

VITAE – GERMANO S. IANNACCHIONE

I. PERSONAL

Professor, Department of Physics, Worcester Polytechnic Institute
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I.1. Education

Ph.D. Physics; *AC-Calorimetric Study of Liquid Crystal Phase Transitions in Restrictive Geometries*, D. Finotello advisor, Kent State University, 18 December 1993.
M.Sc. Physics; *Influence of Polydispersity and Curative/Resin Ratio on Molecular Mobility in Epoxy Networks*, E. von Meerwall advisor, University of Akron, 7 January 1990.
B.Sc. Physics; University of Akron, 31 May 1987.

I.2. Career

2015- now *Research Member*, Integrative Materials Design Center (iMdc), Mech. & Mater. Eng., WPI.
2014- now *Professor*, Department of Physics, WPI.
2023- 2026 *Division Director*, Division of Materials Research, MPS, NSF.
2020- 2023 *Expert*, Division of Materials Research, MPS, NSF.
2017- 2020 *Program Director*, Condensed Matter Physics, Division of Materials Research, MPS, NSF.
2018- 2019 *Program Director*, Biomaterials Program, Division of Materials Research, MPS, NSF.
2012- 2017 *Director*, Nuclear Science and Engineering (NSE) Program, Physics, WPI.
2012- 2016 *Director*, Master of Science in Physics for Educators (MPED) Program, Physics, WPI.
2006- 2016 *Head*, Department of Physics, WPI.
2013- 2014 *Member*, Board of Trustees, Spirit of Knowledge Charter School, Worcester, MA.
2004- 2014 *Associate Professor*, Department of Physics, WPI.
1998- 2004 *Assistant Professor*, Department of Physics, Worcester Polytechnic Institute (WPI).
1999- 2000 *Consultant*, Planar Systems / Standish Inc., Madison, WI.
1998- 1999 *Research Affiliate*, Center for Materials Science and Engineering, MIT.
1996- 1998 *Postdoctoral Research Associate*, Department of Chemistry and Center for Materials Science and Engineering, Massachusetts Institute of Technology (MIT).
1994- 1996 *Postdoctoral Research Fellow*, Department of Physics, Kent State University.
1989- 1993 *ALCOM Research Assistant*, Department of Physics, Kent State University.
1987- 1989 *Morton-Thiokol Research Associate and Graduate Assistant*, Department of Physics, University of Akron.

I.3. Teaching Summary

Courses: **166** course sections, **4,165** students, **12,452** total credit hours
Projects: MQPs: **71** projects completed with **122** students (B.S.).
IQPs: **26** projects completed with **50** students.
Advising: Academic (current): **5** undergraduate and **2** graduate students
Research: graduated **11** Ph.D. and **14** M.S. Physics students

I.4. Scholarship Summary

ORCID: 0000-0003-0567-5843; Scopus ID: 7003567913; ResearcherID: H-2555-2017
Publications: **98** refereed papers, **15** conference papers, and **6** book chapters.
Web of Science: 106 works, citations = 3372 (3020 w/o self-cite), h-index = 30, cites/work = 31.81
Google Scholar: 187 works, citations = 4449, h-index = 33, i10-index = 80
ResearchGate: 184 works, citations = 3755, h-index = 32, Research Interest Score = 1863
Grants: **15** funded (NRC, NIST, NSF, Research Corporation)
Presentations: **41** invited seminar/colloquium and **121** contributed abstracts.

VITAE – GERMANO S. IANNACCHIONE

II. AWARDS, RECOGNITION, SERVICE

II.2. Honors and Awards

1. *Morton-Thiokol Research Associate*, Physics, University of Akron (1988- 89).
2. *David B. Smith Fellowship* (honoring the outstanding graduate student in each department), Physics, Kent State University (1991- 92).
3. National Science Foundation CAREER Award DMR-0092786 (2001- 05).
4. *Sigma Xi Young Faculty Research Award*, WPI Chapter, April 2004.
5. *WPI Coleman Fellow*, Coleman Foundation Faculty Entrepreneurship Fellows Program (2010- 11).
6. Elected *Sigma Xi* Northeastern Region Member on *Committee on Nominations*, (2017- 20).

II.3. Professional Memberships

1. Board of Trustees – Spirit of Knowledge Charter School (2010- 11, 2013- 15)
2. American Physical Society (since 1996, Lifetime member)
3. International Liquid Crystal Society (since 1996)
4. American Association of University Professors (since 1999)
5. American Association for the Advancement of Science (since 1998)
6. Materials Research Society (since 2018)
7. Sigma Xi (since 2003, Lifetime member); Secretary, WPI Chapter of Sigma Xi (2003- now).

II.4. Referee / Reviewer / Evaluator

1. Peer-Reviewed Journals: Journal of Chemical Physics, Journal of Physical Chemistry, Journal of Physics and Chemistry of Solids, Journal of Molecular Liquids, Liquid Crystals, Molecular Crystals Liquid Crystals, Molecules, Physical Review (**B**, **E**, and Letters), Physica **E**, Nanomaterials, Symmetry.
2. Reviewer for Funding Agencies / Organization: National Science Foundation, U.S. Civilian Research and Development Foundation, ACS Petroleum Research Fund, W.M. Keck Foundation.
3. External evaluator with Joel D. Brock (Cornell U.) of proposal for a PhD in Physics at RIT, final report supporting proposal submitted 09 August 2021. Physics PhD program at RIT approved by NYSDE 2022.

II.5. WPI Committee and Administrative Service

1. Physics Colloquium Committee (1998- 99).
2. Physics Search Committees (11):
 - a) Faculty (1998- 99): hired Nancy Burnham – AFM experimentalist
 - b) Machinist/Laboratory Coordinator (1999- 2000): hired Fred Hutson
 - c) Faculty (2001- 02): hired Carolann Koleci – Physics Education
 - d) Faculty (2002- 03): hired Rafeal Garcia – Soft-matter experimentalist
 - e) Faculty (2006- 07): hired Stephan Koehler – Soft-matter experimentalist
 - f) Faculty (2007- 08): hired Izabela Stroe – Biophysics experimentalist
 - g) Faculty (2008- 09): hired Erkan Tuzel – Biophysics theorist/computationalist
 - h) Faculty (2010- 11): hired Qi Wen – Biophysics experimentalist
 - i) Faculty (2011- 12): hired David Medich – Medical/Nuclear experimentalist, start-up by NRC grant
 - j) Faculty (2013- 14): hired Lyubova Titova – THz optics and spectroscopy experimentalist
 - k) Faculty (2021- 22): hired William McCarthy – Nuclear and medical physics experimentalist.
3. Physics Graduate Recruitment Committee (1998- 99). Now part of Physics Dept. Graduate Committee.
4. Physics Department Graduate Committee (PDGC):
 - a) Established Committee Charter in Fall 1999.
 - b) Elected First Chair for 1999- 01 term: PH graduate students Fall 1999: 7 Ph.D. and 0 M.S.

VITAE – GERMANO S. IANNACCHIONE

* Started “Directed Research Rotations” for incoming graduate students establishing a first-year research experience in order to match students with advisors.

c) Re-elected Chair for 2001- 03 term: Authored first “*WPI Physics Graduate Student Handbook*”.

d) Re-elected Chair for 2003- 05 term: PH graduate students Fall 2003: 12 Ph.D. and 3 M.S.

5. Head, Department of Physics (April 2006- August 2016).
6. Conducted first-ever external review of the Department of Physics, November 2009.
7. Director of Masters in Physics for Educator Program (August 2012- May 2016), founding.
8. Director of Nuclear Science and Engineering Program (January 2013- July 2017), founding.
9. Physics Department Tenure Committee (PDTC): elected AY22-23.
10. Committee on Advising and Student Life (CASL): (Replacement term, 2003- 04, campus-wide).
11. Chair, Committee on Academic Operations (CAP): elected August 2016- July 2017, campus-wide.
12. Committee on Academic Promotions (COAP): elected August 2019- July 2022, campus-wide; elected chair of COAP for AY21/20; COAP rep on MME Head Search Committee (2022) – hired Robert Hyers; elected August 2023- July 2024, campus-wide.

II.6. Contributions and Promotions

1. Contributions in the media:
 - a) Newspeak article on the Research Corporation Grant (1 February 2000)
 - b) Interview on local Channel 3 news about the same Grant (21 February 2000)
 - c) Newspeak article on the NSF-Career award (1 March 2001)
 - d) TechNews Faculty Corner article, “*The World Year of Physics 2005*”.
(Vol. 70, Issue 6, 22 February 2005)
 - e) “*The physics of Santa’s Christmas night journey*”, by Yvonne Abraham, Boston Globe Columnist, 23 December 2012.
 - f) Meteor Impact in Russia Interview, NPR & Channel 3, March 2013.
 - g) Interviewed on latest quantum computing developments, ComputerWorld, October 2014.
 - h) “*Deflategate*” interviews, WBZ tv and radio, Worcester News Tonight, January 2015.
 - i) Quoted in “*Soil trucks in Central Mass. routinely exceed limits*” by Susan Spencer, Watchdog Report, Worcester Telegram, 14 November 2016.
4. Running of Department Tours, Open Houses, and Closer Look programs for Physics at WPI since 2000.
5. Founded the “Goddard Cup Competition” in 2008 on the 100th Anniversary of the graduation of Robert H. Goddard from WPI. The 'Cup' has been the prize for an annual water rocket competition of area k-12 teams.
6. Founded WPI's first Physics summer camp, Physicspalooza, for 6-8 graders Summer 2013. Expanded summer programs with Physics Ignite for 7-8 graders (2016). Expanded summer programs with Physics Launch for 8-9 graders (2017) and Physics Spark for 5-6 graders (2017).
7. Developed Physics contribution for 2012 inaugural *TouchTomorrow* event (annual celebration of science and technology in association with NASA). Expanding contribution for 2013 *TouchTomorrow* event to include a 'Virtual Tour of the Universe', repeated annual until 2021.

VITAE – GERMANO S. IANNACCHIONE

III. SCHOLARSHIP

Citation Reports

As of January 2026, peer-reviewed journals (98), conference papers (15), and Book Chapters (6)

Web of Science: 106 works, citations = 3372 (3020 w/o self-cite), h-index = 30, cites/work = 31.81

Google Scholar: 187 works, citations = 4449, h-index = 33, i10-index = 80

ResearchGate: 184 works, citations = 3755, h-index = 32, Research Interest Score = 1863

III.1. Publications

Number of citations by *Web of Science* are given in braces with key papers in **(> 20 citations)**. Student co-authors denoted by underline (graduate) and double-underline (undergraduate).

III.1.a. Peer-Reviewed Papers

- {9} “Concentration dependence of solvent diffusion in a colloidal suspension”, E. von Meerwall, D. Mahoney, G. Iannacchione, D. Skowronski, *Journal of Colloid and Interface Science* **139** (2), 437-45 (1990).
- {13} “The influence of polydispersity and curative / resin ratio on molecular mobility in epoxy networks”, G. Iannacchione, E. von Meerwall, *Journal of Polymer Science: Polymer Physics* **B 29** (6), 659-668 (1991).
- {9} “Orientational effects on confined 5CB”, G.S. Iannacchione, G.P. Crawford, J.W. Doane, D. Finotello, *Molecular Crystals and Liquid Crystals* **222**, 205-13 (1992).
- {134} “Characterization of the cylindrical cavities of Anopore and Nuclepore membranes”, G.P. Crawford, L.M. Steele, R. Ondris-Crawford, G.S. Iannacchione, C.J. Yeager, J.W. Doane, D. Finotello, *Journal of Chemical Physics* **96** (10), 7788-96 (1992).
- {138} “Calorimetric study of phase transitions in confined liquid crystals”, G.S. Iannacchione, D. Finotello, *Physical Review Letters* **69** (14), 2094-7 (1992).
- {12} “Confinement and orientational study at liquid crystal phase transitions”, G.S. Iannacchione, D. Finotello, *Liquid Crystals* **14** (4), 1135-42 (1993).
- {9} “Interface influenced phase transitions of alkylcyanobiphenyl liquid crystals: A calorimetric study”, G.S. Iannacchione, A. Strigazzi, D. Finotello, *Liquid Crystals* **14** (4), 1153-61 (1993).
- {16} “AC calorimetry technique: applications to liquid helium films and liquid crystals”, L.M. Steele, G.S. Iannacchione, D. Finotello, *Review of Mexican Physics* **39** (4), 588-601 (1993).
- {206} “Randomly constrained orientational order in porous glass”, G.S. Iannacchione, G.P. Crawford, S. Zumer, J.W. Doane, D. Finotello, *Physical Review Letters* **71** (16), 2595-8 (1993).
- {67} “Surface induced discrete smectic order in the isotropic phase of 12CB in cylindrical pores”, G.S. Iannacchione, J.T. Mang, S. Kumar, D. Finotello, *Physical Review Letters* **73** (20), 2708-11 (1994).
- {87} “Specific heat dependence on orientational order at cylindrically confined liquid crystal phase transitions”, G.S. Iannacchione, D. Finotello, *Physical Review* **E 50** (6), 4780-95 (1994).
- {17} “Liquid crystal order in a highly restrictive porous glass”, G.S. Iannacchione, S. Qian, G.P. Crawford, S.S. Keast, M.E. Neubert, J.W. Doane, D. Finotello, L.M. Steele, P.E. Sokol, S. Zumer, *Molecular Crystals and Liquid Crystals* **262**, 13-23 (1995).
- {4} “Smectic order in a porous interconnected substrate”, S. Qian, G.S. Iannacchione, D. Finotello, L.M. Steele, P.E. Sokol, *Molecular Crystals and Liquid Crystals* **265**, 395-402 (1995).
- {7} “AC-calorimetry studies at the HexB – SmA and CryB – HexB phase transitions in two compounds with hydrogen bonding”, G. Iannacchione, E. Gorecka, W. Pyzuk, S. Kumar, D. Finotello, *Physical Review* **E 51** (4), 3346-9 (1995).
- {11} “Numerical study of cylindrically confined nematic liquid crystals”, R.M. Marroum, G.S. Iannacchione, D. Finotello, M.A. Lee, *Physical Review* **E 51** (4), R2743-6 (1995).

VITAE – GERMANO S. IANNACCHIONE

16. {9} “High-resolution calorimetric studies at phase transitions for alkylcyanobiphenyl liquid crystals confined to submicron size cylindrical cavities”, D. Finotello, G.S. Iannacchione, *International Journal of Modern Physics B* **9** (18-19), 2247-83 (1995).
17. {65} “Nematic ordering in highly restrictive Vycor glass”, G. Iannacchione, G. Crawford, S. Qian, S. Zumer, J. Doane, D. Finotello, *Physical Review E* **53** (3), 2402-11 (1996).
18. {29} “Critical behavior of the smectic-*A* to nematic transition confined to a random network”, S. Qian, G.S. Iannacchione, D. Finotello, *Physical Review E* **53** (5), R4291-4 (1996).
19. {73} “Deuterium NMR and morphology study of polymer disperse liquid crystal Bragg gratings”, G.S. Iannacchione, D. Finotello, L.V. Natarajan, R.L. Sutherland, V.P. Tondiglia, T.J. Bunning, W.W. Adams, *Europhysics Letters* **36** (6), 425-30 (1996).
20. {6} “Critical behavior of the smectic-*A* to nematic transition of confined liquid crystal mixtures”, S. Qian, G.S. Iannacchione, D. Finotello, *Molecular Crystals and Liquid Crystals* **292**, 175-81 (1997).
21. {2} “The effect of chirality on the phase transitions of chiral/8CB mixtures”, G.S. Iannacchione, S. Qian, M. Wittebrood, D. Finotello, *Molecular Crystals and Liquid Crystals* **302**, 989-99 (1997).
22. {18} “Calorimetric study of phase transitions for octylphenylthiol-pentyloxybenzoate in silica aerogel”, B. Zhou, G.S. Iannacchione, C.W. Garland, *Liquid Crystals* **22** (3), 335-9 (1997).
23. {78} “Random field effects on the nematic – smectic-*A* phase transition due to silica aerosil particles”, B. Zhou, G.S. Iannacchione, C.W. Garland, T. Bellini, *Physical Review E* **55** (3), 2962-8 (1997).
24. {45} “Liquid crystalline behavior of octylcyanobiphenyl confined to submicron size randomly connected porous glasses”, G.S. Iannacchione, S. Qian, F. Aliev, D. Finotello, *Physical Review E* **56** (1), 554-61 (1997).
25. {23} “Quasicritical heat capacity at a smectic-*A* – hexatic-*B* phase transition”, H. Haga, Z. Kutnjak, G. Iannacchione, S. Qian, D. Finotello, C.W. Garland, *Physical Review E* **56** (2), 1808-18 (1997).
26. {17} “AC calorimetric studies of phase transitions in porous substrates: Superfluid helium and liquid crystals”, D. Finotello, S. Qian, G.S. Iannacchione, *Thermochimica Acta* **304/305**, 303-316 (1997).
27. {38} “Critical behavior of a smectic-*A* to nematic phase transition embedded in a random network of voids”, S. Qian, G.S. Iannacchione, D. Finotello, *Physical Review E* **57** (4), 4305-15 (1998).
28. {4} “Phase behavior in the reentrant nematic region of chiral frustrated smectics”, G.S. Iannacchione, C.W. Garland, J. Mieczkowski, E. Gorecka, *Physical Review E* **58** (1), 595-601 (1998).
29. {204} “Calorimetric and SAXS study of phase transitions in octylcyanobiphenyl-aerosil mixtures”, G.S. Iannacchione, C.W. Garland, J.T. Mang, T. Rieker, *Physical Review E* **58** (5), 5966-81 (1998).
30. {14} “Critical heat capacity at the smectic-*A* – smectic-*C* transition in a partially fluorinated liquid crystal”, G. Iannacchione, C.W. Garland, P.M. Johnson, C.C. Huang, *Liquid Crystals* **26** (1), 51-55 (1999).
31. {2} “Twist-grain-boundary transitions in a chiral tolane compound”, G.S. Iannacchione, C.W. Garland, *Liquid Crystals* **26** (1), 69-74 (1999).

----- Started at WPI August 1998 -----

32. {32} “Effects of quenched disorder on the orientational order of the octylcyanobiphenyl liquid-crystal”, H. Zeng, B. Zalar, G.S. Iannacchione, D. Finotello, *Physical Review E* **60** (5), 5607-18 (1999).
33. {6} “Nematic structures in randomly interconnected porous hosts”, D. Finotello, H. Zeng, B. Zalar, G.S. Iannacchione, *Molecular Crystals and Liquid Crystals* **358**, 237-250 (2001).
34. {24} “Elastic coupling of silica gel dynamics in a liquid-crystal – aerosil dispersion”, C.C. Retsch, I. McNulty, G.S. Iannacchione, *Physical Review E* **65** (3), 032701-4 (2002).
35. {42} “Hydrogen-bonded silica gels dispersed in a smectic liquid-crystal: A random field XY system”, S. Park, R.L. Leheny, R.J. Birgeneau, J-L. Gallani, C.W. Garland, G.S. Iannacchione, *Physical Review E* **65** (5), 050703(R) (2002), [cond-mat/0112073].
36. {69} “Smectic ordering in liquid-crystal – aerosil dispersions II: Scaling analysis”, G.S. Iannacchione, S. Park, C.W. Garland, R.J. Birgeneau, R.L. Leheny, *Physical Review E* **67** (1), 011709 (2003), [cond-mat/0208287].

VITAE – GERMANO S. IANNACCHIONE

37. {95} “Smectic ordering in liquid-crystal – aerosil dispersions I: X-ray analysis”, R.L. Leheny, S. Park, C.W. Garland, R.J. Birgeneau, G.S. Iannacchione, *Physical Review E* **67** (1), 011708 (2003), [cond-mat/0208284].
38. {51} “Effect of a quenched random field at a continuous symmetry breaking transition: Nematic to smectic-*A* in an 8OCB+aerosil dispersion”, P.S. Clegg, C. Stock, R.J. Birgeneau, C.W. Garland, A. Roshi, G.S. Iannacchione, *Physical Review E* **67** (2), 021703 (2003).
39. {33} “High-resolution x-ray study of the nematic – smectic-*A* and the smectic-*A* – smectic-*C* transitions in 8S5-aerosil gels”, P.S. Clegg, S. Park, R.J. Birgeneau, C.W. Garland, G.S. Iannacchione, R.L. Leheny, M.E. Neubert, *Physical Review E* **68** (3), 031706 (2003), [cond-mat/0305378].
40. {53} “Evolution of the nematic to isotropic phase transition in 8OCB+aerosil dispersions”, A. Roshi, G.S. Iannacchione, P.S. Clegg, R.J. Birgeneau, *Physical Review E* **69** (3), 031703 (2004), [cond-mat/0310070].
41. {68} “Review of liquid-crystal phase transitions with quenched random disorder”, G.S. Iannacchione, *Fluid Phase Equilibria* **222/223**, 177 (2004). (Proceedings of the 15th Symposium on Thermophysical Properties (NIST), Boulder CO, June 2003).
42. {59} “Isotropic to nematic transition in aerosil-disordered liquid crystals”, M. Caggioni, A. Roshi, S. Barjami, F. Mantegazza, G.S. Iannacchione, T. Bellini, *Physical Review Letters* **93** (12), 127801 (2004).
43. {23} “Critical linear thermal expansion in the smectic-*A* phase near the nematic – smectic-*A* phase transition”, E. Anesta, G.S. Iannacchione, C.W. Garland, *Physical Review E* **70** (4), 041703-8 (2004).
44. {16} “Calorimetric study of the nematic – smectic-*A* and smectic-*A* – smectic-*C* phase transitions in liquid-crystal–aerosil dispersions”, A. Roshi, G.S. Iannacchione, P.S. Clegg, R.J. Birgeneau, and M.E. Neubert, *Physical Review E* **72** (5), 051716 (2005) [cond-mat/0510238].
45. {120} “Off-axis thermal properties of carbon nanotube films”, S. Sinha, S. Barjami, G. Iannacchione, A. Schwab, G. Muench, *Journal of Nanoparticle Research* **7** (6), 651-7 (2005), (Proceedings of Nanotechnology / Thin Films Conference, Singapore, July 2004).
46. {44} “Thermodynamics of activated phase transitions of octylcyanobiphenyl: DSC and MC calorimetry”, D. Sharma, J.C. MacDonald, G.S. Iannacchione, *Journal of Physical Chemistry B* **110** (33), 16679-84 (2006).
47. {9} “Structure and dynamics of a nano-colloidal silica gel dispersion”, A. Roshi, S. Barjami, D. Paterson, I. McNulty, G.S. Iannacchione, *Physical Review E* **74** (3), 031404-8 (2006).
48. {15} “Role of an aerosil dispersion on the activated kinetics of an LC_{1-x}Sil_x system”, D. Sharma, J.C. MacDonald, G.S. Iannacchione, *Journal of Physical Chemistry B* **110** (51), 26160-9 (2006).
49. {8} “Kinetics of induced crystallization of the LC_{1-x}Sil_x system”, D. Sharma, G.S. Iannacchione, *Journal of Physical Chemistry B* **111** (8), 1916-22 (2007).
50. {10} “Induced thermal dynamics in the melt of glycerol and aerosil dispersions”, D. Sharma, G.S. Iannacchione, *Journal of Chemical Physics* **126** (9), 094503 (2007).
51. {6} “Specific heat and thermal conductivity measurements parallel and perpendicular to the long-axis of cobalt nanowires”, N.R. Pradhan, H. Duan, J. Liang, G.S. Iannacchione, TMS2008 (*Minerals, Metals, and Materials*) 137th Annual Meeting Supplemental Proceedings Vol. 1: Materials Processing and Properties, page 159 (TMS Publishing, ISBN 978-0-87339-716-2, 2008).
52. {5} “Calorimetric study of the isotropic to nematic phase transition in an aligned liquid crystal nano-colloidal gel”, F. Cruceanu, D. Liang, R.L. Leheny, G.S. Iannacchione, *Liquid Crystals* **35** (9), 1061-1071 (2008).
53. {19} “High-resolution dielectric spectroscopy in a rotating electric field on several carbon allotropes including multi-wall and single-wall nanotubes”, R. Basu, G.S. Iannacchione, *Applied Physics Letters* **92**, 052906 (2008); selected for *Vir. J. Nan. Sci. & Tech.* **17**(7), 18 February 2008.
54. {26} “Observation of a possible tetrahedric phase in bent-core liquid crystals”, D. Wiant, K. Neupane, S. Sharma, A. Jakli, J.T. Gleeson, S. Sprunt, N. Pradhan, G. Iannacchione, *Physical Review E* **77** (6), 061701-7 (2008).
55. {106} “Carbon nanotube dispersed liquid crystals – A nano-electromechanical system”, R. Basu, G.S. Iannacchione, *Applied Physics Letters* **93**, 183105-3 (2008).
56. {28} “Dielectric response of multiwalled carbon nanotubes as a function of applied ac-electric fields”, R. Basu, G.S. Iannacchione, *Journal of Applied Physics* **104**, 114107 (2008).

VITAE – GERMANO S. IANNACCHIONE

57. {12} “Specific heat and thermal conductivity measurements for anisotropic and random macroscopic composites of cobalt nanowires”, N.R. Pradhan, H. Duan, J. Liang, G.S. Iannacchione, *Nanotechnology* **19**, 485712 (2008).
58. {3} “Emergent 1-D Ising behavior in an austere cellular automaton model”, P. Kassebaum, G.S. Iannacchione, *International Journal of Modern Physics C (IJMPC)* **20** (1), 133-145 (2009).
59. {13} “High-resolution calorimetric study of the nematic to smectic-*A* transition in aligned liquid crystal - aerosil gels”, F. Cruceanu, D. Liang, R.L. Leheny, C.W. Garland, G.S. Iannacchione, *Physical Review E* **79** (1), 011710-8 (2009).
60. {7} “Effect of aerosil gels on de Gennes nematic–smectic coupling”, C.W. Garland, G.S. Iannacchione, *Journal of Physical Chemistry B* **113** (12), 3901-05 (2009).
61. {165} “The specific heat and thermal conductivity of composites containing single-walled and multi-walled carbon nanotubes”, N.R. Pradhan, H. Duan, J. Liang, G.S. Iannacchione, *Nanotechnology* **20**, 245705-7 (2009).
62. {133} “Evidence for directed self-assembly of quantum dots in a nematic liquid crystal”, R. Basu, G.S. Iannacchione, *Physical Review E* **80** (1), 010701(R)-4 (2009).
63. {90} “Nematic anchoring on carbon nanotubes”, R. Basu, G.S. Iannacchione, *Applied Physics Letters* **95**, 173113-3 (2009), selected for *Vir. J. Nan. Sci. & Tech.* **20** (19), 29 October 2009.
64. {63} “Dielectric hysteresis, relaxation dynamics, and non-volatile memory effects in carbon nanotube dispersed liquid crystals”, R. Basu, G.S. Iannacchione, *Journal of Applied Physics* **106**, 124312-6 (2009).
65. {7} “Relaxation dynamics of the glass transition in PMMA+SWCNT composites by temperature-modulated DSC”, N. Pradhan, G.S. Iannacchione, *Journal of Physics D: Applied Physics* **43**, 105401-7 (2010).
66. {102} “Orientational coupling enhancement in a carbon nanotube dispersed liquid crystal”, R. Basu, G.S. Iannacchione, *Physical Review E* **81** (5), 051705-5 (2010), selected for *Vir. J. Nan. Sci. & Tech.* **21** (21), May 2010.
67. {12} “Evolution of the isotropic to nematic phase transition in binary mixtures of octylcyanobiphenyl and n-hexane”, K. Sigdel, G.S. Iannacchione, *Journal of Chemical Physics* **133**, 044513-7 (2010).
68. {18} “Thermal properties and glass transition in PMMA+SWCNT composites”, N.R. Pradhan, G.S. Iannacchione, *Journal of Physics D: Applied Physics* **43**, 305403-9 (2010).
69. {13} “Study of the isotropic to smectic-*A* phase transition in liquid crystal and acetone binary mixtures”, K.P. Sigdel and G.S. Iannacchione, *Journal of Chemical Physics* **133**, 174501-7 (2010).
70. {13} “Calorimetric study of the nematic to smectic-*A* phase transition in octylcyanobiphenyl-hexane binary mixtures”, K.P. Sigdel, G.S. Iannacchione, *Physical Review E* **82** (5), 051702-8 (2010).
71. {35} “Effect of carbon nanotubes on the isotropic to nematic and the nematic to smectic-*A* phase transitions in liquid crystal and carbon nanotube composites”, K.P. Sigdel, G.S. Iannacchione, *European Physics Journal E* **34**, 34-43 (2011).
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VITAE – GERMANO S. IANNACCHIONE

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95. {0} “Bio-colloidal drying droplets: Current trends and future perspectives on imaging processing applications” G.S. Iannacchione, A. Pal, *Academia Letters*, article 2661 (2021); <https://doi.org/10.20935/AL2661>, 2430 views.

VITAE – GERMANO S. IANNACCHIONE

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99. {0} “Revolutionizing Materials Science and Technology to Secure Our Future”, Richard A. Vaia, G.S. Iannacchione, Anthony D. Rollett, *The Bridge* **55** (3), 19-27 (2025); <https://nae.edu/341005/Revolutionizing-Materials-Science-and-Technology-to-Secure-Our-Future>
100. {-} “Extraction of viscoelastic properties from topological defect dynamics in chromonic liquid crystals”, Xuxia Yao, Alireza Shams, A.D. Rey, Jung Ok Park, G.S. Iannacchione, M. Srinivasarao, – in preparation (2022).
101. {-} “High-resolution experimental study and numerical modeling of population dynamics in a bacteria culture”, A. Chatterjee, A. Charest, S. Alagarni, G.S. Iannacchione, *Physical Review E* – in preparation (2022).
102. {-} “Local equilibrium hypothesis as the principle of equivalence in thermodynamics”, A. Chatterjee, G.S. Iannacchione, *Entropy* – in preparation (2022).
103. {-} “Study of nematic fluctuations dynamics utilizing high-speed imaging and a digital dynamic light microscopy technique”, Beom-Jin Yoon¹, Min Sang Park, Jung Ok Park, G.S. Iannacchione, M. Srinivasarao, – in preparation (2022).

III.1.b. Book Contributions

1. “High-Resolution Calorimetric Studies at Phase Transitions for Alkylcyanobiphenyl Liquid Crystals Confined to Sub-micron Size Cylindrical Cavities”, D. Finotello, G.S. Iannacchione, in Liquid Crystals in the Nineties and Beyond, Chap. 4, p. 109-145, edited by S. Kumar (World Scientific, 1995).
2. “Phase Transitions in Restricted Geometries”, D. Finotello, G.S. Iannacchione, and S. Qian, in Liquid Crystals in Complex Geometries Formed by Polymer and Porous Networks, Chap. 16, p. 325-343, edited by G.P. Crawford, S. Zumer (Taylor & Francis, London, 1996). ISBN: 0-7484-0464-3.
3. “Critical Behavior of a Smectic-*A* to Nematic Transition of Confined Liquid Crystal Mixtures”, S. Qian, G.S. Iannacchione, D. Finotello, Dynamics and Defects in Liquid Crystals: A Festschrift in Honor of Alfred Saupe, Chap. 3, p. 203-209, edited by P. Palffy-Muhoray and P. Cladis (Gordon and Breach Science Publishers, London, 1998). ISBN: 90-5699-649-5.
4. “Studies of Nanocomposites of Carbon Nanotubes and a Negative Dielectric Anisotropy Liquid Crystal”, P. Kalakonda, G.S. Iannacchione, Carbon Nanotubes: Recent Progress, Chap. 10, p. 188-206, edited by Abdullah Mohammed Asiri, Mohammed Rahman (IntechOpen, 2018).
5. “Image-Based Analysis of Patterns Formed in Drying Drops”, A. Pal, A. Gope, G.S. Iannacchione, in Pattern Recognition and Machine Learning, p. 567-574 (8th International Conference, PReMI 2019, LNCS 11941, Tezpur, India, December 17–20, 2019 Proceedings, Part I) edited by B. Deka et al. (Springer Nature Switzerland AG, 2019); https://doi.org/10.1007/978-3-030-34869-4_62.
6. “Statistical Image Analysis of Drying Bovine Serum Albumin Droplets in Phosphate Buffered Saline”, A. Pal, A. Gope, G.S. Iannacchione in Biomedical Data Mining for Information Retrieval - Methodologies, Techniques and Applications, Artificial Intelligence and Soft Computing for Industrial Transformation series, Chp. 8, p. 213-235 (Scrivener – Wiley Publishing, 2021); ISBN 978-1-119-71124-7.

III.2. Grants and Patents

VITAE – GERMANO S. IANNACCHIONE

Total grants awarded 15 for \$3,208,776

1. **Research Corporation**, Research Innovation grant: RI0388: “New approach for practical calorimetric spectroscopy”. Period: 1 May 2000 to 1 May 2002. Budget: \$35,000 (equipment). Role: PI
2. **National Science Foundation**, Division of International Programs NSF-CNRS: 0910016: “Magnetic properties of mono-molecular Langmuir-Blodgett films of organic radicals”. Period: 1 March 2000 – 1 March 2002. Budget: \$7,000 (travel). Role: PI
3. **National Science Foundation**, Division of Materials Research: DMR-0092786: “CAREER – Random disorder in phase transitions of complex fluids”. Period: 15 March 2001 – 14 March 2006. Budget: \$499,683 (salary/student). Role: PI.
4. **National Institute of Science and Technology**, Summer Undergraduate Research Fellowship for Adam Darvish, 2008. Budget: \$7,615. Role: PI.
5. **National Institute of Science and Technology**, Summer Undergraduate Research Fellowship for Long Tong, 2009. Budget: \$7,715. Role: PI.
6. **National Institute of Science and Technology**, Summer Undergraduate Research Fellowship for Christopher Horgan, 2010. Budget: \$8,315. Role: PI.
7. **National Science Foundation**, Division of Materials Research: DMR-0821292: “MRI: Acquisition of a Modulated Differential Scanning Calorimeter and Spectroscopic Ellipsometer for Characterizing Complex Fluids”. Period: 1 July 2008 – 31 June 2011. Budget: \$233,194 (equipment). Role: PI.
8. **Dow Chemical Corporation Equipment Donation**: July 2013, total value: \$225,000. Role: Lead.
9. **U.S. Nuclear Regulatory Commission**: WPI Nuclear Science and Engineering Curriculum Development. Period: Aug. 2014 – Sept. 2016. Budget: \$190,000. Role: co-PI (PI = Izabela Stroe).
10. **U.S. Nuclear Regulatory Commission**: WPI NSE UG Scholarship. Period: Aug. 2014 – Sept. 2016. Budget: \$196,022 (student support). Role: co-PI (PI = David Medich).
11. **U.S. Nuclear Regulatory Commission**: WPI NSE Graduate Fellowship. Period: Aug. 2014 – Sept. 2016. Budget: \$400,000 (student support). Role: co-PI (PI = David Medich).
12. **U.S. Nuclear Regulatory Commission**: WPI NSE Faculty Development. Period: Aug. 2014 – Sept. 2017. Budget: \$367,022 (equipment & personnel support). Role: PI.
13. **National Science Foundation**: DMR-1748184 “IPA with National Science Foundation”. Role: PI. Period: 7 August 2017 – 1 August 2018, Budget: \$172,681; Renewal period: 7 August 2018 – 6 August 2019, Budget: \$202,738; Renewal period: 7 August 2019 – 6 August 2020, Budget: \$206,792; Award total = \$582,211.
14. **U.S. Nuclear Regulatory Commission**: WPI NSE Faculty Development. Period: Apr. 2021 – Mar. 2024. Budget: \$449,999 (equipment & personnel support). Role: co-PI (PI = David Medich).
15. **National Science Foundation**: DMR-2316008 “IPA with National Science Foundation”. Role: PI. Period: 30 January 2023 – 29 January 2024, Budget: \$213,424; Renewal period: 30 January 2024 – 29 January 2026, Budget: \$431,931. Award total = \$645,354.

Patents

1. “A Novel Manufacturing Method Of Polymer-Matrix Composite Materials For Use In 3D Printing And Other Applications”, Matthew Ryder, Diana Lados, Germano Iannacchione, Amy Peterson, Provisional Patent, EFS ID 30264940, App. # 62554181, US 2017.

III.3. Consulting

VITAE – GERMANO S. IANNACCHIONE

Consultant, Planar Systems / Standish Inc., Madison WI. 1999- 2000. Provided expert advise in polymer composites and LCD technologies. Performed characterization measurements on propriety compounds used for LCD applications.

III.4. Presentations

III.4.a. Seminars, Colloquiums, Proceedings (**bold** = contributed paper)

1. “Influence of polydispersity and curative-epoxy ratio on molecular mobility in epoxy networks”, G. Iannacchione and E. von Meerwall, *Morton-Thiokol/University IR&D Review*, (Invited, August 15, 1989).
2. “Diffusion in colloidal suspensions: Application of mixture theories”, G. Iannacchione, Dept. of Physics, *University of Akron*, (Invited, 25 October 1990).
3. “AC heat capacity measurements on 5CB and 8CB liquid crystals confined in submicron size cavities”, G. Iannacchione, Research Symposium, *Kent State University*, (Invited, 18 March 1991).
4. “Show and tell: AC calorimetric studies of liquid crystals”, G. Iannacchione, Dept. of Physics, *Kent State University*, (Invited, 2 April 1991).
5. “Confinement and orientational study at liquid crystal phase transitions”, G. S. Iannacchione and D. Finotello, *14th International Liquid Crystal Conference*, Pisa, Italy (Invited, 25 June 1992).
6. “A study of liquid crystal phase transitions in porous geometries”, G. Iannacchione, Dept. of Physics, *Kent State University*, (Invited, 9 September 1993).
7. “Confined liquid crystal phase transitions: a calorimetric study”, G. Iannacchione, Dept. of Physics, *Rutgers University*, (Invited, 15 April 1995).
8. “Deuterium NMR spectroscopy of confined liquid crystals”, G. Iannacchione, Materials Research Directorate, *Wright Patterson AFB*, (Invited, 30 August 1995).
9. “The effect of chirality on the phase transitions of chiral/8CB mixtures”, G. Iannacchione, S. Qian, M. Wittebrood, and D. Finotello, *16th International Liquid Crystal Conference*, Kent, OH (Invited, 25 June 1996).
10. “The effect of random-disorder on liquid crystal phase transitions”, G. Iannacchione, Dept. of Physics, *Chez Pierre Seminar, Massachusetts Institute of Technology*, (Invited, 17 October 1997).
11. “The effect of random-disorder on liquid crystal phase transitions”, G. Iannacchione, Center for Biomolecular Science and Engineering, *Naval Research Laboratory*, (Invited, 12 December 1997).
12. “The effect of random-disorder on liquid crystal phase transitions”, G. Iannacchione, Dept. of Physics, *University of Nevada at Las Vegas*, (Invited, 12 February 1998).
13. “The effect of random-disorder on liquid crystal phase transitions”, G. Iannacchione, Dept. of Physics, *Worcester Polytechnic Institute*, (Invited, 26 February 1998).
14. “The effect of random-disorder on liquid crystal phase transitions”, G. Iannacchione, Dept. of Physics, *Wayne State University*, (Invited, 3 March 1998).
15. “The effect of random-disorder due to aerosil dispersions on liquid crystal phase transitions”, G. Iannacchione, *American Physical Society*, (Invited, 18 March 1998); *Bulletin of the American Physical Society* **43**(1), 510 (1998).

----- Started at WPI August 1998 -----

16. “Liquid crystals all around us”, G. S. Iannacchione, Minority Introduction to Engineering, Entrepreneurship and Science Program, *Massachusetts Institute of Technology*. (Lecture, 17 July 1998).
17. “Calorimetric studies of order-disorder phase transitions”, G.S. Iannacchione, Dept. of Physics, *Worcester Polytechnic Institute* (Colloquium, 2 November 1998).
18. “Disorder by random order: random perturbation studies on liquid crystals”, G.S. Iannacchione, Dept. of Physics, *SUNY at Albany* (Seminar, 19 November 1999).

VITAE – GERMANO S. IANNACCHIONE

19. “Review of order-disorder phase transitions in liquid crystals”, G.S. Iannacchione, Dept. of Mathematics, *Worcester Polytechnic Institute* (Seminar, 29 March 2000).
20. “Disorder by random order: liquid crystals + aerosil dispersions”, G.S. Iannacchione, Dept. of Physics, *Case Western Reserve University* (Colloquium, 13 April 2000).
21. “Liquid crystals imbedded with silica: a model system for random perturbations”, G.S. Iannacchione, Dept. of Physics, *Clark University* (Colloquium, 20 April 2000).
22. “Quenched random disorder and finite-size effects on liquid crystalline phase transitions”, G.S. Iannacchione, *VII – International Conference on Advanced Materials (ICAM 2001)*, Cancun, Mexico (Invited, 26 August 2001).
23. “Review of liquid crystal phase transitions with quenched random disorder”, G.S. Iannacchione, *15th Symposium on Thermophysical Properties* (NIST), Boulder, CO (Invited, 22-27 June 2003).
24. “Review of liquid crystal phase transitions with quenched random disorder”, G. Iannacchione, Dept. of Physics, *Worcester Polytechnic Institute* (Colloquium, 24 November 2003).
25. “Dynamics of a nano-colloidal aerosil gel”, G.S. Iannacchione, Dept. of Physics and Astronomy, *John Hopkins University* (Seminar, 14 April 2004).
26. “Recent Advances in Calorimetry for Complex Fluids and Biology”, G.S. Iannacchione, Sigma Xi Lecture Series, WPI Chapter (Lecture, 1 February 2005).
27. “The World Year of Physics 2005: Einstein and Brownian Motion”, G.S. Iannacchione, Dept. of Physics, *Worcester Polytechnic Institute* (Society of Physics Students Seminar, 2 March 2005).
28. “Recent Advances in Calorimetry for Complex Fluids and Biology”, G.S. Iannacchione, Dept. of Physics, *University of Milano*, Italy (Colloquium, 13 December 2005).
29. “Liquid crystal phase transitions with quenched random disorder”, G.S. Iannacchione, Dept. of Physics / INFM, *University of Milano*, Italy (Seminar, 15 December 2005).
30. “Thermodynamics and biophysics”, G.S. Iannacchione, *Franklin W. Olin College of Engineering* (guest lecture, 23 January 2009).
31. “The future of biophysics at WPI”, G.S. Iannacchione, Dept. of Biomedical Engineering, *Worcester Polytechnic Institute* (Seminar, 25 October 2009).
32. “Image-analysis light-scattering: Probing structure and dynamics of gels and complex fluids”, G.S. Iannacchione, Dept. of Physics, *Clark University* (Colloquium, 30 January 2013).
33. “Liquid crystal and carbon-nanotube nanocomposites: How random surfaces can have non-random effects” G.S. Iannacchione, Polymer Sci. Seminar Series, *U. Massachusetts – Lowell* (Seminar, 7 March 2013).
34. “**Digital image capture and analysis for simultaneous static and dynamic light scattering for biological systems**”, G.S. Iannacchione, S. Algarni, 2016 International Conference Laser Optics (LO) – IEEE, *St. Petersburg, Russia* (June 27 – July 1, 2016).
35. “Rayleigh-Benard Cells as a Prototype System for Non-Equilibrium Thermodynamics”, G. S. Iannacchione, Informal Statistical Physics Seminar, *University of Maryland* (Seminar, 24 April 2018).
36. “**Bio-inspired Far-From-Equilibrium Materials**”, G.S. Iannacchione, *MRS OnDemand Webinar Series* (Webinar, 20 February 2019); <https://mrs.digitellinc.com/mrs/sessions/31693/view>
37. “Bio-inspired Far-From-Equilibrium Materials”, G.S. Iannacchione, Second Northeast Regional Conference on Complex Systems (NERCCS 2019), *SUNY-Binghamton* (5 April 2019).
38. “Biomaterials Far-From-Equilibrium: New Opportunities in Synthetic Biology”, G.S. Iannacchione, Distinguished Speaker in Chemical Engineering, *Northeastern University* (26 April 2019).
39. “Synthetic Biology & Biomaterials”, G.S. Iannacchione, invited seminar, *Massachusetts Institute of Technology*, Cambridge, MA (24 May 2019).
40. “Emergence of Order and Disorder Far-from-Equilibrium: A Fundamental Frontier in Thermodynamics and Condensed Matter Physics”, G.S. Iannacchione, Keynote, *Thermodynamics 2.0*, International Association for the Integration of Science and Engineering (IAISAE), virtual, Boston, MA (24 June 2020).
41. “Emergent Structures in Driven and Relaxing Non-Equilibrium Systems”, G.S. Iannacchione, Keynote, *Global Experts Meet: Condensed Matter Physics 2022 (GEMCMP22)*, Rome, Italy (16 June 2022).

III.4.b. Contributed Abstracts (**bold** = contributed paper)

VITAE – GERMANO S. IANNACCHIONE

1. “Influence of polydispersity and curative/resin ratio on molecular mobility in epoxy networks”, G. Iannacchione, E. von Meerwall, F. Kelley, Bull. Am. Phys. Soc. **34** (3), 855 (1989).
2. “Gel fraction and molecular mobility in epoxy networks above T_g ”, G. Iannacchione, E. von Meerwall, Bull. Am. Phys. Soc. **35** (1), 54 (1990).
3. “Solid diffusion in a colloidal suspension”, E. von Meerwall, D. Skowronski, G. Iannacchione, D. Mahoney, Bull. Am. Phys. Soc. **35** (3), 453 (1990).
4. “Drying of a colloidal suspension: self-diffusion in a water based emulsion”, D. Mahoney, G. Iannacchione, D. Skowronski, E. von Meerwall, Bull. Am. Phys. Soc. **35** (5), 1220 (1990).
5. “Effect of polydispersity on NMR T_2 relaxation in polymer melts”, G. Iannacchione, E. von Meerwall, Bull. Am. Phys. Soc. **35** (5), 1220 (1990).
6. “Use of mixture theories to describe solvent diffusion in a colloidal suspension”, E. von Meerwall, D. Skowronski, G. Iannacchione, D. Mahoney, Bull. Am. Phys. Soc. **36** (1), 115 (1991).
7. “AC heat capacity measurements on 5CB and 8CB liquid crystals confined in submicron size cavities”, G.S. Iannacchione, G.P. Crawford, J.W. Doane, D. Finotello, Bull. Am. Phys. Soc. **36** (1), 595 (1991).
8. “AC heat capacity measurements on 8CB and 5CB liquid crystals confined in submicron size cavities”, G.S. Iannacchione, D. Finotello, American Physical Society – Ohio Section, Athens, OH (April 1991).
9. “Confinement effect on 5CB and 8CB: a heat capacity study”, G.S. Iannacchione, G.P. Crawford, J.W. Doane, D. Finotello, PDLC Workshop, NSF-ALCOM Technical Reports, vol. **I** (June 1991).
10. “Orientational effects on confined 5CB”, G.S. Iannacchione, G.P. Crawford, J.W. Doane, D. Finotello, 4th International Topics Meeting on Optics of Liquid Crystals, Cocoa Beach, FL (October 1991).
11. “Heat capacity study of alkylcyanobiphenyl liquid crystals above the tricritical point”, G.S. Iannacchione, G.P. Crawford, D. Finotello, Bull. Am. Phys. Soc. **37** (1), 131 (1992).
12. “Calorimetric study of blue phases of chiral liquid crystal CE4”, S.T. Shin, G.S. Iannacchione, R. Folks, D. Finotello, S. Kumar, Surfaces Workshop, NSF-ALCOM Technical Reports, vol. **III** (March 1992).
13. “Liquid crystal phase transitions influenced by interfaces”, G.S. Iannacchione, D. Finotello, Surfaces Workshop, NSF-ALCOM Technical Reports, vol. **III** (March 1992).
14. “Orientational effects on confined n CB liquid crystals”, G.S. Iannacchione, D. Finotello, Ohio Academy of Science Conference, Akron, OH (May 1992).
15. “Nematic-less 5CB? 5CB in Vycor glass”, G.P. Crawford, G.S. Iannacchione, J.W. Doane, D. Finotello, Optics Workshop, NSF-ALCOM Technical Reports, vol. **IV** (May 1992).
16. “Interface influenced phase transitions of alkylcyanobiphenyl liquid crystals: A calorimetric study”, G.S. Iannacchione, D. Finotello, 14th International Liquid Crystal Conference, Pisa, Italy (June 1992).
17. “Heat capacity study of cylindrically confined 12CB liquid crystal”, G.S. Iannacchione, G.P. Crawford, D. Finotello, Bull. Am. Phys. Soc. **38** (1), 819 (1993).
18. “Calorimetric study of phase transitions in confined liquid crystals”, D. Finotello, G.S. Iannacchione, G.P. Crawford, 2nd European Conference on Liquid Crystals, Flims, Switzerland (March 1993).
19. “The effect of surface anchoring on the heat capacity of cylindrically confined liquid crystal phase transitions”, G. Iannacchione, D. Finotello, APS Ohio Section, Kent, OH (May 1993).
20. “Nuclear magnetic resonance study of randomly constrained nematic ordering of a liquid crystal in a porous glass”, S. Zumer, G.S. Iannacchione, G.P. Crawford, J.W. Doane, D. Finotello, AMPERE Summer Institute on Advanced Technology in Experimental Magnetic Resonance, Proceedings book p. 159, Portoroz, Slovenia (June 1993).
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VITAE – GERMANO S. IANNACCHIONE

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VITAE – GERMANO S. IANNACCHIONE

IV. TEACHING

IV.1. Teaching Experience

Taught all first-year physics courses (mechanics, e&m, waves, and modern physics) as lecturer, conference instructor, and as laboratory manager from the small (~30) to large (150+) student introductory (general physics) to advanced (principle of physics) level offerings. Taught mechanics, electrodynamics, thermodynamics, statistical physics/mechanics, and laboratory courses over the entire range from intermediate undergraduate (sophomore) to graduate levels.

Maintained a 22 year average student evaluation rating of 4.32/5.00 for instructor and 4.11/5.00 for the courses I have taught with an average 10-14 hrs/wk student reported hours applied to each of my courses.

IV.2. Teaching Innovations

1. Instituted Quiz Competitions into the lectures for PH 2301 – *Electromagnetic Fields*. Twice before each exam, students must prepare a single, exam-level, problem complete with a separate solution. The problem is then exchanged with a fellow student and given 15 minutes to complete. The student is graded $\frac{1}{2}$ on the question generated and $\frac{1}{2}$ on answering and critiquing the exchanged problem. This allows an evaluation of what the students are expecting on the exam, promotes discussion among the students, and introduces “game theory” to encourage careful construction of the problem (i.e., if the problem is too easy then fellow students benefit).
2. PH 2101 – *Principles of Thermodynamics*
A 3 credit sophomore-level experimental course on the foundations of thermodynamics for scientist and engineers to develop knowledge of a general description of large number systems, states, canonical state variables, state functions, response functions, and equations of the state. Through both traditional and project-based approaches, students will develop qualitative and quantitative skills for determining the physical meanings of free-energies, enthalpy, chemical potential, entropy, equilibrium states, reversible versus irreversible processes, phases and phase transformation, as well as the “arrow of time”. Team-based projects allow students to integrate concepts learned to their specific disciplines. Recommended background: introductory mechanics and multi-variable calculus
* First experimental offering, PH 210x, C-term 2012, second exp. offering C-term 2013, final exp. Offering C-term 2014, adopted by faculty as PH 2101 on 17 January 2014.
3. Developed *Problem Set Portfolio* system for evaluating learning of educators taking MPED content courses. Since one of the learning outcomes for the educators is the ability to generate their own problem set and solutions for a given area of physics, the new system focuses on this ability by generating a portfolio of problems and solutions (half assigned by the instructor and half generated by the student). Educators can then take this portfolio back with them into their classrooms.

IV.3. New Curriculum and Programs

IV.3.a. Masters of Science in Physics for Educators (MPED)

Established MPED program and helped establish the umbrella *STEM Education Center* at WPI. Approved by faculty and launched in Fall 2012. The MPED program is intended for educators seeking an advanced degree in Physics and obtain Professional Teaching License in MA. Founding director.

Created an entirely new and unique *physics content curriculum* for educators, a *Problem Set Portfolio* grading system, innovative Education Theory component, and culminating in a Graduate Qualifying Project (GQP). Developed a set of 4 Depth Courses 2 credits each (MPE 510 Classical Mechanics, MPE 520 Electrodynamics, MPE 530 Modern Physics, MPE 540 Differential Equations in Nature), 2 Methods Courses at 2 credits each (MPE

VITAE – GERMANO S. IANNACCHIONE

550 Computational Methods in Physics, MPE 560 Experimental Methods in Physics), and 3 Breadth Courses at 3 credits each (MPE 572 Physics Research Experience for Teachers, MPE 574 Physics for Citizens and Leaders, MPE 576 Physics in Popular Culture).

As the director of the MPED Program (2012- 16), I had oversight of scheduling and teaching assignments, development of curriculum, and recruiting. Program began in Fall 2013 with 5 admitted M.S. Educators and grew to 10 in Summer of 2013. All MPE courses were developed and offered annually beginning AY13/14.

IV.3.b. Nuclear Science and Engineering Program

Established a revitalized NSE Program at WPI interdisciplinary with Mechanical Engineering and Materials Engineering. Approved by faculty and launched in Fall 2012. Founding and current director.

Created a new NSE Graduate Certificate Curriculum encompassing science (medical and materials), environmental sustainability, and engineering (materials and energy) areas in a blended (in-class with on-line) teaching method. Created six (6) new courses each 3 credits (18 credits total) with 12 credits needed for the graduate certificate.

As the director of the NSE Program (2013- 17), I have oversight of course scheduling, teaching assignments, and curriculum development. Significant Corporate Professional Education participation has emerged with over 50 students evenly between the in-class and on-line registrations. All NSE courses were developed and routinely offered beginning in AY13/14. Proposals submitted for an undergraduate NSE minor, a graduate NSE M.Sc., and a Medical Health Physics Ph.D. degree offerings on track for launch in AY17/18.

IV.3.c. STEM Faculty Launch Workshop

Part of founding organizing team and directed the STEM Faculty Launch is a premier workshop for graduate students and post-doctoral researchers seeking tenure-track positions in the STEM fields. This two-day workshop covers best practices for pursuing, applying for, and establishing faculty careers. This annual workshop is open to candidates nationwide with women and traditionally underrepresented minority candidates especially encouraged to participate. These workshops have received very high evaluations by the participants.

Inaugural workshop = 24-25 September 2015 (80 applications, 27 participants, 21 women)

2nd Annual Workshop = 21-23 September 2016 (174 applications, 34 participants, 24 women)

IV.3.d. Goddard Water Rocket Competition & Physics Summer Programs

Founded the “Goddard Cup Competition” in 2008 on the 100th Anniversary of the graduation of Robert H. Goddard from WPI. The 'Cup' has been the prize for an annual water rocket competition of area k-12 teams since 2008. The Competition repeated annually 2008 – now.

Developed Physics Demonstrations contribution for 2012 inaugural TouchTomorrow event (annual celebration of science and technology in association with NASA). Expanding contribution for 2013 TouchTomorrow event to include a 'Virtual Tour of the Universe', both demonstrations and tour repeated annual since, 2012 – now.

Founded WPI's first Physics summer camp, Physicspalooza, for 6-8 graders Summer 2013. This day camp over 5 days exposes children to various physics activities based on physics lecture demonstrations that they can do and includes a journal to record their discoveries. Expanded summer programs with Physics Ignite for 7-8 graders (2016). Expanded summer programs with Physics Launch for 8-9 graders (2017) and Physics Spark for 5-6 graders (2017). Annually from 2013- now.

VITAE – GERMANO S. IANNACCHIONE

IV.4. Projects Advised

IV.4.a. Major Qualifying Projects (MQP): 71 projects, 122 students, 19 awards (noted in **bold**)

1. *Eric Clinton*, “The Design, Fabrication, and Testing of an Ultra-stable Thermal Platform for Temperature Sensor and Experimental Cell Housing”, PH GSI-9801 (May 1999) – **Lawton-Plimpton Award**.
2. *Jeremy Gogos*, “Numerical Simulation of the Confined Nematic to Isotropic Phase Transition”, PH GSI-9802 (May 1999) – **Provost MQP and Robert H. Goddard Award**.
3. *Karen Hirst*, “A Frustrated Liquid crystal”, PH GSI-9901 (May 2000) – **Lawton-Plimpton Award**.
4. *Kevin King*, “Thermal Response Optimization Study of AC-Calorimetric Cells”, PH GSI-9903 (May 2000) – **Provost MQP Award**.
5. *Anthony Cruz*, “Fractal Formation in Confined Geometries”, PH GSI-0001 (May 2001).
6. *Sarah House, Lewis Kotredes*, “GSFC NASA-WPI: Design and Testing of an Advanced Adiabatic Demagnetization Refrigerator”, co-advised with S. N. Jaspersen and F. J. Looft, PH SNJ-G201 (October 2001) – **L. Kotredes received the Salsibury Award**.
7. *Joseph P. Lefrancois*, “Construction of a Versatile Low-Temperature AC-Calorimeter”, PH GSI-0102 (May 2002) – **Lawton-Plimpton Award**.
8. *Brian Dewhirst*, “Dielectric Measurements of a Liquid Crystal-Aerosil Dispersion”, PH GSI-0103 (May 2002).
9. *Matthew Hilt*, “Construction of a Thermoacoustic Refrigerator”, PH GSI-0106 (May 2002) – **Lawton-Plimpton Award**.
10. *Brittany R. Morgan*, “Simulation of Micro-Elasticity in a Fractal Network”, PH GSI-0101 (May 2002).
11. *Nikole Howard*, “Numerical Simulations of the Impact of Jupiter's Migration on the Formation of the Hilda Asteroid Group”, PH GSI-0107 (May 2002) – **Robert H. Goddard Award**.
12. *Elizabeth Bouvier*, “Operation of a Low-Temperature Versatile AC-Calorimeter”, PH GSI-0304 (May 2004).
13. *Helen Hanson, Deanna Wolfson*, “Geiger-Mode Avalanche Photo-diode for LADAR”, MIT/Lincoln Labs, PH GSI-0504 (December 2005) – **WPI/Sigma Xi MQP Award & Honorable Mention Provost MQP Award**
14. *Anne Bothmer, Kevin Glynn*, “Photomechanical Properties of a Liquid Crystal”, co-advisor with N. Burnham, PH NAB-MQP5 (March 2006) – **Honorable Mention Provost MQP Award, A. Bothmer won the Salisbury Award**,
15. *William Aust*, “Firefighter Location Detection System”, co-advisor with D. Cyganski, PH DC-0501 (May 2006).
16. *Jared Bollinger*, “Digital Dynamic Light Scattering Experiment for Colloids”, PH GSI-0501 (May 2006).
17. *Christopher Kalisz*, “Disorder Strength Measurement of a Liquid Crystal – Silica Colloid”, PH GSI-0502 (May 2006).
18. *Brenden Brown*, “Theoretical Modeling of AC/RF Calorimetry”, PH GSI-0503 (May 2007).
19. *Caroline F. Mallory*, “Accelerator Beam Window: Radiation Cooled Window for an ADS Reactor”, PH GSI-0605 (May 2007).
20. *Jesse Sawyer and Eugeny Sosnovsky*, “Omni-directional Horizontally Polarized UHF Antenna Design”, MIT Lincoln Labs, PH GSI-0701 (December 2007) – **E. Sosnovsky won the Salsibury Award**.
21. *Eric Scheid* (PH), *Christopher Cleary* (ECE), and *Sara Duran* (ECE), “Discriminating Between Splitting and Crossing Targets: A Radar Tracking Problem”, MIT Lincoln Labs, co-advised with K. Clements, PH KAC-0702 (December 2007).
22. *Angelo Chandler* (PH), *Thomas MacDonald* (ECE), “Profit and Loss Work flow Analysis”, Bank of America – London UK, co-advised with M. J. Ciaraldi, A. Gerstenfeld, and J. Orr, PH MXC-W075 (December 2007).
23. *John Schneeloch*, “Structural Analysis of a Simulated Super-cooled Liquid”, co-advised with G. D. J. Phillies, PH GDP-0701 (May 2008).
24. *Olga Petrova*, “Search for Coincidence Events in LIGO and GEO600 Data” at MIT, PH GSI-0702 (May 2008) – **Robert H. Goddard Award**.
25. *Christopher Calomusi*, “AC Calorimetry Spectroscopy”, PH GSI-0303 (May 2008).

VITAE – GERMANO S. IANNACCHIONE

26. *Jillian Daniels*, “Gravity Anomalies and Flexure”, PH GSI-0705 (May 2008).
27. *Andrew Lingenfelter, Meghan LeBounty*, “Optimization of a Thermoacoustic Refrigerator”, PH GSI-0706 (May 2008).
28. *Michael Kavulich*, “The Physics of Sand Dune Formation and Migration on Mars”, co-advised with D. De Paor, PH GSI-0801 (May 2008).
29. *Steven Rose* (PH), *Bradley Scoville* (ECE), “Aircraft Lasercom Terminal Compact Optical Module (ALT-COM)”, MIT Lincoln Labs, co-advised with W. Michalson (ECE) PH GSI-0806 (October 2008).
30. *Joseph Mullin, Matthew Silva Sa, Dericc Orso*, “Rutherford Scattering and GeLi Detection”, co-advised with S. Weekes (MA) PH GSI-0805 (December 2008).
31. *Amanda Cox, Jessica LaGoy, Thomas MacDonald*, “Catapults, Corked Bats, and Tesla Coils: Finding the Truth”, PH GSI-0802 (May 2009).
32. *Vineet Barot, David Coit*, “Experiments with a Thermoacoustic Refrigerator”, PH GSI-0807 (May 2009).
33. *Nicholas LeCompte, Dante Amaroso*, “Thin-Film Ferrofluidics”, joint MQP co-advised with B. Verneascu (MA) PH GSI-0808 (May 2009) – ***N. LeCompte won the Salisbury Award, D. Amoroso won the R. H. Goddard Award.***
34. *Ronald Turba*, “Production of a Fluid Microjet Using Electrospray and Flow Focusing”, co-advised with J. Blandino (AE), JB3-MFJ1 / PH GSI-0809 (May 2009).
35. *Caleb Teske, Robert Lowery*, “An Experimental Study of a Table-Top Doppler Effect Simulation”, PH GSI-0812 (May 2009).
36. *Charles Fancher, Glenn Amundsen, Long Tong, Genevieve Bowman*, “Linking Radar Data to Physical Models”, MIT Lincoln Laboratory, PH GSI-0904 (October 2009).
37. *Steve Ellis*, “The Nematic-Isotropic Phase Transition in Liquid Crystal and Carbon Buckyball Colloids”, PH GSI-0901 (May 2010).
38. *Christopher Horgan* (PH), *Justin Fraize* (ECE), *Matthew Sirocki* (ECE), “High-Powered Microwave Systems for Boost Phase Interception”, MIT Lincoln Laboratory, co-advised with E. Clancy (ECE) PH GSI-0905 (October 2010).
39. *Matthew Rumore*, “Experimental Study of GEMs”, at Brookhaven National Laboratory, PH GSI-0803 (February 2011).
40. *Caitlyn Shaddock*, “Ellipsometry of Biofilms”, PH GSI-1006 (May 2011).
41. *Robert Connick*, “Musical Tesla Coil”, PH GSI-1009 (May 2011).
42. *Samantha O'Connor* (PH), *Christopher Massa* (ECE), and *Erik Silva* (ECE), “The Beacon Locator Project: A Passive Direction Finding System for Locating Pulsed Emitter Signals”, MIT Lincoln Laboratory, co-advised with E. Clancy (ECE), PH GSI-1104 (October 2011).
43. *Craig Janeczek* (PH/ECE), “Pedestrian Car Alert System”, co-advised with S. Bitar (ECE), PH SJB-1A11 (May 2012).
44. *Autumn Paro*, “Introduction to Plasma Physics”, co-advised with A. Zozulya (PH), PH AZ-AZ01 (May 2012).
45. *Shane Jackson* (PH), *Daniel Guerin* (ECE), *Jon Kelly* (ECE), “Passive Direction Finding a Phase Interferometry Direction Finding System for an Airborne Platform”, MIT Lincoln Laboratory, co-advised with E. Clancy (ECE), PH GSI-1202/EXC-1202 (October 2012).
46. *Jeffrey Peters*, Cellular Uptake of Functionalized Gold Nanoparticles”, PH GSI-1206 (May 2013).
47. *Xiaojing (Cathy) Wang* (PH/MA), “Three Phase Boundary Models”, double-major MQP co-advised with J. Fehribach (MA), PH/MA JDF-1211 (May 2013) – ***Provost MQP Award.***
48. *Bo Rim Seo* (ME), “Bio-Inspired Robotic Flapping Wing”, co-advised with M. Popovic (PH/RBE), RBE MBP-AAAG (May 2013).
49. *Roberto Alvarado* (PH), *Michael Bartlett* (ME), *Richard Beski* (ME), *Santiago Isaza* (ME), “Thermomechanical Reliability”, co-advised with R. Pryputniewicz (ME), PH RJP-1211 (May 2013).
50. *Shaun Marshall*, “Liquid Crystals and Protein Mixtures”, co-advised with I. Stroe (PH), PH IZS-SH12 (May 2013).
51. *Bryan Bergeron*, “Statistical Mechanics”, PH GSI-1204 (June 2013).
52. *Jack O'Brien*, “Physics Education Research”, PH GSI-1301 (May 2014).

VITAE – GERMANO S. IANNACCHIONE

53. *Eric Reich*, “Statistical Mechanics and Graph Theory”, co-advised with MA, BZS-1305 (May 2014).
54. *Jeffrey Havill* (ME) and *Steve Thuo* (PHE), “Transport Properties in Materials”, co-advised with D. Lados (ME), PH GSI-1302 (expected Summer 2014).
55. *Kevin Brown* (PH), “Transport Properties in Materials”, PH GSI-1302 (December 2014).
56. *Stephanie Herpich*, “Self-Assembly of Quantum Dots”, PH GSI-1304 (expected Spring 2015).
57. *Daniel Banco* (PH/ECE), *Benjamin Rude* (PH), and *Matthew Zawatsky* (PH), “Infrared Video Tracker”, MIT Lincoln Laboratory, co-advised with E. Clancy (ECE), PH GSI-1402 (October 2014).
58. *Lydia George* (ME), *Charles Plummer* (ME), *Daniela Ruiz* (ME w/ MAT), *Xiaoyu Wang* (ME), “Thermal/Electrical Transport”, co-advised with D. Lados (ME), PH GSI-1401 (May 2015).
59. *Jennifer Albores* (RBE), *Stephen Couitt* (PH/ME), *Stephen Montanez-Sanchez* (RBE/ME), and *Timothy Neilan* (RBE), “Holography of Soft Tissue”, co-advised with C. Furlong (ME), ME CF-HO15 (May 2015).
60. *Rose Carmichael*, *Jordan Kovar*, “Moving Target Trackers”, MIT Lincoln Laboratory, co-advised with J. Fehribach (MA), PH GSI-1601 (May 2016 for J. Kovar, May 2017 for R. Carmichael).
61. *Gyneth Campbell* (ME), *Scott Davison* (ME), *Adam Gatehouse* (ME), *Daniel Mortarelli* (ME), “Thermal and Electrical Transport Measurements in Cast and Wrought Aluminum Alloys”, co-advised with D. Lados (ME), ME DL1-1701 (May 2017)
62. *Daniel Braconnier* (ME), *Kristin Markuson* (ME), *Mila Maynard* (ME), “Fabrication and Properties of Novel Polymer-Metal Composites Using 3D Printing”, co-advised with D. Lados (ME), A. Peterson (CHE), ME AMP-PMCP (May 2017) – **ASM Chapter 1st Place Award**.
63. *Kevin Martin* (AE), *Finn O’Brien* (AE/PH), *Eric Periera* (ME), “Peroxide Propulsion Follow-On”, MIT Lincoln Laboratory, co-advised with N. Gatsonis (AE/MA), AE NAG-1702 (December 2017).
64. *Ann Kaczowka* (ME), *Nde Aghanui Nkimbeng* (ME), *Justin Coppolino* (ME), “Polymer-Metal Composites”, co-advised with D. Lados (ME), ME GSI-1802 (May 2018).
65. *Andrzej Bielecki* (ME), *Dexter Y. Gutierrez* (ME), “Thermal and Electrical Transport Measurements in Advanced Materials”, advised with D. Lados (ME), ME DL1-1801 (May 2018).
66. *Takayoshi Tsutsui*, “ICON”, advised by Frank Hoy (BUS), FRH-FH18 (May 2018).
67. *Nicholas E. Mears* (PH), “Stochastic Simulations of Non-Equilibrium Thermal Systems”, PH GSI-1802 (December 2018).
68. *Joseph V. Calnan* (ME), *Jack A. Grubbs* (ME), *Richard C. Smith* (ME), *Andrea P. Claudio* (ME), “Polymer-Metal Composites”, co-advised with D. Lados (ME), ME DL1-1901 (May 2019).
69. *Yash Yadati* (PH/ME), “Experimental and Computational Studies in Far-from-equilibrium Systems like Rayleigh-Bénard Convection”, co-advised with R. Daniello (ME), PH GSI-1902 (May 2020).
70. *William Luksha* (PH), “Black-Hole Simulations”, co-advised with W. Sanguinet (MA), E-project-081123-203127 (August 2023).
71. *Alexandra Spezzano* (PH), “Explorations in the Modification of Newton’s Law of Gravitation and Einstein’s Field Equations: Accounting for Dark Energy and Dark Matter”, E-project-042524-143435, (May 2024).

IV.4.b. Interactive Qualifying Projects (IQP): 26 projects, 50 students

1. *Joshua S. Engstrom* and *Christopher A. Knight*, “Designing an 8th Grade Science Curriculum”, IQP –51 GSI-0002 (May 2001).
2. *Michael DeLuc*, “Characteristics of Successful Physics Departments”, IQP –51 GSI-0301 (May 2004).
3. *Sumeet Sharma*, *Nathan T. Hanify-Neal*, and *Mordecai Waegell*, “Augmentation of the Physics E&M Labs.”, co-advised with C. Koleci, IQP –51 CK-ID04 (December 2004)
4. *Gregory Artim*, *Clifford Harvey*, and *Michael Kavulich*, “Physics in a Box”, IQP –51 GSI-0707 (May 2008).
5. *Kyle Pydynkowski*, *Bennett Lessard*, *Konrad Perry*, *John McGinley*, and *Bennie Jones*, “Ongoing Advancement of the Physics Toolbox”, co-advised with F. Hutson, IQP –51 GSI-0810 (December 2008).
6. *Andrew Crouse*, “Robert H. Goddard as a Proto-Plan Student”, IQP –51 GSI-0801 (May 2009).
7. *Stephen Mann*, “Physics Data Sharing”, co-advised with F. Hutson, IQP –51 GSI-0903 (October 2009).

VITAE – GERMANO S. IANNACCHIONE

8. *Guy Mann, Justin Pombrio, and Christopher Wellington*, “Physics and Education Interdisciplinary Qualifying Project”, co-advised with F. Hutson, IQP –51 GSI-0902 (May 2010).
9. *Joshua Faucher, Daniel Spitz, John Vilc, and Jennifer Wunschel*, “Physics Lab Toolbox – Collisions Laboratory”, co-advised with F. Hutson, IQP –51 GSI-0907 (May 2010).
10. *Meshal Alasfour, Brian Grabowski, and Brendan Harris*, “Using Media to Enhance Student's Ability to Learn Physics”, co-advised with F. Hutson, IQP –51 GSI-0909 (May 2010).
11. *Marc Umbricht*, “Inquiry Based First-Year Physics Laboratories”, co-advised with F. Hutson and Y. Zastavker, IQP –51 GSI-1005 (suspended).
12. *Angelos Plataniias*, “Using Media to Enhance Student's Ability to Learn Physics”, co-advised with F. Hutson, IQP –51 GSI-1008 (May 2011).
13. *Jeremy Moody*, “Physics Laboratory Student Perception Surveys”, co-advised with F. Hutson and Y. Zastavker, IQP –51 GSI-1102 (May 2012).
14. *Matthew Fredrick*, “Development of an Inquiry-based Physics Lab”, co-advised with F. Hutson and Y. Zastavker, IQP –51 GSI-11005 (May 2012).
15. *Andrew Johns*, “Physics Performance Data Mining”, co-advised with F. Hutson and Y. Zastavker, IQP –51 GSI-1106 (May 2012).
16. *Bryan Bergeron*, “Revision of the PH 1120 Laboratory”, co-advised with F. Huston, IQP –51 GSI-1201 (August 2012).
17. *Gregory McCarthy*, “Physics Instructional Toolbox”, co-advised with F. Hutson, IQP –51 GSI-1303 (May 2014).
18. *Alec Benson, Matthew Mancini*, “Improving the PH-1110/1111/1120/1121 Physics Laboratories”, co-advised with G. Phillies, IQP –51 GDP-9999 (May 2015).
19. *Yu Jing*, “Design of Nuclear Labs for PH1130”, IQP –51 GSI-1701 (December 2016).
20. *Jarrett Jacobson*, “Reworking and Improving PH 2101. Principles of Thermodynamics”, IQP –51 GSI-1602 (May 2016).
21. *Christopher Pierce* (PH), “A History of Physics at WPI”, IQP -51 GSI-1603 (May 2017).
22. *Luke Brown* (MA), *Bintang Hoenbuckle* (AE), *Olivia Leavitt* (BE), “Fukushima I”, co-advised with M. Katfolen, D. Medich, I.R. Stoe, IQP –41 GSI-NU01 (May 2018).
23. *Taylor Trottier* (PH), *Yudith Chumsosa* (BE), *Joseph LeBlanc* (BE), “Chernobyl Dogs”, co-advised with M. Katfolen, D. Medich, I.R. Stoe, IQP –41 GSI-NU02 (May 2018).
24. *Steven Franca* (BE), *Son Nguyen* (ECE), *Thang D. Pham* (CM), “Fukushima II”, co-advised with M. Katfolen, D. Medich, I.R. Stoe, IQP –41 GSI-NU03 (May 2018).
25. *John Kahler* (CM), *Bailey Waterman* (AE), “Sellafield, UK”, co-advised with M. Katfolen, D. Medich, I.R. Stoe, IQP –41 GSI-NU04 (May 2018).
26. *Yash Yadati* (PH), “ODPL Web Site Construction”, IQP –51 GSI-1801 (May 2020).

IV.4.c. Master of Science Graduate Students (M.Sc.) - Physics

1. **11** M.S. degrees earned (exam option) by my graduate students en-route towards their Ph.D.
2. *Kevin Vanslette* (MS, Spring 2013), “Theoretical study of variable measurement uncertainty h and infinite unobservable entropy” (self-supported).
3. *Jeffrey Peters*, (BS/MS, Spring 2014), “Model cellular uptake of functionalized gold nanoparticles” (self-supported).
4. *Elizabeth C. Tyree* (MS, Fall 2000 – Summer 2020), “Solar Signals – Possible correlations between the 11-Year Solar Sunspot Cycle and Earthquakes on Earth using the Fourier Transform” (self-supported).

IV.4.d. Doctoral Graduate Students (Ph.D.) - Physics, 3 awards noted in bold.

1. *Aleksander Roshi* (Summer 2000 – M.S. May 2004 – Ph.D. May 2005), “Effect of disorder through quenched random order on liquid crystalline phase transitions”.
2005- 2016: Senior Research Engineer, Analogic Corp., Peabody, MA

VITAE – GERMANO S. IANNACCHIONE

- 2016- now: Senior Research Engineer, MIT Lincoln Laboratory, Lincoln, MA.
2. *Saimir Barjami* (Summer 2001 – M.S. May 2004 – Ph.D. May 2005), “Calorimetric spectroscopy techniques: RF-heat modulation and heat capacity bridge”.
June- August 2005: Physics Research Scientist, WPI, Worcester, MA.
2005- 2010: Physics Lecturer, Cal. Poly. State U., San Luis Obispo, CA.
2011- now: Physics Instructor, Lamar University, Beaumont, TX.
 3. *Florentin Cruceanu* (Fall 2003 – M.S. May 2006 – Ph.D. May 2008), “Dielectric spectroscopy study of quenched random disorder on liquid crystalline phase transitions”.
2008- 2010: Physics Instructor, Toronto School System, Toronto, Canada.
deceased: May 2010
 4. *Rajratan Basu* (Spring 2007 – M.S. May 2009 – Ph.D. May 2010), “Dielectric studies of nanostructures and directed self-assembled nanomaterials in nematic liquid crystals”.
2009 1st Place, Science Division, Graduate Research Achievement Day (GRAD).
2010 Sigma Xi Outstanding Ph.D. Research Award
2010- 2012: Post-doctoral Fellowship, Prof. C. Rosenblatt, Case Western Reserve University.
2012- 2017: Assistant Professor of Physics, U.S. Naval Academy.
2017- now: Associate Professor of Physics (tenured), U.S. Naval Academy
 5. *Nihar Pradhan* (Fall 2007 – M.S. May 2009 – Ph.D. May 2010), “Thermoconductivity of nanowires, nanotubes, and polymer-nanotube composites”.
2010- 2012: Post-doctoral Fellowship, U. of Mass. Amherst.
2012- 2017: Post-doctoral Research Scientist, National High-Magnetic Field Laboratory, FL
2017- now: Assistant Professor Of Physics, Jackson State University, FL
 6. *Krishna Sigdel* (Spring 2007 – M.S. May 2009 – Ph.D. May 2011), “Phase transitions studies of liquid crystal colloids with solvents and nano-solids”.
2011: 3rd Place Science Division, GRAD
2011- 2018: Post-doctoral Fellowship, Prof. Gavin M. King, U. of Missouri, Columbia.
2018- now: Assistant Professor of Physics, Cal. Poly. State U., Pomona, CA.
 7. *Parvalathlu Kalakonda* (Fall 2010 – M.S. May 2011 – Ph.D. May 2013), “Thermodynamic and thin film study of liquid crystalline polymers, polymers, and nano-particle colloidal dispersions”.
2013- 2014: Post-doctoral Fellowship, Prof. M. Islam, Carnegie Mellon University.
2014- now: Research Scientist, Indian Institute of Science, University in Bengaluru, India.
 8. *Klaida Kashuri* (Summer 2005 – M.S. May 2008 – Ph.D. May 2014), “Calorimetric study of protein unfolding and self-assembly of sterols/biomaterials”.
2014- 2016: Adjunct Lecturer, Dept. of Physics, WPI.
2016- 2018: Adjunct Lecturer, Dept. of Natural Sciences, Assumption College.
2018- 2021: Adjunct Lecturer, Physical Sciences, Becker College
2021- now: Programmer for start-up company.
 9. *Saad Al-Garni* (Fall 2010 – M.S. May 2011 – Ph.D. May 2015), “Development and application of an Area Recorded Generalized Optical Scattering – ARGOS – technique” (fully supported by Saudi Government).
2015- now: Assistant Professor of Physics, King Saud University, Saudi Arabia.
 10. *Atanu Chatterjee* (Spring 2016 – M.S. May 2017 – Ph.D. May 2020), “Studies on the Emergence of Order in Out-of-equilibrium Systems”.
2020- now: Post-doctoral Fellowship, Prof. Ofer Feinerman, Weizmann Institute of Science, Israel.
 11. *Anusuya Pal* (Summer 2017 – M.S. May 2018 – Ph.D. May 2021), “Self-Assembly and Morphological Patterns in Drying Droplets of Bio-colloids”.
2021- now: Post-doctoral Fellowship, Prof. Marco Polin, University of Warwick, Coventry, UK.
 12. *Mashaal A. Alghamdi* (Spring 2012 – M.S. May 2014 – Ph.D. now), “Ellipsometry of thin-films and nano-composites”. (fully supported by Saudi Government).

IV.4.c. Research Associates / Research Group Members

VITAE – GERMANO S. IANNACCHIONE

Dr. Dipti Sharma, Post-doctoral Associate (July 2004- June 2007).

Dr. Saimir Barjami, Research Scientist (June 2005- August 2005).

Dr. Hektor Kashori, Assistant Teaching Professor (August 2009- now)

Dr. Sabyasachi Sarkar, Assistant Teaching Professor (August 2011- now)

IV.5. Independent Studies Lead

Independent study areas guided include the physics of liquid crystals, phase transitions, calorimetry, NMR, thermodynamics, and critical phenomena. Have also offered as IS/P (undergraduate) to cover courses out of sequence based on student needs at all levels.

From 1998 to 2016: **37** Independent Study/Project (IS/P) and **18** Independent Study Graduate (ISG)

IV.6. Academic Advising

From 1998 to 2013: typically carried **7-9** primary and **2-4** secondary advisees per academic year.

Insight Advisor for AY2004/05 and AY2005/06.

Academic Advisor for Alpha Phi Omega (APO), WPI's largest service co-ed fraternity, 2013- now.

Academic Advisor for the Society of Physics Students (SPS), 1999- 2003, 2013/14.

VITAE – GERMANO S. IANNACCHIONE

V. OTHER

V.1. Non-Academic Contributions to Student Welfare

1. WPI Chapter of Sigma Xi: Secretary (2003- 19, 2020- now; campus-wide).
2. Member, Board of Trustees, Spirit of Knowledge Charter School, Worcester, MA (2010- 11, 2013- 15).
3. Faculty Advisor to Alpha Phi Omega (APO), the largest service fraternity at WPI (2013- now).

V.2. Snapshot of Physics Department at WPI during time as Head

AY2004/05: Just before assuming the role of Head of Physics at WPI

Faculty = 12 T/TT and 0 NTT = 12 FTE (2 women)

Staff = 2 Administrative and 2 Technical

Ph.D. Student Support = 7 TA positions, 3 RA, 1 Fellowship, and 1 Self-funded

M.S. Student Support = all Self-Funded

Graduate Students = 12 Ph.D. And 1 M.S. = 13 total

Graduate Degrees = 4 Ph.D. and 3 M.S.

Physics and Engineering Physics Majors and Minors = 76 total

Undergraduate PH/PHE Degrees = 8 Majors and 3 Minors

Total Credit Hours Delivered = 5820

AY2014/15: Year previous to stepping down as head of Physics at WPI

Faculty = 11 T/TT and 8 NTT = 19 FTE (5 women)

Staff = 2 Administrative and 2 Technical

Ph.D. Student Support = 11 TA positions, 5 Fellowship, 2 RA and 2 Self-Funded

M.S. Student Support = all Self-Funded

Graduate Students = 20 Ph.D., 7 M.S., and 6 MPED students = 33 total

Graduate Degrees = 1 Ph.D. And 2 M.S.

Physics and Engineering Physics Majors and Minors = 95 total

Undergraduate PH/PHE Degrees = 13 Majors and 10 Minors

Total Credit Hours Delivered = 7821