

Luca Fabrizio Di Cerbo

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Positions

Visiting Assistant Professor, *Stony Brook University*, September 2017 -

S.-S. Chern Senior Postdoctoral Fellow, *International Centre for Theoretical Physics (ICTP)*, September 2016 - August 2018

Postdoctoral Fellow, *International Centre for Theoretical Physics (ICTP)*, June 2016 - August 2016

Visiting Assistant Professor, *Notre Dame University*, August 2014 - May 2015

Simons Postdoctoral Fellow, *Duke University*, August 2011 - July 2014

Research Visits

Max Planck Institute for Mathematics (MPIM), June 2015 - May 2016

Education

Ph.D. Mathematics, Stony Brook University, NY, USA

September 2006-May 2011

Thesis: *Aspects of the Seiberg-Witten equations on manifolds with cusps*

Advisor: Prof. Claude LeBrun

Laurea Specialistica (M. Sc.) summa cum laude in Mathematics, University of Rome "La Sapienza", Italy

September 2004-July 2006

Laurea Triennale (B. Sc.) summa cum laude in Physics, University of Rome "La Sapienza", Italy

September 2001-November 2004

Research

Publications

1. (with M. Stover) *Classification and arithmeticity of toroidal compactifications with $3\bar{c}_2 = \bar{c}_1^2 = 3$.*
Geom. Topol. (Announced on the journal website).
2. (with G. Di Cerbo) *On Seshadri constants of varieties with large fundamental group.*
Ann. Sc. Norm. Super. Pisa Cl. Sci. (Announced on the journal website).
3. (with G. Di Brino) *Exceptional collections and the bicanonical map of Keum's fake projective planes.*
Commun. Contemp. Math. (2018) (Available on the journal website).

4. (with G. Di Cerbo) *On the canonical divisor of smooth toroidal compactifications of complex hyperbolic manifolds*. To appear in **Math. Res. Lett.** (arXiv:1502.06258v4[math.AG]).
5. *The Toledo invariant and Seshadri constants of fake projective planes*. **J. Math. Soc. Japan** **69**, no. 4 (2017), 1601-1610
6. (with M. Stover) *Bielliptic ball quotient compactifications and lattices in $PU(2, 1)$ with finitely generated commutator subgroup*. **Ann. Inst. Fourier (Grenoble)** **67**, no. 1 (2017), 315-328.
7. (with M. Stover) *Multiple realizations of varieties as ball quotient compactifications*. **Michigan Math. J.** **65**, no. 2 (2016), 441-447.
8. (with G. Di Cerbo) *Positivity in Kähler-Einstein theory*. **Math. Proc. Cambridge Philos. Soc.** **159**, no. 2 (2015), 321-338.
9. (with G. Di Cerbo) *Effective results for complex hyperbolic manifolds*. **J. London Math. Soc.** **91**, no.1 (2015), 89-104.
10. *On Kähler-Einstein surfaces with edge singularities*. **J. Geom. Phys.** **86** (2014), 414-421.
11. *Generic properties of homogeneous Ricci solitons*. **Adv. Geom.** **14**, no. 2 (2014), 225-237.
12. (with G. Di Cerbo) *A sharp cusp count for complex hyperbolic surfaces and related results*. **Arch. Math. (Basel)**. **103**, no. 1 (2014), 75-85.
13. *Seiberg-Witten equations on surfaces of logarithmic general type*. **Internat. J. Math.** **24**, no. 9 (2013), 1350074, 23 pages.
14. *Finite-volume complex-hyperbolic surfaces, their toroidal compactifications, and geometric applications*. **Pacific J. Math.** **255**, no. 2 (2012), 305-315.
15. *Finite-volume complex surfaces without cuspidal Einstein metrics*. **Ann. Global Anal. Geom.** **41**, no. 3 (2012), 371-380.
16. *Seiberg-Witten equations on certain manifolds with cusps*. **New York J. Math.** **17** (2011), 491-512.
17. *A gap property for the growth of closed 3-manifold groups*, **Geom. Dedicata** **143** (2009), 193-199.
18. (with M. Disconzi) *Yamabe solitons, determinant of the Laplacian and the uniformization theorem for Riemann surfaces*. **Lett. Math. Phys.** **83** (2008), 13-18.
19. *Eigenvalues of the Laplacian under the Ricci flow*. **Rend. Mat. Appl. (7)** **27**, no. 2, (2007), 183-195.
20. (with F. Calogero and R. Droghei) *On isochronous Shabat-Yamilton-Toda lattices: equilibrium configurations, behavior in their neighborhood, Diophantine relations and conjectures*. **Phys. Lett. A** **355** (2006), 262-270.
21. (with F. Calogero and R. Droghei) *On isochronous Bruschi-Ragnisco-Ruijsenaars-Toda lattices: equilibrium configurations, behavior in their neighborhood, Diophantine relations and conjectures*. **J. Phys. A: Math. Gen.** **39** (2006), 313-325.

Papers submitted and preprints

1. (with M. Stern) *Price inequality and Betti numbers growth on manifolds without conjugate points*, arXiv:1704.06354v1[math.DG].

Others

1. *Aspects of the Seiberg-Witten equations on manifolds with cusps*, Ph.D. Thesis, Stony Brook University, 2011.
2. *A Ricci nilsoliton is nongradient*, arXiv:0801.0004v1[math.DG].

Undergraduate Students Supervised

Farnaz Ghanbari - *Spring / Summer 2017*, **ICTP Diploma Thesis**. Title: Introduction to General Relativity and Positive Energy Theorem (supervised jointly with C. Arezzo).

Teaching Services

September 2016 - Served on the ICTP Entrance Exam Committee for the 2016/2017 Diploma Student Class.

January - February 2017 - Served on the ICTP Selection Committee for the 2017/2018 Diploma Student Class.

September 2017 - Contributed to the writing of the ICTP Entrance Diploma Exam for the 2017/2018 Class.

Teaching Experience

Department of Mathematics, **Stony Brook University**, NY.

Instructor for Undergraduate Classes

Fall 2017 - MAT 132, Calculus II

Mathematics Section, **International Centre for Theoretical Physics** (ICTP).

Instructor for both Graduate and Undergraduate Classes

Summer 2017 - ICTP - EAUMP School on Modern Functional Analysis, Nairobi - Kenya:
The Laplacian on Riemannian Manifolds (jointly with C. Arezzo)

Fall 2016 - Diploma Course: Curves and Surfaces (Single Instructor)

Fall 2016 - Weekly Reading Course: Symplectic Geometry (jointly with C. Arezzo)

Department of Mathematics, **Notre Dame University**, IN.

Instructor for Undergraduate Classes

Spring 2015 - MAT 10360, Calculus B

Spring 2015 - MAT 20580, Introduction to Linear Algebra and Differential Equations

Fall 2014 - MAT 10250, Elements of Calculus I

Fall 2014 - MAT 10350, Calculus A for the Life and Social Sciences

Department of Mathematics, **Duke University**, NC.

Instructor for both Graduate and Undergraduate Classes

Spring 2014 - MAT 790-90.05, Positive Currents and Lelong Numbers (Advanced Graduate Level Class)

Fall 2013 - MAT 625.01, Riemann Surfaces (Graduate Level Course)

Spring 2013 - MAT 633.01, Complex Analysis (Graduate Level Course)

Spring 2012 - MAT 790-03.02, Theorems of Bombieri and Reider (Advanced Graduate Level Class)

Fall 2011 - MAT 353.02, Ordinary and Partial Differential Equations

Department of Mathematics, **Stony Brook University**, NY.

Teaching Assistant for Undergraduate Classes

Spring 2011 - MAT 303, Calculus IV with Applications

Fall 2010 - MAT 123, Introduction to Calculus

Spring 2010 - MAT 205, Calculus III

Fall 2009 - MAT 132, Calculus II

Spring 2009 - MAT 305, Calculus IV

Fall 2008 - MAT 126, Calculus B

Spring 2008 - MAT 126, Calculus B

Fall 2007 - MAT 132 Calculus II

Spring 2007 - MAT 126 Calculus B

Fall 2006 - MAT 125 Calculus A (Grader)

Honors, Awards, & Fellowships

International Centre for Theoretical Physics (ICTP), **S.-S. Chern Senior Postdoctoral Fellowship** (with Travel Grant), 2016-2018.

Max Planck Institute for Mathematics (MPIM), **Fellowship** (with Travel Grant), 2015-2016.

Duke University, **Simons Postdoctoral Fellowship** (with Travel Grant), 2011-2014.

SUNY Stony Brook, **Renaissance Technologies Fellowship** (From the Simons Foundation), 2006-2009.

Institut Henri Poincaré (IHP), **Marie Curie Fellowship** (From the European Commission), April-June, 2008.

SUNY Stony Brook, Research Assistantship plus Tuition Scholarship, 2010-2011.

SUNY Stony Brook, Research Fellowship, 2009-2010.

SUNY Stony Brook, Teaching Assistantship with half duties plus Tuition Scholarship, 2006-2010.

University of Rome "La Sapienza", Tuition Scholarship, 2004-2006.

University of Perugia, Scholarship, summer 2004.

University of Rome "La Sapienza", Tuition Scholarship, 2001-2004.

Colloquia and Conference Presentations

1. *Colloquium*, **Centre for Quantum Geometry of Moduli Spaces** (Aarhus University), May 26th, 2017.
2. *Special Colloquium*, **Stockholm University**, September 26th, 2016.
3. *Conference on Differential Geometry celebrating Claude LeBrun's 60th birthday*, **Montréal, Canada**, July 5-9, 2016.
4. *Oberseminar*, **Max Planck Institute for Mathematics**, August 6th, 2015.
5. *Colloquium*, **Queens College CUNY**, April 27th, 2015.
6. *Colloquium*, **Queen's University, Canada**, February 4th, 2015.
7. *Colloquium*, **University of Arizona**, January 21st, 2015.

8. *Colloquium*, **UC Davis**, December 15th, 2014.
9. *Conference "Giornate di Geometria Algebrica e Argomenti Correlati"*, **Torino, Italy**, June 7th, 2014.
10. *Conference "Geometria Algebrica nella Capitale"*, **Rome, Italy**, July 5th, 2013.
11. *Conference "Algebraic & Hyperbolic Geometry-New Connections"*, **Cabo Frio, Brazil**, June 18th, 2013.
12. *American Mathematical Society Eastern Section Meeting "Complex Geometry and Microlocal Analysis"*, **Boston College**, April 6th, 2013.
13. *Shanks Workshop "Kähler geometry on the edge"*, **Vanderbilt University**, March 22nd, 2013.
14. *Simons Postdoctoral Fellows Meeting*, **Simons Center for Geometry and Physics**, April 11th, 2012.
15. *Conference "Progressi Recenti in Geometria Reale e Complessa"*, **Levico Terme (Trento), Italy**, October 20th, 2010.

Seminars

1. *Geometry-Topology Seminar*, **Temple University**, October 25th, 2017.
2. *Algebraic Geometry Seminar*, **Washington University in St. Louis**, October 16th, 2017.
3. *Geometry Seminar*, **Centre for Quantum Geometry of Moduli Spaces** (Aarhus University), May 26th, 2017.
4. *Geometry Seminar*, **Florence University**, May 24th, 2017.
5. *Geometry Seminar*, **Texas A&M University**, May 12th, 2017.
6. *Geometry-Topology Seminar*, **Stony Brook University**, May 9th, 2017.
7. *Geometry Seminar*, **Rome III University**, April 20th, 2017.
8. *Geometric Analysis Seminar*, **ICTP-SISSA**, March 23rd, 2017.
9. *Geometry-Topology seminar*, **Warwick University**, November 3rd, 2016.
10. *Waterloo Geometry Summer School*, **Waterloo University**, June 30th, 2016.
11. *Waterloo Geometry Summer School*, **Waterloo University**, June 29th, 2016.
12. *Differential Geometry & Geometric Analysis Seminar*, **Max Planck Institute for Mathematics**, January 12th, 2016.
13. *General Mathematics Seminar*, **University of Luxembourg**, November 3rd, 2015.
14. *Felix Klein Seminar*, **Notre Dame University**, October 30th, 2014.
15. *Topology-Analysis-Geometry Seminar*, **Notre Dame University**, October 9th, 2014.
16. *Complex Geometry seminar*, **Columbia University**, April 3rd, 2014.
17. *Algebraic Geometry Seminar*, **Princeton University**, October 24th, 2013.
18. *Complex Geometry Seminar*, **John Hopkins University & University of Maryland**, October 22nd, 2013.
19. *Geometry-Topology Seminar*, **Stony Brook University**, September 24th, 2013.
20. *Geometry-Topology Seminar*, **Duke University**, March 19th, 2013.
21. *Geometry-Topology Seminar*, **Stony Brook University**, October 9th, 2012.

22. *Differential Geometry & Geometric Analysis Seminar*, **Princeton University**, October 5th, 2012.
23. *Geometry Seminar*, **Universita' di Roma "La Sapienza"**, June 19th, 2012.
24. *Geometry Seminar*, **Universita' di Roma "La Sapienza"**, June 14th, 2012.
25. *Topology Seminar*, **University of California at Riverside**, May 1st, 2012.
26. *Graduate-Faculty Seminar*, **Duke University**, January 20th, 2012.
27. *Geometry-Topology Seminar*, **Duke University**, December 6th, 2011.
28. *Symplectic and Differential Geometry Seminar*, **Vanderbilt University**, November 30th, 2011.
29. *Geometry-Topology Seminar*, **Duke University**, March 29th, 2011.
30. *Geometry Seminar*, **Simons Center for Geometry and Physics**, January 24th, 2011.
31. *Geometry-Topology Seminar*, **University of Pennsylvania**, January 12th, 2011.
32. *Geometry Seminar*, **Universita' di Roma "La Sapienza"**, June 8th, 2010.
33. *Geometry Seminar*, **Universita' di Roma "La Sapienza"**, June 7th, 2010.
34. *Graduate Student Seminar*, **Stony Brook**, March 2010.
35. *Séminaire de jeunes mathématiciens (Organized by P. Pansu)*, **Institut Henri Poincaré**, May 2008.

Service to the Mathematics Community

Co-organizer, **AMS Special Session** on “Geometry and Topology of Ball Quotients and Related Topics” at the Spring Eastern Sectional Meeting Hunter College, City University of New York, New York, NY May 6-7, 2017.

Co-organizer, **Geometry-Topology seminar**, Duke University, Fall 2011- Spring 2014.

Co-organizer, **27th Geometry Festival**, Duke University, April 27th-29th, 2012.

Referee for several journals, since 2011.

Reviewer for Math Reviews.