Andrea Loi: Curriculum Vitae et Studiorum.

Personal Details

Date of birth: September 28, 1969   Place of birth: Cagliari, Italy.

address: Dipartimento di Matematica e Informatica   email: loi@unica.it
Via Ospedale 72, 09124 Cagliari-Italy   phone number: 39 070 6758526

Current Position
Full Professor at University of Cagliari (Italy).

Postgraduate studies

1998 Ph.D. in Mathematics at the University of Warwick, supervisor J. Rawnsley, dissertation titled *Quantization of Kähler manifolds and Holomorphic immersions in projective spaces.*

1994 Master in Mathematics at the University of Warwick, supervisor J. M. Micallef, dissertation titled *Deformation of complex structures : Complex Tori and K3 Surfaces.*

Skills

- Proficient in written and spoken English; good in written and spoken French.

Scientific travels

- Universit di Evora (Portugal) (1 September–06 September 2013).

- Visiting Professor, Institut Fourier de Mathmatiques (Grenoble) (9 January - 9 February 2012).

- University of München (Germany) (18-21/12/2011).

- University of Bilbao (Spain) (06-10/10 2011).

- The thirteenth international conference on Geometry, Integrability and Quantization; Varna (Bulgaria), (with a cast grant) (03-08/06 2011).

- Workshop on Symplectic Geometry, Contact Geometry, and Interactions; Department if Mathematics, Uppsala University (with a CAST grant) (27-29/1 2011).

- University of Sofia (Bulgary) (6-8/9 2010).

- University of Veliko Tarnovo (Bulgary) (8-10/9 2010)].

- Mathematics Institute, Princeton University (invitation by G. Tian);

  Courant Institute, Department of Mathematics New York (invitation by M. Gromov) (01/04-30/04 2008)

- University of Sofia (15/7-15/9 2003).

- I.H.E.S. (invitation by J. P. Bourguignon) (one month: October 1995)

- University of Warwick, England (1993-98)

- Mathematics Institute Louis Pasteur, Strasbourg (one year: 1990-91).

Invited speakers to the following conferences

2013 *The Gromov width of symmetric spaces*, XXII International fall workshop on Geometry and Physics, 2-5 September 2013, Evora (Portugal).

2012 *Kähler immersions of homogeneous Kähler manifolds into complex space forms*, Institut Fourier de Mathématiques (Grenoble), 24 Gennaio 2012.

2011 *Balanced metrics, TYZ expansion and Szegö kernel*, conference at the Mathematics Institute of the University of München, München (Germany) 20 Dicembre 2011.

2011 *Gllobal Symplectic coordinates on Kähler manifolds*, EMS-RSME JOINT MATHEMATICAL WEEKEND, Bilbao, October 7-9, 2011.

2011 *Balanced metrics, Tian–Yau–Zelditch expansion and quantization of a Kähler manifold*, The thirteenth international international conference on Geometry, Integrability and Quantization, Varna (Bulgaria) 3-8 June 2011.

2011 *Metriche bilanciate, espansione di Tian–Yau–Zelditch e quantizzazione di una varietá di Kähler*, Geometry in Bicocca (Milan) 2011, 12-13 May 2011.

2010 *Kähler immersions of homogeneous Kähler manifolds into complex space forms* Global Analysis and PDE on Manifolds, IMI, BAS, SOFIA, 6-8 September 2010.

2010 *Kähler immersions of homogeneous Kähler manifolds nto complex space forms* ICDG (International Congress in Differential Geometry 2010, Veliko Tarnovo 8-10 September 2010.

2008 *Holomorphic immersions of Kähler-Einstein manifolds into complex space forms* (School and Conference on Differential Geometry, ICTP, Trieste, 2 June - 20 June 2008)

2008 *Symplectic duality between complex domains* (Extremal Kaehler metrics and Kaehler-Ricci flow, Centro De Giorgi, Pisa, 2 March - 29 March 2008).

2007 *Immersioni simplettiche in spazi di forme complessi* (Giornate di Geometria, Pavia, February 13-14).

2006 *Symmetric coordinates on symmetric domains and their compact duals* (Mathematics and its applications, Torino, July 3-7).

2006 *Symmetric coordinates on symmetric domains and their compact duals* (Recenti sviluppi della geometria complessa, differenziale, simplettica, Centro di Ricerca Matematica Ennio de Giorgi, Pisa, Marzo 9-11).

2003 *On Nash's C^1-isometric theorem* (Miniworkshop on PDE and Geometry, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Settembre 1-2).

2002 *Una versione simplettica del teorema di immersione isometrica di Nash* (Nuovi contributi italiani alla geometria differenziale III, Palermo).

2000 *Isometric Immersions and Symplectic Geometry* (Dynamical Systems and PDE, Cagliari).

1999 *Decomposizioni a libro aperto positive e strutture di contatto bordo sulle 3-variet* (Nuovi contributi italiani alla geometria differenziale II, Palermo).

1997 *Quantizzazione di variet di Kähler* (Nuovi contributi italiani alla geometria differenziale I, Bari).

Research interests

1. Induction of geometric structures (Kähler form, symplectic forms, Riemannian metrics and connections);

2. analytic and geometric methods for the quantization (geometric and by deformation) of a Kähler manifold;

3. balanced metrics and the TYZ (Tian–Yau–Zelditch) expansion.

Research publications

1. (joint with Michela Zedda) *The diastasis function of the Cigar metric*, to appear in JGP.

2. (joint with Fabio Zuddas) *Explicit symplectic coordinates on Kähler manifolds*, proceedings del workshop "New perspectives in differential geometry: special metrics and quaternionic geometry in honour of Simon Salamon (Rome, 16-20 Novembre 2015), Springer-INdAM.

3. (joint with Roberto Mossa e Fabio Zuddas) *The log-term of the disc bundle over a homogeneous Hodge manifold*, Ann. Global Anal. Geom., ??? (2016)

4. (joint with Fabio Zuddas) *On the Gromov width of Homogeneous Kähler manifolds*, Diff. Geom. Appl. 47, 130-132 (2016).

5. (joint with C. Arezzo and F. Zuddas) *Some remarks on the symplectic and Kähler geometry of toric varieties*, Annali di Matematica Pura e Applicata 4, 1287-1304 (2016).

6. (joint with R. Mossa and F. Zuddas) *Symplectic capacities of Hermitian symmetric spaces of compact and non compact type*, Journal of Symplectic Geometry Volume 13, Number 4, 1049-1073 (2015).

7. (joint with Stefano Bonzio e Luisa Peruzzi) *On the first law of cubology for the Rubik's Revenge.* to appear in Mathematica Slovacca (2015).

8. (joint with Roberto Mossa) *Some remarks on Homogeneous Kähler manifolds*, to appear in Geometriae Dedicata Volume 179 (2015), 1-7.

9. (joint with S. Matta) *On the topology of the set of critical equilibria.* to appear in International Journal Economic Theory (2015).

10. (joint with Michela Zedda) *On the coefficients of TYZ expansion of locally Hermitian symmetric spaces.* Manuscripta Mathematica (2015),Vol. 148, 303-315.

11. (joint with Daria Uccheddu e Michela Zedda) *On the Szegö kernel of Cartan–Hartogs domains*, Arxiv for Matematik, Vol. 54 Issue 2 (2015), 473-484.

12. (joint with S. Matta) *Increasing complexity in structurally stable models*, J. Math. Econom. 57 (2015), 20-24.

13. (joint with L. Cadeddu and Gallot) *Maximizing mean exit-time of the Brownian motion on Riemannian manifolds*, Monatsh. Math. Vol. 176, Issue 4 (2015), 551-570.

14. (joint with R. Mossa and F. Zuddas) *Some remarks on the Gromov width of homogeneous Hodge manifolds*, Int. J. Geom. Methods Mod. Phys. Vol. 11, No. 2 (2014).

15. (joint with C. Arezzo and F. Zuddas) *Szego Kernel, regular quantizations and spherical CR-structures*, Math. Z. (2013) 275, 1207-1216.

16. (joint with M. Zedda) *Global symplectic coordinates on gradient Kähler–Ricci solitons*, Monatsh. Math. (2013) 171:415-423.

17. (joint with S. Matta) *Structural stability and catastrophes*, Economics Bulletin (2012) Vol.32 No. 4, 3378-3385 **NO MATHSCINET**.

18. (joint with S. Matta) *Measures of economies with an arbitrarily large number of equilibria*, International Journal of Economic theory (2012) Vol.8, No.4, 337-343.

19. (joint with C. Arezzo and F. Zuddas) *On homothetic balanced metrics*, Ann. Global Anal. Geom. 41, n. 4 (2012), 473-491.

20. (joint with M. Zedda and F. Zuddas) *Some remarks on the Kähler geometry of the Taub–NUT metrics*, Ann. Global Anal. Geom. 41, n. 4 (2012), 515-533.

21. (joint with A. J. Di Scala and H. Hishi) *Kähler immersions of homogeneous Kähler manifolds into complex space forms*, Asian Journal of Mathematics Vol. 16 No. 3 (2012), 479-488.

22. (joint with R. Mossa) *Berezin quantization of homogeneous bounded domains*, Geom. Dedicata 161 (2012) 119-128.

23. (joint with M. Zedda) *Calabi's inhomogeneous Einstein manifold is globally symplecto-morphic to $\mathbb{R}^{2n}$*, Diff. Geom. Appl. (30) 2 (2012), 145-147.

24. (joint with M. Zedda) *Balanced metrics on Cartan and Cartan-Hartogs domains* Math. Z. 270 (2012), no. 3-4, 1077-1087.

25. (joint with M. Zedda), *Kähler-Einstein submanifolds of the infinite dimensional projective space*, Math. Ann. 350 (2011), 145-154.

26. (joint with Roberto Mossa), *The diastatic exponential of a symmetric space*, Math. Z. 268 (2011), no. 3-4, 1057-1068.

27. (joint with G. D'Ambra and R. Deleo) *Partially isometric immersions and free maps* Geom. Dedicata 151 (2011), 79-95.

28. (joint with S. Matta) *Catastrophes minimization on the equilibrium manifold*, J. Math. Econom. 47 (2011), 617-620.

29. (joint with Roberto Mossa) *Uniqueness of balanced metrics on complex vector bundles*, J. Geom. Phys. 61 (2011) , 312-316.

30. (joint with M. Zedda) *Balanced metrics on Hartogs domains* Abh. Math. Semin. Univ. Hambg. 81 (2011), no. 1, 6977.

31. (joint with T. Gramchev) *TYZ expansion for some rotation invariant Kähler metrics*, Proceedings of the 2nd International Colloquium on Differential Geometry and Its Related Fields, World Sci., (2011), 91-108.

32. (joint with M. Zedda), *A note on the l^2-norm of the second fundamental form of algebraic manifolds* , Serdica Math. J. 36 (2010), 67-74.

33. (joint with A. J. Di Scala), *Kähler manifolds and their relatives*, Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5) Vol. IX (2010), 495-501.

34. (joint with S. Matta) *A note on the structural stability of the equilibrium manifold* J. Math. Econom. 46 (2010) n.4, 591-594.

35. (joint with A. J. Di Scala and F. Zuddas), *Symplectic duality between complex domains* Monatsh. Math. 160 (2010) 403-428.

36. (joint with F. Zuddas), *Canonical metrics on Hartogs domains*, Osaka J. Math. Vol. 47, No.2 (2010), 507-521.

37. (joint with A. Greco), *Radial balanced metrics on the unit disk*, J. Geom. Phys. 60 (2010), 53-59.

38. (joint with S. Matta), *Evolution paths on the Equilibrium Manifold*, J. Math. Econom. 45 (2009), 846-851.

39. (joint with F. Zuddas), *Engliš expansion for Hartogs domains*, Int. J. Geom. Methods Mod. Phys. Vol. 6, No. 2 (2009), 233-240.

40. (joint with A. J. Di Scala and F. Zuddas), *Riemannian geometry of Hartogs domains*, International Journal of Mathematics Vol. 20, Number 2 (2009), 139-149.

41. (joint with T. Gramchev), *TYZ expansion for the Kepler manifold*, Comm. Math. Phys. 289, (2009), 825-840.

42. (joint with M. Zedda), *Cartan domains and indefinite Euclidean spaces*, Extracta Math. 23 no. 3 (2008), 255-263.

43. (joint with S. Matta), *Geodesics on the equilibrium manifold*, J. Math. Econom. 44 (2008), no. 12, 1379–1384.

44. (joint with A. J. Di Scala and Guy Roos), *The bisymplectomorphism group of a bounded symmetric domain*, Transformation Groups Vol. 13, Number 2 (2008), 283-304.

45. (joint with A. J. Di Scala) *Symplectic duality of symmetric spaces*, Adv. Math. 217 (2008), 2336-2352.

46. (joint with F. Zuddas), *Symplectic maps of complex domains into complex space forms*, J. Geom. Phys. 58 (2008), 888-899.

47. (joint with C. Arezzo and A. Ghigi) *Stable bundles and the first eigenvalue of the Laplacian*, J. Geom. Anal. Vol. 17, N. 3 (2007), 401-412.

48. (joint with F. Cuccu) *Balanced metrics on $\mathbb{C}^n$*, J. Geom. Phys. 57 (2007), 1115-1123.

49. (joint with G. D'Ambra) *Non-free isometric immersions of Riemannian manifolds*, Geom. Dedicata 127 (2007), 151-158.

50. (joint with A.J. Di Scala) *Kähler maps of Hermitian symmetric spaces into complex space forms*, Geom. Dedicata 25 (2007), 103-113.

51. *Regular quantizations and covering maps*, Geom. Dedicata 123 (2006), 73-78.

52. *Calabi's diastasis function for Hermitian symmetric spaces*, Differential Geom. Appl. 24 (2006), 311-319.

53. (joint with F. Cuccu) *Global symplectic coordinates on complex domains*, J. Geom. Phys. 56 (2006), 247-259.

54. (joint with S. Matta) *A Riemannian metric on the Equilibrium Manifold: the smooth case*, Economics bulletin 30 (2006), 1-9. **NO MATHSCINET**.

55. *A Laplace integral on a Kähler manifold and Calabi's diastasis function*, Differential Geom. Appl. 23 (2005), 55-66.

56. *Bergman and balanced metrics on complex manifolds*, Int. J. Geom. Methods Mod. Phys. 2 (2005), 553-561.

57. *A Laplace integral, the T-Y-Z expansion and Berezin's transform on a Kaehler manifold* Int. J. Geom. Methods Mod. Phys. 2 (2005), 359-371.

58. *Regular quantizations of Kähler manifolds and constant scalar curvature metrics*, J. Geom. Phys. 53 (2005), 354-364.

59. (joint with C. Arezzo) *A note on Kähler-Einstein metrics and Bochner's coordinates*, Abh. Math. Sem. Univ. Hamburg 74 (2004), 49-55.

60. (joint with C. Arezzo) *Moment maps, scalar curvature and quantization of Kähler manifolds*, Comm. Math. Phys. 243 (2004), 543-559.

61. *The Tian–Yau–Zelditch asymptotic expansion for real analytic Kähler metrics*, Int. J. Geom. Methods Mod. Phys. v. 1 No 3 (2004), 253-263.

62. (joint with G. D'Ambra) *Inducing connections on $SU(2)$-bundles*, JP J. Geom. Topol. 3 (1) (2003), 65-88.

63. (joint with C. Arezzo) *Quantization of Kähler manifolds and the asymptotic expansion of Tian–Yau–Zelditch*, J. Geom. Phys. 867 (2003), 1-13.

64. (joint with G. D'Ambra) *A symplectic version of Nash C^1-isometric embedding theorem*, Differential Geom. Appl. 16, no. 2 (2002), 167-179.

65. *Holomorphic maps of Hartogs domains in Complex Space forms*, Riv. Mat. Univ. Parma (7), vol. 1 (2002), 103-113.

66. (joint with R. Piergallini) *Compact Stein surfaces with boundary as branched covers of B^4*, Invent. Math. 143 (2001), 325-348.

67. (joint with D. Zuddas) *Some remarks on Bergmann metrics*, Riv. Mat. Univ. Parma 6, no. 4 (2001), 71-86.

68. *The function epsilon for complex Tori and Riemann surfaces*, Bull. Belg. Math. Soc. Simon Stevin 7, no. 2 (2000), 229-236.

69. (joint with P. Sitzia) *Explicit formulas for geodesics of homogeneous $SO(2)$-isotropic three dimensional manifolds*, Adv. Math. 156 (2000), 1-22.

70. *Quantization of bounded domains*, J. Geom. Phys. 29 (1999), 1-4.

Teaching experience

- *Topology for the first degree in Mathematics and Algebraic Topology (postgraduate level)*, University of Cagliari (2008-2013).

- *Linear Algebra and Geometry for Informaticians (undergraduate level)*, University of Cagliari (2002-2008).

- *Mathematics for biologists (undergraduate level)* University of Sassari (Italy) (1999-2001);

- *Mathematics for ambiental sciences (undergraduate level)*, University of Oristano and University of Nuoro (Italy) (1999-2011);

- Lectures on *Complex vector bundles* (for Ph.D. students), University of Camerino (Italy) (1997-98);

- Lectures and seminars on *Quantization of Kähler manifolds* (for Ph.D. students), University di Warwick (1996-97).

- Undergraduate example classes of the course *Geometry of Curves and Surfaces* (undergraduate level), University of Warwick (1995-96).

Supervisor for 30 tesi di Laurea in Matematica (first degree in Mathematics) at Cagliari University.

Supervisor for 18 tesi di Laurea in Matematica (second degree) at Cagliari University.

Supervisor for the following Ph.D. dissertation

- Dott. Roberto Mossa, *Balanced metrics on complex vector bundles and the diastatic exponential of a symmetric space* (January 2011) .

- Dott. Michela Zedda, *Kähler immersions of KählerEinstein manifolds into infinite dimensional complex space forms* (January 2010).

- Daria Uccheddu started her Ph.D. in Mathematics under my supervision in January 2011.

Academic experiences

- Head of the Department of Mathematics and Computer Sciences, University of Cagliari (2015-)

- Coordinator for the Mathematics (among which manager of the local funds for research and teaching) in the Faculties of Mathematics, Informatics and Engeneering at the University of Cagliari (2010-2011).

- Erasmus Coordinator for the Mathematics at the Universtiy of Cagliari (2007-11)

- Member of the Council of the Ph.D. School in Mathematics at the University of Cagliari (2007-2010).

- Local Coordinator of a National Research Project (denominated PRIN) in the field of Geometry of Real and Complex Manifolds (2010).