Curriculum Vitæ   Michele Schiavina

CONTACT INFORMATION	University of Pavia	
	Department of Mathematics	Via Ferrata, 5 - 27100 Pavia
	Citizenship: Italian	*Mobile 1:* +39 3512865230
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	ORCID: 0000-0001-5760-4794	*G. Scholar:* Michele Schiavina

CURRENTLY
09/2022 - NOW

Assistant Professor (Ricercatore 'tipo b') at University of Pavia, Italy.
Department of Mathematics

PREVIOUS ACADEMIC POSITIONS
2016 - 2022

Oberassistent at **ETH, Zürich**, Switzerland.
Department of Mathematics
Institute for Theoretical Physics
Co-funded by SNF Swiss National fund, SwissMAP
October '21 - August '22

Postdoctoral fellow at **ETH, Zürich**, Switzerland.
Department of Mathematics - Prof. Giovanni Felder
Institute for Theoretical Physics - Prof. Niklas Beisert
Co-funded by SNF Swiss National fund, SwissMAP
February '19 - September '21.

Postdoctoral fellow at **University of California, Berkeley**, USA.
Department of Mathematics - Prof. Nicolai Reshetikhin.
Funded by SNF Swiss National Science Foundation - "Advanced Mobility" Postdoc grant
August '18 - February '19.

Guest Researcher at **Max Planck Institute, Bonn**, Germany.
March '18 - August '18.

Visiting Scholar at **University of California, Berkeley**, USA.
February '18 - August '18.

Postdoctoral fellow at **University of California, Berkeley**, USA.
Department of Mathematics - Prof. Nicolai Reshetikhin.
Funded by SNF Swiss National Science Foundation - "Early Mobility" Postdoc grant
August '16 - February '18.

PHD
2012 - 2016

Doctor of Natural Sciences - **Mathematics**.
Zürich Graduate School in Mathematics, University of Zürich, Switzerland.
Institut für Mathematik - Prof. Alberto S. Cattaneo.
Jan '12 - July '16 (PhD awarded on 29/04/2016).

HABILITATIONS

Italian National Scientific Habilitation, Associate professor level - Mathematical Physics (Mat/07)
French 'Maître de Conférence' Habilitation - Mathematics (Section 25)
French 'Maître de Conférence' Habilitation - Applied Mathematics (Section 26)

PUBLICATIONS

Preprints (authors in alphabetical order)

- with A.S. Cattaneo and P. Mnev, Preprint arXiv:2307.07761 [math-ph]
  BV Quantisation

- with Griffin S. M., Preprint arXiv:2008.08066 [cond-mat.mtrl-sci]
  Generalized spontaneous symmetry breaking

Published and accepted papers

1. with A.S. Cattaneo and L. Menger, To appear in Classical and Quantum Gravity
   Gravity with torsion as deformed BF theory

2. with Riello A., To appear in Advances in Theoretical and Mathematical Physics
   Hamiltonian gauge theory with corners: constraint reduction and flux superselection

3. with Riello A., Annales Henri Poincare (Volume and Issue pending)
   Null Hamiltonian Yang-Mills theory. Soft symmetries and memory as superselection

4. with Stucker T., Annales Henri Poincare (Volume and Issue pending)
   Perturbative BF theory in axial, Anosov, gauge

5. with. Blohmann C. and Weinstein A., Pure and Applied Mathematics Quarterly, **19** (4) (2023)
   A Lie-Rinehart algebra in general relativity

6. with Simão F. M. C. and Cattaneo A. S., Letters in Mathematical Physics **113** (25) (2023)
   BV equivalence with boundary

7. with Martinoli S., Letters in Mathematical Physics, **112** (35) (2022)
   BV analysis of Polyakov and Nambu-Goto theories with boundary

8. with Canepa G., Advances in Theoretical and Mathematical Physics, **26** (3) (2022)
   Fully extended BV-BFV description of General Relativity in three dimensions.

9. with Contreras I., Manuscripta Mathematica **168** (2022)
   Kähler fibrations in quantum information theory.

10. with Canepa G. and Cattaneo A. S., Communications in Mathematical Physics, **385** (2021).
    General Relativity and the AKSZ construction.

11. with Rejzner, K., Communications in Mathematical Physics, **385** (2021).
    Asymptotic symmetries in the BV-BFV formalism.

12. with Canepa G. and Cattaneo A. S., Advances in Theoretical and Mathematical Physics **25** (2) (2021).
    Boundary structure of General Relativity in tetrad variables.

13. with Hadfield C. and Kandel S., Annales Henri Poincaré, **21** (12) (2020)
    Ruelle zeta function from field theory.

14. with Cattaneo A. S., Advances in Theoretical and Mathematical Physics, **23** (8) (2019),
    BV-BFV approach to General Relativity: Palatini–Cartan–Holst action.

15. with P. Mnev and K. Wernli, Annales Henri Poincaré, **21** (3) (2020)
    Towards Holography in the BV-BFV setting.

16. with Cattaneo A. S., Annales Henri Poincaré, **20** (2) (2019)
    The reduced phase space of Palatini–Cartan–Holst theory.

17. with Cattaneo A. S. and Selliah I., Letters in Mathematical Physics, **108** (8) (2018)
    BV equivalence between triadic gravity and BF theory in three dimensions.

18. with Cattaneo A.S., Letters in Mathematical Physics, **107** (2) (2017)
    On time.

19. with Contreras I. and Ercolessi E., Journal of Mathematical Physics **57** (6) (2016)
    On the geometry of mixed states and the Fisher information tensor.
    JMP Editor's Pick

20. with Cattaneo A. S., Journal of Mathematical Physics **57** (2) (2016)
    BV-BFV approach to General Relativity: Einsten Hilbert action.

21. with Micheli G., Advances in Mathematics of Communications **8** (3) (2014)
    A general construction for monoid-based knapsack protocols.

22. with Ercolessi E., Physics Letters **A 377** (34-36) (2013)
    Symmetric logarithmic derivative for general n-level systems and the quantum Fisher information tensor for three-level systems.

23. with Ercolessi E., Journal of Physics **A 45** (2012)

    Geometry of mixed states for a q-bit and the quantum Fisher information tensor.

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24. PhD Thesis, University of Zürich (2015),

    BV-BFV Approach to General Relativity.

APPROVED RESEARCH PROJECTS

MIUR Ministry of Education
· Programma per Giovani Ricercatori "Rita levi Montalcini" - Tenure Track Assistant Professor Position (EUR 201.327,59)
Lawrence Berkeley National Laboratory
· *Molecular Foundry*, User Proposal Program - Research Collaboration, Jan/2019 - Feb/2020
SNF Swiss National Science Foundation
· *Advanced Mobility* Postdoc Grant (USD 76.150), 01/Aug/2018 - 31/Jan/2020 (Interrupted 31/Jan/19 to accept ETH offer)
· *Early Mobility* Postdoc Grant (USD 70.650), 01/Aug/2016 - 31/Jan/2018
· *Forschungskredit* Research Grant (CHF 55.200), 01/Jul/2013 - 31/Aug/2014

AWARDS & SCHOLARSHIPS

University of Pavia
· "Bando Attrattivitá" 2023 (EUR 20.000)
· "Fondo Ricerca Giovani" 2023 (funding for one postdoctoral position, EUR 25.000)
· INROAd+2022 Financing for future ERC applicants (EUR 10.000)
Collegio Superiore, University of Bologna
· Excellence Studentship (EUR 13.250 + tuition), during Bachelor and Master, Sep/06-Jul/11.

ACADEMIC ACTIVITIES

Organisation of International Conferences and Workshops

· Higher Structures in Caprarola '24 - February '24, Caprarola, Italy

  with C. Esposito, D. Fiorenza, F. Bonechi, F. D'Andrea, L. Vitagliano and N. Ciccoli

· GAP XVIII, Séminaire Itinérant "Géométrie et Physique": Homotopy algebras and higher structures - May '23, Paris, France

  with A. Cattaneo, M. Jotz Lean, H.-Y. Liao, M. Stiénon and P. Xu

· Higher Structures in Caprarola '23 - February '23, Caprarola, Italy

  with C. Esposito, D. Fiorenza, F. Bonechi, F. D'Andrea, L. Vitagliano and N. Ciccoli

· *Noncommutative Geometry and Higher Structures* - June '22, Scalea, Italy

  with F. D'Andrea, G. Dito, M. Jotz Lean and P. Xu

Invited conference talks, posters and workshops

1. Poisson 2024 [Invited Conference Talk]

   Accademia Pontaniana - July '24

2. AQFTUK 8 [Invited Conference Talk]

   University of York - June '24

3. Field theory and topology [Invited Conference Talk]

   Center for Mathematics at Notre Dame - June '24

4. Quantum and Classical Fields Interacting with Geometry [Contributed Workshop Talk]

   IHP Paris - March '24

5. Emergent Geometries from strings and quantum fields [Invited Conference Talk]

   Galileo Galilei Institute - July '23

6. *Dg-manifolds in Geometry and Physics* [Invited Conference Talk]

   IHP Paris - July '23

7. The Many Interactions of Symplectic and Poisson Geometry: Alan Weinstein's 80th Birthday [Invited Conference Talk]
   IHP Paris - June '23

8. Three Facets of Gravity [Invited Minicourse (6h shared with K. Rejzner)]
   Humboldt University, Germany - May '23

9. Quantum Gravity Around the Corner [Invited Conference Talk]
   Perimeter Institute, Waterloo, Canada - October '22 - Watch

10. LOOPS '22 [Contributed Conference Talk]
    ENS Lyon - July '22

11. *Informal Workshop on Corners* [Invited Workshop Attendance]
    Online, Centre de Physique Theorique, University of Marseille - May '22

12. *Informal Workshop on Corners* [Invited Workshop Talk]
    Online, Centre de Physique Theorique, University of Marseille - November '21

13. A gauge summer with BV [Invited Conference Talk]
    Scalea, Italy - September '21

14. Geometry for Higher Spin Gravity: Conformal Structures, PDEs, and Q-manifolds [Invited Conference Talk],
    Erwin Schrödinger Institute, Austria - August '21 - Watch

15. International Congress on Mathematical Physics [Contributed Conference talk],
    Switzerland - August '21

16. *SwissMap general meeting poster session* [Contributed Poster],
    Switzerland, August '20

17. *A gauge summer with BV - teaser* [Invited Conference Talk],
    Online, June '20

18. *Field Theories and Higher Structures in Mathematics and Physics* [Invitation to Workshop],
    Banff center for Mathematical Research, Oaxaca, ME - June '17

19. *Quantum Field Theory on Manifolds with Boundary and the BV Formalism* [Invited Conference Talk],
    Perimeter Institute, Waterloo, CA - May '17

20. *Lichnerovicz Memorial Conference* [Contributed Poster],
    IHP, Paris, FR - Dec '15

21. *Algébres L_∞, Homotopie rationnelle, opérades et super géométrie* [Invited Conference Talk],
    Rabat, MO - Jun '15

22. *Perspectives in Physical Mathematics* [Invited Conference Talk],
    University of Bologna, IT - Dec '14

Additional invited research talks

1. HEP-TH Joint Belgian Seminars, U Mons, Belgium, May '23
   Hamiltonian Gauge Theory with Corners

2. Higher Differential Geometry Seminar, Max Planck Institute for Mathematics, Bonn, February '23
   Hamiltonian Gauge Theory with Corners

3. Mathematical Physics Seminar, University of York, November '22
   Hamiltonian Gauge Theory with Corners

4. One World IAMP Mathematical Physics Seminar, Online, January '22
   Ruelle Zeta Function from Field Theory - Watch

5. Joint Heidelberg-Mainz-Munich-Wien "RIND" Math-Physics seminar, November '21
   BV-BFV approach to General Relativity

6. Department of Mathematics, University of California, Davis, November '21
   BV-BFV approach to General Relativity

7. Department of mathematics, University of Lyon 1, Lyon, October '21
   BV-BFV approach to General Relativity

8. Department of mathematics, University of Padua, Italy, April '21
   Ruelle zeta function from field theory. [online]

9. Department of mathematics, ETH Zürich, Switzerland, April '21
   Ruelle zeta function from field theory.

10. Department of Mathematics, University of California, Davis, November '20
    Ruelle zeta function from field theory. [online]

11. Department of Mathematics, University of Zürich, November '20
    Ruelle zeta function from field theory. [online]

12. Department of physics, ETH Zürich, Switzerland, March '19
    Field theory on manifolds with boundary.

13. Department of mathematics, ETH Zürich, Switzerland, February '19
    Towards Holography in the BV-BFV formalism.

14. Perimeter Institute, Canada, November '18
    Quantum Gravity Group Meeting: On the BV-BFV Formalism.

15. Northwestern University, USA, November '18
    Equivalence of gauge theories in the presence of boundaries: insights from General Relativity - Part 1.

16. Northwestern University, USA, November '18
    Equivalence of gauge theories in the presence of boundaries: insights from General Relativity - Part 2.

17. University of Freiburg, Germany, June '18
    Equivalence of field theories in the BV-BFV formalism. Insights from General Relativity.

18. Max Planck Institute for Mathematics, Bonn, Germany, Mar '18
    Equivalence of field theories in the BV-BFV formalism. The example of (three dimensional) General Relativity.

19. Univeristy of Bologna, Italy - June '17
    Equivalence of theories in the BV-BFV formalims, the case of GR.

20. Perimeter Institute, Waterloo, Canada - May '17 - Watch
    Equivalence of theories in the presence of boundaries: the example of General Relativity.

21. Northwestern University, Evanston, USA - May '17
    BV-BFV formalism and General Relativity.

22. University of Illinois at Urbana Champaign, USA - May '17
    A geometrical perspective on the quantum Fisher information index.

23. University of California at Davis, USA - Apr '17
    BV-BFV formalism and General Relativity.

24. University of California at Berkeley, USA - Mar '17
    BV-BFV formalism and General Relativity.

25. University of California at Davis, USA - Feb '17
    A geometrical perspective on the quantum Fisher information index.

26. UFR de mathématiques de l'université Paris Diderot, Paris, Fr - Dec '15
    BV-BFV approach to General Relativity.

27. Max Planck Institute for Mathematics, Bonn, De - Nov '15
    Semiclassical BV-BFV approach to General Relativity.

28. Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Ca - Oct '15
    BV-BFV approach to General Relativity.

29. University of California, Berkeley, USA - Feb '15
    Gauge theories on manifolds with boundaries.

30. University of Bologna, It - Feb '14
    Classical and quantum gauge theories on manifolds with boundaries.

31. ETH Zürich, Ch - Apr '13
    What is… a BV-BFV theory.

32. University of Lille, Fr - Jan '13
    Coadjoint orbits of classical Lie groups.

STUDENTS' SUPERVISION

Master Theses

- Leon Geiger, Master Thesis, Spring '22 - ETH Zurich
  Quadratically Extended BF Theory in the BV Formalism

- Endrit Konjuhi, Master Thesis, Fall '21 - ETH Zurich
  4d Chern–Simons Theory and Integrability

- Thomas Stucker, Master Thesis, Spring '21 - ETH Zurich
  *Gauge Fixing Independence and the Partition Function of BF Theory,
  With an Application to the Analytic Torsion and the Ruelle Zeta Function*

- Francisco Castela Simao, Master Thesis, Spring '20 - ETH Zurich
  BV equivalence between one-dimensional reparametrisation invariant models

- Sebastiano Martinoli, Master Thesis, Fall '19 - ETH Zurich
  BV equivalence between Nambu-Goto and Polyakov theories with boundary.

- Iswaryaa Selliah, Master Thesis, '17 - University of Zurich
  BV equivalence between triadic gravity and BF theory in three dimensions.

Semester Theses

- Sylvain Rossi, Semester Project, Fall '20
  Comparing perturbative algebraic quantum field theories and factorization algebras.

- Thomas Stucker, Semester Project, Fall '20
  Flat regularisation in field theory.

- Leonardo Fossati, Semester Project, Spring '20
  Cohomological ambiguities in General Relativity.

- Francisco Castela Simao, Semester Project, Fall '19
  1d models in the BV-BFV formalism.

- Enya Hsiao, Summer research project, '17 - University of California, Berkeley
  The boundary structure of two dimensional Einstein–Hilbert gravity.

TEACHING	Full Courses

- *Geometric Structures in Mathematical Physics*, 24 hours (3ECTS), Università di Pavia, Fall '22

- *Mathematics for geology*, 24 hours (3 ECTS), Università di Pavia, Fall '22 and '23 - with M. Zanella (9 ECTS in total)

- *Mechanics for industrial engineering*, 30 hours (3 ECTS), Università di Pavia, Fall '22 - with F. Bisi (6 ECTS in total)

- *Geometric methods for mathematical physics*, 28 hours (4 ECTS), ETH Zürich, Spring '22

- *Mathematical aspects of classical and quantum field theory*, 56 hours (4 ECTS), ETH Zürich, Spring '21 - with G. Canepa (8 ECTS in total)

- *Field theory with symmetries and the Batalin–Vilkovisky formalism*, 28 hours (4 ECTS), ETH Zürich, Fall '19

- *General Relativity for mathematicians*, 28 hours (4 ECTS), University of Zürich, Spring '16

Head assistance and coordination

- *Allgemeine Mechanik* (Classical Mechanics), ETH Zürich, Fall '20

Minicourses (as lecturer, partially or entirely)

- Max Planck Institute, Bonn - April to June '18
  Quantum field theory and BV formalism.

- Collegio superiore, University of Bologna - Feb '14
  Geometric methods for physics and quantisation.

- Collegio superiore, University of Bologna - Feb '13
  Co-adjoint orbit of compact Lie groups.

Reading Seminars Organisation

- *Learning seminar on quantum field theory and BV formalism.*, Bonn, Spring '18.

- *Log-symplectic geometry and applications*, Zürich, Autumn '15.

- *Mathematical methods in quantum field theory*, Zürich, Spring '15.

Teaching Assistance

- *Introduction to general relativity and gauge theories for mathematicians* - Zürich, Spring '15

- *Quantum mechanics for mathematicians* - Zürich, Autumn '14

- *Classical mechanics for mathematicians* - Zürich, Spring '14

- *Lie groups and Lie algebras* - Zürich, Autumn '13

- *Linear algebra II* - Zürich, Spring '13

- *Linear algebra I* - Zürich, Autumn '12

- *Mathematics for chemistry II* - Zürich, Spring '12

Organised seminar series

- *Talks in mathematical physics*, ETH Zürich - Fall '21 and Spring '22

- *Representation Theory and Mathematical Physics Seminar*, UC Berkeley - Fall '17

- *Graduate talks in mathematics*, University of Zürich - Spring '14 through Spring '16

SCIENTIFIC DUTY	Department Small Council

- Università di Pavia 2022 - 2025

PhD Committee

- University of Zürich, March 2021

Editor for

- European Physical Journal Plus (EPJP, Springer)

Member of

- International Association of Mathematical Physics
- Alumni Collegio di Studi Superiori, Universitá di Bologna

Referee for

- Communications in Mathematical Physics
- Letters in Mathematical Physics
- Journal of Geometry and Physics
- Journal of Mathematical Physics
- Mathematical Physics, Analysis and Geometry
- Scipost
- Physical Review, D
- Sigma

Reviewer for

- American Mathematical Society

EDUCATION
2006 - 2011

University of Bologna, Italy.

- Bachelor and Master of Science in Physics.
  Prof. Elisa Ercolessi and Prof. Luca Migliorini.
- Diploma of advanced and interdisciplinary excellence studies - *Collegio Superiore, UniBo.*
  Prof. Ettore Remiddi.

OUTREACH

Interviews

- Perspectives, journal of the Swiss Mathematical Physics Research Network
  Issue 6, 2021