

Gino Biondini: Curriculum Vitæ

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Contact information

State University of New York at Buffalo, Department of Mathematics
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Education

1997: Doctorate in Theoretical Physics, University of Perugia, Italy
1991: Laurea in Theoretical Physics (Summa Cum Laude), University of Perugia, Italy

Employment

State University of New York at Buffalo, Department of Mathematics
2007–present: Associate Professor
2004–2007: Assistant Professor

Ohio State University, Department of Mathematics
2001–2004: Hans Zassenhaus Assistant Professor

Northwestern University, Department of Engineering Science and Applied Mathematics
2001–2003: Adjunct Assistant Professor
1999–2001: Research Assistant Professor

University of Colorado, Department of Applied Mathematics
1997–1999: Post-Doctoral Research Associate
1995–1997: Visiting Research Assistant

University of Perugia, Physics Department
1993–1997: Graduate Researcher

Research interests

Ordinary and partial differential equations

Multiple scale and asymptotic methods, perturbative methods, nonlinear wave equations, integrability, inverse scattering transform, solitons, finite genus and quasi-periodic solutions, nonlinear modulations and Whitham theory, semiclassical/dispersionless limits, differential-difference and integro-differential evolution equations, forced and initial-boundary value problems, computational methods.

Nonlinear optics and optical fiber communications

Nonlinear and stochastic effects, wavelength-division multiplexing, dispersion management, four-wave mixing, solitons and return-to-zero formats, differential-phase-shift keying, birefringence and polarization effects, quadratic materials, second harmonic generation, parametric processes, wavelength conversion and optical parametric oscillation, femtosecond lasers, photonic crystals.

Applied probability and stochastic processes

Stochastic differential equations, large deviations theory, variance reduction techniques, importance sampling, multi-canonical and Markov chain Monte Carlo methods.

Grants and awards

- 2007–2009: NSF award DMS-0722504, “Scientific research computing environments for the mathematical sciences at Buffalo”, principal investigators: E. B. Pitman, G. Biondini and B. J. Spencer
- 2007: U.S. Patent 7,289,708, “Method and system for the controlled production of polarization mode dispersion”, inventors: W. L. Kath, G. Biondini and S. L. Fogal
- 2006: U.S. Patent 7,068,896, “Method and system for the controlled production of polarization-mode dispersion”, inventors: W. L. Kath, G. Biondini and S. L. Fogal
- 2005–2008: NSF award DMS-0506101, “Mathematical and computational methods for high-performance lightwave systems”, principal investigator
- 2001–2005: NSF award DMS-0101476, “Mathematical and computational methods for high-data-rate optical fiber communications”, principal investigators: W. L. Kath and G. Biondini
- 1998–2002: NSF award ECS-9800152, “Wavelength division multiplexing in soliton communications”, senior personnel (principal investigator: M. J. Ablowitz)

Service

Reviews

- Journals: about one review a month, for the following journals:
Appl. Math. Lett., Appl. Opt., Chaos, Nuovo Cimento B, J. Comput. Phys., J. Eng. Math., J. Light-wave Technol., J. Opt. Soc. Am. B, J. Opt. A, J. Phys. A, J. Phys. B, J. Quantum Electron., J. Sel. Topics Quantum Electron., Math. Comput. Simul., Nonlinearity, Opt. Quantum Electron., Opt. Laser Technol., Opt. Expr., Opt. Lett., Photon. Technol. Lett., Physica D, Phys. Rev. E, Phys. Rev. Lett., SIAM J. Appl. Math., SIAM J. Optim., Theor. Math. Phys., Wave Motion
- Books: SIAM, Springer-Verlag, Freeman & Co., Chapman & Hall / CRC Press
- Proposals: CRDF, South Carolina Research Initiative, QNRF
- Colleagues: external reviewer for a promotion and tenure case

Guest editing

- Chaos: “Optical solitons: perspectives and applications”, volume 10 no. 3, September 2000
- Mathematics and Computers in Simulation: “Optical solitons”, volume 56 no. 6, July 2001

Conferences

- “Nonlinearity and randomness in complex systems”, Buffalo, NY, 2006: main workshop organizer
- SIAM “Nonlinear waves and coherent structures”, Seattle, WA, 2006: co-organizer of two sessions
- IMACS “Nonlinear Evolution Equations and Wave Phenomena”, Athens, GA
2003–2007: Conference co-chair
2001–2007: Scientific program committee member
1999–2007: Session organizer
- “Colorado Days at Los Alamos”, Los Alamos, NM, 1999: workshop co-organizer

Departmental

- 2007–present: Executive committee, Department of Mathematics, SUNY at Buffalo
- 2006–present: Graduate studies committee, Department of Mathematics, SUNY at Buffalo
- 2005–2006: Undergraduate studies committee, Department of Mathematics, SUNY at Buffalo
- Colloquium committee, Department of Mathematics, SUNY at Buffalo
2007–present: co-chair
2004–2007: member

Invited lectures

- 2007: *Dynamics Days Europe*, Loughborough, UK
IMACS *Nonlinear Evolution Equations and Wave Phenomena V*, Athens, GA
- 2006: SIAM *Nonlinear Waves and Coherent Structures*, Seattle, WA
AMS-MAA Joint Meetings, San Antonio, TX
Kyushu University, Department of Mathematics, Fukuoka, Japan
McMaster University, Department of Mathematics, Hamilton, Canada
Lucent Technologies, Holmdel, New Jersey
- 2005: AAAS *Annual Meeting*, Washington, D.C.
SIAM *Applications of Dynamical Systems*, Snowbird, UT
Nonlinear Waves, Integrable Systems and Applications, Colorado Springs, CO
University of Toronto, Department of Mathematics, Toronto, Canada
Rensselaer Polytechnic Institute, Department of Mathematical Sciences, Troy, NY
- 2004: SIAM *Nonlinear Waves and Coherent Structures*, Orlando, FL
Nonlinear Physics, Theory and Experiment III, Gallipoli, Italy
University of Akron, Department of Mathematics, Akron, OH
University of South Florida, Department of Mathematics, Tampa, FL
- 2003: AMS Joint Central and Western Section Meeting, Boulder, CO
AMS Southeastern Section Meeting, Chapel Hill, NC
SIAM *Computational Science and Engineering*, San Diego, CA
OSA *Optical Fiber Communications*, Atlanta, GA
IEEE/LEOS Topical meeting on *Polarization-Mode Dispersion*, Vancouver, Canada
Pennsylvania State University, Department of Mathematics, State College, PA
State University of New York, Department of Mathematics, Buffalo, NY
University of North Carolina, Department of Mathematics, Chapel Hill, NC
University of Maryland Baltimore County, Department of Mathematics, Baltimore, MD
Illinois Institute of Technology, Department of Applied Mathematics, Chicago, IL
University of Colorado, Department of Mathematics, Colorado Springs, CO
- 2002: SIAM *50th Anniversary and Annual meeting*, Philadelphia, PA
Nonlinear Physics, Theory and Experiment II, Gallipoli, Italy
Summer School on Polarization-Mode Dispersion, Venice, Italy
Colorado State University, Department of Mathematics, Fort Collins, CO
Howard University, Department of Mathematics, Washington, D.C.
- 2001: IMACS *Nonlinear Evolution Equations and Wave Phenomena II*, Athens, GA
Soliton Equations: Theory and Applications, Colorado Springs, CO
University of Delaware, Department of Mathematical Sciences, Newark, DE
New Jersey Institute of Technology, Department of Mathematical Sciences, Newark, NJ
University of Padova, Department of Electronics and Computer Science, Padova, Italy
Photonex Corporation, Bedford, MA
- 2000: SIAM *Computational Science and Engineering*, Washington, D.C.
University of Vermont, Department of Mathematics and Statistics, Burlington, VT
Northwestern University, Department of Engineering Science and Applied Mathematics, Evanston, IL
University of Colorado, Department of Applied Mathematics, Boulder, CO
Ohio State University, Department of Mathematics, Columbus, OH

- 1999: IMACS *Nonlinear Evolution Equations and Wave Phenomena I*, Athens, GA
Corning Incorporated, Corning, NY
- 1998: SIAM *Mathematical and Numerical Aspects of Wave Propagation*, Golden, CO
AFOSR-ACMS *Nonlinear Optics Workshop*, Tucson, AZ
- 1997: AMS-MAA Joint Meetings, San Diego, CA

Other conference presentations

- 2007: *Nonlinear Evolution Equations and Dynamical Systems*, Ametlla del Mar, Spain
- 2006: *Nonlinear Physics, Theory and Experiment. IV*, Gallipoli, Italy
- 2005: NSF/CBMS regional research conference on *New perspectives for boundary value problems and their asymptotics*, Edinburgh, TX
- 2004: OSA Topical meeting on *Nonlinear Optics*, Waikoloa, Hawaii
- 2002: OSA *Optical Fiber Communications*, Anaheim, CA
- 2001, 2003, 2005: IMACS conference on *Nonlinear Evolution Equations and Wave Phenomena II, III & IV*, Athens, GA; Tutorial on "Optical Fiber Transmission Systems"
- 2001: OSA *Optical Fiber Communications*, Anaheim, CA
- 1999: IMACS *Nonlinear Evolution Equations and Wave Phenomena*, Athens, Georgia
- 1998: OSA *Nonlinear Guided Waves and Their Applications*, Victoria, Canada
Los Alamos Days at Colorado, Boulder, Colorado
- 1997: LANL/CNLS *Nonlinear Waves and Solitons in Physical Systems*, Los Alamos, NM
- 1996: *Colorado Days at Los Alamos*, Los Alamos, New Mexico
- 1995: *Nonlinear Coherent Structures in Physics and Biology*, Edinburgh, Scotland
- 1994: *Nonlinear Evolution Equations and Dynamical Systems*, Los Alamos, NM

Mentoring

Post-doctoral researchers supervised:

2005–2006: Elaine Spiller (SUNY at Buffalo)

Graduate students advised:

2007–present: Guenbo Hwang and Danhua Wang (SUNY at Buffalo)

2005–2007: Jinglai Li (Ph.D., SUNY at Buffalo)

2005–2007: Hyung-kul Kil (M.A., SUNY at Buffalo)

Undergraduate students advised:

2007: Siu-Fai Chow (SUNY at Buffalo)

2006: Brenton R. Stone (SUNY at Buffalo)

2002: Akil C. Narayan (Ohio State University)

Teaching

State University of New York at Buffalo, Department of Mathematics

2007: Instructor for "Methods of Applied Mathematics II" (graduate)

2006: Instructor for "Nonlinear Wave Propagation" (graduate)

2005–2007: Instructor for "Methods of Applied Mathematics I" (graduate)

2004–2007: Instructor for "Calculus II" and "Ordinary differential equations"

Ohio State University, Department of Mathematics

2002–2004: Instructor for “Numerical methods for partial differential equations” (graduate)

2003–2004: Instructor for “Mathematical methods in science and engineering” (graduate)

2001–2004: Instructor for “Calculus IV”, “Complex variables” and “Vector analysis”

Northwestern University, Department of Engineering Science and Applied Mathematics

2001: Instructor for “Nonlinear Wave Propagation” (graduate)

2000–2001: Instructor for “Calculus III”

University of Colorado at Boulder, Department of Applied Mathematics

1998–1999: Instructor for “Calculus II”

1997: Teaching assistant for “Linear Algebra and Differential Equations”

University of Perugia, Physics Department

1995: Lecturer on “Fourier and Laplace Transforms”

Liceo Scientifico G. Alessi (high school), Perugia, Italy

1995: Teacher of Mathematics

Istituto Professionale di Stato per l’Industria e l’Artigianato (professional high school), Spoleto, Italy

1993–1994: Teacher of Electronics

Professional memberships

AMS, SIAM, OSA

Publications

Special works

1. “A method for calculating outage probabilities due to polarization-mode dispersion using importance sampling”, G. Biondini, W. L. Kath and C. R. Menyuk, *Opt. Photon. News* **12** #12 p. 20 (2001)
(Each year the December issue of *Opt. Photon. News* summarizes the most important works in optics.)

Invited articles in refereed journals

2. “Importance sampling for polarization-mode dispersion: Techniques and applications”, G. Biondini, W. L. Kath and C. R. Menyuk, *J. Lightwave Technol.* **22**, 1201–1215 (2004), **24**, 1065 (2006)
3. “Applications of importance sampling to polarization-mode dispersion”, G. Biondini and W. L. Kath, *J. Opt. Fiber Commun. Reports* **1**, 14–31 (2004)

Articles in refereed journals: nonlinear waves and integrable systems

4. “Line soliton interactions of the Kadomtsev-Petviashvili equation”, G. Biondini, *Phys. Rev. Lett.* **99**, 064103: 1–4 (2007)
5. “Inverse scattering transform for the integrable discrete nonlinear Schrödinger with non-vanishing boundary conditions”, M. J. Ablowitz, G. Biondini and B. Prinari, *Inv. Probl.* **23**, 1711–1758 (2007)
6. “Elastic and inelastic line-soliton solutions of the Kadomtsev-Petviashvili II equation”, G. Biondini and S. Chakravarty, *Math. Comp. Simul.* **74**, 237–250 (2007)
7. “On the Whitham equations for the defocusing nonlinear Schrödinger equation with step initial data”, G. Biondini and Y. Kodama, *J. Nonlin. Sci.*, **16**, 435–481 (2006)
8. “Inverse scattering transform for the vector nonlinear Schrödinger equation with non-vanishing boundary conditions” B. Prinari, M. J. Ablowitz and G. Biondini, *J. Math. Phys.* **47**, 063508: 1–33 (2006)

9. "Soliton solutions of the Kadomtsev-Petviashvili II equation", G. Biondini and S. Chakravarty, *J. Math. Phys.* **47**, 033514: 1–26 (2006)
10. "Resonance and web structure in discrete soliton systems: the two-dimensional Toda lattice and its fully- and ultra-discrete analogues", K.-i. Maruno and G. Biondini, *J. Phys. A* **37**, 11819–11839 (2004)
11. "On a family of solutions of the Kadomtsev-Petviashvili equation which also satisfy the Toda lattice hierarchy", G. Biondini and Y. Kodama, *J. Phys. A* **36**, 10519–10536 (2003)
12. "Methods for discrete solitons in nonlinear lattices", M. J. Ablowitz, G. Biondini and Z. H. Musslimani, *Phys. Rev. E* **65**, 026602: 1–4 (2002).
13. "Nonlinear Schrödinger equations with mean terms in non-resonant multi-dimensional quadratic materials", M. J. Ablowitz, G. Biondini and S. Blair, *Phys. Rev. E* **63**, 046605: 1–15 (2001)
14. "Multidimensional optical pulses in non-resonant quadratic materials", M. J. Ablowitz, G. Biondini and S. Blair, *Math. Comp. Simul.* **56**, 511–519 (2001)
15. "On the Burgers equation with moving boundary", G. Biondini and S. De Lillo, *Phys. Lett. A* **279**, 194–206 (2001)
16. "Optical solitons: perspectives and applications", M. J. Ablowitz, G. Biondini and L. A. Ostrovsky, *Chaos* **10**, 471–474 (2000)
17. "On the well-posedness of the Eckhaus equation", M. J. Ablowitz, G. Biondini and S. De Lillo, *Phys. Lett. A* **230**, 319–323 (1997)
18. "Multi-dimensional pulse propagation in non-resonant $\chi^{(2)}$ materials", M. J. Ablowitz, G. Biondini and S. Blair, *Phys. Lett. A* **236**, 520–524 (1997)
19. "The Burgers equation on the semiline with time-dependent flux at the origin", G. Biondini and S. De Lillo, *Phys. Lett. A* **220**, 201–204 (1996)

Articles in refereed journals: optical fiber communications

20. "Noncompliant capacity ratio for systems with an arbitrary number of polarization hinges", J. Li, G. Biondini, H. Kogelnik and P. J. Winzer, to appear in *J. Lightwave Technol.*
21. "Noise-induced perturbations of dispersion-managed solitons", J. Li, E. T. Spiller and G. Biondini, *Phys. Rev. A* **75**, 053818: 1–13 (2007)
(Selected for the June 2007 issue of the Virtual Journal of Ultrafast Science.)
22. "A method for computing statistics of large noise-induced perturbations of nonlinear Schrödinger solitons", R. O. Moore, G. Biondini and W. L. Kath, *SIAM J. Appl. Math.* **66**, 1418–1439 (2007)
23. "Polarization-dependent chromatic dispersion and its impact on return-to-zero transmission formats", G. Biondini and W. L. Kath, *Photon. Technol. Lett.* **17**, 1866–1868 (2005)
24. "Collision-induced timing-shift reduction by periodic-group-delay dispersion compensation in dispersion-managed quasi-linear systems", M. J. Ablowitz, C. Ahrens, G. Biondini, S. Chakravarty and A. Docherty, *Theor. Math. Phys.* **144**, 881–887 (2005)
25. "Collision-induced timing jitter in dispersion-managed quasi-linear systems with periodic-group-delay dispersion compensation", M. J. Ablowitz, C. Ahrens, G. Biondini, S. Chakravarty and A. Docherty, *Opt. Lett.* **29**, 2354–2356 (2004)
26. "Polarization-mode dispersion emulation with Maxwellian length sections and importance sampling", G. Biondini and W. L. Kath, *Photon. Technol. Lett.* **16**, 789–791 (2004)
27. "A comparative study of single-section polarization-mode dispersion compensators", I. T. Lima, A. O. Lima, G. Biondini, C. R. Menyuk and W. L. Kath, *J. Lightwave Technol.* **22**, 1023–1032 (2004)
28. "Statistical analysis of the performance of PMD compensators with multiple importance sampling", A. O. Lima, I. T. Lima, C. R. Menyuk, G. Biondini, B. S. Marks and W. L. Kath, *Photon. Technol. Lett.* **15**, 1716–1718 (2003)

29. "Four-wave mixing in dispersion-managed return-to-zero systems", M. J. Ablowitz, G. Biondini, S. Chakravarty and R. L. Horne, *J. Opt. Soc. Am. B* **20**, 831–845 (2003)
30. "Importance sampling for noise-induced amplitude and timing jitter in soliton transmission systems", R. O. Moore, G. Biondini and W. L. Kath, *Opt. Lett.* **28**, 105–107 (2003)
31. "Multiple importance sampling for first- and second-order polarization-mode dispersion", S. L. Fogal, G. Biondini and W. L. Kath, *Photon. Technol. Lett.* **14**, 1273–1275 (2002); **14**, 1487 (2002)
32. "Importance sampling for polarization-mode dispersion", G. Biondini, W. L. Kath and C. R. Menyuk, *Photon. Technol. Lett.* **14**, 310–312 (2002)
33. "Analysis of polarization-mode dispersion compensators using importance sampling", I. T. Lima, G. Biondini, B. S. Marks, W. L. Kath and C. R. Menyuk, *Photon. Technol. Lett.* **14**, 627–629 (2002)
34. "Self-induced thermal effects and modal competition in continuous-wave optical parametric oscillators", R. O. Moore, G. Biondini and W. L. Kath, *J. Opt. Soc. Am. B* **19**, 802–811 (2002)
35. "Collision-induced timing shifts in dispersion-managed soliton systems", M. J. Ablowitz, G. Biondini, A. Biswas, S. Chakravarty, A. Docherty and T. Hirooka, *Opt. Lett.* **27**, 318–320 (2002)
36. "Nonlinear chirp of dispersion-managed return-to-zero pulses", G. Biondini and S. Chakravarty, *Opt. Lett.* **26**, 1761–1763 (2001)
37. "Quasi-linear optical pulses in dispersion-managed transmission systems", M. J. Ablowitz, G. Biondini and T. Hirooka, *Opt. Lett.* **26**, 459–461 (2001)
38. "Incomplete collisions of wavelength-division multiplexed dispersion-managed solitons", M. J. Ablowitz, G. Biondini and E. S. Olson, *J. Opt. Soc. Am. B* **18**, 577–583 (2001)
39. "A comparison between lumped and distributed filter models in wavelength-division multiplexed soliton systems", M. J. Ablowitz, G. Biondini, S. Chakravarty and R. L. Horne, *Opt. Commun.* **172**, 211–227 (1999)
40. "On timing jitter in wavelength-division multiplexed soliton systems", M. J. Ablowitz, G. Biondini, S. Chakravarty and R. L. Horne, *Opt. Commun.* **150**, 305–318 (1998)
41. "Multiple scale dynamics in communication systems with strong dispersion management", M. J. Ablowitz and G. Biondini, *Opt. Lett.* **23**, 1668–1670 (1998)
42. "Four-wave mixing in wavelength-division multiplexed soliton systems: lossless fibers", M. J. Ablowitz, G. Biondini, S. Chakravarty, R. B. Jenkins and J. B. Sauer, *J. Opt. Soc. Am. B* **14**, 1788–1794 (1997)
43. "Four-wave mixing in wavelength-division multiplexed soliton systems: damping and amplification", M. J. Ablowitz, G. Biondini, S. Chakravarty, R. B. Jenkins and J. B. Sauer, *Opt. Lett.* **21**, 1646–1648 (1996)

Chapters in books

44. "Applications of importance sampling to polarization-mode dispersion", G. Biondini and W. L. Kath, in *Polarization-Mode Dispersion*, Ed. A. Galtarossa and C. R. Menyuk, Springer series on Optics and Fiber Communications Research (Springer-Verlag, 2005)

Invited contributions in refereed conference proceedings

45. "Applications of importance sampling to polarization-mode dispersion", G. Biondini and W. L. Kath, in *IEEE summer topicals: Polarization-mode dispersion*, IEEE/LEOS Tech. Digest Ser. (2003)
46. "Calculating PMD statistics and outage probabilities with importance sampling", G. Biondini and W. L. Kath, in *Optical Fiber Communications*, OSA Tech. Digest Ser. (2003)
47. "Soliton communications and wavelength-division multiplexing", M. J. Ablowitz, G. Biondini and S. Chakravarty, in *Mathematical and Numerical Aspects of Wave Propagation*, Ed. J. De Santo (SIAM, 1998)

Contributions in refereed conference proceedings

48. "Amplitude and phase noise of dispersion-managed solitons", E. T. Spiller and G. Biondini, in *Nonlinear Photonics*, OSA Tech. Digest Ser. (2007)
49. "A scheme for the generation of intense short optical pulses via frequency modulation and nonlinear compression", G. Biondini and Y. Kodama, in *Nonlinear Optics*, IEEE/LEOS Tech. Digest Ser. (2004)
50. "Reduction of collision-induced timing jitter via periodic-group-delay dispersion-compensating modules in quasi-linear return-to-zero systems", M. J. Ablowitz, C. Ahrens, G. Biondini, S. Chakravarty and A. Docherty, in *Nonlinear Optics*, IEEE/LEOS Tech. Digest Ser. (2004)
51. "Multicanonical Monte Carlo simulations of first- and second-order polarization-mode dispersion", S. L. Fogal, G. Biondini and W. L. Kath, in *Summer topicals: Polarization-mode dispersion*, IEEE/LEOS Tech. Digest Ser. (2003)
52. "Targeted importance sampling for first-order polarization-mode dispersion", S. L. Fogal, G. Biondini and W. L. Kath, in *Conference on Lasers and Electro-Optics*, OSA Tech. Digest Ser. (2003)
53. "PMD emulation with importance sampling and Maxwellian length sections", G. Biondini and W. L. Kath, in *Optical Fiber Communications*, OSA Tech. Digest Ser. (2003)
54. "Importance sampling for noise-induced amplitude and timing jitter in soliton transmission systems", R. O. Moore, G. Biondini and W. L. Kath, *Nonlinear Guided Waves*, OSA Tech. Digest Ser. (2002)
55. "Importance sampling for first- and second-order polarization-mode dispersion", S. L. Fogal, G. Biondini and W. L. Kath, in *Optical Fiber Communications*, OSA Tech. Digest Ser. (2002)
56. "Importance-sampled pulse broadening before and after polarization-mode dispersion compensation", S. L. Fogal, G. Biondini and W. L. Kath, in *Optical Fiber Communications*, OSA Tech. Digest Ser. (2002)
57. "Calculation of outage probabilities due to polarization-mode dispersion using importance sampling", I. T. Lima, G. Biondini, B. S. Marks, W. L. Kath and C. R. Menyuk, *IEEE/LEOS Annual Conference*, IEEE/LEOS Tech. Digest Ser. (2001)
58. "Optimization of a polarization-mode dispersion compensator with constant differential group delay using importance sampling", I. T. Lima, G. Biondini, B. S. Marks, W. L. Kath and C. R. Menyuk, in *Conference on Lasers and Electro-Optics*, OSA Tech. Digest Ser. (2001)
59. "Analysis of polarization-mode dispersion compensators using importance sampling", I. T. Lima, G. Biondini, B. S. Marks, W. L. Kath and C. R. Menyuk, in *Optical Fiber Communications*, OSA Tech. Digest Ser. (2001)
60. "Non-Maxwellian differential group delay of polarization-mode dispersion emulators", G. Biondini, W. L. Kath and C. R. Menyuk in *Optical Fiber Communications*, OSA Tech. Digest Ser. (2001)
61. "Reduced nonlinearity in strongly dispersion-managed return-to-zero systems", M. J. Ablowitz, G. Biondini, T. Hirooka and W. L. Kath, in *Nonlinear Guided Waves and Their Applications*, OSA Tech. Digest Ser. (2001)
62. "Spectral collapse of wavelength-division multiplexed dispersion-managed solitons", M. J. Ablowitz, G. Biondini and E. S. Olson, in *Nonlinear Optics*, IEEE/LEOS Tech. Digest Ser. (2000)
63. "Four-wave mixing in strongly dispersion-managed wavelength-division multiplexed soliton systems", M. J. Ablowitz, G. Biondini, S. Chakravarty, R. L. Horne and E. Spiller, in *Nonlinear Optics*, IEEE/LEOS Tech. Digest Ser. (2000)
64. "Collision-induced timing jitter in dispersion-managed soliton systems", M. J. Ablowitz, G. Biondini, S. Chakravarty and R. L. Horne, in *Nonlinear Guided Waves*, OSA Tech. Digest Ser. (1998)
65. "Multidimensional optical pulses in non-resonant quadratic materials", M. J. Ablowitz, G. Biondini and S. Blair, in *Nonlinear Optics*, IEEE/LEOS Tech. Digest Ser. (1998)

Other conference proceedings

66. "On the characteristic parameters of dispersion-managed optical pulses", G. Biondini and S. Chakravarty, in *Nonlinear Physics, Theory and Experiment. II*, Eds. M. J. Ablowitz, M. Boiti, F. Pempinelli and B. Prinari (World Scientific, 2003)
67. "Importance sampling for noise-induced amplitude and timing jitter in soliton systems", R. O. Moore, G. Biondini and W. L. Kath, in *Nonlinear Physics, Theory and Experiment. II*, Eds. M. J. Ablowitz, M. Boiti, F. Pempinelli and B. Prinari (World Scientific, 2003)
68. "Using importance sampling to assess the effects of polarization-mode dispersion on system performance", W. L. Kath and G. Biondini, in *Symposium on Optical Fiber Measurements*, NIST Technical Digest (NIST Special Publications, 2002)
69. "On the evolution and interactions of dispersion-managed solitons", M. J. Ablowitz, G. Biondini and E. S. Olson, in *Massive Wavelength-Division-Multiplexed and Time-Division-Multiplexed Soliton Transmission Systems*, Ed. A. Hasegawa (Kluwer, 2000)
70. "Stochastic effects on nonlinear Schrödinger solitons", G. Biondini and S. De Lillo, in *Nonlinear Klein-Gordon and Schrödinger Systems, Theory and Applications*, Eds. L. Vásquez, L. Streit and V. M. Pérez-García (World Scientific, 1996)
71. "Analytical and numerical solutions of the semiline Burgers equation", G. Biondini and S. De Lillo, in *Nonlinear Physics, Theory and Experiment*, Eds. E. Alfinito, M. Boiti, L. Martina and F. Pempinelli (World Scientific, 1996)
72. "The (2+1)-dimensional Eckhaus equation: display of some solutions", G. Biondini, F. Calogero and S. De Lillo, in *Nonlinear Evolution Equations and Dynamical Systems*, Eds. V. Markhankov, A. Bishop and D. Holm (World Scientific, 1995)

Other works

73. "Harmonic generation", R. O. Moore and G. Biondini, in *Encyclopedia of Nonlinear Science*, A. C. Scott, Ed. (Routledge, 2005)
74. "Einstein equations", R. G. Halburd and G. Biondini, in *Encyclopedia of Nonlinear Science*, A. C. Scott, Ed. (Routledge, 2005)

Dissertations

75. "Forced and boundary value problems for nonlinear wave equations with applications", Doctoral Thesis (University of Perugia, Italy, 1997)
76. "Cosmological models with dark matter composed of monochromatic axinos", Laurea Thesis (University of Perugia, Italy, 1991)

Sub judice

77. "Statistics of polarization-mode dispersion emulators with unequal sections", B. R. Stone, G. Biondini and W. L. Kath, submitted to *SIAM J. Applied Math.*
78. "Initial-boundary value problems for differential difference evolution equations: discrete linear and integrable discrete nonlinear Schrödinger equations", G. Biondini and G. Hwang, submitted to *Inv. Probl.*

Advisors

Post-graduate: William L. Kath (Northwestern University), Yuji Kodama (Ohio State University)

Graduate: Mark J. Ablowitz (University of Colorado), Silvana De Lillo (University of Perugia)

Undergraduate: Silvio A. Bonometto (University of Perugia)

Abbreviations

Journals:

Appl. Math. Lett.	Applied Mathematics Letters
Appl. Opt.	Applied Optics
Inv. Probl.	Inverse Problems
J. Comput. Phys.	Journal of Computational Physics
J. Eng. Math.	Journal of Engineering Mathematics
J. Lightwave Technol.	IEEE Journal of Lightwave Technology
J. Math. Phys.	Journal of Mathematical Physics
J. Nonlin. Sci.	Journal of Nonlinear Science
J. Opt.	Journal of Optics
J. Opt. Fiber Commun. Rep.	Journal of Optics and Fiber Communications Reports
J. Opt. Soc. Am.	Journal of the Optical Society of America
J. Phys.	Journal of Physics
J. Quantum Electron.	Journal of Quantum Electronics
J. Sel. Topics Quantum. Electron.	Journal of Selected Topics in Quantum Electronics
Math. Comp. Simul.	Mathematics and Computer Simulation
Opt. Commun. / Lett. / Expr.	Optics Communications/Letters/Express
Opt. Quantum Electron.	Optical and Quantum Electronics
Opt. Laser Technol.	Optics and Laser Technology
Opt. Photon. News	Optics and Photonics News
Photon. Technol. Lett.	IEEE Photonics Technology Letters
Phys. Lett.	Physics Letters
Phys. Rev.	Physical Review
SIAM J. Appl. Math.	SIAM Journal on Applied Mathematics
SIAM J. Optim.	SIAM Journal on Optimization
Tech. Digest Ser.	Technical Digest Series
Theor. Math. Phys.	Theoretical and Mathematical Physics

Organizations:

AAAS	American Association for the Advancement of Science
ACMS	Arizona Center for Mathematical Sciences
AFOSR	Air Force Office of Scientific Research
AMS	American Mathematical Society
CBMS	Conference Board of the Mathematical Sciences
CNLS	Center for Nonlinear Sciences
CRDF	U.S. Civilian Research and Development Foundation
DMS	Division of Mathematical Sciences
ECS	Division of Electrical and Communications Systems
IEEE	Institute of Electrical and Electronic Engineers
IMACS	International Association for Mathematics and Computer Simulations
LANL	Los Alamos National Laboratory
LEOS	Lasers and Electro-Optics Society
MAA	Mathematical Association of America
NIST	National Institute of Standards and Technology
NSF	National Science Foundation
OSA	Optical Society of America
QNRF	Qatar National Research Foundation
SIAM	Society for Industrial and Applied Mathematics
SUNY	State University of New York