

# Roberto Mossa

## Curriculum Vitae

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### Education

- 2011 **PhD in Mathematics**, *Università degli Studi di Cagliari, Italy*.  
Supervisor: Prof. Andrea Loi. Thesis title: “Balanced metrics on complex vector bundles and the diastatic exponential of a symmetric space”.
- 2007 **MSc (Hons) in Mathematics**, *Università degli Studi di Cagliari, Italy*.  
Supervisor: Prof. Andrea Loi. Thesis title: “Riemannian geometry of the Hartogs domains”.
- 2005 **BSc (Hons) in Mathematics**, *Università degli Studi di Cagliari, Italy*.  
Supervisor: Prof. Andrea Loi. Thesis title: “Jordan-Brouwer separation theorem”.

### Research interests

- Kähler geometry
- Complex differential geometry
- Hermitian symmetric spaces

### Academic positions held

- 01/07/2022–  
Today **Assistant Professor**, Dipartimento di matematica e informatica, Università degli studi di Cagliari.  
Italy
- 11/03/2021–  
30/6/2022 **Associate Professor**, Instituto de Matemática e Estatística, Universidade de São Paulo.  
Brazil
- 10/04/2018–  
10/03/2021 **Assistant Professor**, Instituto de Matemática e Estatística, Universidade de São Paulo.  
Brazil
- 4/11/2015–  
9/04/2018 **Assistant Professor**, Departamento de Matemática, Universidade Federal de Santa Catarina, Brazil.

### Postgraduate studies

- 2015 **Postdoc (one semester)**, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil, (supported by FAPESP grant, process 2014/25190-0).
- 2013–2014 **Research fellow**, Dipartimento di Matematica e informatica, Università degli Studi di Cagliari, Italy.
- 2012 **Postdoc**, Laboratoire de Mathématiques Jean Leray, Université de Nantes, France.
- 2011 **Postdoc (one semester)**, Institut Fourier de Mathématiques, Université de Grenoble 1, France.

### Research grants

- 2018-2022 Responsible for the research project “Diastatic entropy and rigidity of hyperbolic manifolds”. Project funded by the “Programa Jovens Pesquisadores em Centros Emergentes”, grant provided by FAPESP (Fundação de Amparo à Pesquisa do Estado de SP). Process number 2018/08971-9 (130 KBRL over four years).
- 2019-2020 USP grant “Programa de Apoio aos Novos Docentes da USP” (15 KBRL).

## Conference and seminar presentations

- 2019 Seminar. Title of the talk: “Introduction to complex geometry”. Panoramas de matemática at the São Paulo University (IME-USP). São Paulo (Brazil).
- 2018 Congress. III Congresso Brasileiro Jovens Pesquisadores em Matemática Pura, Aplicada e Estatística. Title of the talk: “On the Szegő kernel of the disk bundle over polarized manifolds”. Curitiba-PR (Brazil).
- 2018 Seminar. Title of the talk: “Log-term of the Bergman kernel and Szegő kernel of the disc bundle over polarised manifold”. USP-UNICAMP Geometry Seminar at the São Paulo University (IME-USP). São Paulo (Brazil).
- 2017 Seminar. Title of the talk: “Capacidades simplécticas dos espaços Hermitianos simétricos”. Pontifícia Universidade Católica of Rio de Janeiro (PUC). Rio de Janeiro (Brazil).
- 2017 Seminar. Title of the talk: “Capacidades simplécticas dos espaços Hermitianos simétricos”. São Paulo University (IME-USP). São Paulo (Brazil).
- 2016 Congress. II Congresso Brasileiro de Jovens Pesquisadores em Matemática Pura e Aplicada. Title of the talk: “Symplectic capacities of Hermitian symmetric spaces”. IMECC/UNICAMP, Campinas-SP (Brazil).
- 2016 Seminar. Title of the talk: “Gromov width of hermitian symmetric spaces”. Geometry Seminar at the Federal University of Santa Catarina (UFSC). Florianopolis (Brazil).
- 2016 Congress. First Joint Meeting Brazil-Italy in Mathematics. Title of the talk: “Upper and lower bound for the first eigenvalue and the Cheeger constant for Kähler manifolds in terms of Diastasis function”. IMPA, Rio de Janeiro-SP (Brazil).
- 2015 Seminar. Title of the talk: “Diastasis e entropia diastatica”. Geometry Seminar at the Federal University of Santa Catarina (UFSC). Florianopolis (Brazil).
- 2014 Seminar. Title of the talk: “Diastasis and diastatic entropy”. Universidade de São Paulo (IME-USP). São Paulo (Brazil).
- 2014 Seminar. Title of the talk: “Upper and lower bounds for the first eigenvalue of noncompact Kähler manifolds”. Northumbria University. Newcastle (England).
- 2012 Seminar. Title of the talk: “Diastasis function and diastatic entropy”. Laboratoire de Mathématiques Jean Leray, Nantes University. Nantes (France).
- 2012 Congress. Journées Nancéiennes de Géométrie. Title of the talk: “Balanced metrics on complex manifolds”. Institut Élie Cartan, Université de Lorraine, Nancy (France)
- 2012 Seminar. Title of the talk: “Balanced metrics on complex manifolds”. Laboratoire de Mathématiques Jean Leray, Nantes University. Nantes (France).
- 2011 Seminar. Title of the talk: “The diastasis function”. Institut Fourier, Université de Grenoble 1. Grenoble (France).
- 2011 Seminar. Title of the talk: “Balanced metrics on complex manifolds”. Institut Fourier, Université de Grenoble 1. Grenoble (France).
- 2010 Congress. Progressi Recenti in Geometria Reale e Complessa. Title of the talk: “The diastatic exponential of a symmetric space”. Levico Terme (Italy).
- 2010 Congress. International Congress in Differential Geometry (ICDG). Title of the talk: “The diastatic exponential of a symmetric space”. Veliko Tarnovo (Bulgaria).

- 2010 Congress. Global Analysis and PDE on Manifolds. Title of the talk: “The diastatic exponential of a symmetric space”. IMI, BAS, Sofia (Bulgaria).

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## Long-term research visits

- 2014 Universidade Federal de Rio de Janeiro, Brazil (one month).  
2011 Institut Fourier de Mathématiques, Université de Grenoble 1, France (four months).

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## Participation in conferences and schools

- 2015 30th Colóquio Brasileiro de Matemática , IMPA, Rio de Janeiro, Brazil.  
2013 Conference on Complex Analysis and Geometry - XXI, Levico Terme, Trento, Italy.  
2012 ICTP-ESF School and Conference on Geometrical Analysis, ICTP, Miramare-Trieste, Italy (two weeks).  
2012 Aspects Conformes de la Géométrie, ACG, Jussieu, Paris, France.  
2010 Summer School: Scuola Matematica Interuniversitaria, SMI, Perugia, Italy (one month).  
2009 Summer School: Symplectic and Contact Geometry and Topology. MSRI, Berkeley California. Supported by INDAM grant (two weeks).  
2008 Summer School: Scuola Matematica Interuniversitaria, SMI, Perugia, Italy (one month).

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## Teaching experience

### PhD/Msc courses

- 2021 “Differentiable manifolds and Lie groups”, 1-semester course at the Mathematics Department of the Institute of Mathematics and Statistics of the São Paulo University, Brazil.  
2020 “Differentiable manifolds and Lie groups”, 1-semester course at the Mathematics Department of the Institute of Mathematics and Statistics of the São Paulo University, Brazil.  
2019 “Kähler Geometry”, 1-semester course at the Mathematics Department of the Institute of Mathematics and Statistics of the São Paulo University, Brazil. (<https://www.ime.usp.br/mat/pos/disciplinas/horarios>)  
2017 “Differential Geometry”, 1-semester course for the Department of Mathematics of the Federal University of Santa Catarina, Brazil. (<http://ppgmtm.posgrad.ufsc.br/informacoes-ao-aluno/horarios-disciplinas-2017>). Academic Year 2017.  
2015 (Joint with Professor Paolo Piccione), “G-structures and Kähler geometry”, mini course for the Mathematics Department of the Institute of Mathematics and Statistics of the São Paulo University, Brazil.

### BSc courses

- 2018-2019 One-semester courses for the Polytechnic School of Engineering of the São Paulo University, Brazil.  
- Differential and Integral Calculus IV (4 hours per week)  
- Differential and Integral Calculus III (two courses, 4 hours per week each)  
- Linear algebra II (two courses, 4 hours per week each)
- 2018 One-semester courses at the Federal University of Santa Catarina, Brazil.  
- Math 1, Economic Science Department (4 hours per week)  
- Financial Mathematics, Economic Science Department (4 hours per week)

- 2017 One-semester courses at the Federal University of Santa Catarina, Brazil.  
 - Linear algebra, Agronomy Department (4 hours per week)  
 - Mathematics, Economic Science Department (4 hours per week)  
 - Financial Mathematics, Economic Science Department (4 hours per week)
- 2016 One-semester courses at the Federal University of Santa Catarina, Brazil.  
 - Analytic Geometry, Electrical Engineering Department (4 hours per week)  
 - Group Theory, Mathematics Department (4 hours per week)  
 - Analytic Geometry, Electrical Engineering Department (4 hours per week)
- 2014 Lectures of Discrete Mathematics, one-semester course, 4 hours per week at the Department of Computer Science, University of Cagliari, Italy.
- 2013 Lectures of Discrete Mathematics, one-semester course, 4 hours per week at the Department of Computer Science, University of Cagliari, Italy.
- 2011 Example classes of Discrete Mathematics, one-semester course at the Department of Computer Science, University of Cagliari, Italy.
- 2009 Example classes of Algebraic Topology, one-semester course at the Department of Mathematics, University of Cagliari, Italy.
- 2006 Example classes of Linear Algebra, one-semester course at the Department of Mathematics, University of Cagliari, Italy.

## Scientific publications

Orcid ID: 0000-0001-9173-2386

Web of Science ResearcherID: H-9979-2018

Scopus Author ID: 35786153500

1. (Joint with R. G. Bettiol, A. Derdzinski, P. Piccione) *Subspace foliations and collapse of closed flat manifolds*, Math. Nachr. 295 (2022), no. 12, 2338-2356.
2. (Joint with M. Zedda) *Symplectic geometry of Cartan-Hartogs domains*, Ann. Mat. Pura Appl. (4) 201 (2022), no. 5, 2315-2339.
3. (Joint with M. Zedda) *A Cartan-Hartogs version of the polydisk theorem*, Geom. Dedicata 216 (2022), no. 5, Paper No. 51.
4. (Joint with A. Loi) *Kähler immersions of Kähler-Ricci solitons into definite or indefinite complex space forms*, Proc. Amer. Math. Soc. 149 (2021), no. 11, 4931-4941.
5. *On the  $\Delta$ -property for complex space forms*, Abh. Math. Semin. Univ. Hambg. 91 (2021), no. 1, 137-143.
6. (Joint with A. Loi, F. Zuddas) *Finite TYCZ expansions and cscK metrics*, J. Math. Anal. Appl. 484 (2020), no. 1, 123715.
7. *On the diastatic entropy and  $C^1$ -rigidity of complex hyperbolic manifolds*, J. Geom. Phys. 142 (2019), 213-228.
8. (Joint A. Loi, R. Mossa, F. Zuddas) *Bochner Coordinates on Flag Manifolds*, Bull. Braz. Math. Soc., New Series 50 (2018), no 2, 497-514.
9. (Joint with A. Loi, F. Zuddas) *The log-term of the disc bundle over a homogeneous Hodge manifold*, Ann. Global Anal. Geom. 51 (2017), no. 1, 35-51.
10. *Diastatic entropy and rigidity of complex hyperbolic manifolds* Complex Manifolds 3 (2016), 186-192.

11. (Joint with A. Loi, F. Zuddas) *Symplectic capacities of Hermitian symmetric spaces*, J. Symplect. Geom. 13 (2015), no. 4, 1049-1073.
12. (Joint with A. Loi) *Some remarks on homogeneous Kähler manifolds*, Geometriae dedicata. 179 (2015).
13. (Joint with G. Placini) *Minimal symplectic atlases of Hermitian symmetric spaces*, Abh. Math. Sem. Hamburg 85 (2015), no. 1, 79-85.
14. *A note on diastatic entropy and balanced metrics*, J. Geom. Phys. 86 (2014), 492-496.
15. (Joint with A. Loi, F. Zuddas) *Some remarks on the Gromov width of homogeneous Hodge manifolds*, Int. J. Geom. Methods Mod. Phys. 11 (2014), no. 9.
16. *The volume entropy of local Hermitian symmetric space of noncompact type*, Differential Geom. Appl. 31 (2013), no. 5, 594-601.
17. *A bounded homogeneous domain and a projective manifold are not relatives*, Riv. Mat. Univ. Parma 4 (2013), no. 1, 55-59.
18. (Joint with A. Loi) *Berezin quantization of homogeneous bounded domains*, Geom. Dedicata 161 (2012), 119-128.
19. (Joint with A. Loi) *Uniqueness of balanced metrics on complex vector bundles*, J. Geom. Phys. 61 (2011), no. 1, 312-316.
20. (Joint with A. Loi) *The diastatic exponential of a symmetric space*, Math. Z. 268 (2011), no. 3-4, 1057-1068.
21. *Balanced metrics on homogeneous vector bundles*, Int. J. Geom. Methods Mod. Phys. 8 (2011), no. 7, 1433-1438.

## Scientific journals of which I am referee

2017-Present Journal of Geometry and Physics.

## Other acknowledgements

- 2021 Habilitation for the associate professor position in Brazil (Livro Docente).
- 2020 Habilitation for the associate professor position in Italy (Abilitazione Scientifica Nazionale, <https://asn18.cineca.it/pubblico/miur/esito/01%252FA2/2/3>).
- 2013 Habilitation for the lecturer position in France (Qualification aux fonctions de maître de conférences, [https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/pdf/qualification/archives\\_resultat\\_s\\_qualification/2013/qualifies2013MCF.pdf](https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/pdf/qualification/archives_resultat_s_qualification/2013/qualifies2013MCF.pdf)).

## Languages

- Italian native language
- English fluent
- Portuguese fluent
- French good verbal and written communications skills.

Luogo e data: São Paulo, 25/01/2020.