Faculty Vitae

Name	Department	Date
María Cristina Pereyra	Mathematics and Statistics	October 25, 2008

Educational History

- **Ph.D.:** 1993, Yale University, New Haven, CT, Mathematics.
  Thesis Title: *Sobolev Spaces on Lipschitz Curves. Paraproducts, Inverses and some related operators.*
  Thesis Advisor: Peter W. Jones.
- **M.S.:** 1989, Yale University, New Haven, CT, Mathematics.
- **B.S** 1986, Universidad Central de Venezuela, Licenciado Summa Cum Laude en Matemáticas.

Employment History–principal positions since Bachelor's degree

- Associate Professor, 2001–present, University of New Mexico, Albuquerque, NM.
- Assistant Professor, 1996–2001, University of New Mexico, Albuquerque, NM.
- Instructor, 1993–96, Princeton University, Princeton, NJ.
- Teaching Assistant, 1987–93, Yale University, New Haven, CT.

Employment History–concurrent temporary or visiting appointments

- Visiting Fellow, Fall 2003, Centre de Recerca Matemática, Barcelona, Spain.
- Visiting Fellow, June 1–July 9, 1999, Centre de Recerca Matemática, Barcelona, Spain.
- Visiting Fellow, June 1997, University of Edinburgh, Scottland.
- Visiting Fellow, Summer 1996, Macquarie University at Sydney, Australia.
- Member, Jan-June 1994, Institute for Advanced Study, Princeton, NJ.
- Teaching Assistant, 1987–93, Yale University, New Haven, CT.

Awards and Honors

- Nominated for the UNM 2007-2008 Faculty of Color Awards. Forty faculty of color from programs across UNM's campus were nominated by students, staff, faculty and the community.
- Department of Mathematics and Statistics Outstanding Graduate Professor for academic year 2006-2007.
- Department of Mathematics and Statistics Outstanding Graduate Professor for academic year 2005-2006.
- Member of the Venezuelan team for the International Mathematics Olympiad: in 1981 at Washington, DC, USA; and in 1982 at Budapest, Hungary.

Research

I am a harmonic analyst by education. The themes that most directly relate to my research are dyadic harmonic analysis, operator theory on weighted spaces, and wavelets. In particular, I am interested in the treatment of singular integral operators and the study of function spaces with the aid of some simple dyadic models: Haar multipliers, dyadic square functions, and paraproducts, see the articles [3, 4, 5, 7, 17, 19, 21][1]. Examples of the classical operators include the Hilbert transform and maximal operators [5, 6, 10, 16]. Particularly interesting are the connections that the simple dyadic models have to matrix and operator valued weighted inequalities [6, 17]. The study of optimal operator bounds on weighted L^2-spaces in terms of A_2 or RH_2 characteristics of the underlying weight, has seen an explosion in the last 10 year with the introduction of Bellman function techniques. My contributions here include [18], and [21]; as well as my role as PhD advisor for Oleksandra Beznosova [PhD 2008], [Beznozova, J. Func. Anal. To appear]. A natural question is to find optimal bounds in weighted L^p-spaces, see [16], and my PhD student Darek Panek's dissertation [PhD 2008].

Wavelet theory is on the boundary between Mathematics and Engineering, its applications include data compression, signal denoising, and numerically analyzing differential equations, see [1] a book I wrote on the subject. Decomposing functions into atoms, which are simpler to understand, is the underlying idea of Fourier analysis, the basis of modern harmonic analysis, and also of wavelet theory. The connection to differential operators and the possibility of manufacturing particular wavelets that have properties adapted to them is very interesting. A very fruitfull collaboration with J. Lakey from NMSU to design wavelets useful to engineers and numerical analysts was started in 1997. To support research along these lines we received a SURP Grant from Sandia National Laboratories during the 1997-98 academic year, the grant was renewed for a second year. Much of this work is encompassed in the papers [8, 9, 18, 20] which lay down the theory of divergence-free multiwavelets. These multiwavelets are useful for the study of Navier-Stokes systems [12, 18] (for a layman's account see Quantum, Spring 1999, p.22-25). These multiwavelets have also found applications to statistics to optimal denoising and recovery of derivatives from noisy signals [11, 13, 15].

Teaching

At UNM I have been able to teach a variety of courses ranging from Calculus to advanced undergraduate courses and graduate courses. UNM has offered me a congenial atmosphere for carrying out teaching projects, such as designing a new course on Wavelets, contributing to the effort of the Department to improve the engineering calculus sequence (Calculus Team), and contributing to the success of a new sequence of calculus designed for biology and medical students. I was instrumental in making viable the regular offering of the upper level undergraduate course Advanced Calculus II (now offered every Spring), and the graduate one year course sequence Functional Analysis sequence (offered every other year).

In the Fall 1999, I accepted the challenge of creating and grading the problems for the *New Mexico Math Contest*, a High School competition sponsored by the Department of Mathematics and Statistics for 41 years. I was in charge until Spring 2006, except for the year 2003-2004, when I went on sabatical. This experience has acquainted me with some of the brightest students from all corners of the state.

Since 2000, I have taught every other year *minicourses* at various levels on harmonic analysis and wavelets in different countries and also at UNM. Two books, one already published [1], and another in advanced stages of preparation [21], and a set of published lecture notes [19], are the result of these efforts.

I have two students who received their PhDs in 2008 and both got jobs, and two students who received their MS, one in 2006 the other in 2008. I enjoy teaching and mentoring, and I regard it as a very rewarding component of my career.

Service

In Fall 2006, I became the *Chair of the Graduate Committee* in the Department (a three year commitment). To improve the state of the graduate program, in Spring 2007, we applied for a relatively large (750K) *NSF - Mentoring through Critical Transition Points (MCTP)* grant, with me as a PI, and three of my colleagues as Co-PIs. The grant was awarded as requested. We started a three year cycle of year round activities on Summer 2008, with a five week intensive workshop for undergraduate and first year graduate students. As chair, I reorganized the in-service week, adding a strong academic component: a series of talks introducing a large subset of the Faculty and their research interests, several inspiring lectures, and student warmup evenings (organized by senior graduate students). What we now call the *Academic Warmup* has been running now for three years (August 2006-08).

I organized many conferences and departmental seminars. I have been an organizer from the begining (1998) of the *New Mexico Analysis Seminar* (NMAS), an annual conference alternating between Albuquerque and Las Cruces, that will celebrate in Spring 2009 its 12th anniversary. The NMAS seminar has had uninterrupted *NSF support* since 2000 (I have been the PI of these grants, we are now on the third grant). Additionally I have organized public lectures by famous mathematicians: Prof. Graham (UC San Diego), Prof. Lang (Yale) and Prof. Conway (Princeton).

I served on several departmental commitees: Undergraduate, Graduate, Hiring, Math Contest, Calculus Team. I also served on a Hiring Committee for EECE and CE. I have composed and graded qualifying exams almost every semester.

[1] The numbering for the articles refers to next section

Scholarly achievements

Books Co-authored

1. Martin J. Mohlenkamp, María Cristina Pereyra, *Wavelets, their friends, and what they can do for you,* EMS Series of Lectures in Mathematics, European Mathematical Society Publishing House, ETH-Zentrum FLI C4, CH-8092 Zürich, Switzerland. 110 pages, 2008.

Articles in Refereed Journals

2. M. Cotlar, J. León, M. C. Pereyra. *Eigenfunction expansions of covariance kernels of Hilbert space processes.* Acta Cient. Venezolana 38 # 5-6, p. 563-569 (1987).

3. M. C. Pereyra. *On the resolvents of dyadic paraproducts.* Rev. Mat. Iberoamer. **10** # 3, p. 627-664 (1994).

4. M. C. Pereyra. *On the resolvent of the dyadic paraproduct, and a non linear operation on RH_p weights.* Contemp. Math. **189**, Amer. Math. Soc. p. 461-471 (1995).

5. M. C. Pereyra. *Sobolev spaces on Lipschitz curves.* Pacific J. Math. **172** # 2, p. 553-589 (1996).

6. N. Katz, M. C. Pereyra. *On the two weight problem for the Hilbert transform.* Rev. Mat. Iberoamer. **13** #1, p. 211-243 (1997).

7. M. C. Pereyra, L. Ward. *Paraexponentials, Muckenhoupt weights, and resolvents of paraproducts.* Proc. Amer. Math. Soc. **126** #1, p. 135-144 (1998).

8. J. D. Lakey, P. Massopust, M. C. Pereyra. *Divergence-free multiwavelets.* "Approximation theory IX. Computational aspects", C. K. Chui, L. L. Schumaker eds. Innov. Appl. Math., Vanderbilt University Press, Nashville, TN, **2**, p. 161-168 (1998) (refereed conference proceedings).

9. J. Lakey, M. C. Pereyra. *Multiwavelets on the interval and divergence-free wavelets.* In "Wavelet applications in signal and image processing VII", M. Unser, A. Aldroubi, A. Laine eds., Proc. SPIE **3813**, p. 162-173 (1999) (refereed conference proceedings).

10. M. C. Pereyra, A. M. Vargas. *A note on a maximal function over arbitrary sets of directions.* Bull. London Math. Soc. **32** # 1, p. 71-74 (2000).

11. S. Efromovich, N. Tymes, M. C. Pereyra. *The Application of Multiwavelets to Recovery of Signals.* Computing Science and Statistics, **33** (2000).

12. J. Lakey, S. Obeidat, M. C. Pereyra. *Multiwavelet characterization of function spaces adapted to the Navier-Stokes equations.* Proc. SPIE Vol. 4119, p. 372-383, Wavelet Applications in Signal and Image Processing VIII, Akram Aldroubi; Andrew F. Laine; Michael A. Unser; Eds (2000) (invited paper).

13. T. Berkopec, J. Lakey, M. C. Pereyra, N. Tymes Jr. *Multiwavelets and EP denoising.* Proc. SPIE Vol. 4478, p. 230-241, Wavelets: Applications in Signal and Image Processing IX, Andrew F. Laine; Michael A. Unser; Akram Aldroubi; Eds. (2001) (refereed conference proceedings).

14. Paul F. Hubbard, M. C. Pereyra, Kristin L. Umland, and Thomas P. Caudell. *Three -dimensional audio localization using wavelet-domain convolution,* Proc. SPIE Vol. 5207, p.271-279 Wavelets: Applications in Signal and Image Processing X, Michael A. Unser, Akram Aldroubi, Andrew F. Laine; Eds. (2003) (refereed conference proceedings).

15. S. Efromovich, J. Lakey, N. Tymes, M. C. Pereyra. *Data-driven and optimal denoising of a signal and recovery of its derivative using multiwavelets.* IEEE Transactions on Signal Processing, vol 52, no. 3, p.1-8 (2004).

16. Oliver Dragičević, Loukas Grafakos, M. C. Pereyra, and Stefanie Petermichl. *Extrapolation and sharp norm estimates for classical operators on weighted Lebesgue spaces.* Publ. Mat.**49** p.73-91 (2005).

Articles Appearing in Chapters in Edited Volumes (Peer Reviewed)

17. N. H. Katz, M. C. Pereyra. *Haar multipliers, paraproducts and weighted inequalities.* In "Analysis of Divergence", W. Bray, C. Stanojevic eds., Birkhäuser, Boston, Chapter 10, p. 145-170 (1999) (invited paper).

18. J. Lakey, M. C. Pereyra. *Divergence-free multiwavelets on rectangular domains.* Lecture Notes in Pure and Applied Mathematics Series **212**, "Wavelet Analysis and Multiresolution Methods", edited by Tian-Xiao He. Marcel Decker, Inc. Chapter 9, p. 203-240 (2000) (invited paper).

19. M. C. Pereyra. *Lecture Notes in Dyadic Harmonic Analysis.* In "Second Summer school in analysis and mathematical physics. Topics in analysis: harmonic, complex, nonlinear and quantization," Cuernavaca Morelos, Mexico, June 12-22, 2000. S. Pérez-Esteva, C.Villegas eds. Contemporary Mathematics **289** AMS, Ch. I, p. 1-61 (2001).

20. J. Lakey, M. C. Pereyra. *On the non-existence of certain divergence-free multi-wavelets.* In "Wavelet Transforms and Time-Frequency Signal Analysis", L. Debnath editor. Birkhauser Boston, Vol 2, Chapter 3, p. 41–54 (2003)(invited paper).

Works Accepted for publication

21. M. C. Pereyra. *Haar multipliers meet Bellman functions.* Accepted for publication in Rev. Mat. Iberoamericana (acceptance letter received on October 8, 2008).

Works in Progress

22. María Cristina Pereyra, Lesley Ward, *Harmonic Analysis: from Fourier to Haar.* Book in preparation, so far more than 270 pages. Being considered for publication by the American Mathematical Society.

23. O. Beznosova, D. Panek, M. C. Pereyra. *Weighted L^p-estimates for the dyadic square function on homogeneous spaces: from Bellman functions to sharp Lerner's extrapolation.* In Preparation.

24. D. Panek, M. C. Pereyra. *Optimal estimates for the σ-maximal operator and σ-extrapolation theorems on homogeneous spaces.* In Preparation.

25. O. Beznosova, M. C. Pereyra. *Haar multipliers revisited.* In Preparation.

Other Writings

- **Lecture Notes**
  - *Wavelets, their friends, and what they can do for you,* with Martin Mohlenkamp. Fifty one pages lecture notes used for the short course *From Fourier to Wavelets* at the III Panamerican Advanced Studies Institute in Computational Science and Engineering (PASI III), held at the Universidad Tecnológica de la Mixteca, Huajuapan de León, Oaxaca, México (July 16-21, 2006). This was a revised version of the lecture notes used for the short course *Wavelets and Partial Differential Equations* at the II Panamerican Advanced Studies Institute (PASI II) held at Universidad Autonoma de Honduras, Tegucigalpa, Honduras (June 2004).
  - *Harmonic Analysis: from Fourier to Haar,* with Lesley Ward. Seventy pages lecture notes delivered at the Program for Women in Mathematics held at the Institute for Advanced Studies, Princeton (May 2004).
  - *Lecture notes on wavelets: theory and applications.* Sixty pages lecture notes delivered at the I Panamerican Advanced Studies Institute, held at FAMAF, Facultad de Matemática, Astronomía y Física Universidad Nacional de Córdoba, Córdoba, Argentina (June-July 2002).
- *UNM/PNM Statewide Mathematics Contest*: First and Second Round exams for six years of the Math Contest corresponding to the academic years 1999/00, 2000/01, 2001/02, 2002/03, 2004/05, and 2005/06. Corresponding First and Second Round Solutions (an average of 15 pages per solution set).
- *Parental Leave for Graduate Students.* Document produced in Fall 2007.

Invited or Refereed Abstracts at Professional Meetings

- *Bounds on the norm of the dyadic paraproduct on weighted Lebesgue spaces.* Oleksandra Beznosova (speaker), M. C. Pereyra.
  AMS Meeting # 1032, Albuquerque, NM (Oct 2007). Special Session on Harmonic Analysis and Operator Theory.

- *Sharp Extrapolation Theorems.* M. C. Pereyra.
  VII Joint Meeting AMS-SMM (American Mathematical Society and Sociedad Matemática Mexicana), Zacatecas, México (May 2007). Special Session on Functional and Harmonic Analysis.

- *Haar multipliers revisited.* M. C. Pereyra.
  AMS Meeting # 982, Orlando, Florida (Nov 2002). Special Session on function Spaces, Singular Integrals and Applications to PDEs.

- *Multiwavelets on the interval and divergence-free wavelets on a rectangle.* J. Lakey, M. C. Pereyra (speaker).
  AMS Meeting # 948, University of Texas, Austin (Oct 1999). Special Session on Wavelets and Approximation Theory.

- *Divergence-free multiwavelets.* J. Lakey, M. C. Pereyra (speaker).
  VII Joint Meeting AMS-SMM (American Mathematical Society and Sociedad Matemática Mexicana), Denton, Texas (May 1999). Special Session on Functional Analysis and its Applications.

- *On multiwavelets on the interval.* J. Lakey (speaker), M. C. Pereyra.
  AMS Meeting # 941, University of Illinois, Urbana, IL: Special Session on Wavelet Analysis and Multiresolution Methods, II (March 1999). Special Session on Wavelets Analysis and Multiresolution Methods.

- *On the two-weights problem for the Hilbert transform.* M. C. Pereyra.
  AMS Meeting # 926. Georgia Institute of Technology, Atlanta, Georgia (Oct 1997). Special Session on Harmonic Analysis and its Applications.

- *Paraexponentials, Muckenhoupt weights, and resolvents of dyadic paraproducts.*
  M. C. Pereyra, L. Ward (speaker).
  AMS Meeting # 915, Chattanooga, Tennessee (Oct 1996). Special Session on Conformal Analysis.

- *Haar multiplers.* M. C. Pereyra.
  AMS Meeting # 904, Kent, Ohio (Nov 1995). Special Session on Harmonic Analysis and Applications.

Invited and Contributed Oral Presentations at Professional Meetings

- Invited Speaker at the Special Session in *Harmonic and Functional Analysis* in the joint AMS-SMM in Zacatecas, México (May 2007).

- Invited Speaker at the *21^{t}h Auburn Mini Conference on Harmonic Analysis and Related Areas*, Auburn University, Alabama (November 2006) (Couldn't atttend for personal reasons).

- Contributed talk at the *Sixth Prairie Seminar*, held at University of Kansas, Lawrense, Kansas (October 2006).

- Invited Speaker at *VI Panamerican Workshop in Applied and Computational Mathematics* held at Universidad del Mar, Huatulco, Oaxaca, México (July 23-28, 2006).

- Invited Speaker at *ShowMe Analysis Meeting* 2004 held at University of Missouri-Columbia, Columbia, Missouri (June 3-5, 2004) (couldn't attend due to advanced pregnancy).

- Workshop on *Harmonic Analysis and Partial Differential Equations*, Puerto Vallarta, México (Jun 23-27, 2003).

- Special Session on *Function Spaces, Singular Integrals and Applications to PDEs* at the AMS Southeastern Section Meeting in Orlando, FL (Nov 2002).

- *Wavelets: Applications in Signal and Image Processing*, in the SPIE's 46th Annual Meeting, San Diego, CA (July 2001).
- *Third New Mexico Analysis Seminar*, NMSU, Las Cruces, NM (Feb 2000).
- AMS Meeting # 948, Austin, TX: *Special Session on Wavelets and Approximation Theory* (Oct 1999).
- IV Joint Meeting American Mathematical Society-Sociedad Matemática Mexicana (AMS-SMM), Denton, TX: Special Session on *Wavelets* (May 1999).
- NSF-CBMS Regional Research Conferense on *Wavelet Analysis as a tool for computational and Harmonic Analysis*, Orlando, FL (May 1998).
- *First New Mexico Analysis Seminar*, NMSU, Las Cruces, NM (Feb 1998).
- AMS Regional Meeting # 926, Atlanta, GA: *Special Session on Harmonic Analysis* (Oct 1997).
- *7th International Workshop on Analysis and its Applications*, Maine (Jun 1997).
- AMS Regional Meeting, Kent, OH: *Special Session on Harmonic Analysis and PDE's* (Nov 1995).
- *Conference in honor to Mischa Cotlar*, Caracas, Venezuela (Jan 1994).
- *Conference in honor to Guido Weiss.* Universidad Autónoma de Madrid, Spain (May 1993).

Other Talks

- **Colloquia:** McGill University joint Concordia University, Montreal, Canada (Nov 2007); New Mexico State University, Las Cruces, NM (Sep 2007); Universidad Central de Venezuela (March 2004); Universidad de Sevilla, Spain (Dec 2003); Instituto de Matemáticas, UNAM, Mexico City, México (Mar 2000); Instituto de Matemáticas, UNAM, Unidad Cuernavaca, México (Mar 2000); New Mexico State University, Las Cruces, NM (Feb 1997); MacQuarie University, Sydney, Australia (Aug 1996); University of New Mexico, Albuquerque, NM (Apr 1996); University of Colorado at Colorado Springs, CO (Mar 1996); Yale University, New Haven, CT (Jan 1996); Temple University, Philadelphia, PA (Nov 1995); Lehigh University, PA (May 1994); Wright University, Dayton, OH (Apr 1993).
- **Analysis Seminars:** University of New Mexico, Albuquerque, NM (5 talks in two different seminars, Spring 2006) University of New Mexico, Albuquerque, NM (3 talks, Fall 2005); Institute for Advanced Studies, Princeton, NJ (May 2004); Universidad Autonoma de Madrid, Spain (Dec 2003); Universidad de Valencia, Spain (Dec 2003); Joint Universidad Central de Barcelona, Universidad Autónoma de Barcelona and Centre de Recerca Matemática, Spain (Nov 2003); University of California at Los Angeles (May 2003); University of New Mexico, Albuquerque, NM (4 talks, Fall 2002); Instituto de Matemáticas, UNAM, Ciudad de Mexico (March 2000); University of New Mexico, Albuquerque, NM (Feb 2000); Universitat Autònoma de Barcelona, Spain (Jun 1999); Universidad Autónoma de Madrid, Spain (Jun 1999); University of Missouri at Columbia, MI (Apr 1999); Universidad Central de Venezuela, Caracas, VZLA (Jan 91, Jan 92, Jul 95, Jan 96, Jan 97, Jan 98); University of Edinburgh, Scotland (Jun 1997); University of New Mexico, Albuquerque, NM (Nov 96, Dec 96, Apr 97, May 97); Rice University, Houston, TX (Oct 1996); MacQuarie University, Sydney, Australia (Jul 1996); New South Wales University, Sydney, Australia (Jul 1996); Universitat Central de Barcelona, Spain (Jun 1996); CUNY, New York City, NY (Oct 1995); Brown University, Providence, RI (Sep 1995); University of Colorado at Boulder, CO (Jul 1995); UCLA, Los Angeles, CA (Jun 1995); Princeton University, Princeton, NJ (Oct 1993); University of Texas at Austin, TX (March 1993); Yale University, New Haven, CT (Nov 1992).
- **Other:** Graduate Colloquium at University of New Mexico, Albuquerque, NM (August 2006); Sandia National Labs, Albuquerque, NM (June 1998); Public Lecture at UNM, joint with Prof. Efromovich and Prof. Wofsy as part of the Mathematics Awareness Week, (Apr 1998); Graduate Seminar, UNM, Albuquerque, NM (Feb 1998).

Funding

Proposals Funded

- **Awarded NSF EMSW21-MCTP Grant #0739417**
  - Title: *EMSW21-MCTP Attracting, Motivating and Preparing Mathematics students in the Southwest by building an energetic community.*
  - **P.I.** M. C. Pereyra, **Co-P.I.s** Jens Lorenz, Michael Nakamaye, Monika Nitsche.
  - Starting: 06/15/2008. Ending: 06/14/2011.
  - PP Total costs - $757,346.00
- **Awarded August 2007:** College of Arts and Sciences Faculty Development Fund support in the amount of $2,500 towards the 10th New Mexico Analysis Seminar and *An afternoon in Honor to Mischa Cotlar* held at UNM on October 11-12, 2007.
- **Awarded NSF Grant #DMS-0713888**
  - Title: *New Mexico Analysis Seminars.*
  - **P.I.** M. C. Pereyra, **Co-P.I.s** Tiziana Giorgi (NMSU), J. Lakey (NMSU), Adam Sikora (NMSU), Bob Smits (NMSU).
  - Starting: 09/01/2007. Ending: 08/31/2010.
  - PP Total costs - $25,000.
- **Awarded NSF-CBMS Grant # 0440945**
  - Title: *NSF/CBMS Regional Conference in the Mathematical Sciences,* Nonlinear dispersive and wave equations..
  - **P.I.** J. Lakey (NMSU), **Co-P.I.s** Tiziana Giorgi (NMSU), M. C. Pereyra (UNM), Adam Sikora (NMSU), Bob Smits (NMSU).
  - Starting: 05/01/05. Ending: 04/31/06.
  - PP Total costs - Awd: $31,329.00
- **Awarded NSF Grant #DMS-0431484**
  - Title: *New Mexico Analysis Seminars.*
  - **P.I.** M. C. Pereyra, **Co-P.I.s** Tiziana Giorgi (NMSU), J. Lakey (NMSU), Adam Sikora (NMSU), Bob Smits (NMSU).
  - Starting: 05/01/04. Ending: 04/29/06.
  - PP Total costs - Awd: $15,000.
- **Visitor at CRM:** Local expenses were partially supported by the Centre de Recerca Matematica in Barcelona (Fall 2003).
- **Domestic Travel Grant AWM/NSF:** To participate in the IAS/Park City Mathematics Institute held in Park City, Utah. Grant amount: $1,000 (July 2003).
- **Awarded NSF Grant # 0086986**
  - **Title:** New Mexico Analysis Seminars.
  - **P.I.** María Cristina Pereyra. **Co-P.I.s** Joseph Lakey (NMSU); Josefina Alvarez (NMSU).
  - **Starting:** 01/15/01. **Ending:** 01/15/04.
  - PP Total costs - Awd: $20,941.00
- **AWM-NSF International Travel Grant:** To attend Spring School in Analysis on "Recent Techniques in Harmonic Analysis", Paseky, Czech Republic, May 28-June 3, 2000.
  Amount funded: $1,800.00.

- **SURP Grant # AX-6430, renewal**
  - **Title:** Divergence free multiwavelets in Navier-Stokes systems.
  - **P.I.** M. C. Pereyra, **Co-P.I.** J. Lakey (NMSU).
  - **Funded by:** Sandia National Laboratories.
  - **Starting:** 10/1/98. **Ending:** 9/30/99.
  - PP Total Costs - Awd: $ 35,000.00
- **SURP Grant # AX-6430**
  - **Title:** Divergence free multiwavelets in Navier-Stokes systems.
  - **P.I.** María Cristina Pereyra, **Co-P.I.** Joseph Lakey (NMSU).
  - **Funded by:** Sandia National Laboratories.
  - **Starting:** 10/1/97. **Ending:** 9/30/98.
  - PP Total Costs - Awd: $ 35,000.00
- **EPSRC Visiting Fellowship # GR/160661:** Travel Grant to visit the University of Edinburgh, Scotland (June 1997).

Proposals Not Funded

- **Title:** Collaborative Research: NSF/CBMS Regional Series Conference in the Mathematical Sciences - Bellman functions in Harmonic Analysis. December 15-19, 2008.
  - **P.I.** María Cristina Pereyra, **P.I.** Stephanie Petermichl (Univerity of Texas at Austin, **P.I.** Alex Stokolos (De Paul University).
  - **Sent to:** NSF - Infrastructure Program in Spring 2007.
  - **Requested amount:** $ 1,958 (UNM), $ 33,360 (UT Austin), $ 1,672 (De Paul U.)
- **Title:** Haar multipliers, Bellman functions, and sharp estimates on weighted homogeneous spaces.
  - **P.I.** María Cristina Pereyra.
  - **Sent to:** NSF/DMS Analysis Program in Fall 2006.
  - **Requested amount:** $ 262,865
- **Title:** Solution of Partial Differential Equations on Bounded Domains Using Multiwavelets.
  - **P.I.** María Cristina Pereyra.
  - **Sent to:** NSF/DMS Applied Mathematics in Oct 1999.
  - **Requested amount:** $ 81,132.00
- **Title:** Chips and Salsa Project: A Mechanism for Hands-on Education.
  - **P.I.s** L. Howard Pollard (EECE-UNM), Ramiro Jordán (EECE-UNM).
  - **Co-P.I.s** Mark Salisbury (College of Education-UNM), Jan L. Plass (College of Education-UNM), María Cristina Pereyra.
  - **Sent to:** SMET/NSF Division of Undergraduate Education in Oct 1997.
  - **Requested amount:** $ 194,423.00
- **Title:** Haar Multipliers and Paraproducts.
  - **P.I.** María Cristina Pereyra.
  - **Sent to:** NSF/DMS Analysis Program in Dec 1996.
  - **Requested amount:** $ 63,770.00

Teaching

Doctoral Advisement at UNM

- **Oleksandra Beznosova** (PhD May 2008)
  Dissertation: *Bellman functions, Paraproducts, Haar Multipliers and Weighted Inequalities.*
  Currently Postdoc at University of Missouri, Columbia.
- **Dariuz Panek** (PhD December 2008)
  Dissertation: *On Sharp Extrapolation Theorems.*
  Currently Visiting Assistant Professor at University of Ohio, Athens.
- Dae-Won Chung (expected PhD Spring 2010).

Masters Advisement at UNM

- **Bernadette Mendoza-Spencer** (MS May 2006)
  Thesis: *The continuous and discrete Hilbert transform.* Co-advised with P. Embid.
- **Kourosh Raeen** (MS Summer 2008)
  Thesis: *Gibbs' Phenomenon in Wavelets and Fourier Analysis.*

Teaching at UNM

- **Classroom Teaching:**
  - 2008, Fall, Math 605: Teaching Seminar and Graduate Colloquium; 15 students.
  - 2008, Fall, Math 327: Discrete Mathematical Structures; 21 students.
  - 2008, Fall, Math 180: Calculus I for Biology and BA/MD; 36 students.
  - 2008, Spring, Math 565: Harmonic Analysis, 9 students; ICES med 5.7.
  - 2007, Fall, Math 472/572: Fourier Analysis and Wavelets; 13 students; ICES med 6.0.
  - 2007, Fall, Math 563: Measure Theory; 12 students; ICES med 5.7.
  - 2007, Spring, Math 402/502: Advanced Calculus II; 14 students; ICES med 5.7/6.0
  - 2006, Fall, Math 401/501: Advanced Calculus I; 37 students; ICES med 5.6.
  - 2006, Fall, Math 563: Measure Theory; 9 students; ICES med 6.0.
  - 2006, Spring, Math 511: Real Analysis II; 11 students; ICES med 5.5.
  - 2005, Fall, Math Math 510: Real Analysis I; 16 students; ICES med 5.6.
  - 2005, Fall, Math 311: Vector Calculus; 19 students; ICES med 5.0.
  - 2005, Spring, Math 565: Harmonic Analysis, 6 students; ICES med 5.6.
  - 2004, Fall, Maternity leave.
  - 2004, Spring, Sabatical leave.
  - 2003, Fall, Sabatical leave.
  - 2003, Spring, Math 562: Complex Analysis II; 7 students; ICES med 5.5.
  - 2002, Fall, Math 561: Complex Analysis I; 13 students; ICES med 5.5,
  - 2002, Fall, Math 163: Calculus II; 31 students; ICES med 5.3.
  - 2002, Spring, Math 362/551/579: Advanced Calulus II; 12 students; ICES med 5.5.
  - 2001, Fall, Math 361/461: Advanced Calulus I; 26 students ICES med 5.5/5.6.
  - 2001, Fall, Math 472/572: Fourier Analysis and Wavelets; 11 students; ICES med 6.0.
  - 2001, Spring, Maternity leave.
  - 2000, Fall, Math 264: Calculus III; 62 students; ICES med 5.2.

- 2000, Spring, Math 163: Calculus II; 24 students; ICES med 5.5.
- 1999, Fall, Math 162: Calculus I; 44 students; ICES med 5.1.
- 1999, Fall, Math 563: Measure Theory; 8 students; ICES med 5.5.
- 1999, Spring, Math 582: Functional Analysis II; 7 students; ICES med 5.7.
- 1999, Spring, Math 163: Calculus II; 35 students; ICES med 5.6.
- 1998, Fall, Math 581: Functional Analysis I; 14 students; ICES med 5.7.
- 1998, Fall, Math 579/436: Introduction to wavelets; 13 students; ICES med 5.5.
- 1998, Spring, Math 162: Calculus I; 45 students; ICES med 5.5.
- 1998, Spring, Math 565: Introduction to Harmonic Analysis; 5 students; ICES med 6.0.
- 1997, Fall, Math 180: Elements of Calculus; 60 students; ICES med 5.0.
- 1997, Fall, Math 579/436: Introduction to Wavelets; 7 students (at Los Alamos Campus); ICES med 5.3.
- 1997, Fall, Math 679: Seminar in Applied Mathematics; 4 students;.
- 1997, Spring, Math 579/436: Wavelets and Fourier Analysis, 16 students; ICES med 5.6.
- 1997, Spring, Math 461/361: Advanced calculus; 22 students; ICES med 5.6.
- 1996, Fall, Math 327: Discrete Mathematical Structures; 25 students; ICES med 5.0.
- 1996, Fall, Math 163: Calculus II; 40 students; ICES med 5.2.

- **Math 650 - Reading and Research:** I have done this since Fall 1997, almost every semester (except when on sabatical) for at least one graduate student per semester.

- **Math 499 - Undergraduate Individual Study:**
  - Mathew A. Buicam (Spring 2000),
  - Elena A. Pliss (EECE, Summer 2002 - Wavelets),
  - Jason Brown and Bob Cordwel (Fall 2002, Math 431 - topology).

- **PhD Dissertation Committees:**
  - Adam Ringler, PhD in Mathematics (Fall 2008),
  - Darek Panek, PhD in Mathematics (Chair, August 2008),
  - Jessica Deshler, PhD in Math Education (Summer 2008),
  - Oksana Guba, PhD in Mathematics (Spring 2008),
  - Oleksandra Beznosoba, PhD in Mathematics (Chair, Spring 2008),
  - Zhaoxian Zhou, PhD in Engineering (Spring 2005),
  - Juan Gaspar Vargas-Rubio, PhD in Engineering (Summer 2004),
  - Nate Tymes, PhD in Statistics (Spring 2002),
  - Lyudmilla Sakhanenko, PhD in Statistics (Spring 2002),
  - Dmitriy Panchenko, PhD in Mathematics (Spring 2002),
  - Martha Monteiro, PhD in Mathematics (Aug 2000).

- **MS Thesis Committees:**
  - Kourosh Raeen, MS in Mathematics (Chair, Summer 2008),
  - Daishu Komagata, MS in Applied Mathematics (Summer 2007),
  - Christin Gunning, MS in Applied Mathematics (Summer 2007),
  - Pablo Delgado, MS in Math Education (Spring 2007),
  - Lakshmikanth Reddy Sripuram, MS in ECE (Spring 2007),
  - David Worth, MS in Mathematics (Fall 2006),
  - Bernadette Mendoza-Spencer, MS in Mathematics (Chair, Spring 2006),
  - Bobbi Page, MS in Mathematics (Spring 2006),
  - Vibhor Gautam, MS in Mathematics (Summer 2005).

Other Teaching

- **New Mexico Math Contest:** In the Fall 1999, I accepted the challenge of creating and grading the problems for the *New Mexico Math Contest*, a High School competition that the Department of Mathematics and Statistics has sponsored for 41 years. I inherited the New Mexico Math Contest from Prof. Hahn who retired after 10 years of being solely responsible of creating and grading beautiful problems for the contest. It was a big challenge to keep up to the standards laid down by Prof. Hahn, and I believe I did not dissapoint him. I was in charge until Spring 2006, except for the year 2003-2004, when I went on sabatical and my colleague Michael Nakamaye took over. I stepped down when, in 2006, I became Chair of the Graduate Committee in the Department, but made sure the contest remained in capable hands.

  The contest in the first round gathers around 1400 participants from all over New Mexico, 250 students are invited for the second round, and after a lengthy and careful grading of their papers winners are selected from 8th grade up to 12th grade. I believe this is one way we can help improve the mathematics education in New Mexico. We are trying to encourage all schools to create Math Clubs, and to become enthusiastic about mathematics. The Math Contest seems to be a good vehicle to channel some of that enthusiasm. See attached documentation: exams, solutions, list of winners, etc. More information about the Contest can be accessed at: http://www.math.unm.edu/math_contest/contest.html

- **Minicourses Taught:** Since 2000, I have taught a week-long minicourse every other year, in different countries.

  1. Five six hour sessions on: *Fourier Analysis and Wavelets* at the NSF sponsored MCTP 2008 Summer Program held at the University of New Mexico, Albuquerque, NM (July 7-August 8, 2008).
  2. Five two hour lectures on: *From Fourier to Wavelets* at the III Panamerican Advanced Studies Institute in Computational Science and Engineering (PASI), held at the Universidad Tecnológica de la Mixteca, Huajuapan de León, Oaxaca, México (July 16-21, 2006).
  3. Five lectures on: *Harmonic Analysis: from Fourier to Haar,* at the Program for Women in Mathematics: Analysis and PDE's, at the Institute for Advanced Studies in Princeton, NJ (May 17-28, 2004).
  4. Five lectures on *Wavelets: Theory and applications* at I Panamerican Advanced Studies Institute, held at FAMAF, Facultad de Matemática, Astronomía y Física Universidad Nacional de Córdoba, Córdoba, Argentina (June-July 2002).
  5. Six lectures on *Singular integrals and Haar functions* at the Summer School on Analysis, Instituto de Matemática, Unidad Cuernavaca, UNAM, México (June 2000). Attended by roughly 40 students (advanced undergraduates and graduates) and professors from all over Mexico. Lecture notes were published by Contemporary Mathematics **289** AMS, Ch. I, p. 1-61 (2001).

- **Minicourses Scheduled in the Future:**

  1. Five six hour sessions on: *Fourier Analysis and Wavelets* at the NSF sponsored MCTP Summer Program to be held in June 2009 at the University of New Mexico, Albuquerque, NM.
  2. A week long minicourse on *Dyadic Harmonic Analysis*, in the "Cursos de de Análisis Matemático en Andalucía" to be held in Cádiz, Spain (September 2009).
  3. Five six hour sessions on: *Fourier Analysis and Wavelets* at the NSF sponsored MCTP Summer Program to be held in June 2010 at the University of New Mexico, Albuquerque, NM.

- **Teaching at Princeton University:**

  Taught Basic Calculus, Multivariable Calculus, Linear Algebra (1993-96).

- **Teaching Fellow, at Yale University:**

  Taught Single Variable Calculus, Several Variable Calculus. In charge of several problem sessions, grading and tutoring assignments (1987-92).

Curriculum Development and Teaching Administrative Positions

- I designed and taught a new course entitled *Introduction to Wavelets*. The course was received with enthusiasm by students from Engineering, Mathematics, Physics and other Sciences, as well as researchers from the labs. The success of the class gave impetus to redesign the existing course on Fourier Series and Integrals (that had not been taught in many years). The new course is called *Fourier Analysis and Wavelets* and it is now a staple of our curriculum. It has been taught at least once every two years by me or other professors.

- In 1999, I joined the *Calculus Team*, with Prof. Kapitula and Prof. Nitsche. The Calculus Team was created in an effort to improve the Calculus sequence taken mostly by engineers, and students who are planning to major in Mathematics, Physics or Computer Science. We coordinated the courses, prepared common handouts and mantained a webpage where all the handouts were posted (syllabus, homeworks, review material and exams and their solutions, etc) We selected a new textbook and designed new sillabi which we started using on Fall 2000. Since then Prof. Nitsche has coordinated the Calculus sequence with an iron hand.

- In Fall 2008, I was drafted into teaching a *Calculus for Biology and Medical students*. This is part of a concerted effort orchestrated (BA/MD Program) at the higher levels of the university to provide a very structured academic atmosphere to these students: they live on campus, they take all their classes together, and the cohort moves semester by semester together. The Department's commitment with this effort is to provide the mathematical expertise, and ensure that regular tenure/tenure track faculty teach this specially designed calculus sequence, as opposed to part timers, graduate students or even lecturers. The course emphasizes discrete dynamical systems, simple differential equations, and introduces the students to some probabilistic and statistical ideas.

- In August 2006, I became the *Chair of the Graduate Committee*. The main responsibility attached to this job is to oversee the academic progress of the graduate students in the Mathematics and Statistics Department, specially the Teaching and Research Assistants. It involves overseeing the recruitment and admission of new students to the program, as well as asignment of teaching assistantships. It involves advising the new students until one finds a suitable academic advisor for them. It involves overseeing the production and timely grading of qualifying exams, presentation of progress reports to the faculty, and timely communication of results to the students. It involves tightly monitoring the teaching assistants academic progress, as well as mentoring them on their newly adquired teaching responsibilities. The job also involves identifying and nominating students for university wide teaching awards various University and College Arts and Sciences awards, as well as Summer Efroymson awards for our students.

  Among the many duties a graduate chair has, I decided that seeking outside sources of money to improve the state of the graduate program should be one of them. Consequently, in Spring 2007, we applied for a relatively large (750K) *NSF - Mentoring through Critical Transition Points (MCTP)* grant, with me as a PI, and three of my colleagues as Co-PIs. The grant was awarded as requested. We started a three year cycle of year round activities on Summer 2008, with a five week intensive workshop for undergraduate and first year graduate students. The grant includes funds for two Graduate Trainee awards, as well as funds for Undergraduate research Projects.

  In August 2006, I reorganized the in-service week, adding a strong academic component: a series of talks introducing a large subset of the Faculty and their research interests, several inspiring lectures, and student warmup evenings (organized by senior graduate students). What we now call the *Academic Warmup* has been running for three years (August 2006-08).

  I have also encouraged the graduate students to run the *Graduate Colloquium* every semester, and in Fall 2008, I am also responsible, with Prof. Kristin Umland, for the *Teaching Seminar* that alternates every week with the Graduate Colloquium. This seminar is offered to support the new graduate students in their new role as teachers, both this and the graduate colloquium are meant to help build a healthy community around mathematics.

Service

- **Service to the Mathematical Community**
  - **NSF Panel Member** (Sep 2008).
  - **Reviewer/Referee/Editor:**
    - Editor/referee for the African Diaspora Journal of Mathematics.
    - Referee for Illinois Journal of Mathematics, Indiana University Mathematics Journal, Rev. Mat. Iberoamericana, the Journal of Fourier Analysis and Applications. the Rocky Mountain Journal.
    - Reviewer for Mathematical Reviews.
    - Reviewer for the book *Time-Frequency and Time-Scale Methods* by Jeffrey Hogan and Joseph Lakey. Birkhäuser Series on Applied and Numerical Harmonic Analysis, 2005.
    - Reviewer for book *Classical and Modern Harmonic Analysis* by Loukas Grafakos. Prentice Hall, 2003.
  - **Outside Reviewer for Tenure and Promotion cases**
    Midtenure Review for Stephanie Salomone, University of Portland (2008).
    Tenure an Promotion to Associate Professor for Tomasz Hrycak, Wichita State University (2004).
  - **External Reviewer:** for an internal grant on Targeted Excellence Proposal *Interdisciplinary Interactions in mathematics* presented by the Department of Mathematics from Kansas State University, (2004).
  - **Invited Participant:** to the workshop *Diversity in the Mathematics and Scientific Community* at the BANFF International Research Station for Mathematical Innovation and Discovery, held July 27-29, 2007.

- **Conferences Organized or to be Organized:**
  - *Twelveth New Mexico Analysis Seminar* (joint NMSU/UNM) at Albuquerque, NM, April 22-24, 2009 (sponsored by NSF). Invited Speaker: Loukas Grafakos (University of Missouri at Columbia). (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).
  - *Eleventh New Mexico Analysis Seminar* (joint NMSU/UNM) at Las Cruces, NM, April 4-6, 2008 (sponsored by NSF). Main Speaker: María-Carme Calderer (University of Minnesota). Other Speakers: 13. (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).
  - Co-organizer with Wilfredo Urbina of four Special Sessions on *Harmonic Analysis and Operator Theory* in the AMS Regional Meeting # 1032 held in Albuquerque, October 13-14, 2007. Total Number of Speakers: 24.
  - Co-organizer with Wilfredo Urbina of an *Afternoon in Honor to Mischa Cotlar*, on October 12, 2007. Invited Speakers: Carlos Berenstein (University of Maryland), Carlos Kenig (Chicago University) Cora Sadosky (Howard University), and Serguei Treil (Brown University). More than 100 participants.
  - *Tenth New Mexico Analysis Seminar* (joint NMSU/UNM) at Albuquerque, NM, October 11-12, 2004 (sponsored by NSF). Main Speakers: Rodrigo Bañuelos (Purdue University) and Andrea Nahmod (University of Massachusetts, Amherst). Two other invited speakers: Rodolfo Torres (Unviersity of Kansas) and Oliver Dragicevic (Lyuvlana University, Slovenia). More than 100 participants. Short talks by 60 of our participants were delivered in the AMS meeting. (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).
  - *Ninth New Mexico Analysis Seminar* (joint NMSU/UNM) at Albuquerque, NM, April 6-8, 2006 (sponsored by NSF). Main Speaker: Tatiana Toro (University of Washington). Other Speakers: 12. More than 50 participants. (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).
  - Co-organizer of the NSF/CBMS Regional Conference in the Mathematical Sciences, *Nonlinear dispersive and wave equations.* Featured Speaker Field Medalist Terence Tao (UCLA). June 13-17, 2005, at Las Cruces, NM. (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).

- *Eigth New Mexico Analysis Seminar* (joint NMSU/UNM) at Las Cruces, NM, June 12, 2005 (sponsored by NSF). Main Speaker: Jorge Aarao (McKeena College, Claremont, CA), delivered lectures on preparation for Tao's lectures. Other Speaker: 8. More than 50 participants. (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).
- Co-organizer with Marianne Korten and Charles N. Moore of four Special Sessions on *Regularity in PDEs and Harmonic Analysis* in the AMS Regional Meeting # 1000 held in Albuquerque, October 16-17, 2004. Total Number of Speakers: 24.
- Departmental contact for organization of Southwestern Sectional AMS meeting 1000, held at UNM, Albuquerque, NM, October 16-17, 2004. This was the largest such meeting ever.
- *Seventh New Mexico Analysis Seminar* (joint NMSU/UNM) at Albuquerque, NM, October 13-14, 2004 (sponsored by NSF). Main Speakers: Patricia Bauman (Purdue University) and Luca Capogna (University of Arkansas). Four other invited speakers: Peter Sternberg (Indiana University), Lia Bronsard (McMaster Univeristy, Canada), Donatella Danielli (Purdue University), Scott Pauls (Dartmouth College). Over 90 participants. (with T. Giorgi (NMSU), J. Lakey (NMSU), A. Sikora (NMSU), R. Smits (NMSU)).
- *Sixth New Mexico Analysis Seminar* (joint NMSU/UNM) at Albuquerque, NM, March 6-8, 2003 (sponsored by NSF). Main Speaker: Jill Pipher (Brown University). Other Speakers: 28. More than 60 participants. (with J. Alvarez (NMSU) and J. Lakey (NMSU)).
- *Fifth New Mexico Analysis Seminar* (joint NMSU/UNM) at Las Cruces, NM, Feb 21-23, 2002 (sponsored by NSF). Main Speaker: John Benedetto (University of Maryland). Other Speakers: 20. More than 55 participants. (with J. Alvarez (NMSU) and J. Lakey (NMSU)).
- *Fourth New Mexico Analysis Seminar* (joint NMSU/UNM) at Albuquerque, NM, March 1-3, 2001 (sponsored by NSF). Main Speaker: Steve Hofmann (University of Missouri, Columbia). Other Speakers: 22 . More than 50 participants. (with J. Alvarez (NMSU) and J. Lakey (NMSU)).
- *Third New Mexico Analysis Seminar* (joint NMSU/UNM) at NMSU, Las Cruces, NM, Feb 24-26, 2000 (with J. Alvarez (NMSU) and J. Lakey (NMSU)).
- *Second New Mexico Analysis Seminar* (joint NMSU/UNM) at UNM, Albuquerque, NM, Feb 25-27, 1999 (with Vladimir Koltchiinski (UNM), J. Alvarez (NMSU) and J. Lakey (NMSU)).
- *First New Mexico Analysis Seminar* (joint NMSU/UNM) at NMSU, Las Cruces, NM, Feb 27-28, 1998 (with J. Alvarez (NMSU) and J. Lakey (NMSU)).
- Four Special Sessions in *Harmonic Analysis* in the AMS Regional Meeting # 928 held in Albuquerque, Nov 8-9, 1997 (with Jay Epperson (UNM)).

- **Public Lectures Organized at UNM:**
  - *Elliptic Curves,* by Bjorn Poonen (University of California at Berkeley). Lecture for the participants in the XXXVIII New Mexico Math Contest, UNM, Feb 4, 2006.
  - *Mathematics and computers: problems and prospects,* by Ron Graham (University of California at San Diego). Lecture for the participants in the XXXV New Mexico Math Contest, UNM, Feb 5, 2003.
  - *Spherical harmonics and qubits: old and new computations in invariant theory,* by Roger Howe (Yale University). Colloquium UNM, Feb 1st, 2002.
  - *Mirrors and reflections - Symmetry from several viewpoints,* by Roger Howe (Yale University). Lecture for the participants in the XXXIV New Mexico Math Contest, UNM, Feb 2, 2002.
  - *Periods and L-functions,* by Fernando Rodríguez-Villegas (University of Texas at Austin). Colloquium UNM, Feb 2, 2001.
  - *Lattice polygons: What's 12 got to do with it?* by Fernando Rodríguez-Villegas (University of Texas at Austin). Lecture for the participants in the XXXIII New Mexico Math Contest, UNM, Feb 3, 2001.
  - *Zeta functions and theta functions from the heat kernel,* by Prof. Serge Lang (Yale University). Colloquium UNM, Feb 4, 2000.
  - *The abc polynomial theorem and the abc conjecture,* by Prof. Serge Lang (Yale University). Lecture for the participants in the XXXII New Mexico Math Contest, UNM, Feb 5, 2000.

- *Symmetries,* by Prof. John Conway (Princeton University). Colloquium UNM, Feb 5, 1999.
- *Tangles, Bangles and Knots,* by Prof. John Conway (Princeton University). Lecture for the participants in the XXXI New Mexico Math Contest, UNM, Feb 6, 1999.

- **Seminars Organized at UNM:**
  - Analysis Seminar (Spring 2007 and Fall 2007)
  - Harmonic Analysis and Martingales (Fall 2005, Spring 2006).
  - Harmonic Analysis and PDEs (Fall 2005, Fall 2006, Spring 2008).
  - Navier-Stokes Seminar (Fall 2002).
  - Functional Analysis Seminar (Spring 1999).
  - Wavelets Seminar (Fall 1997, Spring 1998).
  - Analysis Seminar (Fall 1996, Spring 1997, Fall 1997).

- **University Service:**
  - Member of a Hiring Committee for a position in ECE (Fall 07-Spring 2008).
  - Member Computer Engineering Hiring Committee (Spring 2000).

- **Departmental Service:**
  - Chair of the Graduate Committee (Fall 2006, 2007, 2008).
  - Member Hiring committee for the replacement position for Donna George (Coordinator, Student advising) (Spring 2008).
  - Chair Hiring Committee for Pure Mathematics positions (Fall 2006, Spring 2007).
  - Hiring Committee for Pure Mathematics position (Fall 2004-Spring 2005).
  - Hiring Committee for Visiting Position (Spring 2005).
  - Hiring Committee for Applied Analysis position (Fall 2001-Spring 2002).
  - Calculus Team with Todd Kapitula and Monika Nitsche (Fall 1999, Spring 2000).
  - Math Contest Committee with Cathy Gosler (Fall 1999-Spring 2006, excluding Fall 2003-Spring 2004 while on sabatical). Information about the contest can be found online at:
    http://www.math.unm.edu/math_contest/contest.html
  - Hiring Commitee for an Applied Analysis position (Fall 1999-Spring 2000).
  - Hiring Committee for two lecturer positions (Fall 1999).
  - Graduate Committee (Fall 1998, Spring 1999, Fall 1999, Spring 2000, Fall 2000, Spring 2005, Fall 2005, Spring 2006, Chair since Fall 2006).
  - Undergraduate Committee (Spring 1997, Fall 1997, Spring 1998).
  - Member of the subcommittee responsible for writting and grading the *Real Analysis Qualifying Exam* (Spring 1998, Fall 1998, Spring 1999, Fall 1999, Spring 2000, Fall 2000, Fall 2001, Spring 2002, Spring 2005, Fall 2005, Spring 2006, Spring 2007, Fall 2007, Fall 2008).
  - Member of the subcommittee responsible for writting and grading the *Complex Analysis Qualifying Exam* (Spring 2003).

- **Professional Memberships:** American Mathematical Society (AMS), Association for Women in Mathematics (AWM), Mathematical Association of America (MAA).

- **Service to the Community**
  - Volunteer to be a role model at the Hispanic Heroes session in the Hispanic Youth Symposium held at University of New Mexico on July 10, 2008.
  - Referee for AISO (Soccer League), U6-7 (2006-07, 2007-08).
  - Volunteer at Montevista Elementary School: once or twice a month in my son's kindergarden class (2006-07).