

Contact Information	<p>ETH Zürich Department of Mathematics Institute for Theoretical Physics Mobile 1: +41 78 6458218 E-mail: micschia@ethz.ch ORCID: 0000-0001-5760-4794 Citizenship: Italian</p>	<p>Rämistrasse 101, 8092 Zürich, CH Wolfgang-Pauli Strasse 27, 8093, Zürich, CH Mobile 2: +393280846846 Skype: schiavina.michele G. Scholar: Michele Schiavina</p>
Currently	<p>Oberassistent at ETH, Zürich, Switzerland. Department of Mathematics Affiliation with Institute for Theoretical Physics Co-funded by SNF Swiss National fund, SwissMAP October '21 - Current</p>	
Previous Academic Positions 2016 - 2021	<p>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.</p> <p>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.</p> <p>Guest Researcher at Max Planck Institute, Bonn, Germany. March '18 - August '18.</p> <p>Visiting Scholar at University of California, Berkeley, USA. February '18 - August '18.</p> <p>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.</p>	
PhD 2012 - 2016	<p>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 (employed as postdoc since the awarding of the title, 29/04/2016).</p>	
Habilitation	<p>Italian national scientific habilitation - Associate professor level</p>	
Education 2006 - 2011	<p>University of Bologna, Italy.</p> <ul style="list-style-type: none"> • Bachelor and Master of Science in Physics. Prof. Elisa Ercolessi and Prof. Luca Migliorini. • Diploma of advanced and interdisciplinary excellence studies - <i>Collegio Superiore</i>, UniBo. Prof. Ettore Remiddi. 	
Publications	<p>Preprints (authors in alphabetical order)</p> <ul style="list-style-type: none"> • with F. M. C. Simão and A. S. Cattaneo, Preprint arXiv:2109.05268 [math-ph] <i>BV equivalence with boundary</i> • with S. Martinoli, Preprint arXiv:2106.02983 [math-ph] <i>BV analysis of Polyakov and Nambu-Goto theories with boundary</i> 	

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

Published and accepted papers

1. with Canepa G., Accepted for Publication in Advances in Theoretical and Mathematical Physics, [Preprint arXiv:1905.09333 \[math-ph\]](#)
Fully extended BV-BFV description of General Relativity in three dimensions.
 2. with G. Canepa and A. S. Cattaneo, [Communications in Mathematical Physics](#), **385**, 1571-1614 (2021). DOI: 10.1007/s00220-021-04127-6
General Relativity and the AKSZ construction.
 3. with Rejzner, K., [Communications in Mathematical Physics](#), **385**, 1083-1132 (2021). DOI: 10.1007/s00220-021-04061-7
Asymptotic symmetries in the BV-BFV formalism.
 4. with Canepa G. and Cattaneo A. S., To appear in Advances in Theoretical and Mathematical Physics **25** (2). [Preprint arXiv:2001.11004 \[math-ph\]](#)
Boundary structure of General Relativity in tetrad variables.
 5. with Contreras I., [Manuscripta Mathematica](#) (2021)
DOI: 10.1007/s00229-021-01311-9
Kähler fibrations in quantum information theory.
 6. with Hadfield C. and Kandel S., [Annales Henri Poincaré](#), **21** (12), 3835-3867 (2020)
Ruelle zeta function from field theory.
 7. with Cattaneo A. S., [Advances in Theoretical and Mathematical Physics](#), **23** (8) (2019),
BV-BFV approach to General Relativity: Palatini–Cartan–Holst action.
 8. with P. Mnev and K. Wernli, [Annales Henri Poincaré](#), **21** (3), 993-1044 (2020)
Towards Holography in the BV-BFV setting.
 9. with Cattaneo A. S., [Annales Henri Poincaré](#), **20** (2), 445-480 (2019)
The reduced phase space of Palatini–Cartan–Holst theory.
 10. with Cattaneo A. S. and Selliah I., [Letters in Mathematical Physics](#), **108** (8), 1873–1884 (2018)
BV equivalence between triadic gravity and BF theory in three dimensions.
 11. with Cattaneo A.S., [Letters in Mathematical Physics](#), **107**(2), 375-408, (2016/17)
On time.
 12. with Contreras I. and Ercolessi E., [Journal of Mathematical Physics](#) **57**(6), 062209 (2016)
On the geometry of mixed states and the Fisher information tensor.
JMP Editor’s Pick
 13. with Cattaneo A. S., [Journal of Mathematical Physics](#) **57**(2), 023515 (2015/16)
BV-BFV approach to General Relativity: Einstein Hilbert action.
 14. with Micheli G., [Advances in Mathematics of Communications](#) **8** (3), 343-358 (2014)
A general construction for monoid-based knapsack protocols.
 15. with Ercolessi E., [Physics Letters A](#) **377** (34-36), 1996-2002 (2013)
Symmetric logarithmic derivative for general n-level systems and the quantum Fisher information tensor for three-level systems.
 16. with Ercolessi E., [Journal of Physics A](#) **45** 365303 (2012)
Geometry of mixed states for a q-bit and the quantum Fisher information tensor.
-
17. [PhD Thesis, University of Zürich](#) (2015),
BV-BFV Approach to General Relativity.

Approved Research Projects

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

Collegio Superiore, University of Bologna

- Excellence Studentship (EUR 13.250 + tuition), during Bachelor and Master, Sep/06-Jul/11.

Students' Supervision

Master Theses

- Leon Geiger, Master Thesis, Spring '22 (Prospective) - ETH Zurich
- Endrit Konjuhi, Master Thesis, Fall '21 (Ongoing, with G. Felder) - ETH Zurich
- 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

- *Mathematical aspects of classical and quantum field theory*, ETH Zürich, Spring '21
- *Field theory with symmetries and the Batalin–Vilkovisky formalism*, ETH Zürich, Fall '19
- *General Relativity for mathematicians*, 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

- *Representation Theory and Mathematical Physics Seminar*, UC Berkeley - Fall '17
- *Graduate talks in mathematics*, University of Zürich - Spring '14 through Spring '16

Scientific Duty

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, Università di Bologna

Referee for

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

Reviewer for

- American Mathematical Society

Outreach

Interviews

- Perspectives, journal of the Swiss Mathematical Physics Research Network
[Issue 6, 2021](#)

Academic activities

Invited conference talks, posters and participation to workshops

- *Informal Workshop on Corners* - November '21
Online, organised by L. Ciambelli and S. Speziale, Centre de Physique Theorique, University of Marseille [Invited Conference Talk]
- *Workshop on Supergeometry and Bracket Structures in Mathematics and Physics*,
Fields institute, Canada [Invited Conference Talk] - **Prospective, postponed to 2022.**
- *A gauge summer with BV*,
Italy, September '21 [Invited Conference Talk]
- *Geometry for Higher Spin Gravity: Conformal Structures, PDEs, and Q-manifolds*,
Erwin Schrödinger Institute, Austria, August '21 [Invited Conference Talk]
- *International Congress on Mathematical Physics*,
Switzerland, August '21 [Contributed Conference talk]
- *SwissMap general meeting poster session*,
Switzerland, August '20 [Contributed Poster]
- *A gauge summer with BV - teaser*,
Online, June '20 [Invited Conference Talk]
- *Field Theories and Higher Structures in Mathematics and Physics*,
Banff center for Mathematical Research, Oaxaca, ME - June '17 [Invitation to Workshop]
- *Quantum Field Theory on Manifolds with Boundary and the BV Formalism*,
Perimeter Institute, Waterloo, CA - May '17 [Invited Conference Talk]
- *Lichnerowicz Memorial Conference*,
IHP, Paris, FR - Dec '15 [Contributed Poster]
- *Algèbres L_∞ , Homotopie rationnelle, opérades et super géométrie*,
Rabat, MO - Jun '15 [Invited Conference Talk]
- *Perspectives in Physical Mathematics*,
University of Bologna, IT - Dec '14 [Invited Conference Talk]

Invited research talks

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

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

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

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

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

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

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

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

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

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

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

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.

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

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

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

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

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

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

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

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

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

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

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

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

ETH Zürich, Ch - Apr '13

What is... a BV-BFV theory.

University of Lille, Fr - Jan '13

Coadjoint orbits of classical Lie groups.