

Maria Helena Noronha

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Professional Preparation

Postdoctoral studies: University of California:

Santa Barbara: June - December, 1986

San Diego: January - June, 1987

Education Universidade Estadual de Campinas (UNICAMP), São Paulo, Brazil.

Ph.D.: Mathematics - 1983, *Manifolds with pure curvature operator*.

Supervised by Professor Francesco Mercuri.

M.A. Mathematics - 1977, *A generalised Whitney theorem*.

Supervised by Professor Jose Carlos Kiihl.

B.A. Mathematics - 1975.

Special training in the field of education: Courses in Psychology and Didactics as part of the requirements for Single Credential in Mathematics.

Academic/Professional Appointments

- August 2012 - present: Interim Associate Vice President for Graduate Studies, Research, and International Programs at California State University Northridge.
- 2009- 2011 Program Director at the Division of Mathematical Sciences (DMS) National Science Foundation.
- 2006-2008: Chair of the Department of Mathematics California State University, Northridge.
- 2000-2002 Program Director at the Division of Mathematical Sciences (DMS) National Science Foundation.
- 1997-present Professor at California State University Northridge.
- 1990 to 1997 Assistant & Associate Professor California State University Northridge.
- 1989 to 1990 Visiting Researcher at University of California Los Angeles.
- 1983 to 1989 Assistant & Associate Professor at UNICAMP - Brazil.

Main accomplishments as Department Chair

- Approved a new policy for Retention, Tenure, and Promotion.
- Reduced the teaching load of probationary faculty.
- Reduced the teaching load of faculty working on special projects with students and research.
- Created Teaching Assistant and Graduate Assistant positions. The TAs teach College Algebra and Introduction to Statistics, while GAs assist instructors in upper division courses and in large sections.
- Offered Professional Development Programs for Graduate Students.
- Redesigned the Undergraduate Curriculum and created a new option in Applied Mathematical Sciences.
- Created the Mathematics Tutoring Center that includes tutoring for upper division courses by graduate students.
- Facilitated the creation and implementation of hybrid and online classes.

Award: 2009 Service Award from the College of Science and Mathematics, in recognition of outstanding contribution to the Department of Mathematics and the College.

Program Director responsibilities at the National Science Foundation

- During the 2009-2011 term I managed the following programs: Geometric Analysis and Topology, Infrastructure, NSF Post-doctoral Fellowship in Mathematical Sciences, Mentoring through Critical Transition Points, and Unsolicited Workforce proposals.
- During the 2000-2002 term I managed the following programs: Geometric Analysis, Topology, and Foundations and the VIGRE program (Vertical Integration of Graduate Research and Education).
- Activities included reviewing proposals and making funding decisions, managing large budgets, site visits and assessing educational programs, as well as outreach activities.

Other contributions to the University, Community, and Profession

California State University Northridge

- *CSUN's involvement in the SCALE project*, 2004-2009
SCALE is a Mathematics and Science Partnership funded by NSF that was led by the University of Wisconsin in partnership with Los Angeles Unified School District. SCALE leaders worked with universities of the CSU system in the Los Angeles area to establish a coherent and cohesive model of professional development for in-service teachers to better serve such a large school district. I initiated CSUN's involvement in the project and coordinated the activities in the department of mathematics.
- *Graduate Committee:* 1998 - 2000 and 2004 - 2006.
- *Graduate Advisor:* 1998 - 2000 and 2004 - 2006.
- *Hiring Committees,* 1996/1997, 1997/1998, 2002/2003, and 2004/2005 searches.

- *Assessment Liaisons Committee*: 1998 - 2000.
- *Chair of the Departmental Outcomes Assessment Committee*: 1996 - 1998
- *Readers' coordinator of the Department of Mathematics*: 1992 - 1998.
- *Library Committee*: 1994 - 1997.
- *Member of the Faculty Senate*: 1991-1993.

State University of Campinas (UNICAMP), Brazil

- *Coordinator of a "Vestibular" Branch*

Vestibular is the name of the exam that Brazilian students need to pass to be admitted to a university in Brazil. UNICAMP has its own entrance examination to select talented students from thousands of applicants across the country, since it is undoubtedly one of the top three universities in Brazil. All UNICAMP branches for this exam are coordinated by UNICAMP faculty. As a UNICAMP associate professor, I was an associate coordinator for two years (1984 and 1985) and a branch coordinator for the years 1988 and 1989 (the year I moved permanently to the USA).

Besides the academic work, my duties included managing and supervising all faculty and non-academic staff involved in the preparation and implementation of the exams, including hiring, training and scheduling.

- *Representative of the Assistant Professors in the Institute Council and of the Associated Professors in the Department Council*

UNICAMP has councils of faculty members at the Department and at the Institute (equivalent to a small college in the U.S. system) levels, presided by the chair and the dean, respectively. These councils constitute the decision-making body of the departments and of the institutes; important issues such as curriculum, hiring, and promotion are discussed and voted on in the councils. Twice I was elected by my peers to represent them in these councils.

Other Professional Activities

- Reviewer for the *Mathematical Reviews*, March 1989 - present.
- Reviewer for the *National Science Foundation*, June 1991 - present.
- Reviewer for the *Zentralblatt für Mathematik*: January 1998 - present.
- External member of NSF site-visit teams.
- Referred expository papers for the *Mathematical Association of America Monthly journal*.
- Referred expository papers for the *Notices of the American Mathematical Society*
- Referred research papers for the *Journal of Differential Geometry* and the *Geometriae Dedicata*.

Grants

- *NSF- Mentoring through Critical Transition Points (MCTP)*: 2005- present. **\$1, 833, 115**.
Our project is titled *PUMP: Preparing Undergraduates through Mentoring towards Ph.D.s*. <http://www.csun.edu/mathgs/pump/index.html>
Co-PIs: Alberto Candel, Rabia Djellouli, Werner Horn. The project has involved 16 faculty members from the Math Department and its main goal is to increase the number of underrepresented minority students from our department and our region who enter Ph.D. programs in the Mathematical Sciences, as well as to improve the quality of mathematical education provided to them prior to the Ph.D. program.
I stepped down as a PUMP-PI in August 2009 due to my NSF appointment.
- *NSF-Graduate Teaching Fellows in K-12 Education (GK-12)*. 2005-2009. **\$1, 650, 000**.
Our project is titled *FERMAT: Fellows Engaged as Resources in Mathematics to Assist Teachers*. <http://www.csun.edu/mathgs/fermat/>
Co-PIs: Jim Castro, Werner Horn, and Gloria Morrison.
The GK-12 program supports graduate students in mathematics with a fellowship to serve in K-12 schools as resources for teachers. The project involved 13 faculty members from the math department, two faculty from the Secondary Education Department, math teachers, math coaches, and two National Board Certified teachers.
- *NSF-Robert Noyce Scholarship Program*. 2007- present. **\$499, 940**.
<http://www.csun.edu/math/noyce/> Co-PIs: Kellie Evans (Math Department), Gerry Simila (Geology Department), and Virginia Vandergon (Biology Department).
This grant offers scholarships to students that are preparing to be secondary teachers. I also stepped down in August 2009 due to my NSF appointment.
- *NSF-IRES: International Research Experiences for Students*. 2006-2009. **\$96, 225**.
<http://www.csun.edu/math/ires/> This program fostered interactions between American and Brazilian students, by providing students with meaningful experiences in mathematical research. It took place in Brazilian Universities.
- *NSF-International Research Experiences for Undergraduates, a US-Brazil Collaboration*. 2003 - 2005 **\$64, 156**.
<http://www.csun.edu/math/ires/reu.html> This project worked as a pilot for the IRES project described above.
- *NSF-Bridges to Doctorate Program* 2011-2013 **\$972, 000**.
<http://www.csun.edu/math/bridgestothedoctorate.html> Co-PIs: Cristina Cadavid (Physics Department), Kathleen Marsaglia (Geology Department), Karla Pelletier (College of Engineering and Computer Science).
This grant offers scholarships to students from the under-represented groups that want to pursue PhD in STEM disciplines. It is funded as supplement to the Louis Stokes Alliance for Minority Participation (LSAMP) program.
<http://www.csun.edu/math/bridgestothedoctorate.html>

- *Enhancing the Teacher Workforce* funded by Medtronic Foundation. 2005-2006. \$20,796. This was professional development program for in-service middle school teachers.

Teaching Experience

Undergraduate:

- Introductory and advanced courses in Calculus, Algebra, Analysis, Geometry and Topology, Elementary Statistics for GE students and courses for prospective Elementary and High School Teachers.
- In Spring of 1997 I started working closely to undergraduate students from the secondary teaching option and with high school teachers working towards their credential. I wrote notes for these courses and subsequently a textbook on undergraduate geometry, directed primarily to prospective high school teachers.
- The projects *Euclidean and non-Euclidean geometries, Developmental and Applications* (Fall 99), *Learning and communicating geometry through visual thinking and reasoning* (Fall 2002), and *Geometry and Pedagogical Content* (Fall 2003) were funded by the Judge Julian Beck endowment. Through these projects I introduced the use of technology and computer activities and a new methodology in the teaching of geometry. A great emphasis was given to directing and supervising student presentations on topics that used the computer activities that have been developed. The main focus of these courses was on pedagogical content, that is, pre-service teachers understood the content to be taught as they prepared their class presentations.

Graduate:

- Courses in Differential Geometry, Riemannian Geometry, Hermitian Differential Geometry and Topology.
- In 2003 I became interested in the geometry of solitons, a mathematical theory that gives a new context for several research topics in geometry. I taught an advanced graduate course titled *An Introduction to Soliton Geometry* in summer 2004 in an International Differential Geometry Conference organized by the Universidade de São Paulo, Brazil.

Student Advisement:

- *Ph.D. dissertations, both at UNICAMP, Brazil:*
Helvecio de Castro, August 1996
Martha Dussan, August 2000.
- *Master's theses, all at CSUN:*
Susan Tummers, August 1995
Joseph Elakodical, May 1998

Jesus Carbonnel, January 1999
Arash Baharemand, May 2000
Matthew Rayner, August 2000
Cynthia Flores: May 2009.
John Foss: In progress.

- *Educational project for a graduate student:*
Robert Reiner, CSUN. Funded by the Judge Julian Beck endowment, this student worked with prospective teachers on planning and developing lessons that used dynamic geometry software.
- *Undergraduate research:*
Melissa Berta, of CSUN-MAS (Minority Achievers in Science), during her MAERC (Minority Achievers in Energy Related Careers) fellowship, 1992/1993.
- *International Research Experience for Undergraduates (REU) and IRES:*
 - Maia Averett (UCSB), Lisa Helene Feigenbaum (Harvard University), Juliana Abrantes Freire (PUC - Rio de Janeiro), and Mikhail Lev (UCLA). Summer 2003. Project: *Multi-Channel Wireless Telecommunication Systems: An Algorithm for Optimal Channel and Power Allocation.*
 - Brendan Creutz (Cal Poly, San Luis Obispo), Patricia Romano Cirilo and Renato R. V. Zanforlin (Universidade Federal de Minas Gerais), and Jean Carlo P. Garcia (Universidade Federal do Rio Grande do Sul). Summer 2003. Project: *Functions from the plane to the plane.*
 - Sharon Lutz (University of Colorado at Boulder), Patricia Romano Cirilo (Universidade Federal de Minas Gerais), and Jose Regis A. Varão Filho (UNICAMP). Summer 2004. Project: *Closed and Exact Differential Forms.*
 - John Foss (CSUN), Marcelo De Martino (UNICAMP), and Gleison Santos (Universidade Federal do Rio de Janeiro). Summer 2008. Project: *On the codimension three submanifolds of Euclidean Space with nonnegative sectional curvatures.*
- *At CSUN, funded by NSF-PUMP grant:*
 - Cynthia Flores. Spring 2007. Project: *Dressing Actions.*
 - Nicholas Castro (2008): Spring 2008. Project: *Codimension two cohomogeneity-one submanifolds*
 - Ariel Alcaide (2008): Spring 2008. Project: *On the Lie Algebra associated to the Pure Symmetric Operators*
 - Clinton Bowen, Atour Bejan, and Mayra Moran Spring 2009. Project: *Some Homogeneous Manifolds.*

Some invited lectures in the past fifteen years

U.Dini Università di Firenze, Dipartimento di Matematica , (ITALY), May 3, 2012.
Curvature and Topology.

U.Dini Universita' di Firenze, Dipartimento di Matematica , (ITALY), May 4, 2012.
Metrics with nonnegative isotropic curvature

CSU Dominguez Hills, April 4, 2012.
Curvature and Topology.

Federal University of Sao Carlos (BRAZIL), February 2, 2012.
Metrics with nonnegative isotropic curvature.

Interactions between Geometry and Analysis, Univ. of Notre Dame, October 2010.
Funding Opportunities at the Division of Mathematical Sciences.
Funding Opportunities at the Division of Mathematical Sciences.

Cornell University, May 2010.
Metrics with Nonnegative Isotropic Curvature.

International Symposium on Geometry and Topology, Lehigh University, May 2010.

Southern Geometric Analysis Seminar, U.C. Irvine, February 2010.
Complete non-compact manifolds of nonnegative isotropic curvature.

UNICAMP, Brazil, March 2008.
Backlund Transformations and Conformally Flat Submanifolds.

Joint AMS/MAA meeting, San Diego, January 2008.
FERMAT, a Gk-12 project at CSUN.

Sixth Workshop on Lie Theory and Geometry, Cordoba, Argentina, November 2007.
On the topology of manifolds of nonnegative isotropic curvature.

California State University, Fullerton, November 2004
An Introduction to Soliton Geometry.

California State University, Long Beach, October 2004
An Introduction to Soliton Geometry.

Universidade de São Paulo, May 2004
Manifolds of nonnegative isotropic curvature and pure curvature tensor.

Bianchi Seminar, CSUN, September 2002
NSF Opportunities for Primarily Undergraduate Institutions.

Lecturer to the U.S. Math Olympiad Team, Washington D.C., June 2002.
Curvature and Topology.

Connecticut College, 9th National CUR Conference, June 2002
NSF Opportunities for Primarily Undergraduate Institutions.

University of California Santa Barbara, April 2000
Homogeneous Submanifolds of Space Forms.

Brazilian Congress of Mathematicians organized by IMPA at Rio de Janeiro
Manifolds with nonnegative isotropic curvature, July 1999.

University of Campinas, UNICAMP, Brazil, June 1999
Codimension two Homogeneous Submanifolds of Space Forms

University of Missouri, Columbia, October 1998
Metrics with nonnegative Ricci isotropic curvature.

International Conference on Differential Geometry, IMPA, July 1996
Homogeneous Submanifolds of codimension two.

Publication List

Field: Differential Geometry with interests in manifolds with nonnegative curvature, homogeneous manifolds, conformal structures, Kähler manifolds and their isometric immersions in Euclidean spaces and their relationship to Soliton Theory .

Research articles:

1. *On the holonomy algebra of manifolds with pure curvature operator*, Balkan Journal of Geometry and its Applications, Volume 17 (2012), No. 1, pp. 88-94.
2. *Splitting theorems for submanifolds of nonnegative isotropic curvature*, Results Math. **60**, (2011), 235-243 (DOI 10.1007/s00025-011-0152-7)
3. *Codimension three nonnegatively curved submanifolds with infinite fundamental group* (with J. Foss, M. De Martino and G. Santos) Math. Z. (2011) 267: 403-411 (DOI 10.1007/s00209-009-0625-5).
4. *Compact manifolds of nonnegative isotropic curvature and pure curvature tensor* (with Martha Dussan), Balkan Journal of Geometry and its Applications. vol. 10, n. 2, (2005), pp. 58-66.
5. *Codimension two homogeneous submanifolds of Space Forms* (with Helvecio de Castro), Note di Matematica vol. 21, n. 2, (2003), 83-109.
6. *Manifolds with 2-nonnegative Ricci operator* (with Martha Dussan), Pacific J. of Math. **204**, No 2, (2002), 319 - 334.
7. *Homogeneous manifolds in codimension two revisited* (with Helvecio de Castro), Note di Matematica Vol. 21, 1, (2002), 49-57.
8. *Homogeneous submanifolds of codimension two* (with Helvecio de Castro), Geometriae Dedicata, **78** (1999) 89-110.
9. *Conformal flatness, cohomogeneity one and hypersurfaces of revolution* (with F. Mercuri), Differential Geometry and its Applications, **9** (1998) 243-249.
10. *Cohomogeneity one manifolds and hypersurfaces of revolution* (with A. Asperti and F. Mercuri), Bolletino della Unione Matematica Italiana (7) **11-B** (1997), 199 -215.
11. *Positively curved 4-manifolds and the nonnegativity of the isotropic curvatures*, Michigan Math. J. **44**, (1997), 211 - 229.
12. *Low codimensional submanifolds with nonnegative isotropic curvature* (with F. Mercuri), Transactions of the American Mathematical Society **348** (1996) 2711 - 2724.
13. *Some results on nonnegatively curved four manifolds*, Matematica Contemporanea **9** (1995), 153 - 175.

14. *Some results on the topology of four-manifolds with nonnegative curvature*, Illinois Journal of Mathematics **40** (1996), 390 - 401.
15. *Compact homogeneous Einstein manifolds in codimension two* (with A. Asperti and Helvecio de Castro), Note di Matematica (Italy) Vol. 6, **1** (1996), 9-19.
16. *Self-duality and four-manifolds with nonnegative curvature on totally isotropic two-planes*, Michigan Math. Journal **41** (1994), 3 - 12.
17. *On the topology of complete Riemannian manifolds with nonnegative curvature operator* (with F. Mercuri), Rendiconti seminario Facolta Scienze Universita Cagliari (Italy), Vol.63,2 (1993), 1 - 23.
18. *Some compact conformally flat manifolds with nonnegative scalar curvature*, Geometriae Dedicata **47** (1993), 155 - 168.
19. *A note on the first Betti number of submanifolds of nonnegative Ricci curvature in codimension two*, Manuscripta Math. **73** (1991), 335 - 339.
20. *Nonnegatively curved submanifolds in codimension two*, Transactions of the American Mathematical Society **332** (1992), 351 - 364.
21. *Isometric Immersions with congruent Gauss maps* (with J.D. Moore), Proceedings of the American Mathematical Society **110** (1990), 463 - 469.
22. *Codimension two product submanifolds with nonnegative curvature* (with Y. Baldin), Note di Matematica (Italy), Vol.IX, **1** (1989), 463 - 469.
23. *A splitting theorem for complete manifolds with nonnegative curvature operator*, Proceedings of the American Mathematical Society **105** (1989), 979 - 985.
24. *Manifolds with pure nonnegative curvature operator* (with A. Derdzinski and F. Mercuri), Boletim da Sociedade Brasileira de Matematica **18** (1987), 13 - 22.
25. *Codimension two complete non-compact submanifolds with nonnegative curvature*, Transactions of the American Mathematical Society **311** (1989), 739 - 748.
26. *Conformally flat immersions and flatness of the normal connection*, Pacific Journal of Mathematics **195** (1989), 145 - 150.
27. *Some complete manifolds with non-negative curvature operator* (with Y. Baldin), Mathematische Zeitschrift **195** (1987), 383 - 390.
28. *Conformally flat immersions in codimension two*, Geometriae Dedicata **23** (1987), 115 - 130.

Lecture Notes Monograph

- *An Introduction to Soliton Geometry*, International School of Differential Geometry, USP, Brazil, July 26-30, 2004.

Textbooks

- *Euclidean and Non-Euclidean Geometries*, Prentice Hall, New Jersey, 2002.