

Simone Diverio

Curriculum Vitæ

CNRS et Institut de Mathématiques de Jussieu – Paris Rive Gauche
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Personal profile

Gender Male
Date of birth January 31, 1980
Place of birth Torino – Italy
Current position “Chargé de recherche de première classe” (CNRS) in the team of “Analyse Complexe et Géométrie”, Institut de Mathématiques de Jussieu – Paris Rive Gauche, Université Pierre et Marie Curie, Paris.

Education

2009 **One year post-doc position**, SAPIENZA Università di Roma.
Supervisor: Paolo Piazza
10/2008 **One month research grant**, SAPIENZA Università di Roma.
Supervisor: Paolo Piazza
2004–2008 **PhD student in mathematics (joint supervision PhD thesis)**, Université de Grenoble I.
2003–2008 **PhD student in mathematics**, SAPIENZA Università di Roma.
07/2003 **Master’s Degree in mathematics**, Università di Roma “Tor Vergata”, 110/110 *cum laude*.
1998–2003 **Student in mathematics**, Università di Roma “Tor Vergata”.

PhD thesis (Université de Grenoble I & SAPIENZA Università di Roma)

Title *Jet differentials, holomorphic Morse inequalities and hyperbolicity*
Supervisors Jean-Pierre Demailly (Institut Fourier, Université de Grenoble I) & Stefano Trapani (Università di Roma “Tor Vergata”).
Defense September 2008

Publications

Preprints

- *An inequality for Segre forms of Hermite–Einstein vector bundles*. ArXiv e-prints, 13 pages, March 2015.
- with E. Rousseau, *The exceptional set and the Green-Griffiths locus do not always coincide*. ArXiv e-prints, 27 pages, January 2014.

Peer-review journals

- with A. Ferretti, *On a conjecture of Oguiso about rational curves on Calabi-Yau threefolds*. Comment. Math. Helv. **89** (2014), no. 1, 157–172.

- with S. Trapani, *A remark on the codimension of the Green-Griffiths locus of generic projective hypersurfaces of high degree*. *J. Reine Angew. Math.* **649** (2010), 55–61.
- with J. Merker and E. Rousseau, *Effective algebraic degeneracy*. *Invent. Math.* **180** (2010), no. 1, 161–223.
- *Smooth metrics on jet bundles and applications*. *Osaka J. Math.* **46** (2009), no. 4, 1019–1045.
- *Existence of global invariant jet differentials on projective hypersurfaces of high degree*. *Math. Ann.* **344** (2009), no. 2, 293–315.
- *Differential equations on complex projective hypersurfaces of low dimension*. *Compos. Math.* **144** (2008), no. 4, 920–932.

Conference proceedings

- *About the hyperbolicity of complete intersections*. *Boll. Unione Mat. Ital.* (9) **6** (2013), no. 3, 579–590.
- *Rational curves on Calabi-Yau threefolds and a conjecture of Oguiso*. *Oberwolfach Rep.* **9** (2012), no. 3, 2612–2615.

Books and monographs

- *Non-hyperbolicity of compact Kähler manifolds with trivial first Chern class*. Chapter in *Kobayashi hyperbolicity and positivity of the canonical bundle*, edited by Simone Diverio for Panoramas et Synthèses, Soc. Math. France. In preparation.
- with E. Rousseau, *A survey on hyperbolicity of projective hypersurfaces*. *Publicações Matemáticas do IMPA*. Instituto de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, 2011. x+109pp.

Selected oral communications

- 2015 **Segre forms and Kobayashi–Lübke type inequalities**, *Geometria in Bicocca 2015*, Workshop at the University of Milano Bicocca, Milano.
- 2014 **The Green-Griffiths locus of quotients of bounded symmetric domains**, *Complex Geometry, Analysis and Foliations – Honouring the memory of Marco Brunella*, Conference at the ICTP, Trieste.
- 2014 **Fibré canonique et hyperbolicité des variétés projectives complexes**, *Séminaire “Opérateurs de Dirac”*, Laboratoire de Mathématiques d’Orsay, organized by J.-M. Bismut.
3 hours talk
- 2013 **The Green-Griffiths locus of quotients of bounded symmetric domains**, *The locally free geometry seminars – 8th meeting*, “Simion Stoilow” Institute of Mathematics of the Romanian Academy, Bucharest.
- 2013 **Le lieu de Green-Griffiths des variétés uniformisées par le polydisque**, *Séminaire d’Analyse Complexe et Géométrie*, Institut de Mathématiques de Jussieu – Paris Rive Gauche.
- 2012 **Rational curves on Calabi-Yau threefolds and a conjecture of Oguiso**, *Komplexe Analysis*, Mathematisches Forschungsinstitut Oberwolfach.
- 2012 **Kobayashi hyperbolicity and positivity properties of the canonical bundle**, *VMS – SMF Joint Congress*, Hué, Vietnam.
- 2012 **Rational curves on Calabi-Yau threefolds with special divisors**, *Algebraic Geometry Seminar*, University of Cambridge.
- 2011 **Existence of rational curves on Calabi-Yau threefolds with special divisors**, *Algebraic surfaces and related topics*, workshop at the Université de Poitiers.

- 2011 **Intorno all'iperbolicità delle intersezioni complete**, *XIX Congresso dell'unione matematica italiana*, Bologna, Italy.
Plenary talk
- 2010 **Algebro-geometric criteria for Kobayashi hyperbolicity of complex projective manifolds**, *Complex Geometry*, conference in Levico Terme, Italy.
- 2009 **On the Kobayashi conjecture**, *The London topology and geometry seminar*, Imperial College, London.
- 2009 **Effective algebraic degeneracy, I**, *Algebraic varieties and hyperbolicity: geometric and arithmetic aspects*, workshop in Strasbourg.
- 2009 **La conjecture de Kobayashi en dimension trois**, *Séminaire d'Analyse Complexe et Géométrie*, Institut de Mathématiques de Jussieu, Paris.
- 2008 **Métriques lisses sur les espaces des jets**, *Géométrie des variétés complexes III*, conference at the CIRM, Marseille.
- 2007 **Existence of invariant jet differentials via holomorphic Morse inequalities**, *Effective Aspects of Complex Hyperbolic Manifolds*, conference at the "Centre de la Mer", Aber Wrach.

Honors

- 2012 Séminaire Bourbaki: M. Păun, *Techniques de construction de différentielles holomorphes et hyperbolicité (d'après J.-P. Demailly, S. Diverio, J. Merker, E. Rousseau, Y.-T. Siu...)*.
- 2010 Prime d'excellence scientifique (PES) CNRS.

Meeting organization

- 2014 **Conference in honor of Pierre Dolbeault**, *On the occasion of his 90th birthday anniversary*, Institut de Mathématiques de Jussieu - Paris Rive Gauche.
- 2013 **Rencontre sur la stabilité**, *Workshop of the research group ANR "POSITIVE"*, Station Biologique de Roscoff.
- 2012 **MACK5**, *Workshop of the research group ANR "MACK"*, École française de Rome.
- 2012 **MACK4**, *Workshop of the research group ANR "MACK"*, Institut de Mathématiques de Jussieu - Paris Rive Gauche.
- 2012 **Rencontre Faltings/Nadel**, *Workshop of the research group ANR "POSITIVE"*, Institut de Mathématiques de Jussieu - Paris Rive Gauche.
- 2010 **Hyperbolicité**, *Workshop of the research group ANR "POSITIVE"*, Département de Mathématiques d'Orsay.

Teaching experience

Advanced courses

- 2013/2014 **Géométrie birationnelle en dimension supérieure: Minimal Model Program**, *Université Pierre et Marie Curie*.
Course (with Sébastien Boucksom), master level, 24 hours in total
- 2013/2014 **Géométrie complexe et théorie de Hodge**, *Université Pierre et Marie Curie*.
Course + exercise supervision (with Laurent Charles), master level, 36 hours in total
- 2011/2012 **Une introduction à la théorie de Hodge et à la géométrie kählerienne**, *Université Pierre et Marie Curie*.
Course + exercise supervision, master level, 36 hours in total

- 2010/2011 **Une introduction à la théorie de Hodge et à la géométrie kählerienne**, *Université Pierre et Marie Curie*.
Course + exercise supervision, master level, 36 hours in total
- 09/2010 **Hyperbolicity of projective hypersurfaces**, *Instituto de Matemática Pura e Aplicada (IMPA)*, Rio de Janeiro.
Survey specialized mini-course for researchers (with Erwan Rousseau), 12 hours in total
- 2008/2009 **Varietà kähleriane e teorema di immersione di Kodaira**, *SAPIENZA Università di Roma*.
Course for PhD students in mathematics (with Adriano Pisante), 32 hours in total
- Undergraduate courses**
- 2014/2014 **Algèbre**, *PSL and Paris Dauphine*, Course and exercise supervision.
27 hours in total
- 2007/2008 **Linear algebra and geometry**, *Università di Roma "Tor Vergata"*, exercise supervision for the students in civil engineering.
30 hours in total
- 2007/2008 **Linear algebra and geometry**, *SAPIENZA Università di Roma*, exercise supervision for the students in clinical engineering.
30 hours in total
- 2006/2007 **Linear algebra and geometry**, *Università di Roma "Tor Vergata"*, exercise supervision for the students in computer engineering.
30 hours in total
- 2006/2007 **Linear algebra and geometry**, *Università di Roma "Tor Vergata"*, exercise supervision for the students in industrial engineering.
30 hours in total
- 2006/2007 **Introductory course in mathematics**, *SAPIENZA Università di Roma*, for the students in computer sciences.
20 hours in total
- 2005/2006 **Linear algebra and geometry**, *SAPIENZA Università di Roma*, exercise supervision for the students in environmental engineering.
30 hours in total
- 2005/2006 **Linear algebra and geometry**, *SAPIENZA Università di Roma*, exercise supervision for the students in transportation engineering.
30 hours in total
- 2004/2005 **Linear algebra and geometry**, *SAPIENZA Università di Roma*, exercise supervision for the students in aerospace engineering.
30 hours in total
- 2004/2005 **Introductory course in mathematics**, *SAPIENZA Università di Roma*, for the students in architecture.
20 hours in total

Student supervision

Post-docs

- 2012–2013 Victor Lozovanu, one year post-doc of the Fondation Sciences Mathématiques de Paris.

Master thesis

- 2012 Aurelio Carlucci, ERASMUS student at the Université Pierre et Marie Curie of Paris coming from SAPIENZA Università di Roma, “Interactions between Riemannian Holonomy and Algebraic Geometry on Ricci-flat Kähler Manifolds”. Aurelio Carlucci is now a PhD student at SAPIENZA Università di Roma.
- 2011 Andrea Fanelli, ERASMUS student at the Université Pierre et Marie Curie of Paris coming from SAPIENZA Università di Roma, “Fasci di ideali di moltiplicatori: teorema di Nadel e applicazioni”. Andrea Fanelli is now a PhD student at the Imperial College of London.

Bachelor thesis

- 2013 Justin Courrouy, student of the Université Pierre et Marie Curie, “Autour du Petit Théorème de Picard sans uniformisation”.

Funds and research projects

- 2011–2013 POSITIVE - Positivité en géométrie arithmétique, algébrique et analytique – Projet blanc (ANR-2010-BLAN-0119-01) de l’Agence Nationale de la Recherche.
- 2008–2012 FIRB Futuro e ricerca (2008) - Geometria differenziale complessa e olomorfa - RBFR08B2HY_001.
- 2007–2009 PRIN 2007 - 2007BET4BR_004 - Azioni di gruppi su varietà CR e complesse, spazi di moduli, teoria geometrica delle funzioni e dinamica olomorfa.

Other tasks

- 2013/2014 One of the organizers of the “Séminaire d’Analyse et Géométrie” of the Institut de Mathématiques de Jussieu – Paris Rive Gauche.
- 2013 Member of the selection committee for the permanent position MCF-0751722P-4163 (researcher) of the Université de Paris 6, chairperson Nicolas Bergeron.
- From 2013 Member of the “conseil du laboratoire” of the Institut de Mathématiques de Jussieu – Paris Rive Gauche.
- 2009–2010 One of the organizers of the “Séminaire des thésards” of the Institut de Mathématiques de Jussieu.
- From 2009 Reviewer for “Mathematical Reviews”.
- 2007–2009 Reviewer for “Zentralblatt MATH”.
- Referee for several international peer-review journals.

Knowledge of languages

Italian **Mother tongue**
English **Good**
French **Fluent**

253/300 Computer-based TOEFL, 10/2002