

Julian K. Edward - 2016

Department of Mathematics
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Education

Massachusetts Institute of Technology, Cambridge, Massachusetts. PhD in Mathematics, June 1989.

McGill University, Montreal, Quebec. BA in Mathematics, Spring 1985.

Employment

Florida International University, Miami, Florida.

Professor, 2008-present.

Chair 2005-2009.

Associate Professor 1998-2008.

Assistant Professor, August 1993-1998.

McGill University, Montreal, Canada. Visiting Scholar, 9/99-12/00.

University of Toronto, Toronto, Ontario. Assistant Professor, July 1989-August 1993.

Refereed Publications:

- Al-Mulsallam, F, Avdonina, N., and Avdonin, S. **Control and inverse problems for networks of vibrating strings with attached masses**, *Nanosystems: Physics, Chemistry, and Mathematics*, 2016, 7 (5), 835-841.
- Avdonin, S., Avdonina, N., and Edward, J., **Boundary inverse problems for networks of vibrating strings with attached masses**, to be published in *Proceedings of Dynamic Systems and Applications*, Volume-7, 2016
- Dougherty, K., Edward, J. and Ragan, R., **The value of formalism: re-examining external costs and decision costs with multiple groups**, April 2015, *Public Choice* Volume 163, Issue 1, pp 31-52
- Edward, J., Hudson, S. and Leckband, M., **Existence problems for the p -Laplacian**, *Forum Math.* 27 (2015), no. 2, 12031225.
- Decarli, L., Edward, J., Hudson, S., and Leckband, M., **Minimal support results for Schrodinger operators**, *Forum Math.* 27 (2015), no. 1, 343371.
- Dougherty, K. and Edward, J. **Voting for Pareto Optimality: a multidimensional analysis**. *Public Choice*, 2012, 151 (3): 655-78.
- Dougherty, K and Edward, J., *The calculus of consent and constitutional design*. Springer, 2011.
- Dougherty, K. and Edward, J., **The properties and Simple versus Absolute Majority Rule: Cases where absences and abstentions matter**, *Journal of Theoretical Politics*, 22 (2010), 85-122.
- Dougherty, K. and Edward, J., **Even or Odd: Assembly Size and Majority Rule**, *Journal of Politics*, 71, (2009) no. 2, pp. 733-747.
- Edward, J. and Tebou, L., **Uniform internal controllability for structurally damped beam equation**, *Asymptotic Analysis*, 47 (2006), 55-83.
- Edward, J. **Complex Ingham type inequalities and applications to control theory**, *Journal of Mathematical Analysis and Applications*, 324 (2006)
- Dougherty, K. and Edward, J. **A non-equilibrium analysis of Unanimity, Majority, and Two Pareto Concepts**, *Economic Inquiry* 43 (2005), 855-865.
- Dougherty, K. and Edward, J. **The Pareto efficiency and expected cost of k -Majority rules: a probabilistic study of the Calculus of Consent**, *Politics, Philosophy, and Economics* 3, (2004), p.161-189.
- Edward, J. **Trapped modes for periodic structures on waveguides**, *Mathematical Methods in Applied Sciences* 27, (2004), p.91-99.
- Edward, J. **On the resonances of the Laplacian on waveguides**, *J. Math. Anal. Appl.* 272 (2002) 89-116.
- Edward, J. **Corrigendum to the paper "Spectrum of the Neumann Laplacian on planar domains with horn-like ends"**, *Canad. J. Math.* 52, (2000), p.119-122.

Edward, J. **Eigenfunction decay for the Neumann Laplacian on Horn-like domains**, *Canad. Math. Bull.* 43, (2000), p.51-59.

Edward J. and Pravica D. **Bounds on resonances of the Laplacian on perturbations of half-space**, *SIAM J. Math. Anal.*, 30, (1999), 1175-1184.

Edward, J. **Eigenvector decay and eigenvalue accumulation on asymptotically perturbed waveguides**, *Journal of London Mathematical Society* 59, (1999),p. 620-636.

Edward, J. **Spectrum of Schrodinger operators on planar domains with ends of increasing cross-section.**, *Math. Methods Appl. Sci.*, 22 p.139-169, (1999).

Edward, J., **Spectrum of the Neumann Laplacian on planar domains with horn-like ends**, *Canadian J. Math.*, 49, (1997), 232-262.

Edward, J., **“An Inequality for Steklov Eigenvalues for Planar Domains”**, *Zeitschrift fur angewandte Mathematik und Physik* 45, (1994), pp. 493-496.

Edward, J., **“Pre-Compactness of Isospectral Sets of Planar Domains for the Neumann Operator.”**, *Communications in Partial Differential Equations*, Vol. 18, Numbers 7, 8, (1993), pp. 1249-1270.

Edward, J., **“Jacobi Matrices and the Spectrum of the Neumann Operator on a Family of Riemann Surface”**, *Canadian Journal of Mathematics*, Vol. 45, Number 4, (1993), pp. 709-726.

Edward, J., **“The Spectra of Jacobi Matrices, Differential Operators on the Circle, and the $su(1,1)$ Lie Algebra”** *SIAM Journal of Mathematical Analysis*, Vol. 24, No. 3, (1993), pp. 824-831.

Edward, J., **“An inverse spectral result for the Neumann Operator on smooth planar domains”**, *Journal of Functional Analysis*, Vol. 111, No. 2, February (1993), pp. 312-322.

Edward, J. and Wu, S., **“Determinant of the Neumann Operator on smooth Jordan curves,”** *AMS Proceedings*, Volume 111, Number 2, February (1991), pp 357-363.

Accepted:

Edward, J., Hudsons, S., and Leckband, M., **Minimal potential results for Neumann problems**, accepted by *Forum Mathematicum*.

In submission

Avdonin, S.A. and Edward, J, **Exact controllability for string with attached masses.**
Avdonin, S.A. and Edward, J, **Controllability for string with attached masses and Riesz bases for asymmetric spaces**

External Talks

AIMS Conference on Dynamical Systems, Differential Equations, and applications, Orlando, July 2016. 20 minute talk "Exact control for 1-D wave and Schrödinger equations with strong potential singularities".

Contributed presentation at conference: AMContributed presentation at conference: International Conference PDE, Complex Analysis, and Related Topics, Miami, January 2016. 50 minute talk "Exact control for 1-D wave and Schrödinger equations with strong potential singularities".

Contributed presentation at conference: International Conference PDE, Complex Analysis, and Related Topics, Miami, January 2016. 50 minute talk "Exact control for 1-D wave and Schrödinger equations with strong potential singularities".

Contributed presentation at conference: Seventh International Conference on Dynamic Systems and Applications, Atlanta May, 2015. 20 minute talk "Control and inverse results for strings with attached masses".

Contributed presentation at conference: AMS special session on Differential Equations on Graphs, Baltimore March, 2014. 20 minute talk "Leaf peeling on strings with attached masses".

Contributed presentation at conference: AMS special session on Harmonic Analysis and Operator Theory, Albuquerque April, 2014. 20 minute talk "Existence results for p-Laplacian: Dirichlet and Neumann boundary conditions".

25 minute seminar: "Applications of the Boundary Control Method to Inverse Problems", Florida Atlantic University, South Florida Conference in Analysis, 3/20/10.

"Complex Ingham Inequalities and Applications to Control Theory", Analysis seminar, McGill University, March 16/07.

20 minute seminar: "Ingham type inequalities for complex frequencies and applications to control theory", Florida International University, Mini-conference in analysis, 20/10/05.

Seminar "Ingham type inequalities for complex frequencies and applications to control theory", at AMS Workshop in Dynamical Systems and PDE in Control Theory, Snowbird, Utah 7/7/05.

20 minute seminar: "Ingham-type inequalities and null-controllability of beam equation with internal damping". Florida Atlantic University, Mini-conference in analysis, 1/20/05.

Seminar: "Resonances and embedded eigenvalues on manifolds with infinite cylindrical ends", Medical Mathematics Conference, East Carolina University, May 29, 2003.

Seminar: "Quantifying the fairness of various voting schemes", Dept. of Mathematics, Florida Atlantic University, Dec. 6, 2001.

Seminar: "Resonances on acoustic waveguides", in workshop on Scattering Theory at the Erwin Schrodinger Institute, Vienna, Austria, May 26, 2001.

Seminar: “Resonances for the Laplacian on waveguides”, on special session: Partial Differential Equations in Mathematical Physics, 1999 UAB-GIT International Conference on Mathematical Physics and Differential Equations, Birmingham, Ala., Nov. 12, 2000.

Seminar: “Bounds on the number of resonances for the Laplacian on certain asymptotically Euclidean spaces”, Dept. of Mathematics, McGill University, Sept. 7, 1999.

Seminar: “Bounds on the number of resonances for the Laplacian on certain asymptotically Euclidean spaces”, Dept. of Mathematics, University of Toronto, Oct. 15, 1999.

Colloquium: “Trapped waves on waveguides”, Dept. of Mathematics, University of Ottawa, Nov. 12, 1999.

“Scattering theory for quotients of \mathbf{R}^n by finite subgroups of $GL(n)$ ”, The 1999 UAB-GIT International Conference on Mathematical Physics and Differential Equations, Birmingham, Ala., March 16, 1999.

“Spectral resonances contained by compact potential barrier”, Dept. of Mathematics, University of Kentucky, April 30, 1998.

American Mathematical Society Special Session, “PDE’s and mathematical physics”, University of Missouri, Columbia MO.: “Spectrum of Schrodinger operators on domains with ends of increasing cross-section”, Nov. 3, 1996.

American Mathematical Society Special Session, “PDE’s and mathematical physics”, Northeastern University, Boston: “Spectrum of the Neumann Laplacian on planar domains with ends”, Oct. 7, 1995.

University of Miami, Dept. of Mathematics: “Spectrum of the Neumann Laplacian on planar domains with ends”, Sept. 19, 1995.

Conference: Partial Differential Equations and Applications, Fields Institute, Toronto: “Spectrum of the Neumann Laplacian on planar domains with horn-like ends”, June 19, 1995.

University of Toronto, Dept. of Mathematics, “Spectrum of the Neumann Laplacian on planar domains with horn-like ends”, Feb. 27, 1995,

Ohio State University, Dept. of Mathematics, “Spectrum of the Neumann Laplacian on planar domains with horn-like ends”, Jan. 6, 1995,

University of Miami, Dept. of Mathematics, “On the Eigenvalues of the Laplacian on Manifolds with Cusps”, Sept. 19 1993.

McGill University (Montreal), Dept. of Mathematics, “On the Eigenvalues of the Laplacian on Manifolds with Cusps”, Oct. 5 1993.

Canadian Mathematical Society Congress, Victoria, British Columbia, “Jacobi matrices and the spectrum of the Neumann operator on a family of Riemann surfaces”, Dec. 8, 1991.

Universite de Montreal, Dept. of Mathematics, “Invariants spectrales de l’operateur Neumann”, Feb. 20, 1990.

Visiting positions

Visiting scholar, McGill University, 8/1999-12/1999.

Invitations to workshops, etc.

Invited to Medical Mathematics Conference, East Carolina University, May 25-28 2003.

Invited to the program “Scattering Theory” at Erwin Schrodinger Institute, Vienna, Austria, May 16-30.

Invited to the “Program on microlocal methods in geometric analysis and mathematical physics”, Aug.-Dec. 1997 at Fields Institute, Toronto, Canada.

External funding

PI for NSF Educational Grant of \$750,000US over 5 years: Robert Noyce Scholarships, program designed to generate high school teachers in Math and Sciences, 2009-2013.

Senior Personnel for Walmart grant for success of first generation students, 100K over 3 years. Program promotes peer led study groups in lower division courses. Most of the ideas of the proposal came from me. My responsibilities in the actual grant included scheduling, student and LA recruitment, and faculty development.

FIU Foundation Grant, Summer 1997, for proposal “Eigenvalues of the Laplacian on infinite regions”.

Natural Science and Engineering Research Council (Canada) operating grant of \$12,000CAN per annum May 1990-May 1993. Renewed at \$10,000CAN per annum May 1993.

Submitted not funded

Applied as PI for NSF Educational Grant: Robert Noyce Scholarships, program designed to generate high school teachers in Math and Sciences, in 2006, and again in 2007.

Applied as PI for NSF Educational Grant: CSUMS: Training, Research, and Applications in Differential Equations. This was a grant to give enhanced training and research opportunities to undergraduates, 2007.

Applied for FIU foundation grant in 1996, 1997, 2002, 2003.

Applied for NSF grant for research in Political Science as co-PI with Keith Dougherty 2002.

Teaching awards

Won T.I.P. award, Spring 1997.

Teaching Experience

At FIU

Precalculus

Precalculus

Calculus 1

Calculus 2

Calculus 3

Differential Equations

Linear Algebra

Advanced Differential Equations

Partial Differential Equations (Graduate)

Mathematics of Social Choice

Differential Geometry (Graduate and undergraduate)

Methods of Applied Analysis (Graduate)

Stochastic Differential Equations (Graduate)

Numerical Analysis

Topics in Actuarial Studies

At McGill

Differential Equations

At Univ. of Toronto

Calculus 1 for Engineers

Calculus 2 for Engineers

Calculus 3 for Engineers

Differential Equations

Math for Social Sciences

Math for Business

Service to Mathematical Community:

Reviewed over 60 papers for Math Reviews.

Refereed two papers for Proceedings of Royal Society Edinburgh, and one each for SIAM J. Mathematical Analysis, Rocky Mountain Journal, ZAMM, Journal of Differential Equations, Comm. Cont. Math.

(joint with I. Lasiecka) Reviewed one book for IEEE Transactions in Automatic Control.

Service to department

Mentored two graduate students in Master's projects.

Undergraduate Committee, 8/2011-8/15.

Human Resources Committee, 8/2013-8/15.

Chair of Department, 8/2005-8/2009

Director of the Learning Assistant Program, 8/2008-present.

Member of Departmental Scheduling and Curriculum Committee, 8/2000-8/2005. Assisted in creating course Mathematics for Information Technology.

Member of ad-hoc PhD committee, 2004-present.

Head of Scheduling and Curriculum Committee, 3/2002-8/2005

Actuarial Studies Program Committee, 8/01-present

Departmental Review Committee, 8/04-7/2005.

Member of ad-hoc committee that set guidelines for Matriculation Raises (Spring 2001).

Member of ad-hoc committee that presented to the State University Board of Governors a proposal for a Ph. D. program for the F.I.U. Mathematics Department, 2000-present.

Assisted in an ah-hoc committee that discussed reconfiguring the math courses required for Computer Engineering students. (Spring 2000)

F.I.U. Recruitment Committee member, 8/98-4/99 and 8/2001-4/2002. Examined files of candidates, assisted in ranking of candidates, communicated with candidates by email, assisted in the care of the interviewees.

Member of the thesis defense committee for Masters students at FIU.

Organised the departmental Analysis Seminar, 8/94-8/98.

F.I.U. Teaching Incentive Program Committee member, 1998. Assisted in the evaluation and ranking of six teaching files for the purpose to granting teaching awards.

F.I.U. Graduate Committee member, 8/94-8/98. Assisted in decisions regarding admittance of graduate students, allocations of teaching assistantships, setting of curriculum, etc. Created and organised the evaluations for T.A.'s in recitation. Organised a graduate student seminar and evaluated the presentation of the graduate students.

F.I.U. Teaching Incentive Program Committee member, 1996. Assisted in the evaluation and ranking of six teaching files for the purpose to granting teaching awards.

University of Toronto Colloquium Committee, 9/89-4/90: Recruited colloquium speakers, and organised their food and lodging.

University of Toronto Undergraduate Committee, 9/90-4/91. Helped prepare the list of courses to be offered by the Mathematics Department for the subsequent year. Assisted in the formation of a new course.

Service to university

Departmental representative in College Curriculum Committee, 1/2001-4/2002.

College Judiciary Committee, Nov. 2002- present. Have attended 5 hearings in that period.

University Sabbatical Committee, 04-05 and 05-06.

Member of Title V Committee, Fall 05-present.

Seminars for undergraduates, etc.

Gave seminar at Honors College: “Arrow’s Theorem, and the impossibility of the perfect voting system”, 11/8/06.

Gave undergraduate seminar “Some problems in control theory”, FIU Math Club, Spring 2005.

Gave undergraduate seminar “Some problems in control theory”, Department of Mathematics, New College, Sarasota, FL. Spring 2005.

Gave seminar “Arrow’s Theorem: more trouble with the electoral system” to Undergraduate Math Society, Oct. 17, 2003.

Faculty Research Seminar at the Jack Gordon Institute for Public Policy and Citizenship studies: “Quantifying the fairness of a voting scheme”, March 7, 2001.

Assisted in the organisation and the recruit of speakers for the MAA, FIU Chapter, 1994-1999.

Gave address entitled “Arrow’s Theorem: an Application of Mathematics to Political Science”, to Department of Mathematics, New College, University of South Florida, November 1998.

Gave address entitled “Arrow’s Theorem: an Application of Mathematics to Political Science”, to MAA, FIU Chapter, October 1998.

Gave address entitled “Arrow’s Theorem: an Application of Mathematics to Political Science”, to MAA, FIU Chapter, November 1994.

Gave address entitled “Can You Hear the Shape of a Drum?” to MAA, FIU Chapter, February 1994.

Gave address entitled “Can You Hear the Shape of a Drum?” to McGill Chemical Society, McGill University, Montreal, March 17, 1992.

Other Professional Activities

Dispute Judge at High School Math Contest, Varela High, 2/7/04.

Visited Hialeah-Miami Lakes High School on its Mathematics Collegiate Day, spring 2000.

Contributed problems to the textbook “Calculus with Analytic Geometry”, by Joe Repka, Wm. C. Brown Publishers, Dubuque IA., 1994.