Daniele Zuddas

Scientific CV

I was born in Cagliari, Italy, in 11 May 1975.

Contact information

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Research interests

My research is in the area of Geometric Topology in low dimensions. I study 4-manifolds from the topological and differentiable viewpoints, mainly using Lefschetz fibrations, branched coverings, handle decompositions and trisections, with applications to invariants of 4-manifolds, as well as to symplectic and complex geometry.

Education

10/3/2008 **PhD in Mathematics**, *Scuola Normale Superiore*, Pisa, Italy, with honors. Thesis: "Branched coverings and 4-manifolds", supervisor: Prof. Riccardo Piergallini.

19/7/2000 **Laurea in Matematica**, *Università degli Studi di Camerino*, Italy, with honors.

Qualification

- Qualification for associate professor of Geometry and Algebra in Italy, valid from 30 November 2017 to 30 November 2023 (ASN 01/A2 Geometria e Algebra, II fascia).

Current position

From Nov 2019 **Assistant professor of Geometry**, *University of Trieste*, Italy.
Research topics: complex algebraic geometry and topology of manifolds.

Previous positions

2017–2019 **ERC postdoctoral researcher in Mathematics**, *University of Bayreuth*, Germany.

2013–2017 **Research fellow in Mathematics**, *Korea Institute for Advanced Study*, Seul, South Korea.

2013 **Postdoctoral researcher**, *Max Planck Institute for Mathematics*, Bonn, Germany.

2009–2012 **Research fellow in Mathematics**, *Università di Cagliari*, Italy.

2007–2008 **Research fellow in Mathematics**, *Scuola Normale Superiore*, Pisa, Italy.

Scientific member in international research projects

2017–2019 2013 ERC Advanced Research Grant 340258 *Topological, Algebraic, Differential Methods in Classification and Moduli Theory (TADMICAMT)*, Lehrstuhl Mathematik VIII, Mathematisches Institut, University of Bayreuth. Principal investigator: Prof. Fabrizio Catanese.

2010–2015 Research Networking Programme *Contact and Symplectic Topology (CAST)*, European Science Foundation. Principal investigator: Prof. Frédéric Bourgeois.

Funding

2013–2017 Research grants from KIAS, Seoul, South Korea (€ 35.000).

2010–2012 Research grant from Regione Autonoma della Sardegna (FSE 2007–2013), Italy. Project: Lefschetz fibrations on 4-manifolds – CRP3_43 (€ 70.000).

Selected invited talks

- *How to present all compact topological 4-manifolds*, 'Joint meeting of the Italian Mathematical Union, the Italian Society of Industrial and Applied Mathematics and the Polish Mathematical Society', 17-20 September 2018, Wrocław, Poland.
- *The smooth presentation of non-smoothable 4-manifolds*, 'Differential, Algebraic and Topological Methods in Complex Algebraic Geometry', 6-15 September 2018, Cetraro, Italy.
- *Branched coverings of 4-manifolds*, AIM Workshop 'Symplectic four-manifolds through branched coverings', 14-18 May 2018, American Institute of Mathematics, San Jose, CA, USA.
- *Branched covering representation of 4-manifolds and their submanifolds*, 2017 KIAS Research Station Busan on "Self-distributive system and quandle (co)homology theory in algebra and low-dimensional topology", 12-16 June 2017, Busan, South Korea.
- *New holomorphic fillings in contact geometry*, '2nd KAST–Lincei Bilateral Symposium', 6/12/2016, KIAS, Seoul, South Korea.
- *Topological 4-manifolds as branched covers of S^4*, conference '4-Dimensional Topology', 21-23 November 2014, Osaka City University, Japan.
- *An equivalence theorem for Lefschetz fibrations over the disk*, 'OCAMI Workshop on Knots and Related Topics', 7-8 June 2014, Osaka City University, Japan.

Selected contributed talks

- *Branched coverings of CP^2 and other basic 4-manifolds*, 'Topology, Geometry, and Dynamics: Rokhlin – 100', 19-23 August 2019, The Euler International Mathematical Institute, Saint Petersburg, Russia.
- *Cobordisms of Lefschetz fibrations on 4-manifolds*, 'Knots and Low Dimensional Manifolds', a satellite conference of ICM 2014, 22-26 August 2014, Busan, South Korea.

- *Cobordisms of Lefschetz fibrations on 4-manifolds*, 'ICM 2014', 13-21 August 2014, Seoul, South Korea.
- *Fibrazioni di Lefschetz universali*, Incontro del Progetto FIRB 2012 'Geometria Differenziale e Teoria Geometrica delle Funzioni', 23-25 October 2013, University of Florence, Italy.
- *Lefschetz fibration structures on 4-dimensional 2-handlebodies*, 'ICDG 2010', 6-10 September 2010, University of Veliko Tarnovo, Bulgaria.
- *Lefschetz fibration structures on 4-dimensional 2-handlebodies*, 'International Workshop on Global Analysis and PDE on Manifolds', 6-8 September 2010, Sofia, Bulgaria.

Language skills

Italian	Native speaker
English	Advanced level C1 of QCER
French	Elementary

Publications

1. M. Freedman and D. Zuddas, *Certifying a compact topological 4-manifold*, Mathematical Research Letters 26 (2019), no. 1, 67–74, DOI: 10.4310/MRL.2019.v26.n1.a5.
2. R. Piergallini and D. Zuddas, *On branched covering representation of 4-manifolds*, Journal of the London Mathematical Society 100 (2019), no. 1, 1–16, DOI: 10.1112/jlms.12187.
3. R. Piergallini and D. Zuddas, *Special moves for open book decompositions of 3-manifolds*, Journal of Knot Theory and Its Ramifications 27, no. 11 (2018) 1843008, DOI: 10.1142/S0218216518430083.
4. A. J. Di Scala, N. Kasuya and D. Zuddas, *Non-Kähler complex structures on R^4, II*, Journal of Symplectic Geometry 16 (2018), no. 3, 631–644, DOI: 10.4310/JSG.2018.v16.n3.a2.
5. B. Cappelletti–Montano, A. Loi and D. Zuddas, *On codimension-1 submanifolds of the real and complex projective space*, Topology and its Applications 232 (2017), 237–241, DOI: 10.1016/j.topol.2017.10.015.
6. A. J. Di Scala, N. Kasuya and D. Zuddas, *Non-Kähler complex structures on R^4*, Geometry & Topology 21 (2017) n. 4, 2461–2473, DOI: 10.2140/gt.2017.21.2461.
7. A. J. Di Scala, N. Kasuya and D. Zuddas, *On embeddings of almost complex manifolds in almost complex Euclidean spaces*, Journal of Geometry and Physics 101 (2016), 19–26, DOI: 10.1016/j.geomphys.2015.11.008.
8. D. Zuddas, *Universal Lefschetz fibrations and Lefschetz cobordisms*, Geometry & Topology Monographs 19 (2015), 125–144, DOI: 10.2140/gtm.2015.19.125.
9. N. Apostolakis, R. Piergallini and D. Zuddas, *Lefschetz fibrations over the disc*, Proceedings of the London Mathematical Society 107 (2013), 340–390, DOI: 10.1112/plms/pds078.
10. D. Zuddas, *Universal Lefschetz fibrations over bounded surfaces*, Algebraic & Geometric Topology 12 (2012), 1811–1829, DOI: 10.2140/agt.2012.12.1811.
11. D. Zuddas, *Representing Dehn twists with branched coverings*, International Mathematics Research Notices 2009 (2009), 387–413, DOI: 10.1093/imrn/rnn134.
12. R. Piergallini and D. Zuddas, *A universal ribbon surface in B^4*, Proceedings of the London Mathematical Society 90 (2005), 763–782, DOI: 10.1112/S0024611504015072.

13. A. J. Di Scala and D. Zuddas, *Embedding almost-complex manifolds in almost-complex euclidean spaces*, Journal of Geometry and Physics 61 (2011), 1928–1931, DOI: 10.1016/j.geomphys.2011.05.002.
14. A. Loi and D. Zuddas, *Some remarks on Bergmann metrics*, Rivista di Matematica della Università di Parma 4 (2001), 71–86.
15. R. Piergallini and D. Zuddas, *Braiding non-orientable surfaces in S^4*, Atti del Seminario Matematico e Fisico dell'Università di Modena e Reggio Emilia, supplement to volum IL (2001), 229–239.

PhD thesis

D. Zuddas, *Branched coverings and 4-manifolds*, Scuola Normale Superiore, Pisa, Italy, 2007.

Preprints

1. R. Piergallini and D. Zuddas, *Branched coverings of CP^2 and other basic 4-manifolds*, arXiv: 1707.03667 (2017), submitted.
2. N. Kasuya and D. Zuddas, *A concave holomorphic filling of an overtwisted contact 3-sphere*, arXiv:1711.07429 (2017), submitted.

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