

Joe J. Perez
joe_j_perez@yahoo.com
<http://www.joejperez.com>

Education

Northeastern University

Ph.D. in Mathematics (2005) in Partial Differential Equations and Geometry. Dissertation title: The G-Fredholm Property of the $\bar{\partial}$ -Neumann Problem. Advisor: M.A. Shubin. Qualifying exams in Analysis, Geometry, and Algebra.

Tulane University

M.S. (ABD) in Mathematics (1994). Oral exam in Functional Analysis, qualifying exams in Analysis, Topology, and Applied Mathematics. Studied primarily Functional Analysis and Applied Mathematics

Texas A & M University

B.A. in Physics (1988), minor in Mathematics. Also completed some graduate coursework in Math and Physics, concentrating on Quantum Field Theory, General Relativity, and Differential Geometry.

Teaching Experience

Texas A & M University at Kingsville, Department of Mathematics

Visiting Assistant Professor, Spring 2008–Spring 2009

Taught the following courses: College Algebra, Business Math I, II, Calculus I, II, III, Applications of Linear Algebra (graduate), STEP mentor, Spring '08 and '09 (Topics: PDE of math physics, Numerical Methods of PDE and programming).

Advanced Math and Science Academy Charter School

Mathematics Teacher, Fall 2007

Stonehill College, Department of Mathematics

Assistant Professor, Fall 2006 - Spring 2007

Instructor, Fall 2001 - Spring 2006

Taught the following courses: Precalculus, Calculus I, II, and III, Ordinary Differential Equations, Applied Calculus for Business, Calculus for Biology, Linear Algebra, Real Analysis I and II, Complex Analysis, Mathematical Probability and Statistics, Numerical Analysis, Quantum Mechanics, Seminar in Applied Math, and Partial Differential Equations.

Active research collaboration in Topology with A.I. Suciu.

Authored course materials to supplement textbooks and lectures.

Encouraged critical thinking by a systematic first-principles approach, calling on the support of computer-aided methods of solution when appropriate.

Mentored independent study projects, and coached students in preparing oral presentations and written reports.

Served as academic advisor to a group of students each semester.

Initiated collaborations with administrators and colleagues to develop new programs and courses, including an elementary course in logic and proof, and interdisciplinary courses in Classical Wave Theory and in Quantum Mechanics. Wrote a curriculum review proposal extending these initiatives to offer a concentration in Applied Mathematics stressing computer programming skills and basic sciences.

Northeastern University

Teaching Assistant, Department of Mathematics, 1995–2001.

Taught courses in Precalculus, Calculus, Calculus for Biology, Combinatorics, Applied Algebra, and Differential Equations.

Tulane University

Teaching Assistant, Department of Mathematics, 1988-1994.

Led recitation sections for courses in Calculus and Analysis. Helped deepen students' understanding of the material by reviewing lectures and working examples in an individualized setting. Graded for graduate courses in Real and Complex Analysis.

Tutor, Center for Educational Resources and Counseling, 1992-1993.

Tutored Math, Physics, and Engineering.

Texas A & M University

Teaching Assistant, 1985-1988.

Led laboratory sections for courses in Classical Mechanics, Electrodynamics, and Quantum Mechanics. Guided students in collecting and interpreting data, and relating experimental results to theory.

Research Positions

Erwin Schrödinger Institute Vienna, Austria

Visitor, Dec. 2010

Follow-up programme in the $\bar{\partial}$ -Neumann problem

Faculty of Mathematics, University of Vienna, Austria

FWF Postdoc, Fall 2009–present.

Complex Analysis Group

Work in Several Complex Variables, Harmonic Analysis, and Geometry

Erwin Schrödinger Institute Vienna, Austria

Visitor, Fall 2009

Programme in the $\bar{\partial}$ -Neumann problem

Faculty of Mathematics, University of Copenhagen, Denmark.

Visitor, 1995–1996.

Studied Non-Commutative Geometry and Quantum Gravity.

Fields Institute for Mathematical Research, Toronto, Canada.

Graduate Student Fellow, 1994–1995.

Studied Functional Analysis and Operator Algebras. Worked on Schrödinger operator spectra.

Department of Physics, Texas A & M University

Research Assistant, 1985–1988.

Instrument designer and machinist (manual and CNC) for antimatter trapping and cooling project designed to weigh the antiproton. Designed and built machinable glass (macor) and high-purity copper (OFHC) Penning ion traps, helium cryostats, and ultrahigh-vacuum systems and their instrumentation. P.I.: R.A. Kenefick.

Undergraduate Research Assistant, 1984–1985. Built electronic apparatus for detector arrays for Superconducting Supercollider.

Skills

- Extensive experience teaching and mentoring students in Math and Physics
- Solid laboratory experience including instrumentation, machining, instrument design
- Computer Programming (C, Mathematica, Maple) for classroom demonstrations and problem solving in various fields, including image processing, combinatorics, applied statistics, visualization, and animation
- Document preparation in L^AT_EX, Microsoft Office
- Fluent in Spanish and Italian; good reading and fair spoken French; learning German

Publications

- The G -Fredholm property of the $\bar{\partial}$ -Neumann problem. Available at <http://arxiv.org/abs/0711.3870>, *J. Geom. Anal.*, (2009) **19**, 87–106
- The Levi problem on strongly pseudoconvex G -bundles. Available at <http://arxiv.org/pdf/0802.3981>, *Ann. Glob. Anal. Geom.* (2010) **37**, 1–20
- A transversal Fredholm property for the $\bar{\partial}$ -Neumann problem on G -bundles. Available at <http://arxiv.org/pdf/0912.4287v1> to appear in *Contemp. Math.*
- Subelliptic boundary value problems and the G -Fredholm Property. Available at <http://arxiv.org/pdf/0909.1476>
- L^2 -holomorphic extension of boundary values on G -bundles. In preparation.

Meetings–Talks

- Stulken Seminar in Geometry and Analysis Nov. 3, 2010, Rice University, Houston, Texas, Talk: *TBA*
- Several complex variables seminar Oct. 30, 2010, Texas A & M University, College Station, Texas, Talk: *TBA*
- Summer School on Analysis, “Spectral Theory and PDE” Sep. 13–17, 2010 Leibniz Universität, Hannover, Germany
- Seminar, Several Complex Variables group, Universität Wien, Jun. 1, 2010 Talk: *The Transversal Fredholm property and Amenability*
- Paseky Spring School on Harmonic Analysis 2010 May 23–29, 2010
- *Math Oberseminar*, TU–Chemnitz, Apr. 14, 2010 Talk: *Linear PDE on G -manifolds*
- CIRM Meeting, *Le problème du $\bar{\partial}$ -Neumann et l'Analyse spectrale des opérateurs de Hankel*, Talk: *Fredholm Properties of the $\bar{\partial}$ -Neumann problem on G -bundles* Apr. 6–10, 2010
- Math Colloquium, Universität Bern, Mar. 22, 2010, Talk: *Linear partial differential equations on noncompact manifolds with symmetry*
- Seminar, Several Complex Variables group, Universität Wien, Oct. 6, 2009, Talk: *L^2 -holomorphic functions on Grauert tubes of unimodular Lie groups*
- Spectral Theory and Geometric Analysis (meeting in honor of M A Shubin’s 65th birthday) Jul. 29–Aug. 2, 2009
- Several Complex Variables Seminar, Texas A&M University (College Station), Apr. 9, 2009. Talk: *L^2 -holomorphic functions on strongly pseudoconvex G -manifolds*
- South Texas Mathematics Consortium, UTPA, Edinburg, Texas, Saturday, Feb. 21, 2009. Talk: *L^2 -holomorphic functions on G -complexifications of manifolds*
- Departmental Seminar, Texas A & M University - Kingsville, Apr. 18, 2008, Talk: *On Rellich’s lemma in noncompact settings*
- Analysis Seminar, NEU, Dec. 13, 2007, Talk: *On Feynman’s derivation of the Navier-Stokes equation*
- UMass Boston Analysis Seminar, Oct. 29, 2007, Talk: *The G -Fredholm property of the $\bar{\partial}$ -Neumann problem and Paley-Wiener theorems for unimodular groups*
- Analysis Seminar, Montana State University, Apr. 14, 2006, Talk: *The G -Fredholm property and regularity*

Service

- Reviewer for a couple journals.