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Education:

1978 Massachusetts Institute of Technology, Cambridge, MA
Ph.D. in Mathematics, MIT. Advisor: Professor Victor Guillemin:
On the Locality and Invertibility of Radon Transforms
1973 Indiana University, Bloomington, IN
A.B. with Honors in Mathematics

Positions at Tufts University:

2008- Affiliated Faculty, Tufts Department of Education
2007-2008 Interim Mathematics Department Head
2005- Robinson Professor of Mathematics
1992-2005 Professor
1984-92 Associate Professor
1978-84 Assistant Professor
1977-78 Lecturer part-time

Visiting positions:

2016 Guest Professor, DTU Compute, Danish Technical University
2006 Visiting Professor, Universität Karlsruhe
1999, 2000 Visiting Professor, Universität des Saarlandes
1992 Visiting Associate Professor, Universität des Saarlandes
1985 Visiting Associate Professor, Universität Münster
1984 Visiting Associate Professor, Memphis State University
1983 Visiting Assistant Professor, Oregon State University
1983 Research Associate, Universität Münster

Honors:

Otto Mønsted Visiting Professorship, Danish Technical University, 2016
65th Birthday Minisymposium, IPMS, Fethiye Turkey
Tufts Mathematics Society Professor of the Year, 2001, 2011, and 2015
Member, Mathematical Sciences Research Institute, Spring 2001, Fall 2010
Scientific Advisor (one of three), Mobius Imaging, LLC, 2008-
Tufts (FRAC) Distinguished Scholar Award, 2007
Bob Groden Volunteer Award (volunteer of year), Boston Children's Hospital, 2003
Member, Scientific Advisory Board, Breakaway Imaging, LLC, 2002-2007
Leibner Award for Excellence in Teaching and Advising, Tufts University, 1986
Humboldt Foundation Research Fellowship, 1985, 1992, 1999, 2000, 2005, 2006
National Science Foundation Graduate Fellowship, 1973-1976
Phi Beta Kappa

Organizations:

American Association of University Professors, American Mathematical Society,
Association for Women in Mathematics, Mathematical Association of America,
Society for Industrial and Applied Mathematics

RESEARCH AND SELECTED PUBLICATIONS:

Prof. Quinto is an expert on integral geometry and tomography. Integral geometry combines analysis (sample articles: [16, 17, 49, 61]), Fourier integral operators [10, 27, 44] and geometry [12, 33, 47], and it answers important tomographic questions such as uniqueness for X-ray CT with sources on a curve [27] and SONAR [42]. Some of his work involves stationary sets for the wave equation, for example, which points on a drum do not move at all after the drum is hit [34, 35, 45, 48]. He has developed the theory of microlocal tomography for tomographic problems including X-ray CT [30] and for SONAR [44]. Along with Thomas Schuster, he has developed algorithms for SONAR [53] and with Rieder they developed a local algorithm and calculated its symbol as a pseudodifferential operator [67]. He has developed local tomography algorithms that he has successfully tested on industrial data [23, 40, 57], and he has researched cancer radiation dose planning [24, 42]. The first international review was positive (the patent was declared novel and useful). He has developed local uniqueness theorems for the sphere transform on manifolds [56] with the aim of understanding stationary sets of the wave equation (as done in [36] for Euclidean space), sonar, and thermoacoustic tomography. He has developed a new simple, quick, local algorithm for Slant Hole SPECT, a new data acquisition geometry in emission tomography with undergraduate Tufts researchers [61]. He is working with Jan Boman and Hans Rullgård on quantitative measures of instability in tomography problems [64]. Jointly with the Karolinska Institute and KTH, Stockholm, he is developing local algorithms to image individual molecules using electron microscope data [59] and [63 *Proc. Nat. Acad. Sci. USA*] and [74]. This work resulted in two patent applications [1,2]. He and collaborators developed and analyzed microlocal properties of local algorithms for slant-hole SPECT [61,68], sonar [67], and bistatic radar [69, 72, 74]. In [77, 79, 81, 82] Prof. Quinto develops a paradigm to analyze visible features and added artifacts for limited data tomography problems I X-ray CT and thermo/photo-acoustic CT.

ORCID ID: orcid.org/0000-0002-8993-8737

Patent Applications:

1. A limited data algorithm for 3-D electron microscopy, “Lambda Tomography,” Patent application, joint between Tufts and Sidec Technologies, October 6, 2007. February, 2008: The invention passed the first international review with the statement that the “invention is novel and useful.” U.S. Patent Application No. 12/444,501
2. Parallel beam local tomography reconstruction method, Patent application joint between Tufts and Sidec Technologies, application submitted to the European Patent Office, May 11, 2009, EPO patent application nr. 07835304.2.

Edited Books:

3. *Integral geometry and tomography*, Proceedings of the 1989 American Mathematical Society Conference on Integral Geometry and Tomography, Co-editor, Eric Grinberg, Contemporary Mathematics, Vol. 113, Amer. Math. Soc., Providence, RI, 1990.
4. *Tomography, Impedance Imaging, and Integral Geometry*, Proceedings AMS/SIAM summer seminar on Tomography, Impedance Imaging, and Integral Geometry, Lecture Notes in Applied Math., Vol. 30, Chief Editor. Co-editors Margaret Cheney, Peter Kuchment, 1994.
5. *Analysis, Geometry, Number Theory: The Mathematics of Leon Ehrenpreis*, Contemporary Math., Vol. 251, Co-editors Marvin Knopp, Shif Berhanu, Gerardo Mendoza, and Eric Grinberg, 2000.
6. *Radon Transforms and Tomography*, Chief Editor, Co-editors Leon Ehrenpreis, Adel Faridani, Fulton Gonzalez, Eric Grinberg, Contemporary Math, vol. 278, 2001.
7. *The Radon Transform, Inverse Problems, and Tomography*, Co-editor Gestur Olafsson, (Proceedings of the 2005 AMS Short Course, Atlanta, GA) Proceedings of Symposia in

- Applied Mathematics, vol. 63, 2006.
8. *Integral Geometry and Tomography*, Co-editor Andrew Markoe, Contemporary Math, Vol. 405, 2006.
 9. *Radon Transforms, Geometry, and Wavelets*, Co-editors, Gestur Olafsson, Eric Grinberg, David Larson, Palle Jorgensen, Peter Massopust, Boris Rubin, Contemporary Math., Vol. 464, 2008.
 10. *Geometric Analysis and Integral Geometry*, proceedings of 2012 AMS special session honoring Sigurdur Helgason and Tufts Workshop on this topic, Co-editors Jens Christensen and Fulton Gonzalez, *Contemporary Mathematics*, Vol. 598, 2013.

Articles:

11. *On the Locality and Invertibility of Radon Transforms*, Ph.D. thesis, M.I.T., 1978.
12. The dependence of the generalized Radon transform on defining measures, *Trans. Amer. Math. Soc.* **257**(1980), 331-346.
13. A Radon transform on spheres through the origin in \mathbb{R}^n and applications to the Darboux equation, coauthor: A. M. Cormack, *Trans. Amer. Math. Soc.* **260**(1980), 575-581.
14. Topological restrictions on double fibrations and Radon transforms, *Proc. Amer. Math. Soc.* **81**(1981), 570-574.
15. Null spaces and ranges for the classical and spherical Radon transforms, *J. Math. Anal. Appl.* **90**(1982), 408-420.
16. The invertibility of rotation invariant Radon transforms, *J. Math. Anal. Appl.* **91**(1983), 510-522. Erratum, *J. Math. Anal. Appl.* **94**(1983), 602-603.
17. Singular value decompositions and inversion methods for the exterior Radon transform and a spherical transform, *J. Math. Anal. Appl.* **95**(1983), 437-448.
18. An elementary proof of local invertibility for generalized and attenuated Radon transforms, coauthor: A. Markoe, *SIAM J. Math. Anal.* **16**(1985), 1114-1119.
19. Distances between measures from 1-dimensional projections as implied by continuity of the inverse Radon transform, coauthor: M. G. Hahn, *Z. Wahr.* **70**(1985), 361-380.
20. Tomographic reconstruction around the beating heart, *Z. angew. Math. Mech.* **66**(1986), 430-431.
21. The injectivity of rotation invariant Radon transforms on \mathbb{R}^n , *Contemporary Mathematics* **63**(1987), 245-260.
22. Support theorems for real analytic Radon transforms, coauthor: J. Boman, *Duke Math. J.* **55**(1987), 943-948.
23. Tomographic reconstructions from incomplete data—numerical inversion of the exterior Radon transform, *Inverse Problems* **4**(1988), 867-876.
24. A problem in radiotherapy I: questions of non-negativity, coauthor Allan Cormack, *International J. Imaging Systems and Technology* **1**(1989), 120-124.
25. Limited data tomography in non-destructive evaluation, *Signal Processing Part II: Control Theory and Applications, IMA Volumes in Mathematics and its Applications*, Vol. 23, 347-354 Springer-Verlag 1990.
26. The mathematics and physics of radiation dose planning, coauthor Allan Cormack, *Contemporary Mathematics* **113**(1990), 41-55.
27. Computed tomography and rockets, in *Mathematical Methods in Tomography*, Proceedings, Oberwolfach, 1990, *Lecture Notes in Mathematics* #1497, 261-268, Springer Verlag, Berlin, New York, 1991.
28. A note on flat Radon transforms, *Contemporary Mathematics*, **140**(1992), 115-121.
29. Support theorems for real analytic Radon transforms on line complexes in three-space, coauthor: J. Boman, *Trans. Amer. Math. Soc.* **335**(1993), 877-890.
30. Real analytic Radon transforms on rank one symmetric spaces, *Proc. Amer. Math. Soc.* **117**(1993), 179-186.
31. Pompeiu transforms on geodesic spheres in real analytic manifolds, *Israel J. Math.*

- 84**(1993), 353-363.
32. Singularities of the X-ray transform and limited data tomography in \mathbb{R}^2 and \mathbb{R}^3 , *SIAM J. Math. Anal.* **24**(1993), 1215-1225.
 33. Support theorems for Radon transforms on higher rank symmetric spaces, coauthor Fulton Gonzalez, *Proc. Amer. Math. Soc.* **122**(1994), 1045-1052.
 34. Radon transforms satisfying the Bolker assumption, pp. 263-270, Proceedings of conference *Seventy-five Years of Radon Transforms*, International Press Co. Ltd., Hong Kong, 1994.
 35. Radon transforms on curves in the plane, *Lecture Notes in Applied Mathematics* **30**(1994), 231-244.
 36. Injectivity sets for a Radon transform and complete systems of radial functions, an announcement, coauthor Mark Agranovsky, *International Mathematical Research Notes (Duke J.)* **11**(1994), 467-473.
 37. Injectivity sets for the Radon transform over circles and complete systems of radial functions, coauthor Mark Agranovsky, *J. Functional Analysis* **139**(1996), 383-414.
 38. Injectivity of the spherical mean operator and related problems, coauthor Mark Agranovsky, in *Complex Analysis, Harmonic Analysis and Applications*, editors R. Deville, J. Esterle, V. Petkov, A. Sebbar, A. Yger, Addison Wesley, London.
 39. Morera Theorems via Microlocal Analysis, coauthor Josip Globevnik, *J. Geom. Analysis* **6**(1996), 20-30.
 40. Exterior and Limited Angle Tomography in Non-destructive Evaluation, *Inverse Problems* **14**(1998), 339-353.
 41. A Morera Theorem for spheres through a point in \mathbb{C}^n , coauthor Eric Grinberg, R.P. Gilbert, et al., eds. *Recent Developments in Complex Analysis and Computer Algebra*, (1999), 267-275. Kluwer.
 42. On the non-uniqueness of optimal radiation treatment plans, coauthor Christoph Börgers, *Inverse Problems* **15**(1999), 1115-1138.
 43. Two-radius Support Theorems for Spherical Radon transforms on Manifolds, coauthor Yiyang Zhou, *Contemporary Mathematics* **251**(2000), 501-508.
 44. Local Tomographic Methods in SONAR, coauthor Alfred Louis, in *Surveys on Solution Methods for Inverse Problems* Eds.: D.Colton, H.Engl, A.Louis, J.McLaughlin, W. Rundell, Springer Vienna/New York 2000
 45. Morera theorems for complex manifolds, coauthor Eric Grinberg, *J. Functional Analysis* **178**(2000), 1-22.
 46. Radon Transforms, Differential Equations, and Microlocal Analysis, *Contemporary Mathematics*, **278**(2001), 57-68.
 47. Geometry of Stationary Sets for the Wave Equation in \mathbb{R}^n , The Case of Finitely Supported Initial Data, coauthor Mark Agranovsky, *Duke Math. J.*, **107**(2001), 57-84.
 48. Geometry of Stationary Sets for the Wave Equation in \mathbb{R}^n , an announcement, coauthor Mark Agranovsky, *Southwest J. Pure and Appl. Math.*, **7**(1) (2001), 29-37 (electronic journal, <http://rattler.cameron.edu/swjpam/vol1-01.html>).
 49. Analytic Continuation of Convex Bodies and Funk's Characterization of the Sphere, coauthor Eric Grinberg, *Pacific J. Math.* **201**(2) (2001), 309-322.
 50. Stationary sets for the wave equation in crystallographic domains, coauthor Mark Agranovsky, *Trans. Amer. Math. Soc.*, **355**(2003), 2439-2451.
 51. Mean Value Extension Theorems and Microlocal Analysis, *Proc. Amer. Math. Soc.*, **131**(2003) 3267-3274.
 52. Some problems of integral geometry arising in tomography, coauthor Peter Kuchment, appendix to *The Universality of the Radon Transform*, Leon Ehrenpreis, Oxford University Press, Oxford, UK, 2003.

53. On a regularization scheme for linear operators in distribution spaces with an application to the spherical Radon transform, coauthor Thomas Schuster, *SIAM J. Appl. Math.*, **65**(2005), 1369-1387.
54. An Introduction to X-ray tomography and Radon Transforms, *Proceedings of Symposia in Applied Mathematics*, Vol. 63, 2006, pp. 1-24.
55. Remarks on stationary sets for the wave equation, joint with Mark Agranovsky, *Contemporary Mathematics*, **405**(2006), 1-17.
56. Support Theorems for the Spherical Radon Transform on Manifolds, *International Mathematical Research Notices*, **2006**(2006), 1-17, Article ID (DOI) 67205.
57. Local Algorithms in Exterior Tomography, *Journal of Computational and Applied Mathematics*, **199**(2007), 141-148.
58. Range descriptions for the spherical mean Radon transform, joint with M. Agranovsky and P. Kuchment, *Journal of Functional Analysis* **248**(2007), 344-386.
59. Local tomographic methods for electron microscopy, joint with Ozan Öktem, *SIAM J. Appl. Math.*, **68**(2008), 1282-1303.
60. Inversion of the X-ray transform from limited angle parallel beam region of interest data with applications to electron tomography, joint with O. Öktem, *Proc. Appl. Math. and Mech.*, **7**(2007), 105031-105032.
61. Local Tomography in 3-D SPECT, joint with Tufts undergraduate researchers Tania Bakhos and Sohyun Chung, in *Mathematical Methods in Biomedical Imaging and Intensity-Modulated Radiation Therapy (IMRT)*, Yair Censor, Ming Jiang, and Alfred K. Louis, editors, Edizioni della Normale, CRM Series, Pisa, Italy, 2008, pp. 321-348.
62. Helgason's Support Theorem and Spherical Radon Transforms, *Contemporary Mathematics*, **464**(2008), 249-264.
63. Electron Lambda Tomography, with Ozan Öktem and Ulf Skoglund, *Proc. Nat. Acad. Sci. USA*, **106**(2009) no. 51 21842-21847.
64. Local Sobolev Estimates of a Function by means of its Radon transform, with Hans Rullgård, *Inverse Problems and Imaging*, **4**(2010), 721-734.
65. Reply to G. Wang and H. Yu: Both Electron Lambda Tomography and Interior Tomography have their uses, with Ozan Öktem and Ulf Skoglund, *Proc. Nat. Acad. Sci. USA*, **107**(2010), E94-E95.
66. Electron Microscope Tomography over Curves, joint with Hans Rullgård, *Oberwolfach Reports*, **18**/2010, 1092-1095 (the entire collection is at http://www.mfo.de/programme/schedule/2010/15/OWR_2010_18.pdf).
67. Local Inversion of the Sonar Transform Regularized by the Approximate Inverse, with Andreas Rieder and Thomas Schuster, *Inverse Problems*, **27**(2011), 035006 (18p). Chosen as a highlighted article of the year 2011 for *Inverse Problems* <http://iopscience.iop.org/0266-5611/page/Highlights%20of%202011>
68. The Microlocal properties of the local 3-D SPECT operator, with Raluca Felea, *SIAM J. Math. Anal.* **43**(3) 2011, 1145-1157.
69. Microlocal Aspects of Bistatic Synthetic Aperture Radar Imaging, joint with Venkateswaran Krishnan, *Inverse Problems and Imaging*, **5**(2011), 659-674.
70. Remembrances of Leon Ehrenpreis (with Daniele Struppa, Hershel Farkas, Takahiro Kawai, Peter Kuchment, Shlomo Sternberg, and Alan Taylor), *Notices Amer. Math. Soc.*, **58**(2011), 674-681.
71. Microlocal Analysis of Elliptical Radon Transforms with Foci on a Line, joint with Venkateswaran Krishnan and Tufts undergraduate Howard Levinson, in *The Mathematical Legacy of Leon Ehrenpreis*, (editors Irene Sabadini and Daniele Struppa), Springer Proceedings in Mathematics, **16**(2012), 163-182.
72. A class of singular Fourier integral operators in synthetic aperture radar imaging, joint with Gaik Ambartsoumian, Raluca Felea, Venkateswaran Krishnan, and Clifford Nolan,

- Journal of Functional Analysis*, 264(2013), 246-269.
73. Invited review of “Integral Geometry and Radon Transforms” by Sigurdur Helgason, with Fulton Gonzalez, *Bulletin of the American Mathematical Society*, S 0273-0979(2012),01391-5.
 74. Local Singularity Reconstruction from Integrals over Curves in \mathbb{R}^3 , with Hans Rullgård, *Inverse Problems and Imaging*, 7(2)(2013), 585-609.
 75. The Microlocal analysis of the ultrasound operator with circular source and detectors, joint with Gaik Ambartsoumian, Jan Boman, and Venkateswaran Krishnan, *Contemporary Mathematics*, 598(2013), 45-58.
 76. Characterization and reduction of artifacts in limited angle tomography, joint with Jürgen Frikel, *Inverse Problems*, 29 (2013) 125007 (21 pages).
Chosen as a highlighted article of the year 2013 for Inverse Problems
<http://iopscience.iop.org/0266-5611/page/Highlights-of-2013>
 77. How to characterize and decrease artifacts in limited angle tomography using microlocal analysis, joint with Jürgen Frikel, *IOP Insights*, January 7, 2014
<http://iopscience.iop.org/0266-5611/labtalk-article/55769>
 78. Microlocal Analysis and Imaging, in “The Mathematics of the Planet Earth: An International Year of Scientific and Outreach Activities”, with Gaik Ambartsoumian, Raluca Felea, Venkateswaran Krishnan, Cliff Nolan, Chapter 7.6, pages 116-119, Editors, Hans Kaper and Christianne Rousseau, ISBN 978-1-61197-370-9, SIAM, Philadelphia, 2015.
 79. Wavelet methods for a weighted sparsity penalty for region of interest tomography, joint with Esther Klann and Ronny Ramlau *Inverse Problems*, 31(2015) 025001 (22pp).
 80. Microlocal Analysis in Tomography, joint with Venkateswaran Krishnan, chapter in *Handbook of Mathematical Methods in Imaging*, 2e, pp. 847-902, Editor Otmar Scherzer, Springer Verlag, New York, 2015 www.springer.com/978-1-4939-0789-2
 81. Artifacts in incomplete data tomography with applications to photoacoustic tomography and sonar, joint with Jürgen Frikel, *SIAM J. Appl. Math.*, 75(2),(2015) 703–725. (23 pages) Preprint on arXiv: <http://arxiv.org/abs/1407.3453>.
 - A paradigm for the characterization of artifacts in tomography, joint with Jürgen Frikel. (arXiv: <http://arxiv.org/abs/1409.4103>).
 82. Common Midpoint versus Common Offset Acquisition Geometry in Seismic Imaging, with Raluca Felea, Venkateswaran Krishnan, and Clifford Nolan, *Inverse Problems and Imaging*, 10(a)(2016), 87-102.
 83. Limited data problems for the generalized Radon transform in \mathbb{R}^n , joint with Jürgen Frikel, *SIAM J. Math. Anal.*, 48(4)(2016), 2301-2318, Preprint on arXiv: <http://arxiv.org/abs/1510.07151>.
 84. Detectable singularities from dynamic Radon data, with Bernadette Hahn. *SIAM J. Imaging Sciences*, 9(3)(2016), pp. 1195–1225, <http://epubs.siam.org/toc/sjisbi/9/3>
Preprint on arXiv: <http://arxiv.org/abs/1601.00936>
 85. **CONFERENCE PROCEEDINGS:** Simultaneous reconstruction and segmentation with the Mumford-Shah functional for electron tomography, with Li Shen; Shiqiang Wang; Ming Jiang, 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC): (2016), Pages: 5909 - 5912, DOI: 10.1109/EMBC.2016.7592073.
 86. Artifacts and Visible Singularities in Limited Data Tomography, *Sens Imaging* (2017) 18: 9. doi:10.1007/s11220-017-0158-7, Springer version: <http://rdcu.be/oRYJ> or <http://rdcu.be/oRYJ>
 87. Approximate inverse for the common offset acquisition geometry in 2D seismic imaging, joint with Christine Grathwohl, Peter Kunstmann, and Andreas Rieder, submitted, 2016.
 88. Singular FIOs in SAR Imaging, II: Transmitter and Receiver at Different Speeds, with

- Gaik Ambartsoumian, Raluca Felea, Venkateswaran Krishnan, and Clifford Nolan, To appear, SIAM J. Math. Analysis, 2017. arXiv: <http://arxiv.org/abs/1702.07397>.
89. Simultaneous reconstruction and segmentation with the Mumford-Shah functional for electron tomography, with Li Shen; Shiqiang Wang; Ming Jiang, Submitted to *Inverse Problems in Imaging*, 2017.
- Theorems that characterize artifacts for arbitrary limited x-ray CT data, with L. Borg, J. Frikel, J.S. Jørgensen, arXiv: <http://arxiv.org/abs/1707.03055>
90. Characterizing Artifacts for arbitrary limited X-ray CT data sets, with L. Borg, J. Frikel, J.S. Jørgensen, in final preparation.

Work in Progress:

1. Local and microlocal Sobolev Estimates of a Function from X-ray data, with Jan Boman.
2. Microlocal reconstruction methods in electron microscopy, radar and sonar.
3. Microlocal analysis and motion compensated tomography, with Bernadette Hahn.

Research Lectures:

1978-1984: University of Missouri, Purdue University, A.M.S. Regional Meeting, Washington, D. C., Special Session in Transform Methods in Partial Differential Equations; Mathematisches Forschungsinstitut, Oberwolfach, West Germany; Conference on Radon transforms and their applications, Tufts University, Medford, MA; M.I.T. Analysis Seminar. Oregon State University, Tomography Seminar; Ames Laboratories, Ames, IA; A series of 6 lectures at University of Münster, West Germany (as invited Research Associate); Individual talks at Universities of Mainz, Munich and Siegen, West Germany and Linz, Austria; Memphis State University; M. I. T. Probability Seminar; A.M.S. Regional Meeting, Special Session on Probability and Related Analysis, Evanston, IL. University of Maryland, Complex analysis seminar; A.M.S. Conference on Integral Geometry, Bowdoin College; Memphis State University (Analysis and Physics Colloquia); University of Michigan, Computational Mathematics Colloquium.

1985-1990: A series of 4 lectures at University of Mainz, West Germany; Individual lectures at University of Munich, University of Stockholm and Universität Münster (several talks at Tomography seminar and Applied Mathematics Colloquium); Gesellschaft für angewandte Mathematik und Mechanik International Congress, Dubrovnik, Yugoslavia; University of Connecticut; University of Maine. A.M.S. National Meeting, Special Session on Radon Transforms and Tomography, New Orleans, LA; Mathematisches Forschungsinstitut, Oberwolfach, West Germany (twice); Rhode Island College; Tufts seminar on Radon transforms and tomography. Framingham State College (mathematics awareness week); University of Michigan; Bar Ilan University (several talks); Technion; Tel Aviv University; University of Florence. Temple University (several talks); Technische Universität Berlin; Institute for Mathematics and its Applications, University of Minnesota; University of Pennsylvania Medical School; SIAM National Meeting Special session on applications of orthogonal polynomials.

1991-1999: Special Session on Inverse Problems, AMS meeting, Portland, OR; Special Session on Integral Geometry, AMS meeting, Philadelphia, PA, Rensselaer Polytechnic University, University of Toronto, University of Haifa, Bar Ilan University, Universität des Saarlandes, Universität Münster, E. Schrödinger Institut der Universität Wien, Keeler Lectures to undergraduates, Spring 1994, University of Michigan, MIT Geometric Analysis Seminar, 1994 Oberwolfach Conference on Tomography, Oregon State University Colloquium, 1995, Special session on classical harmonic analysis, AMS National Meeting; University of Connecticut, 1996; Brooklyn Polytechnic Institute, 1997, Two presentations at ISAAC meeting, 1997, Trinity College, AMS Special session on Integral geometry and Tomography, 1998, Oberwolfach Conference on Tomography, Wichita State University, Midwest Geometry Conference, Bar Ilan University, Hebrew University, 1999: U. Lowell, Oregon State University, MIT (two talks),

2000-2005: AMS Summer conference on Radon Transforms and Tomography, introductory talk; 2001: AMS national meeting (talks in two special sessions); Boston University Center for Computational Science; Honorary research speech at 60th Birthday celebration for Prof. Dr. Frank Natterer in Münster; 2002: Temple University; Tufts University; Remarks at Honorary Degree Ceremony for Frank Natterer, Saarbrücken; SIDEC Technologies, Sweden, Oberwolfach Mathematical Problems in Tomography; AMS Special Session on Convexity Theory (Boston); MIT Geometric Analysis Seminar (two talks); 2003: AMS Special session on Wavelets (Baton Rouge); PIMS Conference on Medical applications of Tomography; AMS Special Session on Tomography and Integral Geometry, Binghamton; 2004: AMS special session on tomography, Rider University; MIT Geometric Analysis Seminar (two talks); Applied Math Seminar, Uni. des Saarlandes; Principal talk, Conference on Harmonic Analysis, Irsee, Germany; RPI Colloquium; **2005-2010:** AMS Short Course on The Radon Transform and Applications to Inverse Problems; CENSSIS Unifying Framework Workshop; LSU CCT Applied Science Colloquium; Universität des Saarlandes applied mathematics seminar; Bar Ilan University, Colloquium, Analysis Seminar; 2006: IMA Workshop on 3-D imaging; Indiana University, University of Missouri, SIAM Imaging Science Minisymposium, Universität Karlsruhe, CENSSIS Framework II Workshop, Tsukuba conference on Integral Geometry and Harmonic Analysis, AMS Special session on integral geometry and harmonic analysis, Storrs, CT; 2007: LSU Conference on Harmonic Analysis and Integral Geometry, AMS National Meeting Special Session on Harmonic analysis and integral geometry, New Orleans, LA; PIMS Applied Inverse Problems 2007; Conference on Harmonic Analysis honoring Sigurdur Helgason's 80th Birthday, Iceland; Interdisciplinary Workshop on Mathematical Methods in Biomedical Imaging and IMRT, Pisa; RUMBUS "What is Mathematics" panel, Boston University; 2008: SDSC Center Tomography Day, SIAM Minisymposium "Electron Microscope Tomography, Three Dimensional Reconstruction and Data Analysis;" "Support theorems and microlocal analysis," in "Integral Geometry and Tomography," a conference in honor of Jan Boman's 75th birthday; Swedish Royal Institute of Technology (KTH) seminar; Gordon/CENSSIS conference on Applications of Modern Mathematical Methods to Real-World Imaging Problems (Nov., 2008); 2009: AKL Conference talk; KTH colloquium, Tufts/Schlumberger CAM seminar talk; BIRS new modalities conference talk; Case Western Reserve Colloquium; 2010: AMS National Meeting Special Session on Inverse Problems: Analysis and Computations (MRC); Oberwolfach Workshop on Mathematics and Algorithms in Tomography; Wesleyan University Colloquium; Medical Imaging Seminar at KTH, Stockholm; RICAM Linz, Universität Graz, Microlocal Analysis Workshop RPI, CSEMS at Tufts; **2011-2015:** Special Session, Integral Geometry, AMS National Meeting, Series of 3 talks at Universität Linz, Austria, Poster on Tufts Noyce Program at Noyce/NSF national conference; 2012: Tufts Workshop on Geometric Analysis on Euclidean and Harmonic Spaces; Talk at Electron Microscopy minisymposium at SIAM IS meeting; Poster on Tufts Noyce Program at Noyce/NSF national conference; Workshop talk at Gunther Uhlmann's 60th Birthday conference; Series of two talks at Summer School on Image Reconstruction, Mathematics & Applications, Munich Germany; Radon Colloquium, RICAM, University of Linz, AMS Special Session on Microlocal Analysis and nonlinear Evolution Equations, Rochester, NY; 2013: Oberseminar, Universität des Saarlandes; TIFR CAM, Bangalore, India; Indian Institute of Science, Bangalore, India; 2014: Tufts University Department Colloquium; Colgate University undergraduate colloquium; Two talks (hybrid imaging, microlocal analysis) AIMS Conference on Applied Dynamical Systems, Madrid; 2015: University of Texas, Arlington, Colloquium, Applied Inverse Problems, Helsinki, BIRS Conference on Hybrid Methods, TIFR Applied Mathematics Seminar, *Plenary Talk, International Conference of Sensing and Imaging, 2015 (ISCI2015), Chifeng, China*, Applied Mathematics Seminar, Universität des Saarlandes **2016-:** PDE Seminar, Karlsruhe Institute of Technology, Colloquium Tata Institute of Fundamental Research, Bangalore, India, International Conference of Sensing and Imaging, 2016

(ISCI2016), Taiyuan, China, DTU Workshop, insights and algorithms in CT, Stockholm University Analysis Seminar, KTH symposium, DTU Compute Seminar, DTU High School Days talk on limited angle CT. , 2017: DTU Training School: scientific computing for X-ray CT, Invited talk, 100 Years of Radon Transform, Linz, Austria, ICSI 2017 (main talk) Chengdu, China, CTIGIP St. Petersburg, Russia, Colloquium TIFR, Bangalore,

Conference, Special Session, and Seminar Organizer:

1. Conference on Radon Transforms and their Applications April 10-11, 1981, Tufts University, Medford, MA (with M. G. Hahn).
2. Special Session on Radon Transforms and Tomography, January 7-11, 1986, AMS National Meeting, New Orleans, LA (with E. Grinberg).
3. Seminar on Radon Transforms and Tomography, Tufts University 1986-
4. AMS Summer Conference on Integral Geometry, June, 1989 Arcata, California (with Leon Ehrenpreis, Fulton Gonzalez, and Eric Grinberg).
5. AAAS Special Session on Radon transforms: tomography to supersymmetry, AAAS national meeting, February 1990, New Orleans, LA (with Jim Peters).
6. AMS/SIAM Summer Applied Mathematics Conference, 1993, head organizer (with Margaret Cheney, Simon Gindikin, Peter Kuchment, and Larry Shepp).
7. AMS Special Session on Radon transforms and tomography, Rider University, October, 1996 (with Andrew Markoe).
8. AMS Special Session on Radon transforms and tomography, Temple University, April 1998, (with Eric Grinberg).
9. AMS/IMS/SIAM Summer Mathematics Conference, 2000, head organizer (with Leon Ehrenpreis, Adel Faridani, Fulton Gonzalez, and Eric Grinberg)
10. Minisymposium on Tomography at IPAM/SIAM/EMS Conference on Applied Inverse Problems: Theoretical and Computational Aspects (AIP2003), May 18-23, 2003.
11. Workshop on “New Mathematics & Algorithms for 3D Image Analysis”, Louisiana State University, September, 2003 (With Les Butler and Gestur Olafsson).
12. AMS Special Session on Inverse problems in tomography, Binghamton, NY, October 2003 (with Peter Kuchment and Leonid Kunyansky).
13. AMS Special Session on Integral Geometry and Tomography, Rider University, April, 2004 (with Andrew Markoe).
14. AMS Short Course on The Radon Transform and Applications to Inverse Problems, National AMS meeting, January, 2005 (with Gestur Olafsson) The Short Course is an introductory course aimed at a broad audience.
15. AMS Special Session on The Radon Transform and Applications to Inverse Problems, National AMS meeting, January, 2005 (with Adel Faridani and Gestur Olafsson).
16. IMA Workshop 3-D Image Acquisition and Analysis Algorithms, January, 2006 (with Les Butler and Gestur Olafsson).
17. SIAM Imaging Science Minisymposium on Tomography and Sampling Theory, 2006 (with Adel Faridani).
18. Mathematical Methods in Tomography, Mathematisches Forschungsinstitut Oberwolfach, August 2006, (with Alfred Louis and Frank Natterer).
19. AMS Special Session on Radon transforms and convex geometry, National AMS meeting, January, 2007 (with Boris Rubin, Eric Grinberg, Peter Kuchment, and Gestur Olafsson).
20. Conference on Applied Inverse Problems 2007, minisymposium on New Topics in Tomography, Vancouver, June 2007.
21. International Congress of Industrial and Applied Math minisymposium, Trends in

- Tomography, (with Adel Faridani and Andreas Rieder), Zurich July 2007.
22. AMS Special Session on Radon Transforms, Tomography, and related Geometric Analysis, LSU, March 26-28, 2008 (joint with Fulton Gonzalez, Isaac Pesenson, and Boris Rubin).
 23. SIAM Imaging Science Minisymposium, “Inverse Problems in Tomography,” July 2008.
 24. SIAM National Meeting Minisymposium, “Electron Microscope Tomography, Three Dimensional Reconstruction and Data Analysis,” July 2008.
 25. Member Advisory Board of “Integral Geometry and Tomography,” a conference in honor of Jan Boman’s 75th birthday, August, 2008.
 26. Member organizing committee of AMS Mathematical Research Communities conference on Inverse Problems, for young mathematicians, June 2009, head Gunther Uhlmann.
 27. Minisymposium on Inverse problems in tomography, Applied Inverse Problems, Vienna, July 2009.
 28. Oberwolfach conference, “Mathematics and Algorithms in tomography” 2010 with Martin Burger (Münster, Germany) and Alfred Louis (Saarbrücken, Germany).
 29. Integral Geometry: Analysis and Applications, special session at the 2011 AMS national meeting at New Orleans (joint with Gaik Ambartsoumian, Gestur Olafsson and Boris Rubin)
 30. Workshop in Analysis and Geometry, at LSU, Advisory Committee, 2011
 31. ICIAM minisymposium on Tomography: the road ahead, with Adel Faridani and Andreas Rieder, Vancouver, BC, 2011.
 32. AMS Special Session, “Radon Transforms and Geometric Analysis in Honor of Sigurdur Helgason’s 85th Birthday” corresponding coorganizer at 2012 AMS National Meeting, Boston, (with Fulton Gonzalez and Jens Christensen)
 33. Workshop on Geometric Analysis on Euclidean and Homogeneous Spaces, January 2012, with Fulton Gonzalez and Jens Christensen.
 34. Tutorial Mathematics and Science of 3D Electron Microscope Imaging, organized with Ozan Öktem at SIAM Imaging Sciences Meeting, May 20-22, 2012.
 35. Minisymposium Electron Tomography: Mathematics and Science, organized with Ozan Öktem at SIAM Imaging Sciences Meeting, May 20-22, 2012.
 36. Minisymposium on Inverse Problems in Geometry, A conference on inverse problems in honor of Gunther Uhlmann, University of California, Irvine, June 18-22, 2012 (with Vladimir Sharafutdinov).
 37. Program Committee for 7th international conference, “Inverse Problems and Modeling,” May 26-31, 2014, Fethiye, Turkey,
 38. Co-organizer with Peter Maass of two Minisymposia at the “Inverse Problems and Modeling” conference, one to honor Alfred Louis, the other on tomography, Fethiye, Turkey
 39. Co-organizer with Martin Burger (Münster, Germany) and Alfred Louis (Saarbrücken, Germany), Oberwolfach conference, “Mathematics and Algorithms in Tomography,” August 2014.
 40. Co-organizer with Gaik Ambartsoumian, Vladimir Druskin, Esther Klann, Venky Krishnan, and Alfred Louis, Computational and Analytical Aspects of Image Reconstruction, ICERM workshop, Brown University, July 13-17, 2015.
 41. Scientific Advisory Board, International Conference of Sensing and Imaging 2015 (ICSI2015), Chifeng, China, August, 2015.
 42. International Program Committee for 8th international conference, “Inverse Problems and Modeling,” May 23-28, 2016, Fethiye, Turkey.
 43. Academic (main) Committee and Technical (program) Committee International Conference of Sensing and Imaging July 25-28, 2016 (ICSI2016), Northern China University, Taiyuan, China.
 44. Conference Board, Conference on the 100th anniversary of Radon’s seminal paper, March, 2017, RICAM, Linz, Austria.

45. Co-head Program Committee, and member Academic Committee, Third International Conference of Sensing and Imaging Chengdu University of Information Technology (CUIT), Chengdu, Sichuan, China, June 5-7, 2017.
46. Co-head, 9th international conference, “Inverse Problems, Modeling and Simulation,” May 2018, Mellieha, Malta.
47. Program Committee, and member Academic Committee, Fourth International Conference of Sensing and Imaging Liuzhou, Guangxi Province, China, October 15-18, 2018.
48. Head organizer proposed Oberwolfach workshop, 2019.
49. Organizer Cormack conference at Tufts (coorganizers, Fulton Gonzalez, Misha Kilmer, Eric Miller (Tufts), Bernadette Hahn (Uni. Würzburg) and Gaël Rigaud (Uni. Saarlandes).

Journal Editor, Referee, and Reviewer:

Associate Editor:

1. *Inverse Problems* (Editor in Chief, Simon Arridge)
2. *Journal of Fourier Analysis and Applications* (Editor-in-Chief: Hans Feichtinger)
3. *SIAM Journal of Imaging Science*, (Editor-in-Chief Michael Elad).

Past Editor

1. *Documenta Mathematica*, (Managing Editors: A.K. Louis, Ulf Rehmann, Peter Schneider). 2004-2011.

Referee Journal of the AMS; Proceedings of the AMS; Transactions of the AMS; Indagationes Mathematicae; Michigan Mathematical Journal; Mathematische Zeitschrift; J. analyse Math.; Inverse Problems; SIAM Journal on Applied Mathematics; SIAM Journal on Imaging Sciences; SIAM Journal on Mathematical Analysis; The American Mathematical Monthly; Archiv der Mathematik, Journal of Geometric Analysis, Journal of Mathematical Analysis and Applications; Journal of Radiation Oncology, Biology, and Physics; IEEE Transactions on Medical Imaging; Measurement Science and Technology; Rocky Mountain Journal of Mathematics; Periodica Mathematica Hungarica; Subsurface Sensing Technologies and Applications; Israel Journal of Mathematics; Advances in Applied Mathematics; Journal of Lie Theory, Moscow Mathematics Journal, SIAM Journal of Scientific Computing, Journal d’Analyse, Nuclear Inst. and Methods in Physics Research, A, J. Approximation Theory,

Reviewer: Mathematical Reviews, National Science Foundation, Air Force, Army, Humboldt Stiftung, United States-Israel Bi-national Science Foundation, NATO, National Research Council, Dutch National Science Foundation, Panel reviewer for National Science Foundation, National Academy of Sciences of the Ukraine, University of Missouri, National Security Agency, Austrian Science Fund (FWF)

Professional Committees:

American Mathematical Society Advisory Board for Mathematical Research Communities 2013-2016

Grants and Contract Received:

1. National Science Foundation Grant MCS 82-01627
Generalized and exterior Radon transforms 1982-1984, PI.

2. Mellon Grant for Faculty Research Development, Spring 1983
3. NIH Biomedical Research Equipment Grant, Spring 1984 (through Tufts University)
4. National Institutes of Health Grant 1R01 CA32743
Recovering a density from incomplete tomographic data, 1984-1987, PI.
5. National Science Foundation Grant DMS 8604167
Workstation for Mathematical Research (co-PI)
6. National Science Foundation Grant DMS 8701415
Radon transforms and tomography 1987-1989, PI.
7. Faculty Research Award for Student Researcher, Tufts University, 1988
8. National Science Foundation Grant DMS 8901203
Radon transforms and tomography 1989-1992, PI
9. National Science Foundation Grant DMS 9123862
Radon transforms and tomography 1992-1996, PI.
10. Contract to Perceptics, Inc., for industrial tomography, 1993-1996
Support of High Resolution three-dimensional computed tomography, PI.
11. National Science Foundation Grant DMS 9622947
Radon transforms and tomography 1996-1999, PI.
12. FRAC Travel Grant (Tufts University) 1999
13. National Science Foundation Grant DMS 9877155
Tomography and integral geometry 1999-2002, PI.
14. FRAC Senior Research Semester (Tufts University) 2002
15. National Science Foundation Grant DMS 0200788
Tomography and integral geometry 2002-2005, PI.
16. FRAC Research Grant In Aid, 2004
17. FRAC Research Award (for travel), 2005
18. National Science Foundation Grant DMS 0456858
Tomography and integral geometry 2005-2009, PI
19. FRAC Senior Research Semester, 2009
20. FRAC New Directions Travel Grant, 2009
21. Wenner Gren Foundation support for two months of research with colleagues in Sweden, 2009-2012
22. National Science Foundation Grant DMS 0908015
Local Tomography and Microlocal Analysis, 2009-2013, PI
Supplement for Postdoctoral Fellow Venky Krishnan,
 - For 2010: DMS1028096
 - For 2011: DMS 1129154
23. National Science Foundation grant DUE 0962863,
The Poincare institute for Mathematics Education, (senior faculty) 2010-2011
24. National Science Foundation grant DUE 1035342,
The Urban Math and Science Teacher Collaborative, Principal Investigator,
Noyce/NSF Teaching Fellow Program, \$2,130,768 direct (\$0 indirect), PI.
25. AIMs SQUARES grant to do research with Gaik Ambartsoumian, Venky Krishnan,
Raluca Felea, and Cliff Nolan at AIMs in Palo Alto, 2011-2013
26. NSF grant DMS-1200615
Conference on Geometric Analysis on Euclidean and Homogeneous Spaces
(shared between Mathematical Analysis, Applied Math, and Topology), PI
27. National Science Foundation Grant DMS 1311558
Tomography and Microlocal Analysis, 2013-2017 \$202,512 (Direct: \$132,677,
Indirect: \$69,835), PI
28. EADS Grant as a visiting professor at Tata Institute for Fundamental Research
Computational and Applied Mathematics Bangalore (sponsored by TIFR).
29. NSF/Noyce Grant DUE 1439880, The 1-12 Urban Mathematics and Science Teacher
Collaborative, \$1,799,014 (\$132,815 ICR), co-PI (head PI: Barbara Brizuela)

30. FRAC Senior Research Semester, Spring 2017.
31. Otto Mønsted Fond for Visiting Professorship, DKK 210,000.
32. NSF grant DMS 1712207
Tomography and Microlocal Analysis, 2017-2020 \$198,902 (Direct: \$129,152
Indirect: \$67,750), PI

External Departmental Reviewer

Scarsdale High School Mathematics Department, 2011

Current Department and University Responsibilities:

Tenure and Promotion Committee 2014-16
Vice-chair, 2015-2016
Department Curriculum Committee, head 2014-2016 (except fall 2015)
Career Services Faculty Advisory Committee 2009-
Leonard Carmichael Society Faculty-Staff Board, Fall 2002-
Phi Beta Kappa Executive Committee 1986-
President 1987-1990
Faculty Advisor, Tufts Mathematics Society (undergraduate math club)
Department Hiring Committees
Department Academic Honors Committee (except 2013)

Past Department and University Responsibilities:

Department Curriculum Committee, head 2010-2012
Educational Policy Committee 2009-2012
Mathematical Association of America Departmental Representative -2016
Academic Review Board 2006-2011
Interim Head, Mathematics Department, 2007-2008
Dean's Culture Requirement Committee 2004-2005
Educational Policy Committee 2000-2004
Co-head, Fall 2000-Fall 2001, Fall 2002, Fall 2003-2004
Tufts A&S Reaccreditation Committee, 2001-2002
Budget and Priorities Committee (elected) 1994-1998
Co-head, 1995-1998
Trustees' Committee on Administration and Finance
(non-voting observer), Spring 1995-1998
University Committee on Computer Facilities 1987-1991, 1992-1994
Chair 1990-1991, 1992-1994
Chair, TCCS Service Subcommittee 1992-93
Chair, Subcommittee on UNIX Computing 1990-91
Chair, Subcommittee on Fair Access 1988-89
A&S Information Technology Management Team, 1993-1994
University Information Resources Council 1990-91, 1992-1994
Administrative Computer Usage & Facilities Committee 1992-1994
University Grievance Panel (elected) 1988-1991
Ombudsperson 1990-1991
Grievance hearing board member 1990-1991
University Committee on Academic Awards 1980-82, 1983-84, 1985-87
Chair 1985-87
University Advising Committee 1987-88
Department Curriculum Committee 1982-84, 1985-86, 1988-
Chair 1983-84
Department Hiring Committee 1981, 1984-
Chair 1987, 1994

Department Scientific Equipment Committee 1985-1995
Department Academic Honors 1981-85, 1987-
Freshman and Non-major Advisor 1979-80, 1985-1991, 1995-2005
Mathematics Major Advisor 1980-84, 1986-
Mathematics Graduate Student Advisor 1980-82, 1986-88, 1990-
Acting Chair, Department of Mathematics, Summer 1989, 1990
Department Graduate Committee 1978-84, 1986-88
New Student Advisor 1986-87
Faculty Advisor to Environmental House 1982-84

RESEARCH ADVISEES:

Post Doctoral Researchers:

Thomas Schuster, Humboldt Stiftung Feodor Lynen Fellow, 2002-2003.
Hans Rullgård, 2008.
Venky Krishnan, 2007-2008, 2010, 2011.
Jürgen Frikel, Spring 2014
Bernadette Hahn, (DAAD fellowship) Fall 2014

Graduate students:

Beatriz Villa, *M.S. The Radon transform: basic facts, inversion formulas, null spaces and ranges*, 1982.
Gene Gregerson, *M.S. The spherical transform and radiation dose planning*, 1992.
Yiying Zhou, *Ph.D. Support theorems for spherical Radon transforms*, 1997.
Aleksi Beltukov, *Ph.D., Sonar Transforms*, 2004.
Natalie Velasco, *M.S., Local algorithms in cone-beam tomography*, 2008.
Anuj Abhijshk, *Ph.D. current*.

Undergraduate Research Students:

Merilee Goldberg, 1986, 1987.
Jon Polito, 1988.
Carl Schuyler, 1990.
Kyo Shimada, 1995.
Jillian Rennie, 2004 (NSF Research Experiences for Undergraduates).
Her final report appeared in the *Contemporary Mathematics* volume [7].
Sohhyun Chung, Tufts Summer Scholar 2005, senior honors thesis 2006.
Our joint article [61] describes this work.
Tania Bakhos, 2007 (NSF Research Experiences for Undergraduates), senior honors thesis, 2008. Our joint article [61] describes this work.
Dan Cuzzocreo, 2008 (Tufts Summer Scholar).
Howard Levinson 2011 (NSF REU and senior honors thesis, article [71])
Stephen Bidwell 2011-2012 (senior honors thesis)
Joshua Levy, 2012-2013 (NSF REU and reading course)
Sarah Reitzes, 2014 (NSF REU and reading course)
Adrian Devitt-Lee 2014, 2015-2016 (NSF REU, reading courses)
Ivan Tsenov 2017 (reading course, Summer Scholar summer 2017)

Master of Arts in Teaching Students (teaching advisor):

Jeff Snyder, 1994
Al Micozzi, 1997
Claudia Spiro Silverman, 1998
Linda Langdon, 2001
Jake Bergmann, 2003

Mark Bartolanzo, 2009
Cara Hovhanessian, 2010

Volunteer work:

Boston Children's Hospital 1989-
(Volunteer of the month (1995), Bob Groden Award (volunteer of the year 2003),
Volunteer Services Award for National Community Service from Pres. Obama's
office and commendation from MA House and Senate, 25-year pin (2014))
Bishop School library and classroom 2002-2007