Sara Torelli

Curriculum Vitae

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Employment

Postdoctoral Instructor, Aug 2023 - now.
> Employer: University of Texas at Austin, Texas.
> Mentor: Sam Payne.

Alexander von Humboldt fellow, Oct 2021 - Aug 2023.
> Host institution: Leibniz Universität Hannover - Institute of Algebraic Geometry, Germany.
> Host Professor/Mentor: Stefan Schreieder.

Wissenschaftlicher Mitarbeiter (Post-Doc), Oct 2020 - Sep 2021.
> Employer: Leibniz Universität Hannover - Institute of Algebraic Geometry, Germany.
> Mentor: Stefan Schreieder.

Assegnista di ricerca (Post-Doc), Jul 2018 - Jul 2020.
> Employer: Università degli studi di Pavia - Dipartimento di Matematica "Felice Casorati", Italy.
> Mentor: Gian Pietro Pirola.

Qualifications

Scientific Italian habilitation (Abilitazione Scientifica Nazionale) as "Associate Professor" (Professore di II Fascia)
> in Geometry and Algebra (validity: 2022-02-01 to 2031-02-01).

Qualification aux fonctions de Maître de conférences – Section 25: Mathématiques (validity: 30/01/2020 – 31/12/2024).

Education

PhD in Mathematics and Statistics, Università degli studi di Pavia, Italy, 27 Feb. 2018.
> Thesis: Fujita decompositions and infinitesimal invariants on fibred surfaces.
> Advisor: Prof. Gian Pietro Pirola.
> Research area: complex algebraic geometry.

Master in Mathematics, Università degli studi di Parma, Italy, 28 Mar. 2014.
> Thesis: Formalità di Dolbeault di varietà complesse e deformazioni.
> Advisor: Prof. Adriano Tomassini.
> Research area: complex geometry.
> Grade: 110/110 cum laude.

Bachelor in Mathematics, Università degli studi di Parma, Italy, 11 Oct. 2011.

    Thesis: Formalità di varietà Kähleriane.

    Advisor: Prof. Adriano Tomassini.

    Research area: complex geometry.

    Grade: 110/110 cum laude.

Grants and Honors

Premio Fondazione G. Borgia 2022, 2022.

    Award from Dott. Giuseppe Borgia Foundation for a scientific work on Mathematics.

    Accademia Nazionale dei Lincei.

    Scientific work: collection of papers from my Phd Thesis.

Humboldt fellowship for postdoctoral Researchers, 2021-2023.

    Grant of 24 months Postdoctoral fellowship by Alexander von Humboldt Foundation.

    Research project: The geometry of the Jacobian locus in the moduli space of abelian varieties.

Concorso a n. 21 mensilità di borse di studio per l'estero per l'a.a. 2019-2020.

    Grant of 5 months by INDAM.

    Research project: Variation of the Hodge structures on fibrations and Moduli.

    Universitat politècnica de Catalunya, collaboration with Prof. M. A. Barja Yañez.

Riemann Fellowship, 2018.

    4 month fellowship funded by the Riemann Center for Geometry and Physics.

    Leibniz Universität Hannover, collaboration with V. González Alonso.

Borsa Mobilità dottorandi, 2016.

    Grant of 3 months by Università di Pavia.

    Visiting period during the PhD program at Universität Bayreuth, under the supervision of Prof. F. Catanese.

(Inter)national research group

Member of "Progetto di ricerca di Rilevante Interesse Nazionale PRIN 2015 - Progetto 2015ZWST2C-002",
5 Feb. 2017 - 5 Feb. 2020.

Title: "Moduli spaces and Lie Theory".

Funded by: Ministero dell'Istruzione, dell'Universita e della Ricerca. PI: Kieran Gregory O'Gradi.

Unity:Universitá degli studi di Pavia.

Visiting periods

Università degli studi di Pavia, Italy, July 2021. Collaboration with Prof. Gian Pietro Pirola.

Sissa, Trieste, Italy, Jan. 2020. Collaboration with Andrea Ricolfi.

Leibniz Universität Hannover, Germany, Mar. - Jul. 2019. Collaboration with Víctor González-Alonso.

Universität Bayreuth, Germany, Apr. - May. 2016. Visiting period under the supervision of Prof. Fabrizio Catanese.

Universitat de Barcelona, Spain, 10 - 14 Oct. 2016. Collaboration funded by Pragmatic with F. Favale.

Leibniz Universität Hannover, Germany, 12-15 Nov. 2016. Collaboration with Víctor González-Alonso.

Publications

1. Sara Torelli. Correspondences acting on constant cycle curves on K3 surfaces, 2023. *arXiv:2306.02723*.

2. Giulio Codogni, Victor González Alonso and Sara Torelli. Rigidity of modular morphisms via Fujita decomposition, 2023. arXiv.2305.0425v1

3. Filippo Favale, Gian Pietro Pirola and Sara Torelli. Holomorphic 1-forms on the moduli space of curves. Accepted for publication in *Geometry & Topology*, 2023. *arXiv:2009.10490*.

4. Filippo Favale, Joan Carles Naranjo, Gian Pietro Pirola and Sara Torelli. Holomorphic 1-forms on some coverings of the moduli space of curves. Accepted for publication in PAMQ, 2023. *arXiv:2210.07125*.

5. Indranil Biswas, Filippo Favale, Gian Pietro Pirola and Sara Torelli. Quillen connection and uniformization of Riemann surfaces. Accepted for publication in *Annali di Matematica Pura ed Applicata*, 2022. *arXiv:2107.00826*.

6. Victor González Alonso and Sara Torelli. Punctual characterization of the unitary flat bundle of weight 1 PVHS and application to families of curves. Accepted for publication in *Rendiconti Lincei della matematica e applicationi*, 2022. *arXiv:2101.03153*.

7. Sara Torelli. On the Jacobian locus in the Prym locus and geodesics. Advances in Geometry, 2022. https://doi.org/10.1515/advgeom-2021-0037. *arXiv 2001.02113*.

8. Victor González Alonso and Sara Torelli. Families of curves with Higgs field of arbitrarily large kernel. *Bulletin of the London Mathematical Society*, 2020. DOI: 10.1112/blms.12437.

9. Alessandro Ghigi, Gian Pietro Pirola and Sara Torelli. Totally geodesic subvarieties in the moduli space of curves. *Communications in Contemporary Mathematics*, 2020. DOI: 10.1142/S0219199720500200.

10. Víctor González Alonso, Lidia Stoppino and Sara Torelli. On the rank of the unitary flat summand of the Hodge bundle. *Transactions of the AMS*, 2019. https://doi.org/10.1090/tran/7868.

11. Gian Pietro Pirola and Sara Torelli. Massey Products and Fujita decompositions on fibrations of curves. *Collect. Math.*, 2019. https//doi.org/10.1007/s13348-019-00247-4.

12. Sara Torelli. Fujita decompositions and infinitesimal invariants on fibred surfaces. *Università degli Studi di Pavia*. 2018. PhD thesis.

13. Filippo Favale and Sara Torelli. Coverings of elliptic curves and the kernel of the Prym map. *Le Matematiche*, 72 (2), 2017.

14. Adriano Tomassini and Sara Torelli. On Dolbeault formality and small deformations. *Int. J. Math.*, 25, 2014. https://doi.org/10.1142/S0129167X14501110.

Invited Talks

Conferences

1. Algebraic geometry in L'Aquila, Università dell'Aquila, 18-21 July 2023.
   Seminar title: Correspondences acting on constant cycle curves on K3 surfaces.

2. Berlin-Hannover algebraic geometry workshop, Humboldt Universität Berlin, 11-12 May 2023.
   Seminar title: Correspondences acting on constant cycle curves on K3 surfaces.

3. YPATIA 2022, École française de Rome, 8-10 Jun 2022.
   Seminar title: Holomorphic one forms on moduli of curves.

4. Giornate di geometria algebrica e argomenti Correlati XV, Gargnano, Online, 27-30 Apr 2021.
   Seminar title: Holomorphic forms on moduli of curves.

5. 8th European Congress of Mathematics, Slovenia, 20-26 Jun 2021.
   Seminar title: Holomorphic one forms on projective surfaces and applications.

6. GAGC 2019, CIRM, Luminì, 26 Nov 2019.
   Seminar title: A non arithmetic approach to the Coleman-Oort conjecture.

7. YPAG conference, University of Bayreuth, Germany, 4 Apr 2019.
   Seminar title: On the kernel bundle of the Higgs field of families of curves and the Jacobian locus.

8. Conference "Seminario degli ex-studenti (3a edizione)", Università degli studi di Parma, 9 Jan 2018.
   Seminar title: Il gruppo fondamentale e la variazione della struttura di Hodge.

9. Workshop "Fibrations and second Fujita decomposition", Università degli studi di Milano, Italy, 9 Oct 2017.
   Seminar title: Fujita decompositions and Massey products.

10. Mini-workshop "Geometry of Jacobians", Università degli studi di Pavia, Italy, 26 Apr 2017.
    Seminar title: Fujita decompositions and Monodromy results.

11. XX Congresso UMI, Siena, Italy, Sep 2015.
    Seminar title: Formalità di Dolbeault e deformazioni.

Seminars

1. Geometry seminar, Austin, 18 Oct 2023.
   Seminar title: Holomorphic forms on moduli of curves.

2. Joint Seminar on Complex Algebraic Geometry and Complex Analysis (Bochum - Essen - Köln - Münster - Wuppertal), Bergische Universität Wuppertal, Germany, 25 Nov 2022.
   Seminar title: Holomorphic forms on moduli of curves.

3. Seminario di Dipartimento università di Roma Tor Vergata, Italy, 14 Dec 2022.
   Seminar title: Holomorphic one forms on moduli of curves.

4. Seminario di Dipartimento università di Trieste, Italy, 14 May 2021.
   Seminar title: Holomorphic one forms on moduli of curves.

5. Università di Torino, Italy, 19 Feb 2020.
   Seminar title: Locally constant periods in the Jacobian locus and the Coleman-Oort conjecture.

6. Leibniz Universität Hannover, Germany, 14 Jan 2020.
   Seminar title: On the geometry of locally constant periods in the Jacobian locus.

7. Università degli studi di Roma III,Italy, 10 Oct 2019.
   Seminar title: A non arithmetic approach to the Coleman-Oort conjecture.

8. Università degli studi di Firenze,Italy, 29 Nov 2018.
   Seminar title: Local behaviour of the kernel of the i.v.h.s. of weight 1 and applications.

9. University of Warwick, England, 4 Jun 2018.
   Seminar title: On the unitary flat bundle of the second Fujita decomposition of a semistable fibration of curves.

10. Leibniz Universität Hannover,Germany,12 Apr 2018.
    Seminar title: Unitary flat part in polarized variations of the Hodge structure of families of curves.

11. Leibniz Universität Hannover, Germany, Nov 2016.
    Seminar title: Massey products and Fujita decompositions.

Teaching Experience

Calculus, Bachelor in Economics, University of Texas at Austin, Fall semester 2023.
    Instructor.

Brill Noether Theory, Master in Mathematics, Leibniz Universität Hannover, Winter semester 2022 - 2023.
    Instructor.

Algebraische Geometrie II, Master in Mathematics, Leibniz Universität Hannover, Summer semester 2021 - 2022.
    Frequent substitute for main lectures of Professor Klaus Hulek.

Cohomology methods in algebraic geometry - part two, PhD course, Università di Pavia, Feb. 1 - 15, 2022.
    Instructor.

Mathematik für Ingenieure II, Bachelor in Engineering, Leibniz Universität Hannover, 2020 - 2021.
    Corrections of exams (48h, German).

Geometria I, Bachelor in Mathematic, Università di Pavia, Summer Semester 2019-2020.
    Lecturer (28h, Italian) and conductor final exams. Topic: General topology, affine and projective geometry.

Geometria I, Bachelor in Mathematic, Università di Pavia, Summer Semester 2018-2019.
    Teaching assistant for exercise sessions (15h, Italian). Topic: General topology, affine and projective geometry.

Geometria I, Bachelor in Mathematic, Università di Pavia, Summer Semester 2015-2016.
    Teaching assistant for exercise sessions (15h, Italian). Topic: General topology, affine and projective geometry.

Geometria e Algebra, Bachelor in Architecture, Università di Parma. Winter Semester 2013-2014.
    Tutor for exercise sessions (25h, Italian). Topic: Linear algebra and affine geometry.

Geometria e Algebra, Bachelor in Architecture, Università di Parma. Winter Semester 2012-2013.
    Tutor for exercise sessions (25h, Italian). Topic: Linear algebra and affine geometry.

Supervision of students

Bachelor thesis, Leibniz Universität Hannover, Germany, examiner together with Prof. Stefan Schreieder. Candidate: Julian Jahns.

Languages

Native Italian
Fluent English
Intermediate German

References

Prof. Gian Pietro Pirola , Università degli studi di Pavia, Italy.
    Email: gianpietro.pirola@unipv.it
Prof. Stefan Schreieder, Leibniz Universität Hannover, Germany.
    Email: schreieder@math.uni-hannover.de
Prof. Sam Payne , University of Texas at Austin, USA.
    Email: sampayne@utexas.edu
Prof. Wolesensky, William R, University of Texas at Austin, USA. (Teaching reference)
    Email: wolesensky@math.utexas.edu

January 18, 2024