

# Andrea Tamburelli

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*Curriculum Vitae (June 16, 2021)*

## Personal Information

Full name Andrea Tamburelli  
Citizenship Italian  
Place of birth Como  
Date of birth April 15, 1991  
Professional address Rice University  
Department of Mathematics MS-136  
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Languages Italian (native), Spanish, English (fluent), French (intermediate), German (basic)

## Education

2010 **High School Diploma**, *Orsoline S. Carlo*, Como.  
Sep '10–Jun '13 **BSc Mathematics**, *University of Pisa*, 110/110 cum laude.  
July '13–Apr '15 **MSc Mathematics**, *University of Pisa*, 110/110 cum laude.  
Sep '15–Jun '18 **PhD Mathematics**, *University of Luxembourg*, Excellent.

## Employment

Jul '18–Jun '22 **Lovett Instructor**, *Rice University*.

## Phd thesis

June 2018 **Globally hyperbolic anti-de Sitter manifolds: convex domains, foliations and volume.**  
Supervisor: *Jean-Marc Schlenker*.

## Research interests

(Higher) Teichmüller theory, Hyperbolic and AdS geometry, bounded cohomology and simplicial volume, Higgs bundles.

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## Grants and awards

- Jun–July '17 **Research Experience for Graduate Students**, *Gear Network*.  
Oct '17 **Travel grant for graduate students**, *DMPA*, *University of Luxembourg*.  
Jan–Feb '18 **Graduate Internship grant**, *Gear Network*.  
2019–2021 **AMS Simons Travel Grant**, *AMS and Simons Foundation*.  
Sept 2019 **Premio Franco Tricerri**, *for the best Ph.D. thesis in differential geometry*, UMI.  
May 2020 **Premio Mario Baldassarri**, *for the best paper published under the age of 30*, UMI.  
Jul '20–Jun '23 **NSF grant: NSF-DMS 2005501**, *Individual Investigation Award*, \$136,500.

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## Publications

- 1 **Prescribing metrics on the boundary of anti-de Sitter 3-manifolds.**  
*Int. Math. Res. Not. IMRN* 2018, no 5, pp. 1281–1313.  
Total citations: 2, Journal IF: 1.047. [arXiv:1604.05186](#), [Published version](#).
- 2 **Constant mean curvature foliation of domains of dependence in  $AdS_3$ .**  
*Trans. Amer. Math. Soc.* 371 (2019), no. 2, pp. 1359–1378.  
Total citations: 6, Journal IF: 1.422. [arXiv:1610.08867](#), [Published version](#).
- 3 **On the volume of Anti-de Sitter maximal globally hyperbolic three-manifolds,**  
joint with Francesco Bonsante and Andrea Seppi.  
*Geom. Funct. Anal.* 27 (2017), no 5, pp. 1106–1160.  
Total citations: 8, Journal IF: 1.964. [arXiv:1703.01068](#), [Published version](#).
- 4 **Constant mean curvature foliation of globally hyperbolic (2+1)-spacetimes with particles,** joint with Qiyu Chen.  
*Geom. Dedicata* 201 (2019) pp. 281–315.  
Total citations: 2, Journal IF: 0.537. [arXiv:1705.03674](#), [Published version](#).
- 5 **Polynomial quadratic differentials on the complex plane and light-like polygons in the Einstein Universe.**  
*Advances in Mathematics* 352C (2019) pp. 483–515.  
Total citations: 4, Journal IF: 1.494. [arXiv:1712.03767](#), [Published version](#).
- 6 **Regular globally hyperbolic maximal anti-de Sitter structures.**  
*J. Topol.* 13 (2020) pp. 416–439.  
Total citations: 3, Journal IF: 1.642. [arXiv:1806.08176](#), [Published version](#).
- 7 **Degeneration of globally hyperbolic maximal anti-de Sitter structures along pinching sequences.**  
*Differential Geom. Appl.* 64 (2019) pp. 125–135.  
Total citations: 5, Journal IF: 0.556. [arXiv:1808.07758](#), [Published version](#).
- 8 **Wild globally hyperbolic maximal anti-de Sitter structures.**  
*J. Lond. Math. Soc.* 103 (2021), no. 1, pp. 198–221.  
Total citations: 0, Journal IF: 1.121. [arXiv:1901.00129](#), [Published version](#).
- 9 **Fenchel-Nielsen coordinates on the augmented moduli space of anti-de Sitter structures.** *Math. Zeitschrift* 297 (2021), pp. 1397–1419.  
Total citations: 1, Journal IF: 0.881. [arXiv:1906.03715](#), [Published version](#).

- 10 **Riemannian metrics on the moduli space of GHMC anti-de Sitter structures.** *To appear in Geom. Dedicata.*  
Total citations: 0, Journal IF: 0.584. [arXiv:2004.06819](#), [Published version](#).
- 11 **Degeneration of globally hyperbolic maximal anti-de Sitter structures along rays.** *To appear in Comm. Anal. Geom..*  
Total citations: 0, Journal IF: 0.694. [arXiv:1710.05827](#).
- 12 **Limits of Blaschke metrics**, joint with Charles Ouyang.  
*Duke Math. J.* 170 (8), pp. 1683-1722.  
Total citations: 0, Journal IF: 2.194. [arXiv:1911.02119](#), [Published version](#).

## Preprints

- 13 **Planar minimal surfaces with polynomial growth in the  $\mathrm{Sp}(4, \mathbb{R})$ -symmetric space**, joint with Mike Wolf. [arXiv:2002.07295](#).
- 14 **Length spectrum compactification of the  $\mathrm{SO}_0(2, 3)$ -Hitchin component**, joint with Charles Ouyang. [arXiv:2010.03499](#).
- 15 **Boundary of the Gothen components**, joint with Charles Ouyang. [arXiv:2105.01779](#).
- 16 **On surfaces with finite total curvature in rank 2**, joint with Mike Wolf.  
[Preliminary version](#).
- 17 **Para-hyperkähler geometry of the deformation space of maximal globally hyperbolic anti-de Sitter three-manifolds**, joint with Filippo Mazzoli and Andrea Seppi
- 18 **Limits of cubic differentials and buildings**, joint with John Loftin and Mike Wolf.

## Summary of Scientific Achievements

Published papers:	11	(Source: Web of Science)
Papers in press	1	
Preprints:	4	
Total citations:	31	(Source: Web of Science)
Average citations per publications:	3.44	(Source: Web of Science)
H-index:	4	(Source: Web of Science)
Normalized H-index:	1.33	
Total Impact Factor:	10.66	
Average Impact Factor:	1.18	

## Long Research visits

- Nov '16 **Università degli Studi di Pavia**, *Collaboration with F. Bonsante and A. Seppi.*  
 Jun–July '17 **Rice University**, *Supervised by Michael Wolf.*  
 Jan–Feb '18 **Rice University**, *Graduate internship supervised by Michael Wolf.*

## Service

- 13-19 May '19 **Workshop: Geometric aspects of Higgs bundles**, *Sunriver*, Co-organizer.  
 9-11 Nov '18 **Texas Geometry and Topology Conference**, *Rice University*, Co-organizer.  
 2018-20 **Colloquium Committee member**, *Rice University*.

- 2020-21 **Colloquium Committee chair**, *Rice University*.  
 2018-19 **Reading seminars on (higher) Teichmüller theory**, *Rice University*, Organizer.  
 2018- **Referee**, Proc. Lond. Math. Soc., IMRN, Nonlinear Analysis.

## Teaching experience

- Fall '14 **Teaching Assistant**, *University of Pisa*.  
 Tutoring first-year student in Pharmaceutical Technologies for the course *Matematica* and second-year students in Engineering for the course *Analisi 2*.  
 Fall '15 **Teaching Assistant**, *University of Luxembourg*.  
 Exercise sessions for the courses *Analyse 1a, 1b, 1c* for first-year students in Mathematics, Engineering and Physics.  
 Spring '16 **Teaching Assistant**, *University of Luxembourg*.  
 Exercise sessions for the courses *Analyse 2a, 2b* for first-year students in Mathematics.  
 Fall '16 **Teaching Assistant**, *University of Luxembourg*.  
 Exercise sessions for the courses *Analyse 1a, 1b* for first-year students in Mathematics.  
 Fall '17 **Teaching Assistant**, *University of Luxembourg*.  
 Exercise sessions for the courses *Analyse 1a, 1b* for first-year students in Mathematics.  
 Fall '18 **Instructor**, *Rice University*.  
 Math 211-Ordinary Differential Equations.  
 Spring '19 **Instructor**, *Rice University*.  
 Math 302-Introduction to Analysis.  
 Math 366-Geometry.  
 Spring '20 **Instructor**, *Rice University*.  
 Math 101-Single Variable Calculus 1.  
 Math 212-Multivariable Calculus.  
 Fall '20 **Instructor**, *Rice University*.  
 Math 101-Single Variable Calculus 1.  
 Spring '21 **Instructor**, *Rice University*.  
 Math 212-Multivariable Calculus.  
 Math 371-Lie theory.  
 Summer '21 **Instructor**, *Rice University*.  
 Math 479-Summer Undergraduate Research.

## Invited talks

- Sept 2015 **G&T Seminar**, *A vanishing result for  $L^2$ -Betti numbers*, University of Luxembourg.  
 Nov 2016 **Workshop: Paroles aux jeunes chercheurs en géométries et groupes**, *Surfaces with prescribed metrics in  $AdS_3$  manifolds*, IRMA, Strasbourg.  
 Nov 2016 **Seminar**, *Prescribing metrics on the boundary of Anti-de Sitter 3-manifolds*, Università degli Studi di Pavia.  
 Mar 2017 **Darboux Seminar**, *The volume of GHMC  $AdS_3$  manifolds and  $L^1$ -energy*, Université de Montpellier.  
 Aug 2017 **Junior GEAR Retreat**, *An introduction to AdS geometry and the volume of GHMC AdS manifolds*, Stanford University.

- July 2018 **Workshop: Higgs bundles and harmonic maps of Riemann surfaces**, *Minimal Lagrangian maps between surfaces with boundary*, Oaxaca.
- May 2019 **G&T Seminar**, *Geometry of polynomial holomorphic differentials*, University of Luxembourg.
- Oct 2019 **Topology Seminar**, *Compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, Princeton.
- Oct 2019 **G&T Seminar**, *Geometry of polynomial holomorphic differentials*, Caltech.
- Nov 2019 **Seminar**, *Geometry of polynomial holomorphic differentials*, Tianjin University.
- Nov 2019 **Minicourse**, *Holomorphic differentials in Anti-de Sitter geometry*, Chern Institute of Mathematics, Nankai.
- Dec 2019 **FRG Lecture Series**, *Geometric structures parametrized by polynomial holomorphic differentials*, University of Michigan, Ann Arbor.
- Mar 2020 **Workshop: Dynamical aspects of Pseudo-Riemannian geometry**, *Polynomial maximal surfaces in pseudo-hyperbolic spaces*, Braga.
- Mar 2020 **Topology Seminar**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, Rice University.
- Nov 2021 **AMS Sectional Meeting**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, University of Tennessee, Chattanooga.
- Nov 2021 **Colloquium**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, University of Manchester.
- Nov 2019 **G&T Seminar**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, University of Luxembourg.
- Dec 2020 **Colloquium**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, Heidelberg University.
- Dec 2020 **Colloquium**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, Fudan University, Shanghai.
- Dec 2020 **Geometry and Analysis Seminar**, *Geometry of polynomial holomorphic differentials*, ETH, Zurich.
- Feb 2021 **Geometry Seminar**, *Length spectrum compactification of the  $SL(3, \mathbb{R})$ -Hitchin component*, University of Virginia.
- Mar 2021 **Geometry and Geometric Analysis Seminar**, *Para-hyperKähler geometry of the deformation space of convex co-compact anti-de Sitter structures*, University of Massachusetts, Amherst.
- Apr 2021 **Colloquium**, *Thurston boundary for higher Teichmüller spaces*, SISSA.
- May 2021 **Colloquium**, *Thurston boundary for higher Teichmüller spaces*, Aarhus Universitet.
- June 2021 **Nearly Carbon Neutral Geometric Topology Conference**, *Introduction to hyperbolic and anti-de Sitter quasi-Fuchsian manifolds*, online conference.

## Conferences and schools attended

- August 2013 **Summer school: Differential geometry and Complex analysis**, *SMI*, Perugia.
- May 2016 **Advanced School on Geometric Group Theory and Low-Dimensional Topology: Recent Connections and Advances**, *ICTP*, Trieste.

- August 2016 **Workshop: Geometry, Topology and Dynamics of Moduli Spaces**, *NUS*, Singapore.
- Nov 2016 **Workshop: Paroles aux jeunes chercheurs en géométries et groupes**, *IRMA*, Strasbourg.
- Dic 2016 **Workshop: SL2R Days in representation theory and harmonic analysis**, *University of Luxembourg*.
- August 2017 **Third retreat of the GEAR network**, *Stanford University*.
- Sept 2017 **Astonishing workshop**, *INRIA*, Nancy.
- Nov 2017 **Workshop on the geometry and physics of Higgs bundles II**, *UIC*, Chicago.
- Nov 2017 **Workshop: Current trends on spectral data for Higgs bundles III**, *UIC*, Chicago.
- Nov 2019 **Workshop: Holomorphic differentials in Mathematics and Physics**, *MSRI*, Berkeley.

## References

- PhD Supervisor **Prof. Jean-Marc Schlenker**, *University of Luxembourg*  
[jean-marc.schlenker@uni.lu](mailto:jean-marc.schlenker@uni.lu).
- Post-doc **Prof. Michael Wolf**, *Rice University*  
 Mentor [mwolf@rice.edu](mailto:mwolf@rice.edu).
- Prof. Francesco Bonsante**, *Università degli Studi di Pavia*  
[francesco.bonsante@unipv.it](mailto:francesco.bonsante@unipv.it).
- Prof. Jeffrey Danciger**, *University of Texas at Austin*  
[jdanciger@math.utexas.edu](mailto:jdanciger@math.utexas.edu).
- Teaching **Prof. Stephen Wang**, *Rice University*  
[sswang@rice.edu](mailto:sswang@rice.edu).