rackaitis, K. Li, E. Manias, Q. Wang "Micropatterning of Conducting Polymer Thin Films on Reactive Self-assembled Monolayers" **Chemistry of Materials**, 15, 2699-2701 (2003).
53. M. Rackaitis, K. Strawhecker, E. Manias "Water Soluble Polymers with Tunable Temperature-Sensitivity: Solution Behavior" **J. Polym. Sci. B: Polym. Phys.**, 40, 2339-2342 (2002).
52. J.Y. Dong, E. Manias, T.C. Chung "Functionalized syndiotactic polystyrene (s-PS) polymers prepared by the combination of Metallocene catalyst and Borane chemistry" **Macromolecules**, 35, 3439-3447 (2002).
51. Y. Lu, Y. Hu, Z-M. Wang, E. Manias, T.C. Chung "Synthesis of new amphiphilic diblock copolymers containing poly(ethylene oxide) and poly(α -olefin)" **J. Polym. Sci. A: Polym. Chem.** 40, 3416-3425 (2002).
50. E. Manias, J. Chen, X. Zhang "AFM study of Polymeric MEMS components with tunable stiffness", **Applied Physics Letters**, 79, 1700-1704, (2001.)
49. K. Strawhecker, E. Manias, "AFM studies of Poly(vinyl alcohol)/Clay Nanocomposites: Crystallization Behavior", **Macromolecules**, 34, 8475-8482 (2001).
48. (★, †, Ψ) E. Manias, A. Touny, L. Wu, K. Strawhecker, B. Lu, T.C. Chung "Polypropylene/ Montmorillonite Nanocomposites: A Review of Synthetic Routes and Materials Properties", **Chemistry of Materials**, 13, 3516-3523 (2001). [REVIEW]
47. H.J.M. Hanley, C.D. Muzny, D.L. Ho, C.J. Glinka, E. Manias, "A SANS study of organo-clay dispersions." **Int. Journal of Thermophysics**, 22, 1435-1448 (2001).

46. R. Xu, E. Manias, A.J. Snyder, J. Runt, "New Biomedical Poly(urethane urea)-Layered Silicate Nanocomposites", **Macromolecules**, *34*, 337-339 (2001).
45. (*) E. Manias, V. Kuppa "Computer simulations of intercalated PS: The origins of fast segmental dynamics in 2nm-thin confined polymers" **Eur. Phys. J. E**, *8*, 193-199 (2002).
44. V. Kuppa, E. Manias "Computer simulations of PEO/Layered-Silicate Nanocomposites: 2. Lithium Dynamics" **Chemistry of Materials**, *14*, 2171-2175 (2002).
43. E. Manias, V. Kuppa, D.B. Zax, D-K. Yang, "Dynamics of nano-confined Polystyrene: A Molecular modeling study" **Colloids & Surfaces A**, *187-188*, 509-521 (2001).
42. E. Manias, V. Kuppa, "Molecular Simulations of ultra-confined polymers: Polystyrene intercalated in layered silicates." **ACS Sympos. Ser. 804**, 193-207 (2001).
41. (†) E. Manias, H. Chen, R. Krishnamoorti, J. Genzer, E. J. Kramer, E. P. Giannelis, "Intercalation Kinetics of Long Polymers in 2 nm Confinements." **Macromolecules**, *33*, 7955-7966 (2000).
40. D. B. Zax, D.-K. Yang, R. A. Santos, H. Hegemann, E. P. Giannelis and E. Manias, "Dynamical Heterogeneity in Nanoconfined Poly(styrene) Chains; NMR spectroscopy", **J. Chem. Phys.** *112*, 2945-2951 (2000).
39. (*, †) E. Hackett, E. Manias, E.P. Giannelis, "Computer Simulation Studies of PEO/Layered-Silicate Nanocomposites", **Chemistry of Materials**, *12*, 2161-2167 (2000).
38. (*, †, Ψ) J.W. Gilman, C.L. Jackson, A.B. Morgan, E. Manias, E.P. Giannelis, M. Wuthenow, D. Hilton and S.H. Phillips "Flammability Properties of Polymer/Layered-Silicate Nanocomposites. Polypropylene and Polystyrene Nanocomposites." **Chemistry of Materials**, *12*, 1866-1873 (2000).
37. (*, †, Ψ) E. P. Giannelis, R. Krishnamoorti and E. Manias, "Polymer-Silicate Nanocomposites: Model Systems for Confined Polymers and Polymer Brushes," **Advances in Polymer Science**, *138*, 107-147 (1998). [REVIEW]
36. E. Hackett, E. Manias and E. P. Giannelis, "Molecular dynamics simulations of organically modified layered silicates." **J. Chem. Phys.** *108*, 7410-7415 (1998).
35. (*, †) K.E. Strawhecker, and E. Manias, "Structure and Properties of Poly(vinyl alcohol)/Na Montmorillonite Nanocomposites.", **Chemistry of Materials**, *12*, 2943-2949 (2000).
34. (*, †) S. H. Anastasiadis, K. Karatasos, G. Vlachos, E. P. Giannelis and E. Manias "Confinement-induced ultra-fast local dynamics in nanoscopically confined polymers", **Phys. Rev. Lett.** *84*, 915-919 (2000).
33. A. Subbotin, A. Semenov, G. Hadziioannou, G. ten Brinke, E. Manias, M. Doi "Theory of nonlinear dynamics of melted polymer layers." **Macrom.Sym.** *121*, 175-186 (1997).
32. (*, †, Ψ) E. Manias, G. Hadziioannou, G. ten Brinke, "Inhomogeneities in sheared ultra-thin lubricating films; NEMD simulations", **Langmuir**, *12*, 4587-4593 (1996). [REVIEW]
31. E. Manias, I. Bitsanis, G. Hadziioannou and G. ten Brinke, "On the nature of shear thinning in nanoscopically confined films." **Europhysics Letters**, *33*, 371-376 (1996).
30. E. Manias, G. Hadziioannou, G. ten Brinke, "Nanorheology of strongly confined oligomeric lubricants." **J of Computer Aided Materials Design**, *3*, 319-328 (1996).
29. A. Subbotin, A.N. Semenov, E. Manias, G. Hadziioannou and G. ten Brinke "Rheology of confined polymer melts under shear flow: strong adsorption limit." **Macromolecules** *28*, 1511-1515 (1995).
28. A. Subbotin, A.N. Semenov, E. Manias, G. Hadziioannou, and G. ten Brinke "Nonlinear rheology of melts under shear flow." **Macromolecules** *28*, 3898-3900 (1995).
27. E. Manias, A. Subbotin, G. Hadziioannou and G. ten Brinke, "Adsorption-desorption kinetics in nanoscopically confined oligomer films under shear." **Molecular Physics**, *85*, 1017-1036 (1995).
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Course	Enrollment	Elective (%)	Semester	Number of Resp. (%)	Overall Quality (1-7)	
					Course	Instructor
EMS100S (section 009)	22	0%	FA/22	59%	7 /6.5	7 /7.0
EMS100S (section 015)	21	0%	FA/22	53%	7 /7.0	7 /7.0
MatSE497 (NanoComposites)	11	100%	SP/22	37%	7 /6.5	7 /6.5
EMS100S (section 001)	20	0%	FA/21	50%	7.00	7.00
EMS100S (section 015)	18	0%	FA/21	61%	6.00	6.00
MatSE497 (Composites) [℞]	12	100%	SP/21	100%	℞7.00	℞7.00
EMS100S (section 008) [℞]	17	0%	FA/20	47%	℞6.50	℞7.00
EMS100S (section 013) [℞]	10	0%	FA/20	40%	℞5.50	℞6.00
MatSE497 (nanoMaterials) [℞]	17	100%	SP/20	53%	℞6.00	℞6.00
EMSC100S	22	0%	FA/19	93%	6.00	6.78
MatSE497 (Composites)	30	60%	SP/19	56%	5.12	5.29
MatSE597 (Composites)	5	100%	FA/18	(*)	(*)	(*)
MatSE497 (Composites)	35	50%	SP/18	37%	6.00	6.15
MatSE597 (Composites)	3	100%	FA/17	(*)	(*)	(*)
MATSE497 (Comp.w/Lab.)	14	100%	SP/17	36%	6.60	6.80
MatSE202	62	18%	SP/16	40%	5.64	5.64
e-MatSE202	84	60%	SP/16	29%	6.17	6.27
e-MatSE443 special off.&	14	&0%	FA/15	36%	&4.00	&4.00
MatSE597 (Simulations)	2	100%	FA/15	100%	7.00	6.50
MatSE202	40	10%	SP/15	43%	5.38	5.87
e-MatSE202	56	38%	SP/15	38%	5.62	5.84
MatSE202	62	17%	SP/14	47%	5.83	6.00
e-MatSE202	46	6%	SP/14	46%	6.00	6.26
e-MatSE443	39	90%	SP/14	41%	5.50	5.64

℞ Covid-Remote class (zoom lectures).

& Old-program students only: those who had failed the course before, but required it with C-or-better for graduation under the previous curriculum.

(*) Graduate students were integrated in the 497 offering of the following Spring semester.

Courses Taught _____ (**2000-2014**, incl. SRTE scores, where available)

Course	Enrollment	Elective (%)	Semester	Number of Resp. (%)	Overall Quality (1-7)	
					Course	Instructor
MatSE202	38	0%	SP/13	60%	5.70	6.39
e-MatSE443	52	87%	SP/13	37%	5.00	5.07
e-MatSE443	30	50%	SP/12	17%	5.00	6.25
MatSE447	10	0%	FA/12	40%	5.25	5.75
e-MatSE443	38	69%	SP/11	42%	5.63	5.60
MatSE447	20	22%	FA/11	40%	5.50	5.70
e-MatSE443	24	66%	SP/10	37%	5.75	5.75
MatSE447	11	0%	FA/10	80%	5.11	5.33
e-MatSE443	21	67%	SP/09	86%	6.29	6.79
MatSE447	12	8%	FA/09	66%	5.40	6.80
e-MatSE443	28	43%	SP/08	58%	6.00	6.33
MatSE597B (Simulations)	6	100%	FA/08	100%	7.00	7.00
ETY-451 (U.Crete)	82	0%	FA/07	N/A	N/A	N/A
e-MatSE443	34	65%	SP/07	77%	6.00	6.59
MatSE597A (AFM Lab.)	6	100%	SU/07	100%	7.00	7.00

MatSE597B (Simulations)	3	100%	FA/06	100%	7.00	7.00
e-MatSE443	30	82%	SP/06	57%	6.29	6.76
MatSE597D	10	100%	FA/05	70%	6.29	6.71
e-MatSE443	3	33%	SU/05	0%	–	–
e-MatSE443	39	62%	SP/05	33%	6.23	6.54
e-MatSE443	21	70%	SP/04	48%	6.30	6.80
MatSE597D	11	100%	FA/03	82%	6.67	6.78
MatSE443	33	56%	SP/03	100%	6.19	6.94
e-MatSE443	30	53%	SP/03	100%	5.82	6.47
MATSC597P (Prof. Develop.)	12	100%	FA/02	75%	6.44	6.44
PLMSE406	32	72%	SP/02	100%	6.03	6.69
PLMSE496	3	0%	SP/02	–	–	–
PLMSE494W	2	0%	SP/02	–	–	–
PLMSC597C	8	100%	FA/01	100%	6.13	6.63
MATSC597F (Polymer Physics)	12	100%	FA/01	100%	6.33	6.83
PLMSE494W	1	0%	FA/01	–	–	–
PLMSE406	33	62%	SP/01	64%	5.90	6.29
PLMSC597A	6	100%	FA/00	–	–	–
PLMSE406	41	high	SP/00	66%	5.37	5.78
... list truncated, prior courses (before 2000) available upon request						

Research Funding

US Federal Government

NSF DMR-9975624	\$212,564	“Development of an AFM and nanoindenter with a magnetically levitated tip” [1999-2001]
NIST-Fire SRP	\$227,997	“Mechanical Characterization and Flammability Studies of Novel High-Temperature Polymer/Silicate Nanocomposites” [2000-03]
NSF DMR-0079432	\$249,824	“Development of a 2D-FTIR/Dielectric Spectrometer for Materials Research” [2000-03] PI: PC Painter
DoE DE-FC04C02-A1-67608	\$480,000	“Novel Membranes for Use in High Temperature Proton Exchange Membrane Fuel Cells” [2001-03] PI: McDonald
NIST-Fire SRP	\$50,000	“Melt-Processing of syndio-PS Polymer/Silicate Composites” [2001-2003]
NSF CMMI-0209915	\$75,000	“NER: Microscopic Modeling of the Surfactant Mediated Reactive Assembly of Nanostructures” [2002-2003]
NSF EEC-0302163	\$100,000	“NUE: Creating Baccalaureate Level Nanotechnology Minors with Pathways From Existing Associate Degree Programs in U/G Education” [2003-04] PI: Fonash
National Academies	\$9,200	“Collaboration in Basic Science & Engineering: 2004 Project Development” [2004]
NSF CTS-0403268	\$129,993	“NER: Controlling transport of nanosized objects by substrate-grafted polymeric engines” [2003-04]
ONR EQ-N000140510614	\$462,132	“Design of Combinatorial Polymeric Substrates for Adsorption, Separation and Functional Assay of Biological Macromolecules” [2005-07]
NSF DMR-0602877	\$219,000	“MWN: Temperature and Chemical Responsive Polymer Surfaces. Towards the Molecular Design of Intelligent Materials” [2006-09]
USDA 2021-67017-33340	\$499,905	“Interaction of Food Constituents with Novel Metal Can Coatings”, PI: GR Ziegler [2021-23]

US Federal: Subcontracts or Center projects²

NSF MRSEC-0080019	\$32,000	IRG1-seed: “AFM investigations of glass fragility near surfaces” [2001-02] PI: M.Chan (center funding: \$2,330,000)
NSF MRSEC-0080019	\$42,500	IRG1-seed: “Computer Modeling studies of sub-50nm photolithography photoresists” [2005-06] PI: M.Chan (center funding: \$2,330,000)
NSF DGE-9987589	\$120,000	IGERT-project: “Simulations of T-responsive Polymers (Foley)” [2001-06]
EU-NSF bilateral	\$189,732	“EU-USA bilateral collaborations: Conductive polymer/ carbon-nanostructures composites (Xidas)” [2011-2013]

²Amounts shown are only the funds allocated to coPI Manias (the Centers and collaborative proposals identified had substantially higher total funding amounts across all PIs).

NSF IIP-0628817	\$20,000	CDS-seed: "Hierarchical Polymer Nanocomposites for Capacitors" [2012-13]
NSF IIP-1361571	\$50,000	CDP-seed: "Polymer-matrix structured-composites with dispersed high-k fillers" [2015]
NSF IIP-1361571	\$100,000	CDP-project: "High-k structured polymer nanocomposites" [2016-18]

Industrial Funding

ACS/PRF	\$25,000	"AFM investigation of filler-induced crystals in polymer/clay hybrid materials" [2001-03]
Air Products & Chemicals	\$60,000	"Concurrent Property Enhancements of Epoxies by Nano-Dispersion of Inorganic Layered Fillers" [2001-2002]
Kulicke & Soffa	\$7,680	grant-in-aid: "Molecular design of epoxy/silicate nanocomposites" [2001]
Coca-Cola	\$50,000	"Injection Molded (Melt Processable) PET/organo-clay Nanocomposites" [2001-02]
UTC Fuel Cells	\$480,000	"Nafion/clay nanocomposite proton exchange membranes" [2001-03] (DoE federal flow-trough)
ARL E&F Grant	\$200,000	"Epoxy/Inorganic nanocomposites with flame retardant character (Heidecker)" [2002-07]
Air Products & Chemicals	\$30,000	"(Renewal) Concurrent Property Enhancements of Epoxies by Nano-Dispersed Clays" [2002-03]
Sumitomo Chemicals	\$250,000	"Polyolefin/clay nanocomposites: Fundamental studies and materials properties optimization (Nakajima)" [2002-03]
BAYER Polymers	\$50,000	"Polycarbonate/Clay Nanocomposites (fundamental)" [2003-04]
BAYER MaterialScience	\$100,000	"Nanocomposites of PC/PET blends" [two grants: 2006 & 2007]
KRAFT Global Foods	\$610,000	KRAFT Foods, KRAFT Global Foods, and Mondelez funded a substantial multi-year/multi-project effort through 11 grants, as follows: \$50,000 "LLDPE/LDPE clay nanocomposites for Hot Food Packaging" [2003]; \$80,000 "(Renewal & Extension): Polyolefin/Clay Nanocomposites for Food Packaging" [2004]; \$80,000 "Thermomechanical Properties of PP/Clay Nanocomposites for Food Packaging" [2005]; \$50,000 "(3rd Extension): Peelable Nanocomposite Sealants" [2006]; \$70,000 "(4th Extension): LLDPE or HDPE/clay nanocomposites" [2006-07]; \$70,000 "(5th Extension): HDPE/clay sealants" [2008]; \$50,000 "(6th Extension): Nanocomposite sealants" [2009]; \$65,000 "(7th Extension): Low and Med DPE/clay nanocomposites" [2010]; \$30,000 "(8th Extension): LLDPE/EVA blends synergistically reinforced by CaCO ₃ and clays" [2011]; \$65,000 "(9th Extension): PE-blends/clay nanocomposites for flexible food packaging" [2012].

Saint-Gobain USA	\$108,000	“Flame Retardancy through Nanocomposite Formation for EVA and PVC” [two grants 2008-2010]
Saint-Gobain Corporate	\$95,000	“Polymer nanocomposites with novel FR and antimicrobial functionalities” [2010]
BAYER MaterialScience	\$150,000	“Novel organic modification for glassfibers used as fillers for polycarbonates” [2007-08]
BAYER MaterialScience	\$80,000	“Active Polymer Composites for Dye-Sensitized Solar Cells” [2009] Transferred from: Hedden
EATON-Cooper	\$128,392	“Cooper Power Systems: Rubber/inorganic composites for High Voltage Insulation” [2016-17]

Funding for Teaching and Instruction

co-PI in the NSF Centers:

NSF DGE-9987589	\$2,912,433	“Pennsylvania State Consortium for Education in Many Body Problems (Foley)” PI: Anderson [2001-06]
NSF DMR-1156960	\$315,000	“REU Site: Soft Materials at Penn State” PI: Colina [2012-2016]

Penn State University Grants

Wilson Initiation Grant	\$7,500	“Molecular Simulations in Confined Polymers” [2000]
Gladys Snyder Educ. Grant	\$5,500	“Development of Interactive e-Modules for e-MatSE443” [2003]
Schreyer Honors College	\$10,000	“Distinguished Faculty Honors Program (DHFP): Sustainability of Materials and Energy” [2016]