

MARIAN GIDEA

CONTACT INFORMATION

WORK ADDRESS:
Department of Mathematics
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EDUCATION

1993-1997 Doctoral Program in Mathematics at University at Buffalo.
PhD in Mathematics, June 1997.
Thesis advisor: James Reineck.
1987-1992 Faculty of Mathematics, University of Bucharest, Romania.
MS in Mathematics, June 1992.

ACADEMIC POSITIONS

2013- present Professor (Tenured), Yeshiva University.
2021-2022 Program Director (Analysis Program), National Science Foundation.
2007-2013 Professor (Tenured), Northeastern Illinois University (NEIU).
2004-2007 Associate Professor, NEIU (Tenured).
2000-2004 Assistant Professor (Tenure Track), NEIU.
1999-2000 Visiting Assistant Professor, Northwestern University.
1997-1999 Visiting Assistant Professor, Loyola University of Chicago.
1993-1997 Teaching Assistant, University at Buffalo.
1992-1993 Teaching Assistant, University of Bucharest.
1992-1993 Teaching Assistant, Polytechnic University of Bucharest.

VISITING POSITIONS

2018 Research Professor, Mathematical Sciences Research Institute, Berkeley.
2014 Visiting Researcher, Centre de Recerca Matemàtica, Barcelona.
2011-2013 Member, Institute for Advanced Study, Princeton.
2008 Visiting Researcher, Centre de Recerca Matemàtica, Barcelona.

AWARDS AND HONORS

2019 Dean Karen Bacon Faculty Award.
2011 Bernard J. Brommel Distinguished Research Award.
2008, 2006, 2004 NEIU Faculty Excellence Award.

RESEARCH AREAS

- Dynamical Systems
- Applications of Dynamical Systems to:
 - Celestial Mechanics
 - Mathematical Physics
 - Mathematical Biology
 - Financial Mathematics
- Topological Data Analysis.

GRANTS

- 2018-2021 National Science Foundation (NSF), PI, “Dynamical and Statistical Methods Applied to Hamiltonian Systems”, (\$425,022).
- 2017-2018 National Aeronautics and Space Administration – Jet Propulsion Laboratory (NASA-JPL), Collaborator, “Accelerating Diffusion to Enable Rapid Tour Design”, (\$100,022).
- 2016-2017 National Science Foundation, PI, “Conference A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems”, (\$32,010)
- 2016-2017 Sloan Foundation, PI, “Conference Llavest: A broad perspective on finite and infinite dimensional dynamical systems (FIDDS-17)”, (\$20,000).
- 2016-2017 China’s High-End Foreign Expert Program Award, PI, (\$40,000).
- 2015-2018 National Science Foundation, PI, “Large effects in dynamical systems”, (\$289,999).
- 2012-2015 National Science Foundation, PI, “Instability of Dynamical Systems”, (\$138,000).
- 2014-2019 National Institute of Health, PI, “NU-STARs for Northeastern Illinois Student Training in Academic Research in the Sciences” (\$1.3 million).
- 2011-2014 National Cancer Institute, Co-PI, “NU-NEIGHBORS: A social science partnership to reduce cancer disparities”, (\$1.2 million).
- 2011 NEIU Student Center for Science Engagement/Department of Education CCRAA HSI grant, PI (\$16,000).
- 2009 NEIU Student Center for Science Engagement/Department of Education CCRAA HSI grant, PI (\$20,000).
- 2009 NEIU Research Community grant, PI (\$5,000).
- 2007 NIH, PI, “Applications of Dynamical Systems in Oncology and Cardiology” (\$9,450).
- 2006-2009 National Science Foundation, PI, “Hamiltonian Instability” (\$97,334).
- 2001-2004 NASA, team member, “Infusing Space Science into the Science Core Curriculum through a Community of Scholars” (\$300,000).
- 2006 NEIU Research Community grant (\$5,000).
- 2005 NEIU Research Community grant (\$5,000).
- 2004 NEIU research community grant (\$5,000).
- 2002 NEIU COR grant (\$3,000).
- 2001 NEIU Research Grant (\$1,400).

ADMINISTRATIVE EXPERIENCE	2022-present	Associate Dean for STEM Education and Research.
	2019-2021	Director of the Graduate Program in Mathematics, Yeshiva University.
	2018-2021	Chair of the Division of Natural Sciences and Mathematics, Yeshiva University.
	2016-2021	Chair of Mathematical Sciences, Yeshiva University.
	2014-present	Member of the Executive Committee of the Center for Mathematical Sciences of Yeshiva University.
	2007-2011	Advisor of the Master of Science in Mathematics Program, Applied Mathematics track at NEIU.
	2005-2007	Advisor of the Master of Science in Mathematics Program, Secondary Education track at NEIU.
	2010-2011	Member the Graduate Education Task Force at NEIU.
	2008-2011	Member of the Academic Affairs Committee at NEIU.
2000-2011	Member at the Department Personnel Committee at NEIU.	

- BOOKS
1. “Differential Geometry and Topology: with a view to dynamical systems” (with K. Burns), CRC Press, 2005.
 2. “Chaotic Dynamical Systems: An Introduction” (with C.P. Niculescu), Universitaria Press, Craiova, Romania, 2003.

- EDITED VOLUMES
1. “Llavefest: A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems”, (co-editors Xavier Cabre, Amadeu Delshams, Marian Gidea and Chongchun Zeng), Special Issue of Discrete and Continuous Dynamical Systems–A, Vol. 38, American Institute of Mathematical Sciences, 2018.
 2. “Special Issue on Tipping Points: Fundamentals and Applications”, (co-editors J. Sieber, M. Silber, S. Wiczorek), Communications in Nonlinear Science and Numerical Simulation, 2014.
 3. “Special issue devoted to the conference on Hamiltonian Systems and Celestial Mechanics HAMSYS 2010, honoring E.A. Lacombe 65th birthday”, (co-editors A. Delshams, E. Perez-Chavela), Discrete and Continuous Dynamical Systems–A, Vol. 33, 2013.
 4. “Special section on Celestial Mechanics and Applications – 3rd Conference on Nonlinear Science and Complexity 2010 (NSC10)”, (co-editor J. Masdemont), Communications in Nonlinear Science and Numerical Simulation, Elsevier, Vol. 17, 2012.
 5. “Smooth Dynamics, Symbolic Dynamics and Ergodic Theory”, (co-editors A. Sahin and I. Ugarcovici), Discrete and Continuous Dynamical Systems–S, American Institute of Mathematical Sciences, Vol 2, 2009.
 6. “A special issue in honor of the contributions of Donald Saari to the mathematical aspects of Celestial Mechanics”, (co-editors E. Perez-Chavela, C. Robinson), Discrete and Continuous Dynamical Systems–S, American Institute of Mathematical Sciences, Vol. 1, 2009
 7. “Topological and Analytical Shadowing Techniques”, (co-editor C. Robinson), Discrete and Continuous Dynamical Systems–A, 2006.

- ARTICLES
1. “Diffusion along chains of normally hyperbolic cylinders” (with J.-P. Marco), Discrete and Continuous Dynamical Systems, 2022.
 2. “Melnikov method for non-conservative perturbations of the three-body problem” (with R. de la Llave, and M. Musser – graduate student), Celestial Mechanics and Dynamical Astronomy, 2021.

3. “Surface gravity of rotating dumbbell shapes” (with Wai-Ting Lam – graduate student –, and Fredy R. Zypman), *Astrophysics and Space Science* 366, 2021.
4. “Arnold Diffusion, Quantitative Estimates and Stochastic Behavior in the Three-Body Problem”, (with M. Capinski), *Communications on Pure and Applied Mathematics*, 2021.
5. “Global effect of non-conservative perturbations on homoclinic orbits” (with R. de la Llave, and M. Musser – graduate student), *Qualitative Theory of Dynamical Systems*, 20, 2021.
6. “Magnetic field perturbation of the motion of a charge near a circular wire”, (with D. Lazarev – graduate student), submitted.
7. “A general mechanism of instability in Hamiltonian systems: Skipping along a normally hyperbolic invariant manifold”, (with R. de la Llave and T.M. Seara), *Discrete and Continuous Dynamical Systems*, 40, 2020.
8. “Hill four-body problem with oblate tertiary: an application to the Sun-Jupiter-Hektor - Skamandrios system”, (with J. Burgos-Garcia, A. Celletti, C. Gales, W-T. Lam – graduate student), *Journal of Nonlinear Science*, 30, 2020.
9. “A General Mechanism of Diffusion in Hamiltonian Systems: Qualitative Results”, (with R. de la Llave and T. Seara), *Communications on Pure and Applied Mathematics*, 73, 2020.
10. “Topological recognition of critical transitions in time series of cryptocurrencies”, (with Y. Katz, P. Roldan, D. Goldsmith – graduate student, Yo. Shmalo – graduate student), *Physica A*, 548, 2020.
11. “Energy Drift and Diffusion Process in the Three-Body Problem”, *Oberwolfach Reports*, 31, 2019.
12. “Global Melnikov Theory in Hamiltonian Systems with General Time-Dependent Perturbations”, (with R. de la Llave), *Journal of Nonlinear Science*, 28 (5), 1657, 2018.
13. “Combinatorial approach to detection of fixed points, periodic orbits, and symbolic dynamics” (with Yt. Shmalo – graduate student), *Discrete and Continuous Dynamical Systems – A*, 38, 2018.
14. “Topological Data Analysis of Financial Time Series: Landscapes of Crashes” (with Y. Katz), *Physica-A*, 491, 2018.
15. “Construction of diffusing orbits in Hamiltonian systems”, *Oberwolfach Reports*, 32, 2017.
16. “Topological data analysis of critical transitions in financial networks”, *E. Shmueli et al. (eds.), 3rd International Winter School and Conference on Network Science*, Springer Proceedings in Complexity, DOI 10.1007/978-3-319-55471-6_5.
17. “Perturbations of geodesic flows by recurrent dynamics”, (with R. de la Llave), *Journal of the European Mathematical Society*, 19, 2017.
18. “Arnold diffusion in the planar elliptic restricted three-body problem: mechanism and numerical verification” (with M. Capinski and R. de la Llave), *Nonlinearity*, 30, Number 1, 2016.
19. “Arnold’s mechanism of diffusion in the spatial circular restricted three-body problem: A semi-analytical argument” (with A. Delshams, and P Roldan), *Physica D: Nonlinear Phenomena*, 334, 2016.
20. “Stability interchanges in a curved Sitnikov problem” (with L. Franco-Pérez, M. Levi and E. Pérez-Chavela), *Nonlinearity*, 29, 2016.
21. “Hill’s approximation in a restricted four-body problem” (with J. Burgos-Garcia - postdoctoral fellow), *Celestial Mechanics and Dynamical Astronomy*, 122, 2015.
22. “Global diffusion on a tight three-sphere”, *Qualitative Theory of Dynamical Systems*, 14, 2015.
23. “Low-Fuel Spacecraft Trajectories to the Moon”, in *Mathematics of Planet Earth: Mathematicians Reflect on How to Discover, Organize, and Protect Our Planet*, (Eds. H. Kaper and C. Rousseau), SIAM, 2015.

24. “Critical transitions in a model of a genetic regulatory system” (with Jesse Berwald), *Mathematical Biology and Engineering*, 11, 2014.
25. “Automatic Recognition and Tagging of Topologically Different Regimes in Dynamical Systems” (with J. Berwald and M. Vejdemo-Johansson), *Discontinuity, Nonlinearity and Complexity*, 4, 2014.
26. “A Latent Class Analysis of Cancer Risk Behaviors among US College Students”, (with Kang J, Ciecierski CC, Malin EL, Carroll AJ, Gidea M, Craft LL, Spring B, Hitsman B.), *Preventive Medicine*, 64, 2014.
27. “Diffusion along transition chains of invariant tori and Aubry-Mather sets”, (with C. Robinson), *Ergodic Theory and Dynamical Systems*, 33, 2013.
28. “Local and global instability in nearly integrable Hamiltonian systems” (with Rafael de la Llave, Tere Seara), *Oberwolfach Reports*, 34, 2013.
29. “Transition map and shadowing lemma for normally hyperbolic invariant manifolds” (with A. Delshams and P. Roldan), *Discrete and Continuous Dynamical Systems – A*, 33, 2013.
30. “Geometry of Weak Stability Boundaries” (with E. Belbruno and F. Topputo), *Qualitative Theory of Dynamical Systems*, 12, 2013.
31. “A Brief Account on Lagrange’s Algebraic Identity” (with C. Niculescu), *The Mathematical Intelligencer*, 34, 2012.
32. “Deterministic models for simulating electrocardiographic signals” (with C. Gidea and W. Byrd – graduate student), *Communications in Nonlinear Science and Numerical Simulation*, 16, 2011.
33. “Applications of KAM Theory to Population Dynamics” (with J.D. Meiss, I. Ugarcovici, H. Weiss), *Journal of Biological Dynamics*, 5, 2011.
34. “Symmetric planar central configurations of five bodies: Euler plus two” (with J. Llibre), *Celestial Mechanics and Dynamical Astronomy*, 106, 2010.
35. “Weak Stability Boundary and Invariant Manifolds” (with E. Belbruno and F. Topputo), *SIAM Journal on Applied Dynamical Systems*, 9, 2010.
36. “Obstruction argument for transition chains of tori interspersed with gaps” (with C. Robinson), *Discrete and Continuous Dynamical Systems-S*, 2, 2009.
37. “Geometric approaches to the problem of instability in Hamiltonian systems. An informal presentation” (with A. Delshams, R. de la Llave, T. Seara), in *Hamiltonian dynamical systems and applications* (Eds. W. Craig), Springer, 2008.
38. “Resonant Motion, Ballistic Escape, and their Applications in Astrodynamics” (with E. Belbruno, F. Topputo), *Advances in Space Research*, 42, 2008.
39. “Resonance Transitions Associated to Weak Capture in the Restricted Three-Body Problem” (with E. Belbruno, F. Topputo), *Advances in Space Research*, 42, 2008.
40. “Topological methods”, in *Advanced Course on Stability and Instability in Mechanical Systems*, *Quaderns*, 51, Centre de Recerca Matemàtica, 2008.
41. “Shadowing orbits for transition chains of invariant tori alternating with gaps” (with C. Robinson), *Nonlinearity*, 2007.
42. “Phase space reconstruction in the restricted three-body problem” (with G. Anderson and F. Deppe – graduate student), in *New Trends in Astrodynamics and Applications III* (Eds. E. Belbruno), AIP Conference Proceedings, 886, 2007.
43. “Geometry of homoclinic connections in a planar circular restricted three-body problem” (with J. Masdemont), *International Journal of Bifurcation and Chaos*, 17, 2007.

44. “Chaotic orbits in a restricted three-body problem: numerical experiments and heuristics” (with F. Deppe – graduate student), *Communications in Nonlinear Science and Numerical Simulation*, 11, 2006.
45. “Topological methods in the large gap problem” (with R. de la Llave), *Discrete and Continuous Dynamical Systems*, 14, 2006.
46. “On Wesner’s method of searching for chaos on low frequency” (with D. Quaid – graduate student), *Economics Bulletin*, 2005.
47. “Covering relations for multidimensional dynamical systems” (with P. Zgliczyński), *Journal of Differential Equations*, 202, 2004.
48. “Covering relations for multidimensional dynamical systems – II” (with P. Zgliczyński), *Journal of Differential Equations*, 202, 2004.
49. “Symbolic Dynamics and Transition Tori-II” (with C. Robinson), in *New Advances in Celestial Mechanics and Hamiltonian Systems* (Eds. J. Delgado, E.A. Lacomba, J. Llibre and E. Pérez Chavela), Kluwer Academic/Plenum Publishers, 2004.
50. “Topologically Crossing Heteroclinic Connections to Invariant Tori” (with C. Robinson), *Journal of Differential Equations*, 193, 2003.
51. “Chaotic Orbits in Three- and Four-Body Systems” (with M. Burgos – undergraduate student), *Physica A*, 328, 2003.
52. “Chaotic Julia Sets: A Conley Index Approach”, *Topology and its Applications*, 125, 2001.
53. “Non-smooth Dynamical Systems that Exhibit Hyperbolic Behavior”, *Revue Roumaine de Mathématiques Pures et Appliquées*, 45, 2000.
54. “Leray Functor and Orbital Conley Index for Non-Invariant sets”, *Discrete and Continuous Dynamical Systems*, 5, 1999.
55. “The Conley Index for Countable Decompositions of Invariant Sets”, in *Conley Index Theory*, *Banach Center Publications*, 47, Polish Academy of Sciences, 1999.
56. “A Discrete Conley Index for Non-Invariant Sets”, *Universitatis Jagellonicae Acta Mathematica*, in Proceedings of the Topological Methods in Differential Equations and Dynamical Systems Conference, Kraków, Poland, July 17-20, 1996, XXXVI, 1998.
57. “Markov partitions for non-hyperbolic systems”, *Dynamic Systems and Applications*, 5, 1996.
58. “Stability of the Topological Entropy for a Class of Iterations of Rational Functions with Perturbations”, *Mathematical Reports*, 32, 1995.

CONFERENCE
PRESENTATIONS

- Conference H2020 in Hamiltonian dynamics, Venice, Italy, July 25-29, 2022.
- Conference From Exponentially Small Phenomena to Instability (GLADS 22), Barcelona, Spain, July 5-9, 2022.
- BIRS-CMO Workshop Geometric and Variational Methods in Celestial Mechanics, Oaxaca, Mexico, June 19 - June 24, 2022.
- Conference DinAmicI VII, Varese, June 6-9, 2022.
- NSF-DMS Colloquium, March 10, 2022.
- Society of Industrial and Applied Mathematics (SIAM DS21), Virtual Conference, May 23-27, 2021.
- Dynamics, Equations and Applications (DEA 2019), Krakow, Poland, September 16-20, 2019.
- Dynamische Systeme, Mathematisches Forschungsinstitut Oberwolfach, July 2019, Oberwolfach, Germany.
- Hamiltonian systems, from topology to applications through analysis, Mathematical Sciences Research Institute, Berkeley, August 13 - December 14, 2018.

- Perspectives in Hamiltonian dynamics, Venice, Italy, June 18-22, 2018.
- Emerging Interactions of Geometric and Variational Methods, Institute for Advanced Study, Princeton, April 9-13, 2018.
- Workshop on symplectic dynamics and celestial mechanics, Seoul, South Korea, February 19-23, 2018.
- Introduction to Dynamical Systems Methods for Space Mission Design (co-organizer), Georgia Institute of Technology - January 16-19, 2018.
- The Seventh International Meeting on Celestial Mechanics (CELMEC VII), Viterbo, Italy, September 3-9, 2017.
- Conservative Dynamics and Symplectic Geometry, IMPA, Rio de Janeiro, Brazil, August 2017.
- Dynamische Systeme, Mathematisches Forschungsinstitut Oberwolfach, July 2017, Oberwolfach, Germany.
- Llavifest: A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems, June 2017, Barcelona, Spain.
- DinAmicI V - Modern Trends in the Ergodic Theory of Dynamical Systems, Rome, Italy, June 2017.
- Workshop on Beam Dynamics, IPAM-UCLA, 2017.
- Dynamics Days Latin America and the Caribbean, Puebla, Mexico, 2016.
- The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, 2016.
- Jornadas de Trabajo en Mecánica Celeste, Manresa, Spain, 2016.
- Warwick Dynamical Systems Workshop, Warwick, UK, 2016.
- Hamiltonian Systems and Celestial Mechanics, CMO-BIRS Workshop, Oaxaca, Mexico, 2015.
- Global Dynamics in Hamiltonian Systems, Nuria, Spain, 2015.
- Centro di Ricerca Matematica Ennio De Giorgi, Pisa, 2015.
- The 5th Conference on Nonlinear Science and Complexity, Xi'an, China, 2014.
- The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, 2014.
- The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain, 2014.
- The VII-th HAMSYS Symposium (HAMSYS-2014), Barcelona, 2014.
- Hamiltonian Perturbation Theory: Separatrix Splitting, Theory and Applications, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, 2014.
- Workshop on Algebraic Topology in Dynamics, Differential Equations, and Experimental Data, IMA, Minneapolis, 2014.
- Midwest Dynamical Systems Meeting, University of Illinois at Urbana-Champaign, 2013.
- Workshop on Conservative Dynamics and Symplectic Geometry, IMPA, Rio de Janeiro, Brazil, 2013.
- Mathematical Congress of the Americas, Guanajuato, Mexico, 2013.
- Planetary Motions, Satellite Dynamics, and Spaceship Orbits, Centre de Recherches Mathématiques, Montreal, Canada, 2013.
- Dynamische Systeme, Oberwolfach, Mathematisches Forschungsinstitut Oberwolfach, Germany, 2013.
- Workshop on Dynamical Systems and Related Topics, University of Maryland, 2013.

- The First International Conference on Dynamics of Differential Equations, Georgia Institute of Technology, 2013.
- The IX Americas Conference in Differential Equations, Trujillo, Peru, 2012.
- New Trends in Astrodynamics and Applications VI - An International Conference, New York, 2011.
- Hamiltonian Dynamics and Celestial Mechanics, Castro Urdiales, Spain, 2011.
- VI International Symposium HAMSYS-2010, Mexico City, Mexico, 2010.
- Workshop in Dynamical Systems and Related Topics, Penn State University, Pennsylvania, 2010.
- The 3rd Conference on Nonlinear Science and Complexity, Ankara, Turkey, 2010.
- The 8-th AIMS Conference of Dynamical Systems and Differential Equations, Dresden, Germany, 2010.
- The 8-th AIMS Conference of Dynamical Systems and Differential Equations, Dresden, Germany, 2010.
- VIII Americas Conference on Differential Equations, Veracruz, Mexico, 2009.
- The Fifth International Meeting on Celestial Mechanics, Viterbo, Italy, 2009.
- International Conference on Dynamics, Topology and Computations, Bedlewo, Poland, 2009.
- SIAM Conference on Dynamical Systems, Snowbird, Utah, 2009.
- Conference on Stability and Instability in Mechanical Systems, Centre de Recerca Matemàtica, Barcelona, Spain, 2008.
- The 5-th International Symposium HAMSYS 2008, Guanajuato, Mexico, 2008.
- The 7-th AIMS Conference of Dynamical Systems and Differential Equations, Arlington, Texas, 2008.
- The Structure of Phase Space in Chemical Reaction Dynamics, Madrid, Spain, 2007.
- Workshop in Dynamical Systems and Related Topics, Penn State University, 2007.
- International Conference on Scientific Computation and Differential Equations, Saint-Malo, France, 2007.
- Dynamics in Perturbations, Hasselt/Brussels, Belgium, 2007.
- Semi-classical Long-time Evolution, Wolfgang Pauli Institute, Vienna, Austria, 2006.
- New Trends in Astrodynamics and Applications III - An International Conference, Princeton University, 2006.
- International Conference on Nonlinear Science and Complexity, Beijing, China, 2006.
- The 6th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Poitiers, France, 2006.
- International Workshop on Global Dynamics Beyond Uniform Hyperbolicity, Chicago, 2006.
- AMS Spring Central Sectional Meeting, University of Notre Dame, 2006.
- Non-autonomous and Stochastic Dynamical Systems, Seville, Spain, 2005.
- Recent and future developments in Hamiltonian Systems: theory and applications, Institut Henri Poincaré, Paris, France, 2005.
- Midwest Dynamical Systems Conference, University of Minnesota, Minneapolis, 2005.
- The Fifth AIMS International Conference on Dynamical Systems and Differential Equations, Pomona, California, 2004.
- International Workshop on Robustness and Partial Hyperbolicity, Buzios, Brazil, 2003.
- SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, 2003.

- XIII Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics, Colonia del Sacramento, Uruguay, 2002.
- International Conference on Dynamical Methods for Differential Equations, Valladolid, Spain, 2002.
- The Fourth International Conference on Dynamical Systems and Differential Equations, University of North Carolina at Wilmington, 2002.
- Midwest Dynamical Systems Conference, University of North Carolina at Asheville, 2002.
- Second Workshop on the Conley Index and Related Topics, University of Sherbrooke, Canada, 2001.
- Nonlinear Dynamics and Chaos: where should we go from here?, University of Bristol, United Kingdom, 2001.
- The IV International Symposium on Hamiltonian Systems and Celestial Mechanics (HAMSYS-2001), CIMAT, Guanajuato City, Mexico, 2001.
- Conference Board of Mathematical Sciences, Mercer University, Macon, Georgia, 2000.
- Northwest Dynamical Systems Conference, University of Florida, Gainesville, Florida, 2000.
- International Congress of Mathematicians, Berlin.
- AMS Regional Meeting, Chicago, 1998.
- Special Session on “Low Dimensional Dynamics”, AMS Regional Meeting, Milwaukee, 1997.
- Conley Index Workshop, Warsaw, Poland, 1997.
- Midwest Dynamical Systems Conference, Northwestern University, Evanston, 1996.
- AMS Regional Meeting, Rider University, Lawrenceville, 1996.
- Topological Methods in Differential Equations and Dynamical Systems Conference, Kraków, Poland, 1996.
- The 15-th National Conference of Functional Analysis, Sinaia, Romania, 1994.
- The 13-th National Conference of Functional Analysis, Sinaia, Romania, 1992.

COLLOQUIA AND
SEMINARS

- 2020 University of Bio-Bio (Chile); Online North East PDE and Analysis Seminar (ONEPAS); Courant Institute of Mathematical Sciences.
- 2019 Institute for Advanced Study; Florida Atlantic University; Universitat Politècnica de Catalunya (Barcelona, Spain); University of Salento (Lecce, Italy); Georgia Institute of Technology.
- 2018 CUNY Graduate Center; Mathematical Sciences Research Institute, Berkeley.
- 2017 CUNY Graduate Center.
- 2016 Georgia Institute of Technology; Instituto Tecnológico Autónomo de México.
- 2015 Penn State University; Georgia Institute of Technology; Rutgers University.
- 2014 City University of New York; Courant Institute of Mathematical Sciences; Rutgers University.
- 2013 Institute for Advanced Study (Princeton); UAM-Iztapalapa (Mexico City, Mexico); University of Chicago; Courant Institute of Mathematical Sciences.
- 2012 Rutgers University; New Jersey Institute of Technology; Binghamton University (New York); Princeton University.
- 2011 Institute for Advanced Study (Princeton); Cornell University.
- 2010 Universitat de Barcelona – Universitat Politècnica de Catalunya (Barcelona, Spain); De Paul University; Northwestern University.
- 2009 Illinois Institute of Technology (Chicago); UAM-Iztapalapa (Mexico City, Mexico)
- 2008 University of Zaragoza (Spain); Georgia Institute of Technology.
- 2008 University of Illinois at Urbana-Champaign; University of Bucharest (Romania).
- 2007 University of Texas at Austin.
- 2006 Institut de Mathématiques (Paris, France).
- 2006 University of Illinois at Chicago.
- 2005 University of Texas at Austin; Northwestern University; Illinois Institute of Technology.
- 2002 University of Texas at Austin; Universitat de Barcelona – Universitat Politècnica de Catalunya (Barcelona, Spain).
- 2000 Loyola University of Chicago.
- 1998 Northwestern University; University of Illinois at Chicago.
- 1997 Loyola University of Chicago.

CONFERENCE
ORGANIZER

- Co-organizer, Special Session on “Hamiltonian Systems from real world models”, the 13th AIMS Conference on Dynamical Systems, Differential Equations, and Applications, Atlanta, USA, June 5 - 9, 2020.
- Co-organizer, Workshop on “Arnold Diffusion for Non-Convex Hamiltonians”, American Institute of Mathematics, San Jose, August 24-28, 2020.
- Organizer, “Emerging Interactions of Geometric and Variational Methods”, Institute for Advanced Study, Princeton, April 9-13, 2018.
- Organizer, “Introduction to Dynamical Systems Methods for Space Mission Design”, Georgia Institute of Technology - January 16-19, 2018.
- Organizer, CIMPA Research School *Dynamical Systems and Applications: Geometrical, Topological, and Numerical Aspects*, to be held at the African Center of Excellence in Mathematical Sciences and Applications (ACE-SMA), Dangbo, Benin, 2018.

- Member of Organizing Committee, *A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems (FIDDS-17)*, Barcelona, 2017.
- Co-organizer of *Special Session on Dynamical Systems*, Spring Eastern Sectional Meeting of the AMS, Hunter College, New York City, 2017.
- Organizer, NYC Dynamics Seminar at CUNY & Yeshiva University (with P. Hooper, A. Katok, R. Treviño), New York, 2016-present.
- Member of the Global Organizing Committee, *The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications Madrid, Spain*, Madrid, 2014.
- Organizer of Special Session on Celestial Mechanics, *The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications Madrid, Spain*, Madrid, 2014.
- Member of the International Program Committee, *5th Conference on Nonlinear Science and Complexity*, Xi'an, China, 2014.
- Member of the Organizing Committee, *Workshop on Advances in Tipping Point Theory with Applications to Environmental Science*, International Centre for Mathematical Sciences (ICMS), Edinburgh UK, 2013.
- Organizer of Featured Minisymposium “Advances in the Theory and Computation of Hamiltonian Systems”, *SIAM Conference on Dynamical Systems 2013*, Snowbird, UT, May 19 – 23, 2013.
- Member of Technical Program Committee, *4th Conference on Nonlinear Science and Complexity*, Budapest, Hungary, August 6 – 11, 2012.
- Member of International Program Committee, *3rd Conference on Nonlinear Science and Complexity*, Ankara, Turkey, July 28 – 31, 2010.
- Organizer of symposium “Celestial Mechanics and Dynamical Astronomy: Methods and Applications” (with J. Masdemont), *3rd Conference on Nonlinear Science and Complexity*, Ankara, Turkey, July 28 – 31, 2010.
- Organizer of special session “Applied hyperbolic and elliptic dynamics” (with I. Ugarcovici), *8th AIMS International Conference on Dynamical Systems, Differential Equations and Applications*, Dresden, Germany, May 25 - 28, 2010.
- Organizer of minisymposium “Applications of topological methods to dynamical systems” (with P. Roldan), Joint SIAM/RSME-SCM-SEMA Meeting Emerging Topics in Dynamical Systems and Partial Differential Equations DSPDEs'10, Barcelona, Spain, May 31 – June 4 , 2010.
- Member of International Program Committee, *2nd Conference on Nonlinear Science and Complexity*, Porto, Portugal, July 28 – 31, 2008.
- Organizer of symposium “Celestial Mechanics and Dynamical Astronomy: Methods and Applications” (with J. Masdemont), *2nd Conference on Nonlinear Science and Complexity*, Porto, Portugal, July 28 – 31, 2008.
- Organizer of special session “Hamiltonian Systems and Applications” (with A. Delshams and R. de la Llave), *7th AIMS International Conference on Dynamical Systems, Differential Equations and Applications*, Arlington, Texas, May 18 – 21, 2008.
- Organizer of special session “Smooth Dynamical Systems” (with I. Ugarcovici), *AMS Central Section Meeting*, Chicago, October 5–6, 2007.
- Organizer of workshop “Applications of Measurable and Smooth Dynamical Systems to Number Theory” (with A. Sahin and I. Ugarcovici), DePaul University, Chicago, October 4, 2007.
- Organizer of special session “Applications of Dynamical Systems: Celestial Mechanics and Beyond” (with J. Masdemont), *6th AIMS international conference on Dynamical Systems and Differential Equations*, Poitiers, France, June 23–28, 2006.

- Organizer of special session “Topological and Analytical Shadowing Techniques” (with C. Robinson), *5th AIMS international conference on Dynamical Systems and Differential Equations*, June 16–19, 2004, Pomona, California.

PROFESSIONAL
SERVICE

- Editor of *Communications in Nonlinear Science and Numerical Simulation*.
- Associate editor of *Qualitative Theory of Dynamical Systems*.
- Associate editor of *Discontinuity, Nonlinearity, and Complexity*.
- Member of the Editorial Board of *Discrete and Continuous Dynamical Systems, Series S*.
- Advisory Editorial Member of *Lecture Notes on Nonlinear Physical Science*, China Higher Education Publishing and Springer.
- Member of the editorial board of *Transactions of Nonlinear Science and Complexity*, World Scientific.
- Guest-editor of *Discrete and Continuous Dynamical Systems – A*.
- Member of the Mathematics and Climate Research Network (MCRN).
- Reviewer of grant proposals for National Science Foundation.
- Reviewer for *Mathematical Reviews*.
- Referee for *Journal of Modern Dynamics*, *Acta Mathematica*, *Transactions of the American Mathematical Society*, *Proceedings of the American Mathematical Society*, *Nonlinearity*, *Discrete and Continuous Dynamical Systems*, *Journal of Differential Equations*, *SIAM Journal on Applied Dynamical Systems*, *Communications in Nonlinear Science and Numerical Simulation*, *Applied Mathematical Letters*, *International Journal of Mathematics and Mathematical Sciences*, *Banach Center Publications*.

PHD STUDENTS
AND POSTDOCS

- Wai-Ting Lam (PhD student, 2020)
- Maxwell Musser (PhD student, current).
- Hongyu Cheng (MSRI Postdoc, 2018).
- Jaime Burgos-Garcia (Postdoc, 2014-2015).

POSTGRADUATE
COURSES

- CIMPA-BENIN SCHOOL 2018 on “Dynamical Systems and Applications: Geometrical, Topological and Numerical Aspects” (co-organizer), The African Center of Excellence in Mathematical Sciences and Applications (ACE-SMA) of the Institute of Mathematics and Physics, Benin, July 1-14, 2018.
- “Arnold Diffusion in the Three-Body Problem”, II Jornadas de Investigación y Posgrado, Universidad Autónoma Metropolitana, Mexico City, 2014.
- “Aubry Mather Theory from a Topological Viewpoint”, Tenth Workshop on Interactions Between Dynamical Systems and Partial Differential Equations (JISD2012), Barcelona, Spain, 2012.
- “Topological Methods”, Advanced Course on Stability and Instability in Mechanical Systems, Centre de Recerca Matemàtica, Barcelona, 2008.

TEACHING
EXPERIENCE

- Dynamical Systems
- Network Science
- Computational Topology
- Financial Mathematics
- Mathematical Modeling
- Time Series Analysis
- Differential Geometry
- Real Analysis
- Complex Variables
- PDE
- ODE
- Probability Theory
- Mathematical Statistics
- Discrete Mathematics
- Euclidean Geometry
- Linear Algebra
- Calculus
- College Algebra
- Finite Mathematics