

# MARIANA C. GRAÑA

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Date of Birth: February 9, 1973  
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## EDUCATION

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Ph.D.: University of California - Santa Barbara, United States, December 2002  
Thesis title : "Supersymmetric IIB Solutions with fluxes and their effects on D-branes".  
Thesis director: Prof. Joseph Polchinski. GPA : 4.0 / 4.0

B.S. : University of Buenos Aires, Argentina, 1997  
Physics. GPA : 3.8 / 4.0

Languages: Trilingual in English, Spanish and French

## SCIENTIFIC ACTIVITIES

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### Research career

- Permanent Researcher
  - Service de Physique Théorique, CEA/Saclay, from October 2005
- Post-Doctorate
  - Ecole Normale Supérieure, France, Marie Curie Fellowship, January 2004 to October 2005
  - Centre de Physique Théorique, Ecole Polytechnique, France, February to December 2003
- Research Assistant
  - University of California at Santa Barbara, United States, 2000-2002
  - University of Buenos Aires, Argentina, 1997-1998

### Publications

- I. Bena, G. Giecold, M. Grana, N. Halmagyi and S. Massai, "On Metastable Vacua and the Warped Deformed Conifold: Analytic Results," arXiv:1102.2403 [hep-th].
- I. Bena, G. Giecold, M. Grana and N. Halmagyi, "On The Inflaton Potential From Antibranes in Warped Throats," arXiv:1011.2626 [hep-th].
- I. Bena, G. Giecold, M. Grana, N. Halmagyi and F. Orsi, "Supersymmetric Consistent Truncations of IIB on T(1,1)," arXiv:1008.0983 [hep-th].
- G. Aldazabal, E. Andres, P. G. Camara and M. Grana, "U-dual fluxes and Generalized Geometry," arXiv:1007.5509 [hep-th].
- I. Bena, M. Grana and N. Halmagyi, "On the Existence of Meta-stable Vacua in Klebanov-Strassler," JHEP 1009, 087 (2010).
- M. Graña, J. Louis, A. Sim and D. Waldram, "E7(7) formulation of N=2 backgrounds," JHEP 0907 (2009) 104.
- M. Graña, R. Minasian, M. Petrini and D. Waldram, "T-duality, Generalized Geometry and Non-Geometric Backgrounds," JHEP 0904:075,2009.
- P. G. Cámara and M. Graña, "No-scale supersymmetry breaking vacua and soft terms with torsion," JHEP 0802:017, 2008.
- M. Graña, J. Louis and D. Waldram, "SU(3) x SU(3) compactifications and mirror duals of magnetic fluxes," JHEP 0704, 101, 2007.
- M. Graña, R. Minasian, M. Petrini and A. Tomasiello, "A scan for new N=1 vacua on twisted tori," JHEP 0705, 031, 2007.

- M. Graña, "Flux compactifications in string theory : a comprehensive review", Phys. Rept. 423: 91-158, 2006
- M. Graña, R. Minasian, M. Petrini et A.Tomasiello, "Generalized Structures of N=1 vacua", JHEP 0511: 020, 2005.
- M.Graña, J.Louis et D.Waldram, "Hitchin functionals in N=2 supergravity", JHEP 0601: 008, 2006.
- Butti, M. Graña, R. Minasian, M. Petrini and A. Zaffaroni, "The baryonic branch of Klebanov-Strassler: a supersymmetric family of SU(3) structure manifolds", JHEP 0503:069 (2005)
- M. Graña, R. Minasian, M. Petrini and A.Tomasiello, "Supersymmetric backgrounds from generalized Calabi-Yau manifolds," JHEP 0408:046 (2004) .
- M.Graña, T.Grimm, H.Jockers and J.Louis, "Soft supersymmetry breaking in Calabi-Yau compactifications with D-branes and fluxes", Nucl. Phys. B 690, 21 (2004).
- A.Frey and M.Graña, "Type IIB solutions with interpolating supersymmetries", Physics Review D 68, 106002 (2003).
- M.Graña, "MSSM parameters from supergravity backgrounds", Physics Review D 67,0066006 (2003).
- M.Graña and A.Frey, "BPS states of strings in 3-form flux", Physics Review D 67, 026008 (2003).
- M.Graña, "D3-brane action in a supergravity background: the fermionic story", Physics Review D 66, 045014 (2002).
- M.Graña and J.Polchinski, "Gauge/Gravity duals with holomorphic dilaton", Physics Review D 65, 126005 (2002).
- M.Graña and E. Calzetta, "Reheating and Turbulence", Physics Review D 65, 063522 (2002).
- M.Graña and J.Polchinski, "Supersymmetric three-form flux perturbations on AdS5", Physics Review D 63, 026001(2001).

#### **Proceedings from conferences and schools:**

- M. Graña, "Flux compactifications and generalized geometries", Class. Quantum Grav. 23 (2006) S883-S926. Course at RTN Winter School, CERN, Geneva, 2006.
- M. Graña, ""The low energy limit of string theory and its compactifications with background fluxes", Lett. Math Phys, 78 (2006). Presented at "Journées Physique et Mathématiques", Bures sur Yvette, November 2005.
- M. Graña, R. Minasian, M. Petrini and A.Tomasiello, "Type II strings and generalized Calabi-Yau manifolds", C. R. Physique 4 (2004). Presented at Strings 2004, Paris, France, 2004.
- M.Graña, "The Fluid of Primordial Fluctuations", International Journal of Theoretical Physics, 38 N4, 1999, presented at "Quantum Gravity in the Southern Cone", Bariloche, Argentina, 1998.

#### **Citations (taken from <http://www.slac.stanford.edu/spires>)**

- Total number of citations: 1720
- Number of papers with more than 50 citations: 11
- Average citations per paper published: 71

#### **Fellowships**

- Marie Curie Intra European Post-Doctoral Fellowship, March 2004 to October 2005
- Dissertation Fellowship, University of California at Santa Barbara, September to December 2002
- Ferrando-Fithian Fellowship, University of California at Santa Barbara, September 1998

## Grants

- Principal Investigator in the **ERC Starting Grant** “The Low Energy Limit of String Theory and the Observable World”, February 2011 to February 2016.
- Co-investigator in the research grant “Structure of vacuum, topological strings and black holes,” from the French “*Agence Nationale de la Recherche*.” September 2009 to May 2010.
- Co-investigator in the binational France-Argentina travel and collaboration grant “Generalizing Geometry in String Theory : its phenomenological implications”, from ECOS-Sud 2009-2011,
- Co-investigator in the binational France-England travel and collaboration PICS grant, 2009-2011.
- Co-investigator in the travel and collaboration grant “Generalizing geometry in string theory”, from MIT-France Seed fund for collaborative research 2006-2007.

## Organization of international conferences

- **14<sup>th</sup> Itzykson meeting** “Recent Advances in String Theory”, CEA/Saclay, June 2009 (co-organized with I. Bena, R. Minasian and P. Vanhove, 80 participants) <http://ipht.cea.fr/Meetings/Itzykson2009/index.php>
- **String Phenomenology 2010**, College de France, Paris, July 2010 (co-organized with K. Benakli and E. Dudas, 150 participants) <http://stringpheno.cph.polytechnique.fr>

## Conference talks

- Generalized Geometries and String Theory, University of Texas A&M, March 2011
- D-brane Instantons, Wall-crossing and Microstate counting, ICTP, Trieste, November 2010
- 12<sup>th</sup> Marcel Grossmann meeting, Paris, July 2009
- New perspectives in String Theory, GGI, Florence, May 2009
- VII Latin American Symposium on High Energy Physics, Bariloche, Argentina, January 2009
- Geometrical aspects of string theory, Nordita, Stockholm, October 2008
- 39<sup>th</sup> Ahrensoop Conference, Berlin, October 2008
- String Phenomenology 2007, Frascati, June 2007
- Generalized Geometry and Flux compactifications, Hamburg, February 2007
- 38<sup>th</sup> Ahrensoop Conference, Berlin, September 2006
- Generalized Geometries, Brno, September 2006
- Journées Physique et Mathématiques, IHES, Bures sur Yvette, November 2005
- Colloque du SPhT, La Rochelle, October 2005
- Workshop on N=1 Compactifications, Fields Institute, Toronto, March 2005
- Euro GDR supersymmetry, Frascati, November 2004
- RTN Workshop The quantum structure of spacetime and the geometric nature of fundamental interactions, Crete, September 2004
- Strings 2004, Paris, July 2004
- DESY Theory Workshop on GUTs and Branes, Hamburg, September 2003

## Invited Seminars

University of Amsterdam, February 2011; University of Heidelberg, May 2010; Centro Atomico Bariloche, Argentina, February 2010 and January 2011; MIT, Boston, September 2007, Max Planck Institute, Postdam, February 2007, Institut Henri Poincaré, Paris, September 2010, November 2008, October 2007, December 2006 and December 2003; Oxford University, November 2006, University of Durham, June 2006; University of Wales, Swansea, May 2006; Cern Theory Division, Geneva, April 2006 and January 2004; Utrecht University, December 2005; SISSA, Trieste, november 2005;

Université Libre de Bruxelles, June 2005; Max-Planck Institute, Munich, May 2005; Hebrew University, Jerusalem, November 2004; Universidad de Santiago de Compostela, November 2004; Humboldt University, Berlin, April 2004; CEA, Service de Physique Théorique, Saclay, April 2004 and January 2005; Universidad de Buenos Aires, December 2010, February 2010, December 2008, February 2007, February 2004 and February 2005; Universidad Autónoma, Madrid, January 2004 and April 2005; Imperial College, London, January 2004; Universität Hamburg, July 2003; Ecole Polytechnique, Palaiseau, November 2002; University of California at Santa Barbara, April 2002; Caltech-USC Theoretical Physics Center, Los Angeles, March 2002

### Summer Schools

- Cargese Summer School, “String Theory: from Gauge Interactions to Cosmology”, Corsica, June 2004
- Theoretical Advanced Study Institute (TASI-2001), “Strings, branes and extra dimensions”, Boulder, Colorado, June 2001

### Other

- Referee for JHEP, Nuclear Physics B, Classical and Quantum Gravity, Communications in Mathematical Physics, Physics Letters B, Europhysics Letters.
- Reviewer for ESF and NSF
- Reviewer for Mathematical Reviews
- Jury of three theses in String Theory
- Co-organizer of String Theory in Greater Paris’ seminars, 2005 to present
- Organizer of the 14<sup>th</sup> Itzykson meeting “Recent Advances in String Theory”, Saclay, June 2009
- Organizer of String Phenomenology 2010, to be held in Paris on July 2010

## TEACHING EXPERIENCE

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### Discussion Sessions

- Physics Department, University of California at Santa Barbara, United States, 1998-2002
  - Introductory Physics for undergraduate students, mostly Biology majors (4 quarters)
  - General Relativity for graduate students in Physics (6 quarters)
- Physics Department, University of Buenos Aires, Argentina, 1995-1998
  - Wave Mechanics for Physics undergraduate students (1 semester)
  - Advanced Electromagnetism for Physics undergraduate students (4 semesters)

### Lectures

- Mathematics Department, University of Buenos Aires, Argentina, 1995-1998  
Linear Algebra for first year students in Science and Engineering (6 semesters)

### Other

- Invited lecturer
  - Mini course “Generalized Complex Geometry from Supergravity backgrounds”, Perimeter Institute, Waterloo, Canada, February 2005
  - “Flux compactifications and generalized geometries”, RTN Winter School, CERN, Geneva, January 2006
  - “Flux compactifications”, University of Michigan, Ann Arbor, February 2006
- Approved course “Teaching and Learning with new medias”, University of California at Santa Barbara, 2 quarters 2001

### Students

- Francesco Orsi, graduate student since October 2008, funded by CEA fellowship
- Stefano Massai, graduate student since October 2010, funded by CEA fellowship