Alessandro Giacchetto
Curriculum vitæ

Rämistrasse 101, HG J 16.2
8092 Zürich, Switzerland
✉ *alessandro.giacchetto@math.ethz.ch*
🖥 *Personal webpage*

Personal information

Date of birth	October 16, 1993
Place of birth	Spilimbergo (PN), Italy
Nationality	Italian

Employment

Oct 2023 - now	**Postdoctoral Fellow**, *Swiss Federal Institute of Technology Zürich (ETHZ)*, ETH Fellow and Hermann-Weyl-Instructor, Zürich, CH.
Oct 2021 - Sep 2023	**Postdoctoral Fellow**, *Paris-Saclay University, Institut de Physique Théorique Saclay (IPhT)*, funded by the ERC-SyG grant *ReNewQuantum* (PI Profs. Andersen, Eynard, Kontsevich, Mariño), Gif-sur-Yvette, FR.
Oct 2017 - Oct 2021	**PhD in Mathematics**, *Max Planck Institute for Mathematics (MPIM) and University of Bonn*, International Max Planck Research School on Moduli Spaces (IMPRS), Bonn, DE. *Thesis:* Geometric and topological recursion and invariants of the moduli space of curves. *Supervisor:* Prof. G. Borot

Education

Sep 2015 - Jul 2017	**Master degree in Mathematics**, *University of Trieste & International School for Advanced Studies (SISSA)*, joint MSc program, Trieste, IT. *Thesis:* The J-equation on Kähler manifolds and blowups *Supervisor:* Prof. J. Stoppa *Final grade:* 110/110 with honors *Average exam grade:* 29.93/30
Sep 2012 - Jul 2015	**Bachelor degree in Mathematics**, *University of Trieste*, Trieste, IT. *Thesis:* Skein relations and polynomial invariants of knots and links *Supervisor:* Prof. B. Zimmermann *Final grade:* 110/110 with honors *Average exam grade:* 29.93/30

Research

Publications

- "Relations on $\overline{\mathcal{M}}_{g,n}$ and the negative r-spin Witten conjecture", with N. K. Chidambaram, E. Garcia-Failde
  Accepted in *Invent. Math.* 2205.15621 [math.AG]
- "A new spin on Hurwitz theory and ELSV via theta characteristics", with R. Kramer, D. Lewański
  Accepted in *Selecta. Math. (N.S.)* 2104.05697 [math-ph]
- "Symmetries of F-cohomological field theories and F-topological recursion", with G. Borot, G. Umer
  Accepted in *Commun. Math. Phys.* 2406.06304 [math-ph]
- "The factorial growth of topological recursion", with G. Borot, B. Eynard
  Lett. Math. Phys. 115.62 (2025) 10.1007/s11005-025-01950-z
- "Length spectrum of large genus random metric maps", with S. Barazer, M. Liu
  Forum Math. Sigma 13 (2025) 10.1017/fms.2025.31
- "The spin Gromov–Witten/Hurwitz correspondence for $\mathbb{P}^1$", with R. Kramer, D. Lewański, A. Sauvaget
  J. Eur. Math. Soc. (2025), online first. 10.4171/jems/1588
- "Can transformers do enumerative geometry?", with B. Hashemi, R. G. Corominas
  To appear in *13th Int. Conf. Learn. Represent. ICLR* (2025) 2408.14915 [cs.LG]
- "Shifted Witten classes and topological recursion", with S. Charbonnier, N. K. Chidambaram, E. Garcia-Failde
  Trans. Amer. Math. Soc. 377.2 (2024) 10.1090/tran/9046
- "An intersection-theoretic proof of the Harer–Zagier formula", with D. Lewański, P. Norbury
  Algebraic Geom. 10.2 (2023) 10.14231/AG-2023-004
- "Around the combinatorial unit ball of measured foliations on bordered surfaces", with G. Borot, S. Charbonnier, V. Delecroix, C. Wheeler
  Int. Math. Res. Not. 2023.17 (2023) 10.1093/imrn/ rnac231/6674196
- Appendix for "Masur–Veech volumes and intersection theory, the principal strata of quadratic differentials" by D. Chen, M. Möller, A. Sauvaget, with G. Borot, D. Lewański
  Duke Math. J. 172.9 (2023) 10.1215/00127094-2022-0063
- "Topological recursion for Masur–Veech volumes", with J. E. Andersen, G. Borot, S. Charbonnier, V. Delecroix, D. Lewański, C. Wheeler
  J. London Math. Soc. 107.1 (2023) 10.1112/jlms.12686

Preprints

- "Theta classes: generalized topological recursion, integrability and $\mathcal{W}$-constraints", with V. Bouchard, N. K. Chidambaram, S. Shadrin, 2505.11291 [math.AG]
- "Resurgent large genus asymptotics of intersection numbers", with B. Eynard, E. Garcia-Failde, P. Gregori, D. Lewański, 2309.03143 [math.AG]
- "On the Kontsevich geometry of the combinatorial Teichmüller space", with J. E. Andersen, G. Borot, S. Charbonnier, D. Lewański, C. Wheeler, 2010.11806 [math.DG]

Book chapter

- "Les Houches lecture notes on moduli spaces of Riemann surfaces,", with D. Lewański
  To appear on *SciPost Phys. Lect. Notes.* 2410.13273 [math.AG]

Organisation of events and seminars

- School + workshop **Refinements in enumerative geometry and physics** at ICTS, IN (2026).
- School **Quantum Geometry** at Les Houches, FR (29 July–23 Aug, 2024) (visit the website here).
- School **Topological recursion and integrability** at Trieste, IT (11–16 Sep, 2023) (visit the website here).
- Conference **Moduli spaces: theory and coding** at Les Diablerets, CH (27 Feb–3 Mar, 2023)) (visit the website here).
- School + workshop **TR Salento 2022** at Otranto, IT (5–16 Sep, 2022) (visit the website here).
- Conference **Recent Advances on Moduli Spaces of Curves** at Leysin, CH (18–24 Mar, 2022) (visit the website here).
- On-line reading group **Donaldson–Thomas invariants** at MPIM (Spring 2020), with G. Borot, S. Charbonnier, R. Kramer, C. Wheeler.
- Reading group **Integer points in polyhedra** at MPIM (Fall 2019), with G. Borot (visit the website here).
- Reading group **Geometric recursion** at MPIM (Fall 2018), together with D. Lewański (visit the website here).

Teaching experiences

- *Toric Geometry*, lecturer, 30 hours (Spring 2025, ETHZ)
- *Moduli spaces of Riemann surfaces*, PhD mini-course, 4 hours (Aug 2024)
- *Riemann Surfaces*, lecturer, 30 hours (Spring 2024, ETHZ)
- *Hurwitz numbers and Gromov–Witten theory*, PhD mini-course, 4 hours (Oct 2022)
- *General Topology*, teaching assistant, 30 hours (Spring 2017, UniTS)
- *Linear Algebra*, teaching assistant, 30 hours (Fall 2016, UniTS)

Research stays

2025	University of Bordeaux
2024	University of Edinburgh, University of Tokyo, University of Science and Technology of China
2023	University of Trieste
2022	University of Geneva, SISSA, Leiden University, Humboldt University, University of Trieste
2021	Humboldt University
2020	University of Melbourne
2019	Centre for Quantum Mathematics

Invited talks

16 Jun, 2025	*A new spin on Gromov–Witten and Hurwitz.* "Spin structures in enumerative geometry" workshop, Universiteit Leiden, NL
9 Jun, 2025	*Theta classes: topological recursion, integrability, and W-constraints.* "New Trends in Moduli, Integrability and Deformations." workshop, Università di Padova, IT

26 May, 2025	*Resurgent large genus asymptotics of intersection numbers.* Combinatoire et interactions seminar, LaBRI, FR
25 Apr, 2025	*On the spin GW/Hurwitz correspondence.* "Algebraic Geometry @Bogotá " online seminar
16 Dec, 2024	*Resurgent large genus asymptotics of intersection numbers.* "Probabilités Intégrables, Intégrabilité Classique et Quantique" online seminar
20 Sep, 2024	*Resurgent large genus asymptotics of intersection numbers.* Geometry and Mathematical Physics seminar, USTC, CN
8 Sep, 2024	*On the spin GW/Hurwitz correspondence.* Workshop "Alpine Algebraic Geometry", Obergurgl, AT
8 July, 2024	*Topological recursion is Gevrey-2.* Workshop "New Aspects in Topological Recursion, Resurgence and Related Topics", RIMS Kyoto University, JP
11 June, 2024	*Resurgent large genus asymptotics of intersection numbers.* Conference "String-Math 2024", ICTP, IT
8 May, 2024	*Resurgent large genus asymptotics of intersection numbers.* Algebra seminar, University of Edinburgh, UK
23 Nov, 2023	*Resurgent large genus asymptotics of intersection numbers.* Arithmetic & Algebraic Geometry seminar, EPFL, CH
30 Oct, 2023	*Resurgent large genus asymptotics of intersection numbers.* Algebraic geometry and moduli seminar, ETHZ, CH
20 Oct, 2023	*The geometry of combinatorial moduli spaces.* Algebraic geometry and moduli seminar, ETHZ, CH
3 Oct, 2023	*Resurgent large genus asymptotics of intersection numbers.* Conference "Probability and Geometry in, on and of non-Euclidian spaces", CIRM, FR
14 July, 2023	*Topological recursion.* ICTP Physics Latam: Math & HEP online seminar
5 May, 2023	*On the spin GW/Hurwitz correspondence.* Workshop "Refined invariants in Moduli Theory", SISSA, IT
18 Apr, 2023	*The negative side of Witten's conjecture.* Workshop "Topological Recursion", Univerisity of Tokyo, JP
12 Apr, 2023	*Resurgence and large genus asymptotics of intersection numbers.* Workshop "Invitation to Recursion, Resurgence and Combinatorics", OIST, JP
31 Jan, 2023	*Euler classes and negative powers of the canonical class.* "Topological recursion and integrability" online seminar
17 Oct, 2022	*The negative side of Witten's conjecture.* Geometry and Dynamical Systems seminar, University of Cergy-Pontoise, FR
19 Sep 2022	*KdV tau functions from enumerative geometry.* Workshop "Mathematical methods of nonlinear Physics", Otranto, IT
25 Aug, 2022	*The negative Witten r-spin conjecture.* ReNewQuantum workshop, SDU, DK
28 Jun, 2022	*Negative over positive I: the cohomology class.* Online Geometry and Mathematical Physics seminar, USTC, CN

8 Jun, 2022	*A one-integral proof of the Harer–Zagier formula.* Algebra, Geometry and Number Theory seminar, Universiteit Leiden, NL
9 May, 2022	*Witten's conjecture à la Mirzakhani.* Geometry seminar, University of Trieste, IT
2 May, 2022	*The negative side of Witten's conjecture.* Math-Physics seminar, SISSA, IT
29 Apr, 2022	*The negative side of Witten's conjecture.* Workshop "Quantum Geometry", IHES, FR
11 Apr, 2022	*Geometry of combinatorial moduli spaces.* Workshop "ANR MoDiff", LaBRI, FR
9 Mar, 2022	*Euler classes and negative powers of the canonical class.* Algebraic geometry and moduli seminar, ETHZ, CH
14 Jan, 2022	*The combinatorial geometry of the moduli space of curves.* Online seminar "Moduli spaces of complex curves", WWU Münster, DE
14 Dec, 2021	*Hurwitz theory, with (a) spin.* Online ReNewQuantum internal seminar
13 Dec, 2021	*Hurwitz theory, with (a) spin.* Online workshop "Quantum Curves, Integrability and Cluster Algebras", Victoria, AU
16 Aug, 2021	*The Harer–Zagier formula via intersection theory.* Workshop "Noncommutative geometry meets topological recursion", WWU Münster, DE
3 Jun, 2021	*Multicurve count, Masur–Veech volumes and topological recursion.* Online workshop "MoSCATR VII", HSE–Steklov–Skoltech, RU
10 Dec, 2020	*Geometry of combinatorial moduli spaces and multicurve counts.* Séminaire online de Géométrie énumérative, IMJ–PRG, FR
20 Mar, 2020	*On the Kontsevich geometry of the combinatorial Teichmüller space.* Pure Math seminar, University of Melbourne, AU
20 Mar, 2020	*A gentle introduction to moduli spaces.* Pure Math seminar, University of Melbourne, AU
2 Mar, 2020	*On the Kontsevich geometry of the combinatorial Teichmüller space.* Topology seminar, Monash University, AU
3 Feb, 2020	*On the Kontsevich geometry of the combinatorial Teichmüller space.* Workshop "Topological and Geometric recursion", IMSA, US
10 Sep, 2019	*Topological recursion for Masur–Veech volumes.* Conference "Curve counting theories and related algebraic structures", University of Leeds, UK
30 Aug, 2018	*Detached maps and the topological recursion kernel.* Summer school "Topological recursion", Tübingen University, DE

Honours

○ **ETH Fellow: Oct 2023–Sep 2025**. Prestigious post-doc fellowship awarded by ETHZ to young scientists (not only Mathematicians) before the 2nd year after the discussion of their PhD thesis.

○ **Seal of excellence MSCA 2022**. Marie Skłodowska-Curie action. Final score: 88.00%.

○ **Oberwolfach Leibniz Graduate Students 2021**. MFO of Oberwolfach selects few PhDs and post-docs and give them the opportunity to participate to workshops organised by the institute covering the expenses; on a merit base.

○ **Marco Reni prize 2018** (1st placement ex-æquo). Prize given by the University of Trieste to a

student who took the Master degree in Mathematics in Trieste during the previous 3 years.

○ **Friulovest Bank award 2017.** Award assigned by the Friulovest Bank to the best Master students of the region.

○ **SISSA Master degree's Fellowship: Sep 2015–Sep 2017**. Assigned through a national competition (5 fellowships at national level); the annual confirmation of the fellowship is on a merit basis.

○ **Friulovest Bank award 2015.** Award assigned by the Friulovest Bank to the best Bachelor students of the region.

○ **Best freshman 2012/13.** Award assigned to the best freshman of the Department of Mathematics and Geosciences of the University of Trieste.

○ **"Collegio Universitario L. Fonda" Bachelor degree's Fellowship: Sep 2012–Sep 2015**. Assigned through a national competition (3 fellowships at national level); the annual confirmation of the fellowship is on a merit basis.

Language skills

Italian	**Excellent**, *native language*.
English	**Professional proficiency**, *Academic IELTS score 7.5 (exam date: Jan 14, 2017)*.
German	**Beginner**.
French	**Beginner**.

Computer skills

Mathematics	Mathematica, SageMath
Typography	LaTeX, TikZ, Office
Web design	Basics of HTML5, CSS

Academic service

Referee	11 articles
Reviewer	5 articles
Quick opinions	3 articles
Community	Student representative for the Department of Mathematics and Geosciences and member of the joint committee professors-students, April 2016–May 2017