

## CURRICULUM VITÆ

MARÍA LAURA BARBERIS

**Place and Date of Birth:** San Francisco (Córdoba, Argentina), Dec. 3rd, 1966.

**Affiliation:** FAMAFA (Universidad Nacional de Córdoba) - CIEM (Conicet),  
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### ACADEMIC DEGREES

- B.S. in Mathematics, FAMAFA (National University of Córdoba, Argentina), March 1990, Dissertation: *Homogeneous manifolds of negative curvature*, advisor: Prof. I. Dotti.
- Ph.D. in Mathematics, FAMAFA (National University of Córdoba, Argentina), May 1994, Dissertation: *Lie groups admitting left invariant hypercomplex structures*, advisor: Prof. I. Dotti.

### GRANTS AND DISTINCTIONS

- National University of Córdoba Prize for best GPA in undergraduate studies (Math. class 1989);
- Fellowship from Córdoba State Science and Technology Research Council (CONICOR, Argentina) for graduate studies, Apr 1990-Mar 1994;
- Grant from IMPA (Institute of Pure and Applied Math., Rio de Janeiro, Brazil) to attend summer graduate courses, Jan-Feb 1991;
- National University of Córdoba Distinction for outstanding academic career, Sept 1994;
- Postdoctoral fellowship from the National Science and Technology Research Council (CONICET, Argentina) at University of California, San Diego, Jan 1995-Jan 1997.

### TEACHING EXPERIENCE

- Teaching Assistant (as a B.S. student), FAMAFA (1987-1989);
- Teaching Assistant, FAMAFA (1990-1994);
- Lecturer, University of California at San Diego, Winter 1997;
- Teaching assistant, FAMAFA, Apr 1997-Nov 1998;
- Assistant professor, FAMAFA, since Dec 1998.

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*Date:* April 2006.

## RESEARCH POSITIONS

- CONICET research fellow, since Sept 1997.

**Research Interests:** Differential geometry of homogeneous spaces, algebraic methods in representation theory.

## PUBLICATIONS AND PREPRINTS

- (1) *Decomposition of the space of curvature tensors of a riemannian manifold*, Mathematical Surveys B **7**, FAMAFA, 1993.
- (2) (with I. Dotti Miatello and R. Miatello), *On certain locally homogeneous Clifford manifolds*, Annals of Global Analysis and Geometry **13** (1995), no. 3, 298–301.
- (3) (with I. Dotti Miatello), *Hypercomplex structures on a class of solvable Lie groups*, Quart. J. Math. Oxford Ser. (2), **47** (1996), 389–404.
- (4) *Hypercomplex structures on four dimensional Lie groups*, Proc. Amer. Math. Soc. **125**(4) (1997), 1043–1054.
- (5) *Affine connections on homogeneous hypercomplex manifolds*, J. Geom. Phys. **32** (1999), 1–13.
- (6) *Abelian hypercomplex structures on central extensions of H-type Lie algebras*, J. Pure Applied Algebra **158** (2001), 15–23.
- (7) *Hypercomplex structures on special classes of nilpotent and solvable Lie groups*, Proceedings of the Second Meeting on Quaternionic Structures in Mathematics and Physics, World Scientific (2001), 1–5.  
<http://www.univie.ac.at/EMIS/proceedings/QSMP99/index.html>
- (8) *Hyper-Kähler metrics conformal to left invariant metrics on four dimensional Lie groups*, Math. Phys., Analysis and Geom. **6** (2003) 1–8, math.DG/0009035.
- (9) (with I. Dotti) *Abelian complex structures on solvable Lie algebras*, J. Lie theory **14** (1) (2004), 25–34, math.RA/0202220.
- (10) (with I. Dotti) *Complex structures on affine motion groups*, Quarterly Journal of Mathematics Oxford **55** (2004), 375–389, math.DG/0307375.
- (11) (with A. Andrada, I. Dotti y G. Ovando) *Product structures on four dimensional solvable Lie algebras*, Homology Homotopy and Applications **7** (1) (2005), 9–37, arXiv.org:math.RA/0402234.
- (12) (with I. Dotti y A. Fino) *Hyper-Kähler quotients of solvable Lie groups*, Journal of Geometry and Physics **56** (4) (2006), 691–711, arXiv.org:math.DG/0411307.
- (13) (with L.C. De Andrés, I. Dotti and M. Fernández) *Hermitian structures on cotangent bundles of four dimensional solvable Lie groups*, preprint 2006.

## WORK IN PROGRESS

- (1) (with N. R. Wallach) *Continuations of quaternionic discrete series representations*.
- (2) (with A. Andrada and G. Ovando) *Lie bialgebras arising from complex structures*.
- (3) (with I. Dotti) *Parallelizable manifolds of type (1, 1)*.
- (4) (with A. Fino) *Hyper-Kähler with torsion structures on tangent bundles of Lie groups*.

## RESEARCH GRANTS

- Differential geometry of locally homogeneous manifolds, PIP 4888, CONICET, 1163/96.
- Differential geometry of locally homogeneous manifolds, PID 4165, CONICOR, 1416/97.
- Differential geometry of locally homogeneous manifolds, SECYT - UNC, 275/98.
- Quaternionic representations, PEI 0098/98, CONICET, 0079/99.
- Geometry and topology of nilmanifolds, SECYT - UNC, 163/99.
- G-structures on differentiable manifolds, SECYT - UNC, 194/00.
- Spectral theory and geometry of locally homogeneous manifolds and quantum groups, PICT 99 03-06498 Foncyt, 2000-2003.
- Locally homogeneous manifolds and quantum groups, Agencia Córdoba Ciencia, 2001–2003.
- Differential geometry of homogeneous manifolds, PIP 02975, Conicet, 2001-2003.
- G-structures on differentiable manifolds, SECYT - UNC, 104/02, 150/02.
- Special program to foster research, teaching and applications of mathematics, 2003-2005.
- Special structures on Lie groups, SECYT - UNC, 62/03.
- Geometric methods in supersymmetric theories, PEI 6136, CONICET, 1139/03.(\*).
- Locally homogeneous manifolds with special geometric structures, SECYT - UNC, 123/04.
- Spectral theory and geometry of locally homogeneous manifolds and quantum groups, PICT 2003, 13557, Foncyt.
- Interdisciplinary applications of mathematics, PAV 2003, 120, ANPCyT.
- Special geometric structures and applications, Secyt-UNC, 197/05.
- Holonomy, homogeneity, special geometries, quantum groups, spectral theory and code theory, PIP 6303, Conicet.

## UNDERGRADUATE STUDENTS

- Verónica Díaz, B.Sc. (Mathematics), March 2006, Dissertation: *The local structure of Poisson manifolds*.

## GRADUATE STUDENTS

- Alfredo González, since December 2005.
- Verónica Díaz, Conicet fellow since April 2006.

## SCIENTIFIC MEETINGS (LAST FIVE YEARS)

- II Congreso Iberoamericano de Geometría, Guanajuato, Mexico, Jan 2001 (\*\*)
- VI Congreso Monteiro, Bahía Blanca, Arg, July 2001 (\*)
- XIV Coloquio Latinoamericano de Algebra, La Falda, Córdoba, Aug 2001 (\*\*)
- LI Annual Meeting of Union Matemática Argentina, San Luis, Sept. 2001 (\*)
- Geometrie des varietes de petites dimensions et geometries speciales, CIRM, Marseille, June 2002.

- Current Geometry 2002, Naples, July 2002.
- Satellite conference of ICM2002 on Differential Geometry and Global Analysis, Nankai Institute of Mathematics, Tianjin, Aug 2002.
- International Congress of Mathematicians, Beijing, Aug 2002 (\*)
- LII Annual Meeting of Union Matemática Argentina, Santa Fe, Sept 2002 (\*)
- I Encuentro de Geometría Diferencial, Córdoba, June 2003 (\*\*)
- LIII Annual Meeting of Union Matemática Argentina, Río Cuarto, Oct. 2003 (\*)
- II Congreso Latinoamericano de Matemáticos, Cancún, Mexico, June 2004 (\*)
- LIV Annual Meeting of Union Matemática Argentina, Neuquén, Oct. 2004 (\*)
- II Encuentro de Geometría Diferencial, La Falda, Córdoba, June 2005 (\*\*)
- XVI Coloquio Latinoamericano de Algebra, Colonia, Uruguay, Aug. 2005 (\*\*)
- LV Annual Meeting of Union Matemática Argentina, Salta, Sept. 2005 (\*)
- Legacy of S.S. Chern's Mathematics, Guanajuato, Mexico, Nov. 2005.

(\*) short talk

(\*\*) lecture

#### RESEARCH VISITS

- University of California, San Diego, Jan 1995-Jan 1997
- University of Torino, Sept. 1999 (\*)
- E. Schrödinger Institute (ESI), Viena, to take part in the program *Holonomy Groups in Differential Geometry*, Sept 1999 (\*)
- University of California, Riverside, Jan 2001 (\*)
- University of California, San Diego, Jan 2001
- University of Torino, June 2002 (\*)
- Bonn University, June 2002 (\*)
- Max-Planck Institute, Bonn, June 2002
- E. Schrödinger Institute (ESI), Viena, to take part in the program *Geometric and Analytic problems related to Cartan Connections*, Feb. 2004 (\*)
- University of Torino, March 2004 (\*)
- Centro di Ricerca Matematica Ennio De Giorgi, Scuola Normale Superiore, Pisa, to take part in the program *Differential Geometry and Topology*, Nov. 2004 (\*)
- University of Torino, Nov. 2004 (\*)
- CIMAT, Guanajuato, Mexico, Nov. 2005 (\*)
- University of the Basque Country, Bilbao, Nov. 2005 (\*)

(\*) lecture

#### MEMBER OF BOARDS AND COMMITTEES

- High school Math. olympiads board, Sept 2000
- Selection committee to appoint teaching assistants at FaMAF Math. Dept., Aug 2000 and Aug 2001.
- Math. Dept. Advisory Board, FaMAF, 2001-2003.
- Ph.D. thesis board, title of thesis: *Complex structures and Hamiltonian systems on solvable Lie groups*, author: G. Ovando, FaMAF, March 2002

- Ph.D. thesis board, title of thesis: *Complex product structures and associated hypersymplectic metrics*, author: A. Andrada, FaMAF, Dec. 2003
- FaMAF Council, 2002-2004
- Council for Academic Affairs, FaMAF, 2002-2004
- Local organizing committee of the XLVII Annual Meeting of Union Matematica Argentina, Sept 1997.
- Local organizing committee of the XIV Coloquio Latinoamericano de Algebra (Aug. 2001), I Encuentro de Geometria Diferencial (June 2003) and II Encuentro de Geometria Diferencial (June 2005).

## OTHER ACTIVITIES

- Reviewer for Mathematical Reviews since 1996.
- Local secretary of Union Matemática Argentina since March 1998.