

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**, *Eidgenössische Technische Hochschule Zürich (ETHZ)*, ETH Fellow and Hermann-Weyl-Instructor, Zürich, CH.

Oct 2021 - Sep 2023 **Postdoctoral Fellow**, *Institut de Physique Théorique (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)*, 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

- “The spin Gromov–Witten/Hurwitz correspondence for \mathbb{P}^1 ”, with R. Kramer, D. Lewański, A. Sauvaget. To appear in *J. Eur. Math. Soc.* (2024) [2208.03259](#) [[math.AG](#)]
- “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

- “The factorial growth of topological recursion”, with G. Borot, B. Eynard, [2409.17838](#) [[math-ph](#)]
- “Can transformers do enumerative geometry?”, with B. Hashemi, R. G. Corominas, [2408.14915](#) [[cs.LG](#)]
- “Symmetries of F-cohomological field theories and F-topological recursion”, with G. Borot, G. Umer, [2406.06304](#) [[math-ph](#)]
- “Length spectrum of large genus random metric maps”, with S. Barazer, M. Liu, [2312.10517](#) [[math.PR](#)].
- “Resurgent large genus asymptotics of intersection numbers”, with B. Eynard, E. Garcia-Failde, P. Gregori, D. Lewański, [2309.03143](#) [[math.AG](#)]
- “Relations on $\overline{\mathcal{M}}_{g,n}$ and the negative r-spin Witten conjecture”, with N. K. Chidambaram, E. Garcia-Failde, [2205.15621](#) [[math.AG](#)]
- “A new spin on Hurwitz theory and ELSV via theta characteristics”, with R. Kramer, D. Lewański, [2104.05697](#) [[math-ph](#)]
- “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](#)]

Organisation of events and seminars

- 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

- Mini-course (4 hours) on **Moduli spaces of Riemann surfaces**, post-graduate level (Aug 2024).
- **Riemann Surfaces**, lecturer (Spring 2024, ETHZ).
- Mini-course (4 hours) on **Hurwitz numbers and GW theory**, post-graduate level (Oct 2022).
- **General Topology**, teaching assistant (Spring 2017, UniTS).
- **Linear Algebra**, teaching assistant (Fall 2016, UniTS).

Research stays

- 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 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", University 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 τ -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 ETH Zürich to young scientists (not only Mathematicians) before the 2nd year after the discussion of their PhD thesis.
- **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 , <i>native language</i> .
English	Professional proficiency , <i>Academic IELTS score 7.5 (exam date: Jan 14, 2017)</i> .
German	Beginner .
French	Beginner .

Computer skills

Mathematics	Mathematica, SageMath
Typography	L ^A T _E X, TikZ, Office
Web design	Basics of HTML5, CSS

Academic service

Referee	13 articles
Community	Student representative for the Department of Mathematics and Geosciences and member of the joint committee professors-students, April 2016–May 2017