Andrzej J. Święch
CURRICULUM VITAE

Święch, Andrzej J.   Professor
School of Mathematics
Georgia Institute of Technology

Educational Background:

- M.S., Mathematics, 1986, University of Warsaw

- Ph.D., Mathematics, 1993, University of California at Santa Barbara

Employment History:

- Professor, School of Mathematics, Georgia Institute of Technology, 2004-present

- Associate Professor, School of Mathematics, Georgia Institute of Technology, 1999-2004

- Assistant Professor, School of Mathematics, Georgia Institute of Technology, 1993-1999

- Lecturer, Department of Mathematics, University of California at Santa Barbara, Spring 1993

- Graduate Teaching Assistant, Department of Mathematics, University of California at Santa Barbara, 1989-Winter 1993

- Assistant, Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland, 1986-1989

Visiting Positions/Research Visits:

Postdoctoral, Scuola Normale Superiore di Pisa, Italy: June and July 1995
Visiting Researcher, Scuola Normale Superiore di Pisa, Italy: July 1996
Visiting Fellow, Department of Engineering, Faculty of Engineering and Information Technology, Australian National University, Canberra, Australia: August 1996
Visiting Researcher, Scuola Normale Superiore di Pisa, Italy: July 1998
Visiting Researcher, School of Mathematics, University of New South Wales, Sydney, Australia: August 1998
University of Cologne, Germany: June 1999
Saitama University, Japan: January 2001, December 2004, June 2005, October 2007,

July 2010.
University of Padova, Italy: July 2006
Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy: September 2007
Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland: December 2007, July 2009, June 2010, July 2011, July 2012, April 2014, January and February 2019.
University of Pisa, Italy: May 2012, June 2013, February 2014, May 2015.
Tohoku University, Japan: July 2017.
INSA, Rennes, France: May 2019.

Current Fields of Interest:

Nonlinear PDE, PDE in infinite dimensional spaces, integro-PDE, stochastic and deterministic optimal control, stochastic PDE, control theory, differential games, mean field games and mean field control, nonlinear functional analysis, calculus of variations, mathematical finance.

Teaching Experience:

Georgia Institute of Technology:
Fall 2022, Math 4347, Partial Differential Equations I
Fall 2022, Math 6580, Introduction to Hilbert Spaces
Spring 2022, Math 4581, Classical Mathematical Methods in Engineering
Fall 2021, Math 3235, Probability Theory
Fall 2021, Math 2551, Multivariable Calculus
Spring 2021, Math 6342, Partial Differential Equations II
Fall 2020, Math 6580, Introduction to Hilbert Spaces
Fall 2020, Math 6341, Partial Differential Equations I
Spring 2020, Math 4318, Analysis II
Fall 2019, Math 4317, Analysis I
Fall 2019, Math 4347, Partial Differential Equations I
Fall 2018, Math 4581, Classical Mathematical Methods in Engineering
Fall 2018, Math 6580, Introduction to Hilbert Spaces
Spring 2018, Math 4317, Analysis I
Spring 2018, Math 7334, Introduction to Operator Theory
Fall 2017, Math 4581, Classical Mathematical Methods in Engineering
Fall 2017, Math 4347, Partial Differential Equations I
Spring 2017, Math 4305, Topics in Linear Algebra
Fall 2016, Math 6580, Introduction to Hilbert Spaces
Fall 2016, Math 2551, Multivariable Calculus
Spring 2016, Math 6342, Partial Differential Equations II
Fall 2015, Math 6341, Partial Differential Equations I
Fall 2015, Math 4347, Partial Differential Equations I
Spring 2015, Math 4305, Topics in Linear Algebra
Fall 2014, Math 4581A, Classical Mathematical Methods in Engineering

Fall 2014, Math 4581B, Classical Mathematical Methods in Engineering
Fall 2013, Math 4318, Analysis II
Spring 2013, Math 4317, Analysis I
Fall 2012, Math 4581, Classical Mathematical Methods in Engineering
Fall 2012, Math 4347, Partial Differential Equations I
Spring 2012, Math 6342, Partial Differential Equations II
Spring 2012, Math 2403, Differential Equations
Fall 2011, Math 6341, Partial Differential Equations I
Spring 2011, Math 2401, Calculus III
Spring 2011, Math 2406, Abstract Vector Spaces
Fall 2010, Math 4320, Complex Analysis
Spring 2010, Math 7334, Introduction to Operator Theory
Fall 2009, Math 2403, Differential Equations
Fall 2009, Math 4318, Analysis II
Spring 2009, Math 4317, Analysis I
Spring 2009, Math 6342, Partial Differential Equations II
Fall 2008, Math 6341, Partial Differential Equations I
Spring 2008, Math 2403, Differential Equations
Spring 2007, Math 4305, Topics in Linear Algebra
Fall 2006, Math 4581, Classical Mathematical Methods in Engineering
Fall 2006, Math 4347, Partial Differential Equations I
Spring 2006, Math 2401, Calculus III
Fall 2005, Math 2403, Differential Equations
Fall 2005, Math 4317, Analysis I
Spring 2005, Math 4348, Partial Differential Equations II
Fall 2004, Math 4347, Partial Differential Equations I
Fall 2004, Math 6580, Introduction to Hilbert Spaces
Spring 2004, Math 4348, Partial Differential Equations II
Fall 2003, Math 2401, Calculus III
Fall 2003, Math 4347, Partial Differential Equations I
Spring 2003, Math 6342, Partial Differential Equations II
Fall 2002, Math 2401, Calculus III
Fall 2002, Math 6341, Partial Differential Equations I
Spring 2002, Math 2401, Calculus III
Spring 2002, Math 2401, Calculus III
Fall 2001, Math 2403, Differential Equations
Fall 2001, Math 2403, Differential Equations
Spring 2001, Math 2413, Honors Differential Equations
Spring 2001, Math 1502, Calculus II
Fall 2000, Math 1502, Calculus II
Fall 2000, Math 1502, Calculus II
Spring 2000, Math 4581, Classical Mathematical Methods in Engineering
Spring 2000, Math 1502, Calculus II

3

Fall 1999, Math 6327, Real Analysis
Fall 1999, Math 1501, Calculus I
Spring 1999, Math 4348, Introduction to Partial Differential Equations II
Winter 1999, Math 4347, Introduction to Partial Differential Equations I
Winter 1999, Math 1508, Calculus II
Fall 1998, Math 4347, Introduction to Partial Differential Equations I
Fall 1998, Math 1507, Calculus I
Spring 1998, Special Topics Course: Differential Equations and Optimal Control
Winter 1998, Math 4581, Advanced Engineering Mathematics I
Winter 1998, Math 4347, Introduction to Partial Differential Equations I
Fall 1997, Math 1507, Calculus I
Fall 1997, Math 1507, Calculus I
Spring 1997, Math 4348, Introduction to Partial Differential Equations II
Winter 1997, Math 1508, Calculus II
Winter 1997, Math 4347, Introduction to Partial Differential Equations I,
Fall 1996, Math 4581, Advanced Engineering Mathematics I
Fall 1996, Math 4347, Introduction to Partial Differential Equations I
Spring 1996, Math 4581, Advanced Engineering Mathematics I (video course)
Winter 1996, Math 4581, Advanced Engineering Mathematics I
Winter 1996, Math 2507, Calculus IV
Fall 1995, Math 1508, Calculus II
Fall 1995, Math 2508, Calculus V
Spring 1995, Math 8223, Special Topics Course: Viscosity Solutions of Partial Differential Equations
Winter 1995, Math 4582, Advanced Engineering Mathematics II
Winter 1995, Math 1508, Calculus II
Fall 1994, Math 1508, Calculus II
Fall 1994, Math 1508, Calculus II
Spring 1994, Math 4320, Complex Variables
Winter 1994, Math 1508, Calculus II
Fall 1993, Math 1508, Calculus II
Fall 1993, Math 1508, Calculus II

University of California at Santa Barbara:

Spring 1993, Math. 5C, Advanced Calculus

Publications:

1. S. Mayorga and A. Święch, Finite dimensional approximations of Hamilton-Jacobi-Bellman equations for stochastic particle systems with common noise, to appear in *SIAM J. Control Optim.*

2. S. Koike and A. Święch, Aleksandrov-Bakelman-Pucci maximum principle for L^p-viscosity solutions of equations with unbounded terms, *J. Math. Pures Appl.* (9) **168** (2022), 192–212.

3. E. Pimentel and A. Święch, Existence of solutions to a fully nonlinear free transmission problem, *J. Differential Equations* **320** (2022), 49–63.

4. W. Gangbo, S. Mayorga and A. Święch, Finite dimensional approximations of Hamilton-Jacobi-Bellman equations in spaces of probability measures, *SIAM J. Math. Anal.* **53** (2021), no. 2, 1320–1356.

5. A. Święch, Singular perturbations and optimal control of stochastic systems in infinite dimension: HJB equations and viscosity solutions, *ESAIM Control Optim. Calc. Var.* **27** (2021), Paper No. 6, 34 pp.

6. A. Święch, HJB equation, dynamic programming principle, and stochastic optimal control, Nonlinear Partial Differential Equations for Future Applications, Sendai, Japan, July 10–28 and October 2–6, 2017, (S. Koike, H. Kozono, T. Ogawa and S. Sakaguchi eds.), Springer Proceedings in Mathematics and Statistics, vol. 346, Springer, Singapore, 2021.

7. T. Cieślak, J. Siemianowski and A. Święch, Viscosity solutions to an initial value problem for a Hamilton-Jacobi equation with a degenerate Hamiltonian occurring in the dynamics of peakons, *Nonlinear Anal.* **204** (2021), 112204.

8. A. Święch, Pointwise properties of L^p-viscosity solutions of uniformly elliptic equations with quadratically growing gradient terms, *Discrete Contin. Dyn. Syst.* **40** (2020), no. 5, 2945–2962.

9. A. Święch, Viscosity solutions to HJB equations for boundary-noise and boundary-control problems, *SIAM J. Control Optim.* **58** (2020), no. 1, 303–326.

10. R. Gong, C. Mou and A. Święch, Stochastic representations for solutions to parabolic Dirichlet problems for nonlocal Bellman equations, *Ann. Appl. Probab.* **29** (2019), no. 6, 3271–3310.

11. N. Guillen, C. Mou and A. Święch, Coupling Lévy measures and comparison principles for viscosity solutions, *Trans. Amer. Math. Soc.* **372** (2019), no. 10, 7327–7370.

12. S. Koike, A. Święch and S. Tateyama, Weak Harnack inequality for fully nonlinear uniformly parabolic equations with unbounded ingredients and applications, *Nonlinear Anal.* **185** (2019), 264–289.

13. A. Święch, A note on the upper perturbation property and removable sets for fully nonlinear degenerate elliptic PDE, *NoDEA Nonlinear Differential Equations Appl.* **26** (2019), no. 1, Art. 3, 4 pp.

14. C. Mou and A. Święch, Corrigendum to "Aleksandrov-Bakelman-Pucci maximum principles for a class of uniformly elliptic and parabolic integro-PDE" [J.

Differential Equations 264 (2018) 2708–2736], *J. Differential Equations* **265** (2018), no. 11, 5831.

15. C. Mou and A. Święch, Aleksandrov-Bakelman-Pucci maximum principles for a class of uniformly elliptic and parabolic integro-PDE, *J. Differential Equations* **264** (2018), no. 4, 2708–2736.

16. A. Święch and M. Rosestolato, Partial regularity of viscosity solutions for a class of Kolmogorov equations arising from mathematical finance, *J. Differential Equations* **262** (2017), no. 3, 1897–1930.

17. A. Święch and J. Zabczyk, Integro-PDE in Hilbert spaces: Existence of viscosity solutions, *Potential Anal.* **45** (2016), no. 4, 703–736.

18. Y. Bakhtin and A. Święch, Scaling limits for conditional diffusion exit problems and asymptotics for nonlinear elliptic equations, *Trans. Amer. Math. Soc.* **368** (2016), no. 9, 6487–6517.

19. C. Mou and A. Święch, Uniqueness of viscosity solutions for a class of integro-differential equations, *Nonlinear Differ. Equ. Appl. (NoDEA)* **22** (2015), 1851–1882.

20. W. Gangbo and A. Święch, Existence of a solution to an equation arising from the theory of Mean Field Games, *J. Differential Equations* **259** (2015), no. 11, 6573–6643.

21. W. Gangbo and A. Święch, Metric viscosity solutions of Hamilton-Jacobi equations depending on local slopes, *Calc. Var. Partial Differential Equations* **54** (2015), no. 1, 1183–1218.

22. W. Gangbo and A. Święch, Optimal transport and large number of particles, *Discrete Contin. Dyn. Syst.* **34** (2014), no. 4, 1397–1441.

23. S. Koike and A. Święch, Representation formulas for solutions of Isaacs integro-PDE, *Indiana Univ. Math. J.* **62** (2013), no. 5, 1473–1502.

24. J. Feng and A. Święch, with an appendix by A. Stefanov, Optimal control for a mixed flow of Hamiltonian and gradient type in space of probability measures, *Trans. Amer. Math. Soc.* **365** (2013), no. 8, 3987–4039.

25. A. Święch and J. Zabczyk, Uniqueness for integro-PDE in Hilbert spaces, *Potential Anal.* **38** (2013), 233–259.

26. S. Koike and A. Święch, Local maximum principle for L^p-viscosity solutions of fully nonlinear elliptic PDEs with unbounded coefficients, *Commun. Pure Appl. Anal.* **11** (2012), no. 5, 1897–1910.

27. A. Święch and J. Zabczyk, Large deviations for stochastic PDE with Lévy noise, *J. Funct. Anal.* **260** (2011), no. 3, 674–723.

28. A. Święch, Sub- and superoptimality principles and construction of almost optimal strategies for differential games in Hilbert spaces, Advances in Dynamic Games, 149–163, Ann. Internat. Soc. Dynam. Games, 11, Birkhäuser/Springer, New York, 2011.

29. G. Fabbri, F. Gozzi and A. Święch, Verification theorem and construction of ϵ-optimal controls for control of abstract evolution equations, *J. Convex Anal.* **17** (2010), no. 2, 611–642.

30. F. Gozzi, A. Święch and X. Y. Zhou, Erratum: "A corrected proof of the stochastic verification theorem within the framework of viscosity solutions", *SIAM J. Control Optim.* **48** (2010), no. 6, 4177–4179.

31. S. Koike and A. Święch, Weak Harnack inequality for fully nonlinear uniformly elliptic PDE with unbounded ingredients, *J. Math. Soc. Japan.* **61** (2009), no. 3, 723–755.

32. S. Koike and A. Święch, Existence of strong solutions of Pucci extremal equations with superlinear growth in Du, *J. Fixed Point Theory Appl.* **5** (2009), no. 2, 291–304.

33. A. Święch and E. V. Teixeira, Regularity for obstacle problems in infinite dimensional Hilbert spaces, *Adv. Math.* **220** (2009), no. 3, 964–983.

34. A. Święch, A PDE approach to large deviations in Hilbert spaces, *Stochastic Process. Appl.* **119** (2009), no. 4, 1081–1123.

35. S. Koike and A. Święch, Maximum principle for fully nonlinear equations via the iterated comparison function method, *Math. Ann.* **339** (2007), no. 2, 461–484.

36. D. Kelome and A. Święch, Perron's method and the method of relaxed limits for "unbounded" PDE in Hilbert spaces, *Studia Math.* **176** (2006), no. 3, 249–277.

37. F. Gozzi, A. Święch and X. Y. Zhou, A corrected proof of the stochastic verification theorem within the framework of viscosity solutions, *SIAM J. Control Optim.* **43** (2005), no. 6, 2009–2019.

38. F. Gozzi, S. S. Sritharan and A. Święch, Bellman equations associated to the optimal feedback control of stochastic Navier-Stokes equations, *Comm. Pure Appl. Math.* **58** (2005), no. 5, 671–700.

39. R. Jensen and A. Święch, Uniqueness and existence of maximal and minimal solutions of fully nonlinear elliptic PDE, *Comm. Pure Appl. Anal.* **4** (2005), no. 1, 199–207.

40. S. Koike and A. Święch, Maximum principle and existence of L^p-viscosity solutions for fully nonlinear uniformly elliptic equations with measurable and quadratic terms, *NoDEA Nonlinear Differential Equations Appl.* **11** (2004), no. 4, 491–509.

41. M. G. Crandall and A. Święch, A note on generalized maximum principles for elliptic and parabolic PDE, Evolution Equations (Goldstein, Nagel and Romanelli, eds.), 121–127, Lecture Notes in Pure and Appl. Math., vol. 234, Dekker, New York, 2003.

42. D. Kelome and A. Święch, Viscosity solutions of an infinite-dimensional Black-Scholes-Barenblatt equation, *Appl. Math. Optim.* **47** (2003), no. 3, 253–278.

43. F. Gozzi, S. S. Sritharan and A. Święch, Viscosity solutions of dynamic-programming equations for the optimal control of the two-dimensional Navier-Stokes equations, *Arch. Ration. Mech. Anal.* **163** (2002), no. 4, 295–327.

44. A. Święch, Risk-sensitive control and differential games in infinite dimensions, *Nonlinear Anal.* **50** (2002), no. 4, Ser. A: Theory Methods, 509–522.

45. R. Jensen, M. Kocan and A. Święch, Good and viscosity solutions of fully nonlinear elliptic equations, *Proc. Amer. Math. Soc.* **130** (2002), no. 2, 533–542.

46. E. Barucci, F. Gozzi and A. Święch, Incentive compatibility constraints and dynamic programming in continuous time, *J. Math. Econom.* **34** (2000), no. 4, 471–508.

47. M. G. Crandall, M. Kocan and A. Święch, L^p-Theory for fully nonlinear parabolic equations, *Comm. Partial Differential Equations* **25** (2000), no. 11&12, 1997–2053.

48. F. Gozzi and A. Święch, Hamilton-Jacobi-Bellman equations for the optimal control of the Duncan-Mortensen-Zakai equation, *J. Funct. Anal.* **172** (2000), no. 2, 466–510.

49. F. Gozzi, E. Rouy and A. Święch, Second order Hamilton-Jacobi equations in Hilbert spaces and stochastic boundary control, *SIAM J. Control Optim.* **38** (2000), no. 2, 400–430.

50. D. Gatarek and A. Święch, Optimal stopping in Hilbert spaces and pricing of American options, *Math. Methods Oper. Res.* **50** (1999), 135–147.

51. M. G. Crandall, M. Kocan, P. L. Lions and A. Święch, Existence results for boundary problems for uniformly elliptic and parabolic fully nonlinear equations, *Electron. J. Differential Equations*, Vol. 1999 (1999), No. 24, 1–20.

52. M. G. Crandall, P. Fok, M. Kocan and A. Święch, Remarks on nonlinear, uniformly parabolic equations, *Indiana Univ. Math. J.* **47** (1998), no. 4, 1293–1326.

53. W. Gangbo and A. Święch, Optimal maps for the Multidimensional Monge-Kantorovich Problem, *Comm. Pure Appl. Math.* **51** (1998), no. 1, 23–45.

54. A. Święch, $W^{1,p}$-Interior estimates for solutions of fully nonlinear, uniformly elliptic equations, *Adv. Differential Equations* **2** (1997), no. 6, 1005–1027.

55. M. Kocan, P. Soravia, and A. Święch, On differential games for infinite dimensional systems with nonlinear, unbounded operators, *J. Math. Anal. Appl.* **211** (1997), 395–423.

56. A. Święch, A note on the differences of the consecutive powers of operators, Linear Operators, J. Janas, F. H. Szafraniec, and J. Zemanek (eds.), Banach Center Publ. vol. 38, Institute of Mathematics, Polish Academy of Sciences, Warsaw, 1997, 381–383.

57. A. Święch, Another approach to the existence of value functions of stochastic differential games, *J. Math. Anal. Appl.* **204** (1996), no. 3, 884–897.

58. A. Banaszuk, J. Hauser and A. Święch, Least squares integration of one-dimensional codistributions with application to approximate feedback linearization, *Math. Control Signals Systems* **9** (1996), no. 3, 207–241.

59. M. Kocan and A. Święch, Perturbed optimization on product spaces, *Nonlinear Anal.* **26** (1996), no. 1, 81–90.

60. M. G. Crandall, M. Kocan, P. Soravia and A. Święch, On the equivalence of various weak notions of solutions of elliptic PDE's with measurable ingredients, Progress in Elliptic and Parabolic PDE's (A. Alvino et al. eds.), Pitman Research Notes in Math., vol. 350, 1996, 136–162.

61. A. Święch, Sub- and superoptimality principles of dynamic programming revisited, *Nonlinear Anal.* **26** (1996), no. 8, 1429–1436.

62. L. Caffarelli, M. G. Crandall, M. Kocan and A. Święch, On viscosity solutions of fully nonlinear equations with measurable ingredients, *Comm. Pure Appl. Math.* **49** (1996), 365–397.

63. M. Kocan and A. Święch, Second order unbounded parabolic equations in separated form, *Studia Math.* **115** (1995), no. 3, 291–310.

64. A. Święch, Unbounded second order partial differential equations in infinite dimensional Hilbert spaces, *Comm. Partial Differential Equations* **19** (11&12) (1994), 1999-2036.

65. M. G. Crandall, M. Kocan and A. Święch, On partial sup-convolutions, a lemma of P.L. Lions and viscosity solutions in Hilbert spaces, *Adv. Math. Sci. Appl.* **3** (1993/4), 1–15.

66. A. Święch, Spectral characterization of operators with precompact orbit, *Studia Math.* **96** (1990), no. 3, 277–282.

Books:

1. G. Fabbri, F. Gozzi and A. Święch, Optimal Control in Infinite Dimension: Dynamic Programming and HJB Equations, with a contribution by M. Fuhrman and G. Tessitore, Probability Theory and Stochastic Modelling, vol. 82, Springer, 2017.

Papers in Conference Proceedings:

1. A. Święch, Large deviations in Hilbert spaces by PDE methods, International Conference for the 25th Anniversary of Viscosity Solutions (Y. Giga et al. eds.), GAKUTO International Series, Mathematical Sciences and Applications, vol. 30, Gakkotosho, Tokyo, Japan, 2008.

2. A. Święch, HJB equations in Hilbert spaces related to optimal control of stochastic Navier-Stokes equations, Proceedings of RIMS Conference on Viscosity Solution Theory of Differential Equations and Its Developments, Kyoto University, June 29-July 1, 2005, Research Institute for Mathematical Sciences, Kyoto University, Kyoto, Japan, 43-55.

3. A. Święch, The existence of value functions of stochastic differential games for unbounded stochastic evolution, Proceedings of the 34th IEEE Conference on Decision and Control, New Orleans, Louisiana, December 13-15, 1995, 2289–2294.

Other Publications:

1. Viscosity solutions of fully nonlinear partial differential equations with unbounded terms in infinite dimensions, Ph.D. thesis, University of California at Santa Barbara.

Research Grants and Contracts:

1. Infinite Dimensional Analysis, Viscosity Solutions, and Applications, Analysis and Applied Math Programs, Div. of Math. Sci, NSF, $193,261, 8/2009-8/2013.

2. Nonlinear Second-Order PDE in Infinite Dimensional Spaces and Optimal Control of Stochastic PDE, Analysis Program, Div. of Math. Sci, NSF, $78,000, 7/2005-7/2008.

3. Viscosity Solution Methods in Partial Differential Equations, Analysis Program, Div. of Math. Sci, NSF, $84,000, 7/2001-7/2004.

4. Viscosity Solutions and Applications, Analysis Program, Div. of Math. Sci, NSF, $50,000, 8/1997-8/2000.

Invited Talks at Conferences:

1. Conference High Dimensional Hamilton-Jacobi PDEs, IPAM, Lake Arrowhead, CA, USA, December 12-16, 2022.

2. Plenary talk at 2022 SIAM Annual Meeting, Pittsburgh, USA, July 11-15, 2022.

3. Conference Mostly Maximum Principle, Cortona, Italy, May 30-June 3, 2022.

4. Mini-symposium Partial Differential Equations Under Various Metrics, Okinawa Institute of Science and Technology, Japan, December 8-12, 2020.

5. Workshop Mean Field Games and Applications, May 4-8, 2020, part of the IPAM Program High Dimensional Hamilton-Jacobi PDEs, Los Angeles, March 9-June 12, 2020.

6. 1152nd AMS Meeting, Gainesville, Florida, November 2-3, 2019, Special Session on Nonlinear Elliptic Partial Differential Equations.

7. New Trends in Hamilton-Jacobi: PDE, Control, Dynamical Systems and Geometry, Fudan University, Shanghai, China, July 1-6, 2019.

8. Workshop on Recent Problems of Stochastic Control Theory, Banach Center, Warsaw, Poland, January 28-February 2, 2019.

9. Simons Semester on Stochastic Modeling and Control, Banach Center, Warsaw, Poland, January 2-March 31, 2019, course (15 hours of lectures) on Viscosity solutions: theory and applications in stochastic optimal control.

10. Conference on Viscosity Solutions and Related Topics, Tohoku University, Japan, November 22-24, 2018.

11. 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan, July 5-9, 2018, Special Session on Recent Advances in Nonlinear Phenomena.

12. Workshop on Stochastic Control and Related Issues, Kansai University, Osaka, Japan, March 30-31, 2018.

13. Workshop on Optimal Control and PDE, Thematic Program on Nonlinear Partial Differential Equations for Future Applications, Tohoku University, Japan, July 17-21, 2017, mini-course (5 hours) on HJB Equations, Dynamic Programming Principle and Stochastic Optimal Control.

14. Conference on Stochastic Analysis and Its Applications, Banach Center, Bedlewo, Poland, May 28-June 3, 2017.

15. Workshop Mostly Maximum Principle, Banff International Research Station, Canada, April 2-7, 2017.

16. 1127th AMS Meeting, Indiana University, Bloomington, Indiana, April 1-2, 2017, Special Session on Nonlinear Elliptic and Parabolic Partial Differential Equations and Their Applications.

17. SIAM Conference on Control & Its Applications, Maison de la Mutualité, Paris, France, July 8-10, 2015, Minisymposium on Stochastic Control and Its Applications.

18. 13th Viennese Workshop on Optimal Control and Dynamic Games, Vienna, Austria, May 13-16, 2015, Special Session on Optimal Control in Finite and Infinite Dimension and Application to Economics.

19. 1108th AMS Meeting, Michigan State University, East Lansing, Michigan, March 14-15, 2015, Special Session on Fractional Calculus and Nonlocal Operators.

20. 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, July 7-11, 2014, Special Session on Viscosity, Nonlinearity and Maximum Principle.

21. Workshop on Nonlinear Partial Differential Equations and Stochastic Methods, University of Jyväskylä, Jyväskylä, Finland, June 10-13, 2014.

22. 1097th AMS Meeting, Knoxville, Tennessee, March 21-23, 2014, Special Session on Stochastic Processes and Related Topics.

23. Stochastic Analysis and Control. 50 Years of Scientific Activities of Prof. Jerzy Zabczyk, Banach Center, Bedlewo, Poland, May 5-10, 2013.

24. 12th Viennese Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics, Vienna, Austria, May 30-June 2, 2012, Special Session on Dynamic Programming Approach for Optimal Control.

25. 2012 SIAM Southeastern Atlantic Section Conference, Huntsville, Alabama, March 24-25, 2012, Special Session on Recent Advances in Computational and Stochastic Methods in Fluid Dynamics with Control and Estimations.

26. ICIAM 2011, Vancouver, Canada, July 18-22, 2011, Minisymposium on Stochastic Control and Mathematics of Finance.

27. Summer School on Stochastic Control and Related PDEs, Milan, June 27-July 8, 2011, course (6 hours) on Viscosity solutions of HJB equations in Hilbert spaces and optimal control of stochastic PDE.

28. 1068th AMS Meeting, Statesboro, Georgia, March 12-13, 2011, Special Session on Nonlinear Analysis of Partial Differential Equations.

29. Nonlinear PDE in Valparaiso, Valparaiso, Chile, January 10-14, 2011.

30. Symposium on Viscosity Methods and Nonlinear PDE, Hokkaido University, Sapporo, July 21-23, 2010.

31. 1057 AMS Meeting, University of Kentucky, Lexington, March 27-28, 2010, Special Session on Partial Differential Equations in Geometry and Variational Problems.

32. SIAM Conference on Analysis of Partial Differential Equations, Miami, Florida, December 7-10, 2009, Minisymposium on Current Issues of Free Boundary Problems and Fluid Equations.

33. 24th IFIP Conference on System Modelling and Optimization, Buenos Aires, Argentina, July 27-31, 2009, Special Session on Stochastic Control and Mathematical Finance.

34. International Conference on Mathematical Control Theory (in honor of David L. Russell on the occasion of his 70th birthday), Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing, China, May 15-17, 2009.

35. The Banach Center Conference on 50 Years of Optimal Control, Bedlewo, Poland, September 15-20, 2008.

36. WCNA-2008 World Congress of Nonlinear Analysts, Special Session on Variational Analysis and Its Applications, Orlando, Florida, July 2-9, 2008.

37. 13-th International Symposium of Dynamic Games and Applications, Wroclaw, Poland, June 30-July 3, 2008, tutorial talks on Viscosity Solutions and Construction of ϵ-optimal Strategies for Two-player, Zero-sum, Differential Games in Hilbert Spaces, member of the Scientific Committee.

38. AMS-PTM First Joint International Meeting, Warsaw, Poland, July 31-August 3, 2007, Special Session on Control and Optimization of Non-linear PDE Systems.

39. 4th International Conference of Applied Mathematics and Computing, Plovdiv, Bulgaria, August 12-18, 2007, member of the Scientific Committee.

40. 23rd IFIP Conference on System Modelling and Optimization, Cracow, Poland, July 23-27, 2007, Special Session on Control and Optimization of Nonlinear Evolutionary PDE Systems, and Special Session on Stochastic Control and Mathematics of Finance.

41. 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 16-20, 2007, Special Session on Viscosity Solutions of Partial Differential Equations: Recent Advances and Applications.

42. International Conference for the 25th Anniversary of Viscosity Solution, University of Tokyo, June 4-6, 2007, plenary talk.

43. Symposium in Honor of Michael Crandall on the Occasion of His Retirement, University of California, Santa Barbara, May 29, 2007.

44. 1020 AMS Meeting, University of Cincinnati, Ohio, October 21-22, 2006, Special Session on Optimal Controls and Stochastic Differential Games.

45. 6th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Poitiers, France, June 25-28, 2006, Special Session on New Developments in Nonlinear Partial Differential Equations and Control Theory.

46. Italian-Japanese Conference on Nonlinear Partial Differential Equations and Applications, Cortona, Italy, June 19-24, 2006.

47. 22nd IFIP Conference on System Modelling and Optimization Turin, Italy, July 18-22, 2005, Invited Session on Stochastic Systems and Control.

48. RIMS Conference on Viscosity Solution Theory of Differential Equations and Its Developments, Kyoto University, June 29-July 1, 2005.

49. 1004th AMS Meeting, Bowling Green, Kentucky, March 18-19, 2005, Special Session on Partial Differential Equations and Their Applications.

50. Symposium on Stochastic Control, Filtering, and Mathematical Finance, Osaka University, Osaka, Japan, December 18-19, 2004.

51. 54th Midwest PDE Seminar, Wayne State University, November 19-21, 2004.

52. Workshop on Stochastic Analysis and White Noise Calculus, Mini-course "Regularity of solutions of Hamilton-Jacobi-Bellman Equations" (3 lectures), University of Wyoming, Laramie, June 7-11, 2004.

53. WCNA-2004 World Congress of Nonlinear Analysts, Orlando, Florida, June 30-July 7, 2004, Special Session on Variational Analysis and Its Application.

54. IFIP'2003 21st Conference on System Modelling and Optimization, Special Session on Analysis and Control of Systems Governed by Partial Differential Equations: Hamilton-Jacobi-Bellman and Stochastic Problems, Sophia Antipolis, France, July 21-25, 2003.

55. 2003 SIAM Annual Meeting, Minisymposium on Control of Fluid Dynamical Systems: Theory and Numerics, Montreal, Canada, June 16-20, 2003.

56. MCT'03 Louisiana Conference on Mathematical Control Theory, Louisiana State University, Baton Rouge, Louisiana, April 10-13 2003.

57. AMS-UMI First Joint International Meeting, Pisa, Italy, June 12-16, 2002, Special Session on Viscosity Methods in PDE's and Applications.

58. Conference on Stochastic Control and its Applications, Mathematical Research and Conference Center, Bedlewo, Poland, June 3-8, 2002, "Viscosity solutions of a class of infinite dimensional PDE coming from mathematical finance".

59. 5th SIAM Conference on Control and Its Applications, San Diego, California, July 11-14, 2001, Special Session on Control of Fluids: Theory and Numerics, "Viscosity Solutions of Bellman Equations Associated with Optimal Control of the Navier-Stokes Equations".

60. Thematic Programme on Nonlinear Partial Differential Equations, Pacific Institute for the Mathematical Sciences, Vancouver, BC, Canada, Workshop on Viscosity methods in partial differential equations, July 2-10, 2001, Mini-course "Viscosity solutions in infinite dimensional spaces and optimal control of PDEs", 3 plenary lectures.

61. AMS Meeting, University of Kansas, Lawrence, Kansas, March 30-31, 2001, Special Session on Optimal Control, Calculus of Variations, and Nonsmooth Analysis, "Viscosity solutions of Hamilton-Jacobi-Bellman equations for the optimal control of Navier-Stokes equations".

62. 11th Tokyo Conference on Nonlinear PDE, Tokyo Metropolitan University, January 26-27, 2001, "Viscosity and good solutions of fully nonlinear elliptic and parabolic PDE".

63. The Third World Congress of Nonlinear Analysts (WCNA 2000), Catania, Sicily, Italy, July 19-26, 2000, Session on Random Processes and Applications, "Recent results on equations of dynamic programming for optimal control of stochastic PDE".

64. International Conference on Analysis and Control of Deterministic and Stochastic Evolution Equations, Bressanone-Brixen, Italy, July 6-7, 2000, "Hamilton-Jacobi-Bellman equations for the optimal control of the Duncan-Mortensen-Zakai equation", plenary talk.

65. 2000 International Conference on Dynamical Systems and Differential Equations, Kennesaw University, Georgia, May 18-21, 2000, Special Session on Nonlinear Elliptic and Earabolic Equations, "Viscosity and good solutions of fully nonlinear elliptic and parabolic equations", and Special Session on Control and Optimization of Systems Governed by Partial Differential Equations, "Hamilton-Jacobi-Bellman equations for the optimal control of the Duncan-Mortensen-Zakai equation".

66. AMS Meeting, Charlotte, North Carolina, October 15-17, 1999, Special Session on Stochastic PDEs and Turbulence, "Infinite dimensional Hamilton-Jacobi-Bellman equations and control of stochastic PDE".

67. Miniconference on Partial Differential Equations, Canberra, Australia, September 3, 1998, "Existence, uniqueness and regularity of viscosity solutions of fully nonlinear parabolic equations".

68. Banach Center Symposium on Stochastic Systems, Warsaw, Poland, June 1-13, 1998, "Viscosity solutions of second order PDE's in infinite dimensions".

69. 4th SIAM Conference on Control & its Applications, Jacksonville, Florida, May 7-9, 1998; minisymposium on Hamilton-Jacobi Equations and Applications, "Boundary value problems for Hamilton-Jacobi-Bellman equations in Hilbert spaces and exit time problems for infinite dimensional stochastic systems", and minisymposium on Dynamic Programming Methods for Optimal Control of Nonlinear Distributed Parameter Systems, "Fully nonlinear second order equations in infinite dimensions and optimal control of stochastic PDE's".

70. 18th IFPI Conference on Modelling and Optimization, Detroit, Michigan, July 22-25, 1997, session on Stochastic Analysis, Processes, and Systems, "Second order Hamilton-Jacobi-Bellman equations in Hilbert spaces and stochastic boundary control".

71. Workshop on Deterministic and Stochastic Evolutionary Systems, Scuola Normale Superiore di Pisa, Pisa, Italy, July 16-17, 1996, "Infinite dimensional systems and risk sensitive control".

72. Workshop on Dynamical Systems and Applications of Stochastic Differential Equations, Scuola Normale Superiore di Pisa, Pisa, Italy, June 29-30, 1995, "Hamilton-Jacobi-Bellman equations in Hilbert spaces".

73. International Joint Mathematics Meeting, Merida, Jucatan, Mexico, Dec. 1-4, 1993, "Second order Hamilton-Jacobi-Bellman equations in infinite dimensional Hilbert spaces".

Seminar/Colloquium Talks:

University of Tennessee at Chattanooga (1994, Analysis Seminar)
Scuola Normale Superiore di Pisa, Pisa, Italy (1995, Analysis Seminar)
University of Trieste, Italy (1995, Analysis Seminar)
Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland (1995, Analysis Seminar)
University of Padova, Italy (1996, Analysis Seminar)
Australian National University, Canberra, Australia, (1996, PDE Seminar)
Emory University (1998, Analysis Seminar)
Scuola Normale Superiore di Pisa, Pisa, Italy (1998, Analysis Seminar)
University of Tennessee at Chattanooga (1999, Colloquium)
University of Kansas, Lawrence (1999, Colloquium)
University of Cologne, Germany (1999, Analysis Seminar)
University of Wisconsin, Madison (2000, PDE and Applied Analysis Seminar)
University of Virginia, Charlottesville (2000, Colloquium)
North Carolina State University, Raleigh (2000, Stochastic Seminar)
University of Texas, Austin (2000, Analysis Seminar)
University of California, Santa Barbara (2000, PDE Seminar)
Scuola Normale Superiore di Pisa, Pisa, Italy (2000, Analysis Seminar)
University of Padova, Italy (2002, Analysis Seminar)
University of Nevada, Reno (2002, Colloquium)
University of Massachusetts, Amherst (2003, Applied Analysis and Computations Seminar)
University of Wyoming, Laramie (2003, Colloquium)
University of Nevada, Reno (2004, Colloquium)
University of Tokyo, Japan (2004, PDE and Real Analysis Seminar)
Waseda University, Japan (2004, PDE Seminar)
University of California, Santa Barbara (2005, PDE Seminar)
Iowa State University, Ames (2005, Computational and Applied Mathematics Seminar)
University of Wyoming, Laramie (2006, Colloquium)

Emory University (2006, Differential Geometry and Analysis Seminar)
University of Padova, Italy (2006, Analysis Seminar)
Wright State University (2006, Colloquium)
University of Rome "La Sapienza", Italy (2007, PDE Seminar)
Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland (2007, Stochastic Processes Seminar)
University of Kansas, Lawrence (2007, Colloquium)
University of Kansas, Lawrence (2009, Applied Mathematics Seminar)
University of Indiana, Bloomington (2011, PDE seminar)
University of Pisa, Italy (2012, Probability Seminar)
Politechnico di Milano, (2013)
Rutgers University (2013, PDE, Probability and Math Finance Seminar)
University of California, Irvine (2014, PDE Seminar)
University of Pisa, Italy (2014, minicourse on Regularity of Solutions of Second Order HJB Equations, 4 lectures)
Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland (2014, Stochastic Processes Seminar)
Warsaw University, Warsaw, Poland (2014, Seminar of Mathematical Physics Equations Group)
University of Southern California (2015, Mathematical Finance Colloquium)
Kennesaw State University (2016, Analysis and Applied Mathematics Seminar)
Seminar In the Analysis and Methods of PDE (SIAM PDE) (2021, webinar)
Technische Universitaet Berlin (2021, FOR seminar, webinar)
Rio de Janeiro Webinar on Analysis and PDE (2021, webinar)

Professional Service:

NSERC Pure and Applied Mathematics - B Grant Selection Committee, 2005-06.
NSF Panels.
School of Mathematics Hiring Committee, 2005-07, 2015-2017, Chair 2015-2016.
School of Mathematics Senior Promotion and Tenure Committee, 2005-07, 2009-11, Chair 2010-11, 2012-14, 2017-2019, Chair 2018-2019.
School of Mathematics Faculty Advisory Committee, 2003-05, 2008-2009, Chair 2008-2009, 2020-2022.
Search Committee for the Chair of the School of Mathematics, 2000-2001.
School of Mathematics Junior Promotion and Tenure Committee, 2000-2001, 2021-present.
School of Mathematics Salary and Awards Committee, 1999-2002, 2011-2013, 2014-2016.
School of Mathematics Elections and Nominations Committee, 1998-2000, 2009-2010.
School of Mathematics Graduate Committee, 1998-2000, Chair, 1999-2000, 2001-04, 2010-2012, 2015-2017.
School of Mathematics Undergraduate Committee, 1995-97, 2018-2020.

School of Mathematics Postdoc Committee, 2022-present.
Graduate Comprehensive Examination Committee, Spring 1996, Fall 1996, Fall 2001, Fall 2004, Spring 2005, Fall 2017 and Fall 2021 (Differential Equations Exam).

Seminar and Conference Organization:

- Co-organizer (with W. Gangbo, A. Meszaros and C. Mou) of the Special Session on Variational Methods, Optimal Control and Hamilton-Jacobi Equations, 2023 Joint Mathematics Meeting, Boston, MA, January 4-7, 2023.

- Member of the organizing group of the Virtual Analysis and PDE Seminar (online seminar organized by a group of people from UC Irvine, Brown University, Columbia University, Georgia Tech, University of Wisconsin at Madison, Purdue University, UCLA, UCSD and UT Austin) 2020-present.

- Co-organizer (with J. Yong) of the Special Session on Stochastic Control and Related Topics, 1164 AMS Sectional Meeting, Atlanta, GA, March 13-14, 2021.

- Organizer of the School of Mathematics PDE Seminar, 2004-2005 (with R. Pan), 2011–2012.

- Co-organizer (with M. Lacey, J. Metcalfe, G. Mockenhaupt, and R. Pan) of the AMS-SIAM Special Session on Analysis and Applications in Nonlinear Partial Differential Equations, AMS/MAA Joint Mathematics Meeting, Atlanta, GA, January 5-8, 2005.

- CDSNS Colloquium Chairman, 1998/99.

- School of Mathematics Colloquium Chairman and Member of the University Center Interdepartmental Group in Mathematics, 1996/97.

Refereeing/Reviewing:

Abstract and Applied Analysis
Analysis & PDE
Annales IHP
Annals of Applied Probability
Annals of Probability
Applicable Analysis
Applied Mathematics and Optimization
Arch. Rational Mech. Anal.
Bulletin of the London Mathematical Society
Bulletin of Mathematical Sciences
Communications in Mathematical Sciences

Communications in Mathematical Physics
Communications in Partial Differential Equations
Communications on Pure and Applied Analysis
Computational and Applied Mathematics
Czechoslovak Mathematical Journal
Differential and Integral Equations
Discrete and Continuous Dynamical Systems
Duke Mathematical Journal
Indiana University Mathematics Journal
International Journal of Mathematics and Mathematical Sciences
International Mathematics Research Notices
Journal de Mathématiques Pures et Appliquées
Journal of Differential Equations
Journal of Dynamics and Differential Equations Journal of the European Mathematical Society
Journal of Functional Analysis
Journal of Mathematical Analysis and Applications
Journal of Physics
Mathematical Inequalities and Applications
Mathematical Methods in the Applied Sciences
Mathematische Annalen
Nonlinear Differential Equations and Applications (NoDEA)
Nonlinear Analysis
Nonlinearity
NS Partial Differential Equations and Applications
Optimal Control, Applications and Methods
Potential Analysis
Probability Theory and Related Fields
Proceedings of the American Mathematical Society
Pure and Applied Analysis
SIAM Journal on Control and Optimization
SIAM Journal on Mathematical Analysis
SIAM Journal on Optimization
Stochastic Analysis and Applications
Stochastic Processes and their Applications
Stochastics
Studia Mathematica
Systems and Control Letters,
Transactions of the American Mathematical Society

Refereeing for NSF, ARO, NSERC, Czech Science Foundation, Vienna University of Technology, conference proceedings, book articles, book reviews.

Reviewer for Mathematical Reviews, 1994-2006.

Ph.D. Students:

Djivede Kelome, Ph.D. 2002
Chenchen Mou (jointly with Y. Yi), Ph.D. 2016
Sergio Mayorga (jointly with W. Gangbo), Ph.D. 2019

Mentoring:

Visiting Students and Young Faculty: Camelia Tiplea, Giorgio Fabbri, Mauro Rosestolato, Filippo de Feo, Lukas Wessels

Thesis Committees:

T. Gedeon, 1994 (Ph.D., Reading Committee)
A. Banaszuk, 1995 (Ph.D., Reading Committee)
J. Rehacek, 1996 (Ph.D., Reading Committee)
K. A. Simon, 1996 (Masters Oral Exam Committee)
X. F. Yang, 1998 (Ph.D., Reading Committee)
A. Leonessa, 1999 (Masters Oral Exam Committee)
A. Proietti, 1999 (Masters Oral Exam Committee)
M. Weederman, 2000 (Ph.D., Reading Committee)
J. Quinn, 2000 (Masters Oral Exam Committee)
T. Hayakawa, 2001 (Masters Oral Exam Committee)
X. Zhang, 2002 (Masters Oral Exam Committee)
M. Agueh, 2002 (Ph.D., Reading Committee)
H. Maroofi, 2002 (Ph.D., Reading Committee)
E. Boczko, 2002 (Ph.D., Reading Committee)
X. Wang, 2002 (Ph.D., Reading Committee)
S. Day, 2003 (Ph.D., Reading Committee)
B. M. Kim, 2005 (Masters Oral Exam Committee)
S. Ulusoy, 2007 (Ph.D., Reading Committee)
J. Moon, 2009 (Masters Oral Exam Committee)
H. K. Kim, 2009 (Ph.D., Reading Committee)
T. Yolcu, 2009 (Ph.D., Reading Committee)
S. A. Almada, 2011 (Ph.D., Reading Committee)
R. Gong, 2012 (Ph.D., Reading Committee)
M. Sedjro, 2012 (Ph.D., Reading Committee)
W. Zhang, 2014 (Ph.D., Reading Committee)
R. Awi, 2015 (Ph.D., Reading Committee)
D. Sampson, 2017 (Ph.D., Reading Committee)
F. Shirani, 2018 (Ph.D., Reading Committee)
G. Boutselis, 2019 (Aerospace Eng., Ph.D., Reading Committee)
Q. Hu, 2020 (Ph.D., Reading Committee)
Examiner of the Ph.D. Thesis of James T. F. Yang, The University of Sydney, Australia, 2020

Examiner of the Ph.D. Thesis of Perisetti Lakshmi Naga Mahendranath, Indian Institute of Science, Education and Research, Thiruvananthapuram, India, 2020
E. Evans, 2021 (Aerospace Eng., Ph.D., Reading Committee)
Ph.D. Thesis committee of Lukas Wessels, Technische Universität Berlin, 2022

Editorial Boards:

Applied Mathematics and Optimization, 2016-present
Mathematical Control and Related Fields, 2011-2018.
SIAM Journal on Control and Optimization, 2006-2012.
Applicable Analysis, 2012.

Honors and Awards:

1. 2010 JMSJ (Journal of The Mathematical Society of Japan) Outstanding Paper Prize for the article S. Koike and A. Święch, Weak Harnack inequality for fully nonlinear uniformly elliptic PDE with unbounded ingredients, *J. Math. Soc. Japan.* **61** (2009), no. 3, 723–755.

2. Invited talk in the Seminar In the Analysis and Methods of PDE (SIAM PDE) to present a featured article in SIAM J. Math. Anal., W. Gangbo, S. Mayorga and A. Święch, Finite dimensional approximations of Hamilton-Jacobi-Bellman equations in spaces of probability measures, *SIAM J. Math. Anal.* **53** (2021), no. 2, 1320–1356.

3. Plenary talk at 2022 SIAM Annual Meeting, July 11-15, 2022, Pittsburgh, USA.

Membership in Professional Organizations:

American Mathematical Society