

February 18, 2019

## Curriculum Vitae

Peter J. Olver  
School of Mathematics  
University of Minnesota  
Minneapolis, MN 55455  
612-625-5591  
olver@umn.edu  
<http://www.math.umn.edu/~olver>

### Summary:

Peter J. Olver received his Ph.D. from Harvard University in 1976 under the guidance of Prof. Garrett Birkhoff. After being a Dickson Instructor at the University of Chicago and a postdoc at the University of Oxford, he has been on the faculty of the School of Mathematics at the University of Minnesota since 1980, and a full professor since 1985. As of July, 2008, he has been serving as the Head of the Department. He has supervised 22 Ph.D. students to date, with 3 more currently supervised, as well as mentoring over 25 postdocs, visiting students, and visiting scholars from around the world. He has also supervised over 20 undergraduate research projects, many of which have led to publications.

His research interests revolve around the applications of symmetry and Lie groups to differential equations. Over the years, he has done research in mathematical physics, fluid mechanics, elasticity, quantum mechanics, Hamiltonian mechanics, the calculus of variations, differential geometry, classical invariant theory, computer vision, geometric numerical methods, algebra, and elsewhere. Since 1976, he has given more than 500 invited lectures on his research at conferences, universities, colleges, and institutes throughout the world. He is the author of over 140 papers in refereed journals, and over 45 in conference proceedings. He was named a "Highly Cited Researcher" by Thomson-ISI in 2003. He has written 5 books, including the definitive text on applications of Lie groups to differential equations, which was published in 1986, translated into Russian, and also republished in China. His most recent books are two undergraduate texts on partial differential equations and the second edition of Applied Linear Algebra, the latter coauthored with his wife, Chehrzad Shakiban.

**Personal Data:**

Born: January 11, 1952      Twickenham, Middlesex, England  
Emigrated to U.S.A.: June, 1961  
Became Naturalized U.S. Citizen: 1967  
Married: Chehrzad Shakiban, June, 1976  
Children: Parizad, 1979, Sheehan, 1983, Noreen, 1989  
Grandchildren: Tolemei, 2013, Avianna, 2015, Colette, 2016, Fabian, 2018

**Educational Data:**

Sc.B.	1973	Brown University Applied Mathematics Magna Cum Laude With Honors
Ph.D.	1976	Harvard University Mathematics Thesis Advisor: Garrett Birkhoff

**Professional Experience:**

L.E. Dickson Instructor in Mathematics, University of Chicago, 1976–78  
British Science Research Council Grant, University of Oxford, England, 1978–80  
Assistant Professor, School of Mathematics, University of Minnesota, 1980–82  
Associate Professor, School of Mathematics, University of Minnesota, 1983–84  
Professor, School of Mathematics, University of Minnesota, 1985–  
Professor, Department of Mathematics, University of Maryland, 1992–93  
Member of Graduate Faculty, Control Science & Dynamical Systems, University of Minnesota, 2001–  
Head of Department, School of Mathematics, University of Minnesota, 2008–

**Ph.D. Students:**

1989	Petri Juha Pohjanpelto, “Symmetries of Maxwell’s Equations”
1989	David Barton Cooke, “Hamiltonian Systems of Evolution Equations”
1989	Jeffrey Robert Ondich, “Partially Invariant Solutions of Differential Equations”
1992	Philip Wendell Doyle, “Hydrodynamic Poisson Bivectors and Quasilinear Systems in One Space Variable”
1993	Ayşe Humeýra Bilge, “Construction of Recursion Operators for Scalar Evolution Equations”

- 1993 Rui António Loja Fernandes, “Completely Integrable Bi–Hamiltonian Systems”
- 1994 Gary Alan Hatfield, “Conservation Laws in Anisotropic Elasticity”
- 1994 Roberto Murillo, “Cartan’s Equivalence Method and an Application to Second Order Evolution Equations”
- 1998 David Andrew Richter, “Semisimple Lie algebras of Differential Operators”
- 1999 Steven Haker, “Geometric PDE’s in Computer Vision”
- 1999 Mikhail Vassilievich Foursov, “On Integrable Evolution Equations in Commutative And Noncommutative Variables”
- 2000 Irina A. Kogan, “Inductive Approach to Cartan’s Moving Frame Method with Applications to Classical Invariant Theory”
- 2001 Mireille Boutin, “On Invariants of Lie Group Actions and their Application to Some Equivalence Problems”
- 2002 Vladimir Itskov, “Orbit Reduction of Exterior Differential Systems”
- 2005 Jeongoo Cheh, “Symmetry Pseudogroups of Differential Equations”
- 2006 Pilwon Kim, “Invariantization of Numerical Schemes for Differential Equations Using Moving Frames”
- 2009 Francis Valiquette, “Applications of Moving Frames to Lie Pseudo-Groups”
- 2009 Joseph Patrick Kenney, “Evolution of Differential Invariant Signatures and Applications to Shape Recognition”
- 2013 Robert Thompson, “Applications of Moving Frames to Group Foliation of Differential Equations”
- 2014 Joseph Jonathan Benson, “Integrable Planar Curve Flows and the Vortex Membrane Flow in Euclidean 4-Space Using Moving Frames and the Variational Bicomplex”
- 2016 Jessica Louise Senou, “Weighted Differential Invariant Signatures and Applications to Shape Recognition”
- 2017 Örn Arnaldsson, “Involutive Moving Frames”

**Visiting Graduate Student Advisor:**

2009 – 10	Li Wei	Dalian University of Technology, China
2011	Alberto Cogliati	Università degli Studi di Milano, Italy
2012	Reza Aghayan	Kingston University, London, UK
2014 – 15	Gülden Gün Polat	Istanbul Technical University, Turkey
2016, 17	Adrian Ruiz Servan	Universidad de Cádiz, Spain
2016	Markus Dafinger	University of Oldenburg, Germany

2017 Cláudio Basquerotto Universidade Estadual Paulista, Brazil

**Postdoctoral and Visiting Scholar Mentor:**

1984 – 86 John Verosky Visiting Assistant Professor, Tulane University  
1985 – 88 Artemio González-López Fulbright Postdoctoral Fellowship  
1989 Peter J. Vassiliou Postdoctoral Fellowship, Canberra College of Education,  
Australia  
1994 – 95 Rafael H. Heredero Ayuda Posdoctoral Fellowship, Spain  
1995 – 97 Mark Fels NSERC Postdoctoral Fellowship, Canada  
1995 – 98 Yi A. Li Dunham Jackson Assistant Professor  
1996 – 97 Robert Milson NSERC Postdoctoral Fellowship, Canada  
1998 – 99 Jing Ping Wang NWO Postdoctoral Fellowship, Holland  
1999 Enrique Reyes NSERC Postdoctoral Fellowship, Canada  
2000 – 04 Janylle Carter IMA Postdoc  
2001 M<sup>a</sup> Concepción Muriel Patino Postdoctoral Fellowship, Spain  
2003 Saadet Ozer Postdoctoral Fellowship, Turkey  
2004 Teoman Ozer Postdoctoral Fellowship, Turkey  
2006 – 07 José Martins Postdoctoral Fellowship, Brazil  
2010 – 11 Ruoxia Yao Visiting Scholar, China  
2010 – 11 Oscar Fernandez IMA Postdoc  
2014 – 15 Jing Kang Visiting Scholar, China  
2015 – 17 Rohit Gupta IMA Postdoc  
2015 – 19 Natalie Sheils Department and IMA Postdoc  
2017 Ibrar Hussain National University of Sciences and Technology,  
Islamabad, Pakistan  
2017 – 20 Stuart Rogers IMA Industrial Postdoc  
2018 – 19 Yun Yang Visiting Professor, Northeastern University, Shenyang, China

**Undergraduate Student Research Projects:** \* means publication(s), \*\* is coauthored

2005 – 08 Derek Dalle Invariant numerical approximations \*  
2007 – 08 Daniel Ojalvo Object recognition in digital images  
2007 – 09 Daniel Brinkman Invariant histograms and object recognition \*\*  
2008 – 11 Daniel Hoff Signatures and jigsaw puzzle assembly \*\*

2010	Ellen Rice, Laura Maki	Invariant histograms
2010 – 11	Cody Youmans	Pixel-based object recognition
2010 – 12	Madeleine Kotzagiannidis	Invariant histograms *
2011 – 13	Gong Chen	Dispersive quantization of linear and nonlinear waves **
2012	Finsen Hadiwikarsa	Spline interpolation
2012 – 13	Jeremiah Peterson, Jeremy Anthony	Signature flows
2013 – 14	Roland Welter	Dispersive quantization and numerics *
2014 – 15	Yuxuan Chen	Dispersive quantization *
2014 – 15	Anna Grim, Ryan Slechta	3D jigsaw puzzle assembly **
2016	Rajendra Beekie	Dispersive quantization in Fermi-Pasta-Ulam chains
2016–9	Pedro Angulo-Umana, Jacob Elafandi, Bo Hessburg, Ryan O'Neill, Jacob Theis	Geometric analysis and reconstruction of bone fragments in anthropology
2019	Bernardo Bianco Prado	Dispersive quantization

### Publications:

220 papers written to date

149 have appeared or will appear in major refereed journals

47 have appeared in conference proceedings

7 have appeared as appendices and chapters in books

### Books:

Olver, P.J., *Applications of Lie Groups to Differential Equations*, Graduate Texts in Mathematics, vol. 107, Springer-Verlag, New York, 1986.

Olver, P., *Prilozheniya grupp Lie k differentsial' nim upavneniyam*, Mir publishers, Moscow, 1989. (Russian language translation of [1], I.G. Shcherbak and A.B. Shabat, translators.)

Olver, P.J., *Applications of Lie Groups to Differential Equations*, Second Edition, Graduate Texts in Mathematics, vol. 107, Springer-Verlag, New York, 1993.

Olver, P.J., *Equivalence, Invariants, and Symmetry*, Cambridge University Press, Cambridge, 1995.

Olver, P.J., *Classical Invariant Theory*, London Math. Soc. Student Texts, vol. 44, Cambridge University Press, Cambridge, 1999.

Olver, P.J., and Shakiban, C., *Applied Linear Algebra*, Prentice–Hall, Inc., Upper Saddle River, N.J., 2006.

- Olver, P.J., and Shakiban, C., *Student's Solutions Manual for Applied Linear Algebra*, Prentice-Hall, Inc., Upper Saddle River, N.J., 2006.
- Olver, P.J., and Shakiban, C., *Instructor's Solutions Manual for Applied Linear Algebra*, Prentice-Hall, Inc., Upper Saddle River, N.J., 2006.
- Olver, P.J., *Introduction to Partial Differential Equations*, Undergraduate Texts in Mathematics, Springer-Verlag, New York, 2014.
- Olver, P.J., *Selected Solutions Manual for Introduction to Partial Differential Equations*, Springer, New York, 2014.
- Olver, P.J., and Shakiban, C., *Applied Linear Algebra*, Second edition, Springer, New York, 2018.
- Olver, P.J., and Shakiban, C., *Selected Solutions Manual for Applied Linear Algebra*, Springer, New York, 2018.

### **Edited Proceedings:**

- Olver, P.J., and Sattinger, D., eds., *Solitons in Physics, Mathematics, and Nonlinear Optics*, IMA Volumes in Mathematics and its Applications, vol. 25, Springer-Verlag, New York, 1990.
- Kamran, N., and Olver, P.J., eds., *Lie Algebras, Cohomology, and New Applications to Quantum Mechanics*, Contemporary Mathematics, vol. 160, American Mathematical Society, Providence, R.I., 1994.
- Ma, W.-X., Olver, P.J., Yan, M., Hu, J., eds., *Recent Advances in Integrable Systems*, Journal of Nonlinear Mathematical Physics, vol. 9 Supplement, Lulea University of Technology, Sweden, 2002.
- Olver, P.J., and Tannenbaum, A., eds., *Mathematical Methods in Computer Vision*, IMA Volumes in Mathematics and its Applications, Springer-Verlag, New York, 2003.
- Cucker, F., DeVore, R., Olver, P.J., Süli, E., eds., *Foundations of Computational Mathematics, Minneapolis 2002*, London Math. Soc. Lecture Note Series, vol. 312, Cambridge University Press, Cambridge, 2004.
- Li, H., Olver, P.J., and Sommer, G., eds., *Computer Algebra and Geometric Algebra with Applications*, Lecture Notes in Computer Science, Springer-Verlag, vol. 3519, Springer-Verlag, New York, 2005.
- Winternitz, P., Gomez-Ullate, D., Iserles, A., Levi, D., Olver, P.J., Quispel, R., and Tempesta, P., eds., *Group Theory and Numerical Analysis*, CRM Proceedings & Lecture Notes, vol. 39, American Mathematical Society, Providence, R.I., 2005.
- Levi, D., Olver, P., Thomova, Z., and Winternitz, P., eds., *Symmetries and Integrability of Difference Equations*, Journal of Physics A, vol. 42, no. 45, IOP Publishing, Bristol, UK, 2009.
- Levi, D., Olver, P., Thomova, Z., and Winternitz, P., eds., *Symmetries and Integrability of Difference Equations*, London Math. Soc. Lecture Note Series, vol. 381, Cambridge University Press, Cambridge, 2011.

Kalnins, E., Kamran, N., Olver, P., and Winternitz, P., eds., *Symmetry, Separation, Super-integrability and Special Functions* ( $S^4$ ), Special Issue, *Symmetry, Integrability and Geometry: Methods and Applications* (SIGMA), 2011.

Acosta-Humánez, P.B., Finkel, F., Kamran, N., and Olver, P.J., eds., *Lie Algebraic Aspects of Darboux Transformations, Quantum Integrable Systems and Supersymmetric Quantum Mechanics*, Contemporary Mathematics, vol. 563, American Mathematical Society, Providence, R.I., 2012.

Kac, V., Olver, P.J., Winternitz, P., Özer, T., eds., *Symmetries, Differential Equations and Applications*, Springer Proceedings in Mathematics & Statistics, Springer-Verlag, New York, 2018.

### **Honors:**

Distinguished Lecturer, Los Alamos National Laboratory and University of New Mexico, April, 1991.

Invited Hour Speaker, Meeting of the American Mathematical Society, Springfield, MO, March, 1992.

London Mathematical Society Invited Lecturer, University of Bath, United Kingdom, April, 1992.

Australian Research Council Visiting Researcher, University of Sydney, Australia, October, 1992.

Plenary Speaker, Summer Meeting of the Canadian Mathematical Society, University of Alberta, Edmonton, Canada, June, 1994.

Course Lecturer, European School of Group Theory, Valladolid, Spain, July 17–29, 1995.

Plenary Speaker, XXI International Colloquium on Group Theoretical Methods in Physics, Goslar, Germany, July, 1996.

Erskine Fellow, University of Canterbury, Christchurch, New Zealand, 1997.

Invited Long Term Visitor, Program on Symbolic Computation in Geometry and Analysis, Mathematical Sciences Research Institute, Berkeley, August & September, 1998.

Plenary Speaker, Third Conference on Foundations of Computational Mathematics, Oxford, England, July, 1999.

Visiting Professor, EPFL (Swiss Federal Institute of Technology), Lausanne, Switzerland, January – June, 2002.

Plenary Speaker, International Symposium on Symbolic and Algebraic Computation (ISSAC), Lille, France, July, 2002

Course Lecturer, Fields Institute Special Meeting on Symbolic and Numeric Computation in Geometry, Algebra and Analysis, University of Western Ontario, London, Ontario, Canada, July, 2002.

Course Lecturer, Summer School in Geometric Integration, Fevik, Norway, August, 2002.

Named “Highly Cited Researcher” by Thomson – ISI, 2003.

Plenary Lecturer, Fifth International Conference on Geometry, Integrability and Quantization, Varna, Bulgaria, June, 2003.

Plenary Speaker, 6th International Workshop on Mathematics Mechanization, Shanghai, and Mathematics Mechanization Key Laboratory, Beijing, China, May, 2004.

Plenary Speaker, Joint Canadian Math Society and Canadian Applied and Industrial Mathematics Society, Halifax, Canada, June, 2004.

Plenary Speaker, Ninth Meeting on Computer Algebra and Applications, Santander, Spain, July, 2004.

Elected Fellow of the Institute of Physics, UK, 2004.

Plenary Speaker, Red Raider Symposium, Texas Tech University, Lubbock, TX, November, 2004.

Member of EPSRC Review College, UK, 2006–09.

Course Lecturer, 12th International Summer School in Global Analysis and Applications, Comenius University, Bratislava, Slovakia, August, 2007.

Plenary Speaker, 10th International Conference on Differential Geometry and Its Applications, Olomouc, Czech Republic, August, 2007.

Course Lecturer, Summer School in Mathematical Physics, Ravello, Italy, September, 2007.

Course Lecturer, Séminaire de Mathématiques Supérieures, Université de Montréal, Canada, June, 2008.

Course Lecturer, XVIII International Fall Workshop on Geometry and Physics, Benasque Center for Physics, Spain, September, 2009.

A conference in honor of my 60th birthday, "Symmetries of Differential Equations: Frames, Invariants and Applications", was held at the University of Minnesota, May, 2012. A special issue of the online journal *Symmetry, Integrability and Geometry: Methods and Applications* (SIGMA) in my honor, entitled "Symmetries of Differential Equations: Frames, Invariants and Applications", has been published.

Plenary Speaker, XIV International Conference on Geometry, Integrability and Quantization, Varna, Bulgaria, June, 2012.

Fellow of the American Mathematical Society, September, 2012.

Course Lecturer, African Mathematical School, University of Abomey–Calavi, Cotonou, Benin, October–November, 2012.

A special issue of the Springer journal *Foundations of Computational Mathematics*, vol. 13, issue 4, was published in my honor.

Keynote Speaker, 5th International Conference on Nonlinear Mathematical Physics and 12th National Conference on Integrable Systems, Hangzhou, China, August, 2013.

Public Lecture, Texas Tech University, January, 2014

Fellow of the Society for Industrial and Applied Mathematics (SIAM) "for developing new geometric methods for differential equations leading to applications in fluid mechanics, elasticity, quantum mechanics, and image processing", April, 2014.



Tenth Distinguished Lecture Series in Mathematics, Georgia Southern University, April, 2014.

Boeing Distinguished Colloquium Speaker, University of Washington, May, 2014.

Course Lecturer, Nordfjordeid Summer School, Lie Groups and Pseudogroups Actions: from Classical to Differential Invariants, Sophus Lie Conference Center, Nordfjordeid, Norway, June, 2015.

Public Lecture on the Centenary of Noether's Theorem, Perimeter Institute for Theoretical Physics, Waterloo, Canada, June, 2015.

Course Lecturer, MOGRAN 18, Lie groups and Computation Method in Nonlinear Problems of Mathematical Modeling, Shenyang Aerospace University, China, August, 2015.

Plenary Speaker, Conference on Differential Equations and Applications, Lahore University of Management Sciences, Pakistan, May, 2016.

Plenary Speaker, 22nd International Symposium on Mathematical Theory of Networks and Systems, University of Minnesota, July 2016.

Plenary Speaker, WAVES 2017, The 13th International Conference on Mathematical and Numerical Aspects of Wave Propagation, University of Minnesota, May, 2017

Course Lecturer, International Summer School on Geometry, Mechanics and Control, Instituto de Ciencias Matemáticas, Madrid, Spain, July, 2017.

Plenary Speaker, 3rd International Conference on Symmetries, Differential Equations and Applications, Istanbul, Turkey, August, 2017.

Public lecture at the Royal Academy of Sciences, Madrid, Spain, September, 2017, accompanied by article in *La Razon*.

Outstanding Reviewer Award, *Journal of Physics A: Mathematical and Theoretical*, 2017.

### **Research Grants:**

1976–78 National Science Foundation (with J. Douglas)

1978–80 British Science Research Council (with T.B. Benjamin)

1981–82 National Science Foundation MCS 81–00786

1983–85 National Science Foundation MCS 81–00786 (Renewal)

1986–88 National Science Foundation (with J. Verosky) DMS 86–02004

1986–88 NATO Collaborative Research Grant (with Y. Nutku, F. Neyzi and J. Verosky)  
RG.86/0055

1988–90 NATO Collaborative Research Grant (with Y. Nutku) RG.86/0055 (Renewal)

1989–92 National Science Foundation DMS 89–01600

1992–94 National Science Foundation  
(US–USSR Cooperative Research Program) DMS 91–16672

1992–95 National Science Foundation DMS 92–04192

1995–98 National Science Foundation DMS 95–00931.

1995–98 United States–Israel Binational Science Foundation (with P. Rosenau)  
94–00283.

1998–2001 National Science Foundation DMS 98–03154.

2001–05 National Science Foundation DMS 01–03944.

2005–08 National Science Foundation DMS 05-05293.

2008–11 National Science Foundation DMS 08-07317.

2011–16 National Science Foundation DMS 11-08894.

2018–21 National Science Foundation DMS-1816917 (with Jeffrey Calder).

### **Professional Service:**

Member of Organizing Committee for XV International Colloquium on Group Theoretic Methods in Physics, Drexel University, Philadelphia, PA, October 20–24, 1986.

Organizer (with I. Anderson) N.S.F. Conference on Symmetry Methods in Differential Equations, Utah State University, Logan, Utah, June 18–23, 1987.

Member of Organizing Committee for SIAM 35th Anniversary Meeting, October 12–15, 1987, Denver, Colorado.

Member of Organizing Committee for Year on Nonlinear Waves, 1988–89, Institute for Mathematics and its Applications (IMA), University of Minnesota, MN.

Member of Editorial Board, *Journal of Mathematical Physics*, 1988–91.

Member of Editorial Board, *Journal of Physics A*, 1990–93.

Organizer (with K. Meyer), Workshop on Using Algebraic Processors in Dynamical Systems, Institute for Mathematics and its Applications (IMA), University of Minnesota, MN, April 16–20, 1990.

Member of Organizing Committee, Gregynog Differential Equations Conference, Gregynog, University of Wales, Great Britain, July, 1991.

Member of International Advisory Committee, Workshop on Modern Group Analysis, Ufa, Bashkiria, USSR, June 17–22, 1991.

Organizer (with N. Kamran) Special Session on Lie Algebras, Cohomology and New Applications to Quantum Mechanics, Meeting of the American Mathematical Society, Springfield, MO, March 20–21, 1992.

Member of Organizing Committee, AMS–SIAM Summer Seminar in Applied Mathematics, Exploiting Symmetry in Applied and Numerical Analysis, Colorado State University, Fort Collins, Colorado, July 26 – August 1, 1992.

Member of Organizing Committee, International Workshop on Modern Group Analysis, Catania, Sicily, Italy, October 27–31, 1992.

Member of Committee on Group Theory, National Academy of Sciences, 1993–94.

Member of Editorial Board, *Journal of Nonlinear Mathematical Physics*, 1993–98.

Organizer (with M.J. Gotay), Minisymposium on Symplectic Methods in Physics, Cornelius Lanczos Centenary Memorial Conference, University of North Carolina, December, 1993.

Member of Editorial Board, *Lie Groups and their Applications*, 1994–95.

Member of Scientific Committee, International Conference on Modern Group Analysis, Witwatersrand University, Johannesburg, South Africa, January 18–22, 1994.

Member of Advisory Panel for Statements for National Mathematical Awareness Week, April 23–29, 1995.

Member of Advisory Committee, International Conference on Symmetry in Nonlinear Mathematical Physics, Kiev, Ukraine, July 3–8, 1995.

Member of Organizing Committee, Workshop on Mathematical Methods in Computer Vision, Geometry Center, University of Minnesota, September 11–15, 1995.

Member of Scientific Committee, International Conference on Modern Group Analysis, Johannesburg, South Africa, January 15–20, 1996.

Member of Organizing Committee, Workshop on Algebraic Approaches to Quantum Dynamics, Fields Institute, Canada, May 7–12, 1996.

Member of Editorial Board, *Journal of Lie Theory*, 1995– .

Member of Advisory Committee, International Conference on Symmetry in Nonlinear Mathematical Physics, Kiev, Ukraine, July 7–13, 1997.

Member of Organizing Committee, CRM-AARMS Workshop on Bäcklund and Darboux Transformations, Halifax, Nova Scotia, June 4–8, 1999.

Member of Advisory Committee, International Conference on Symmetry in Nonlinear Mathematical Physics, Kiev, Ukraine, July 12–18, 1999.

Member of Editorial Board, *Foundations of Computational Mathematics*, 1999–2015.

Member of Editorial Board, *Mathematical Sciences Research Hot-Line*, 1999–2000.

Member of Focused Research Group Evaluation Panel, National Science Foundation, February, 2000.

Member of International Advisory Committee, Conference on Symmetry and Differential Equations, Krasnoyarsk, Russia, August 21 - 25, 2000.

Member of Editorial Advisory Board, *London Mathematical Society Student Texts*, Cambridge University Press, 2000–07.

Member of Organizing Committee for Year on the Mathematics of Multimedia, Institute for Mathematics and its Applications (IMA), University of Minnesota, MN, 2000–01.

Member of Organizing Committee for Special Session on Integrable Systems, First Joint International Meeting of the AMS and the Hong Kong Mathematical Society, Hong Kong, December 13 - 17, 2000.

Member of Editorial Board, *Advances in Applied Mathematics*, 2000–2012

Member of International Advisory Board, Proposed NSF Mathematics Institute, University of Hawaii, 2000–01.

Member of Editorial Board, *SIAM Journal of Mathematical Analysis*, 2001–03.

Member of International Advisory Committee, International Workshop on Structure Preserving Algorithms, Beijing, China, March 25-31, 2001.

Member of Organizing Committee, European Summer School, What is Integrability?, Newton Institute, Cambridge, England, August 13 - 24, 2001.

Member of CARGO Evaluation Panel, National Science Foundation, December, 2001.

Member of Advisory Panel, *Journal of Physics A*, 2001– .

Member of Organizing Committee, Workshop on Under- and Overdetermined Systems of Algebraic or Differential Equations, Karlsruhe, Germany, March 18–19, 2002.

Member of Organizing Committee for Summer Program on Special Functions in the Digital Age, Institute for Mathematics and its Applications (IMA), University of Minnesota, MN, 2002.

Member of Organizing Committee for Foundations of Computational Mathematics Conference, Institute for Mathematics and its Applications (IMA), University of Minnesota, MN, Summer, 2002.

Co-managing Editor, *Foundations of Computational Mathematics*, 2002–08.

Member of Board of Directors, Foundations of Computational Mathematics, 2002–14.

Organizer (with G. Marî-Beffa), Special Session on Geometric Methods in Differential Equations, Meeting of the American Mathematical Society, Madison, WI, October 12–13, 2002.

Member of Organizing Committee, Workshop on Group Theory and Numerical Analysis, Université de Montréal, Canada, May 26–31, 2003.

Member of Organizing Committee, International Conference on Symmetry in Nonlinear Mathematical Physics, Kiev, Ukraine, June 23–29, 2003.

Member of Organizing Committee, Workshop on Differential Invariants and Invariant Differential Equations, Banff International Research Station, Canada, July 19–24, 2003.

Member of Organizing Committee, IEEE Workshop on Variational, Geometric and Level Set Methods in Computer Vision, Nice, France, October 14–17, 2003.

Member of Organizing Committee, Workshop on Integrable and Near-integrable Hamiltonian PDE, Fields Institute, Canada, May 17-21, 2004.

Member of Organizing Committee, Symmetry and Perturbation Theory, Cala Gonone, Sardinia, May 30 - June 6, 2004.

Member of Organizing Committee, Geometry, Integrable Systems and Quantization, Varna, Bulgaria, June 3-10, 2004.

Member of Applied Mathematics Editorial Board, Cambridge University Press, 2004– .

Member of Organizing Committee, International Conference on Symmetry in Nonlinear Mathematical Physics, Kiev, Ukraine, June 20-26, 2005.

Member of Organizing Committee, Foundations of Computational Mathematics, Santander, Spain, June 30 - July 9, 2005.

Member of Editorial Board, *Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)*, 2005– .

Member of Editorial Board, SIAM Classics Book Series, 2005– .

Member of EPSRC Peer Review College, UK, 2006–09.

Member of Organizing Committee, Abel Symposium, Alesund, Norway, May 25-27, 2006.

Member of Scientific Committee, International Conference on Symmetry in Nonlinear Mathematical Physics, Kiev, Ukraine, June 24-30, 2007.

Member of Organizing Committee, Symmetry and Perturbation Theory, Otranto, Italy, June 2-9, 2007.

Member of Organizing Committee, ISSAC 2007, International Symposium in Symbolic and Algebraic Computation, University of Waterloo, Canada, July 28 - August 1, 2007.

Member of Organizing Committee, Séminaire de Mathématiques Supérieures, "Symmetries and Integrability of Difference Equations", Montréal, Canada, June 9-21, 2008.

Member of Organizing Committee, Foundations of Computational Mathematics, Hong Kong, June 16-26, 2008.

Member of Organizing Committee, Symmetries and Integrability of Difference Equations (SIDE8), Saint Adèle, Canada, June 22-28, 2008.

Member of Editorial Board, *Scholarly Research Exchange*, 2008–10.

Member of Committee on Electronic Information and Communication, International Mathematical Union, 2008–14.

Member of Editorial Board, *Portugaliae Mathematica*, 2008– .

Member of Organizing Committee, International Conference on Differential Geometry and Dynamical Systems (DGDS-2009), Bucharest, Romania, October 8-11, 2009.

Member of Organizing Committee,  $S^4$  Conference: Symmetry, Separation, Super-integrability and Special Functions, University of Minnesota, September 17-19, 2010.

Organizer (with G. Marí Beffa) Special Session on Geometric Flows, Moving Frames and Integrable Systems, Meeting of the American Mathematical Society, St. Paul, MN, April 10-11, 2010.

Member of Organizing Committee, Foundations of Computational Mathematics, Budapest, Hungary, July 4-14, 2011.

Member of First Smale Prize Committee, Foundations of Computational Mathematics, 2011.

Chair of Committee on Electronic Information and Communication, International Mathematical Union, 2011–14.

Chair of Moderating Group, Blog on Mathematical Journals, International Mathematical Union, 2011–12.

Chair of Organizing Committee, Symposium on The Future World Heritage Digital Mathematics Library: Plans and Prospects, June 1-3, 2012, National Academy of Sciences, Washington, D.C.

Member of Editorial Board, *Forum of Mathematics, Pi and Sigma*, 2012– .

Member of Program Committee, Modern Group Analysis, MOGRAN 15, Kemer, Turkey, October 1–6, 2012.

Member of National Academy of Sciences' Committee on The Future World Digital Mathematics Library, 2012–13.

Member of Scientific Committee, Conference on Nonlinear Systems CNLS-2013, Kathmandu, Nepal, June 18-22, 2013.

Member of Epi-Math Publishing Committee, 2013–18.

Member of Program Committee, SIAM Conference on Applied Algebraic Geometry, Colorado State University, August 1-4, 2013.

Member of Scientific Committee, 8th International Conference of Differential Geometry and Dynamical Systems, University of Bucharest, Romania, October 10-13, 2013.

Member of Organizing Committee, Society for Natural Philosophy Conference: on Mathematics and Mechanics in the Physical Sciences, A Tribute to James Serrin, University of Minnesota, November 9-13, 2013.

Member of Organizing Committee, Focused Research Workshop on Exterior Differential Systems and Lie Theory, The Fields Institute, Canada, December 9-13, 2013.

Member of Advisory Committee, 30th International Colloquium on Group Theoretical Methods in Physics, Ghent University, Ghent, Belgium, July 14-18, 2014.

Member of Second Smale Prize Committee, Foundations of Computational Mathematics, 2014.

Chair of American Mathematical Society Whiteman Memorial Prize Committee, 2014–15.

Member of Editorial Board, *Minnesota Journal of Undergraduate Mathematics*, 2015– .

Member of Editorial Board, *European Journal of Applied Mathematics*, 2015– .

Member of Editorial Board, *Journal of Mathematical Imaging and Vision*, 2016– .

Associate Editor, *SIAM Journal on Applied Algebra and Geometry* (SIAGA), 2016–21.

Member of the SIAM T. Brooke Benjamin Prize in Nonlinear Waves Funding Advisory Board, 2016.

Member of Organizing Committee, Special Session on Geometric Flows, Integrable Systems and Moving Frames, AMS Fall Central Sectional Meeting, University of St. Thomas, Minneapolis Campus, October 28-30, 2016.

Member of the SIAM Selection Committee for the Polya Prize in Math Exposition, 2016.

Member of Editorial Board, *Advances in Mechanics and Mathematics Book Series*, Springer, 2016– .

Member of Scientific Committee, 3rd International Conference On Symmetries, Differential Equations and Applications, Istanbul Technical University, Turkey, August 14-17, 2017.

Member of Organizing Committee, Conference on Multiscale Modeling, Theory, and Computation, University of Minnesota, September 23–25, 2017.

Member of Editorial Board, Studies in Applied Mathematics, 2018–

Member of Programme Committee, Conference on Differential Algebra and Related Topics (DART IX), University of Leeds, UK, August 3-5, 2018.

Member of American Mathematical Society Chevalley Prize Selection Committee, 2019–23.

Member of the SIAM Selection Committee, SIAG/Algebraic Geometry Early Career Prize, 2018.

Member of Scientific Committee, Symmetry 2019: Modern Treatment of Symmetries, Differential Equations and Applications Suranaree University of Technology, Nakhon Ratchasima, Thailand, January 14-18, 2019.

### **Professional Societies**

American Mathematical Society (AMS)

Society for Industrial and Applied Mathematics (SIAM)

Foundations of Computational Mathematics (SFoCM)

Society for Natural Philosophy (SNP)