

Sylvain Lavau

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Research Interests Lie ∞ -algebroids, Singular foliations, Holonomy groupoid, Homotopy theory
BRST quantization, Batalin-Vilkovisky formalism, Higher gauge theories

Positions

- Jan 2021 - Present **Postdoc, Euler Institute - Steklov Institute**, Saint-Petersburg,
Grant No. 075-15-2019-1620. from the government of the Russian Federation for the
establishment and development of international research centers.
- Dec 2019 – Dec 2020 **Independent Researcher**, Paris,
Sabbatical leave to focus on personal research projects. Guest at Université Paris VII.
- Jan – Nov 2019 **Postdoc, Université Paris VII Diderot**, Paris,
Fellowship SINGSTAR: Analysis on singular and non compact spaces. A C^* -algebra
approach.
- July – Dec 2018 **Research Fellow, Max Planck Institute**, Bonn (Germany).
- July 2017 – June 2018 **Research Fellow, Universidade do Porto**, Porto (Portugal),
Fellowship UID/MAT/00144/2013 from CMUP (Centro de Matemática da U. Porto).
- Sept 2016 – June 2017 **Teaching and Research Fellow, Université de Lorraine**, Nancy (France),
ATER position : teaching (192h) and research.

Education

- 2018 – 2020 **M. Phil. in Philosophy of Science, Université de Lorraine**, Nancy,
Master in philosophy and history of science, by distance learning.
- 2017 – 2018 **B.Sc. in Sociology, Université Marc Bloch**, Strasbourg (France),
Last year of bachelor in Sociology, by distance learning.

- 2012 – 2016 **Ph.D in Mathematics, Université Claude Bernard**, Lyon (France),
 PhD in mathematics (under the supervision of T. Strobl and H. Samtleben) on the applications of Lie ∞ -structures to higher gauge theories and to foliations theory. Title : *Lie ∞ -algebroids and singular foliations*.
- 2010 – 2012 **M. Sc. in Theoretical Physics, Ecole Normale Supérieure**, Lyon, Paris,
Physics: Master in theoretical physics, majoring in statistical and quantum field theories.
Mathematics: Attended a selection of courses in mathematics, focusing on differential geometry and mathematical physics.
- 2009 – 2010 **Graduate studies in Mathematics, UdeM & McGill Universities**, Montreal,
 Graduate level classes in Mathematics, as an exchange student.
- 2006 – 2009 **B. Sc. in Physics, Lycée du Parc & Ecole Normale Supérieure**, Lyon,
 Bachelor in Physics, majoring in Physics and Mathematics.

Languages French (native), English (fluent), Japanese (JLPT 3), Spanish (B2), Russian (A1)

List of publications

Submitted and accepted paper

Mathematics and Physics

- ◇ S. L. and J. Stasheff, "From differential crossed modules to tensor hierarchies". arXiv:2003.07838
- ◇ S. L. and J. Palmkvist, "Infinity-enhancing of Leibniz algebras", *Lett. Math. Phys.* (2020) **110**(11):3121-3152. arXiv:1907.05752
- ◇ C. Laurent-Gengoux, S.L and T. Strobl, "The universal Lie ∞ -algebroid of a singular foliation", *Doc. Math.* (2020) **25**:1571-1652. arXiv:1806.00475
- ◇ S. L., "Tensor hierarchies and Leibniz algebras", *J. Geom. Phys.* (2019) **144**:147-189. arXiv:1708.07068
- ◇ S. L., "A short guide through integration theorems of generalized distributions", *Differ. Geom. Appl.* (2018) **61**:42-58. arXiv:1710.01627
- ◇ S. L., H. Samtleben, T. Strobl, "Hidden Q-structure and Lie 3-algebra for non-abelian superconformal models in six dimensions", *J. Geom. Phys.* (2014) **86**:497-533. arXiv:1403.7114

Philosophy and Sociology of Science

- ◇ S.L., "What is a theorem (in practice)?", *Trilogía Ciencia Tecnología Sociedad* (2021), **13**(25):e1765. revistas.itm.edu.co/index.php/trilogia/article/view/1765
- ◇ S.L., "Qu'est-ce qu'un théorème (en pratique) ?", *Rev. Anthropol. Connaiss.* (2021), **15**(2). journals.openedition.org/rac/22479
- ◇ Julien Larregue, S.L and Mahdi Khelfaoui, "La sociobiologie est morte, vive la psychologie évolutionniste !", *Zilsel* (2021) **8**:104-143. HAL-SHS:03201759

Teaching

- 2021 – present **Teaching Assistant, Steklov Institute**, Saint-Petersburg,
Master and PhD level classes on Poisson Geometry, topological field theories and gauge theories.
- 2016 – 2017 **Teaching Fellow, Université de Lorraine**, Nancy,
In charge of problem solving sessions in Calculus and Statistics to first year students.
- 2012 – 2016 **Teaching Assistant, Université Claude Bernard**, Lyon,
In charge of problem solving sessions in Algebra, Analysis and Geometry to first and second year students.
- 2011 – 2012 **Teaching Assistant, Lycée Janson de Sailly**, Paris,
In charge of symbolic computing sessions (on Maple) to second year students.
- 2008-2011 **Tutor, Associations Trait d'Union/Toujours Ensemble**, Lyon/Montréal,
Voluntary tutoring to students in middle and high schools in underprivileged communities.

Scientific responsibilities

- 2021-present **Reviewer for *Math. Rev.*, AMS**,
Reviewer for *Mathematical Reviews*.
- Fall 2018 **Seminar Organizer, Max Planck Institute**, Bonn,
Co-organizer of the weekly seminar on Deformation Theory at MPIM: <https://www.mpim-bonn.mpg.de/node/8756>.
- Oct 2017 – Present **Editor in Chief (Maths section), Emergent Scientist**, EDP Sciences,
Creator and editor of the mathematics section in the journal Emergent Scientist of EDP Sciences Editions, whose aim is to provide an academic journal at the undergraduate level: <https://emergent-scientist.edp-open.org>.
- 2014 – 2015 **Seminar Organizer, Institut Camille Jordan**, Lyon,
Co-organizer of the weekly seminar for the institute's mathematical physics team.

Outreach experience

- Oct 2018 – March 2020 **Event manager, Pint of Science**,
Event manager of the Pint of Science Festival in Paris (2019 and 2020), in charge of the evening sessions dedicated to theoretical physics, quantum physics and astrophysics.
- December 2017 **Community Manager, En direct du labo**,
Community manager of the Twitter account @endirectdulabo that gives the opportunity to young researchers to present their work.
- Jan 2017 – Present **Translator, H&K Editions**,
English to French translator of a manga publication about astronomy and the universe.

- Sept – Dec 2016 **Radio Broadcasting**, *Radio Campus Lorraine*, Nancy,
Radio presenter in the weekly scientific broadcast of the students' radio of the Université de Lorraine.
- 2012 – 2015 **Popularizing Assistant**, *Association Mathalyon*, Lyon,
Interventions with middle school students for day long activities promoting mathematics, popularizing research and mathematical reasoning.

Scholarly experience

Talks and contributions

Conferences and workshops

- *Dévaluations et contestations des savoirs légitimes*, September 6-7, 2021, online.
- *Singular Foliations*, May 13-14, 2019, Leuven (Belgium).
- *Colloque tournant*, January 31-February 1, 2019, Poitiers (France).
- *Rencontres Poisson*, June 13-14, 2018, La Rochelle (France).
- *Higher Structures 2*, March 5-8, 2018, Philadelphia.
- *Feuilletages singuliers*, November 23-24, 2017, Metz (France).
- *Géométrie non commutative et applications*, November 2-5, 2016, Metz.
- *Winter School in Mathematical Physics*, January 12-16, 2015, Les Diablerêts (Switzerland).

Seminars

- *Higher structures Seminar*, Göttingen Universität, July 2021, online.
- *Topology Seminar*, Steklov Institute, Mar. 2021, Saint-Petersburg.
- *Sociology of Science (3ST) Seminar*, EHESS, Nov. 2020, Paris.
- *Geometry Seminar*, Université Paul Sabatier, Fev. 2020, Toulouse (France).
- *Algebra, Geometry & Topology Seminar*, Université de Montpellier, Nov. 2018, Montpellier (France).
- *Operator Algebra Seminar*, Université Paris Diderot, Jan. 2019, Paris.
- *Oberseminar*, Max Planck Institute, Sept. 2018, Bonn.
- *Geometry Seminar*, ETH-Univ. Zurich, Sept. 2018, Zurich.
- *Geometry Seminar*, Universität Göttingen, August 2018, Göttingen (Germany).
- *Higher Geometry Seminar*, Max Planck Institute, July 2018, Bonn.
- *Geometry Seminar*, Universidade do Porto, June 2018, Porto.
- *Geometry & Mathematical Physics Seminar*, SISSA, Nov. 2017, Trieste (Italy).
- *Joint Geometry & Algebra Seminar*, Universidade do Porto, Oct. 2017, Porto.
- *Geometry Seminar*, Penn State, May 2017, State College (USA).
- *Deformation Theory Seminar*, UPenn, May 2017, Philadelphia.
- *Geometry Seminar*, KU Leuven, March 2017, Leuven.
- *Geometry Seminar*, National and Kapodistrian University of Athens, March 2017, Athens.
- *Graduate Colloquium*, ETH-Univ. Zurich, May 2015, Zurich.
- *Séminaire des Doctorants*, Université Claude Bernard, March 2015, Lyon.

Schools and Conferences attendance

Mathematics and Physics

- *GEOQUANT 2021*, August 2-6, 2021, online.
- *Higher structures in QFT and String theories*, July 12-16, 2021, online.
- *Singular Foliations and Related Structures*, October 1-2, 2020, online.
- *Supergeometry, Supersymmetry and Quantization*, December 16-19, 2019, Luxembourg.

- *Deformations and Rigidity in algebra, geometry and analysis*, October 7-11, 2019, Würzburg (Germany).
- *Souriau 2019*, May 27-31, 2019, Paris.
- *Groupoids and operator algebras, Applications to analysis, geometry and dynamics*, May 21-24, 2019, Orléans (France).
- *Higher Structures*, January 21-25, 2019, Marseille (France).
- *CIMPA School on Noncommutative Geometry and Index Theory*, December 3-15, 2018, Merida (Mexico).
- *INDAM workshop on Poisson Geometry and Higher Structures*, September 10-14, 2018, Roma.
- *Higher algebra and mathematical physics*, August 13-17, 2018, Bonn.
- *Rencontres Poisson*, June 14-15, 2018, La Rochelle.
- *GAP XVI*, May 29 - June 2, 2018, Timisoara (Romania).
- *Higher Structures 2*, March 5-8, 2018, Philadelphia.
- *Feuilletages singuliers*, November 23-24, 2017, Metz.
- *Winter School in Mathematical Physics*, January 8-13, 2017, Les Diablerêts.
- *Géométrie non commutative et applications*, November 2-5, 2016, Metz.
- *GAP XIV*, August 8-12, 2016, Sheffield (UK).
- *Poisson 2016*, June 27 - July 8, 2016, Geneva/Zurich.
- *From Poisson Geometry to Quantum Fields on Noncommutative Spaces*, October 5-10, 2015, Würzburg.
- *Winter School in Mathematical Physics*, January 12-16, 2015, Les Diablerêts.
- *Higher Structures in Geometry and Physics*, October 27-31, 2014, Geneva.
- *Poisson 2014*, July 28 - August 8, 2014, Urbana-Champaign (USA).
- *Journées de Physique Mathématique de Lyon: Topological Insulators*, September 11-13, 2013, Lyon.
- *GEOQUANT 2013*, August 19-23, 2013, Vienna.
- *18th Claude Itzykson Meeting: Frontiers in string theory*, July 1-3, 2013, Saclay (France).
- *Higher Algebra and Lie-infinity Theory*, June 25-28, 2013, Luxembourg.
- *Winter School in Mathematical Physics*, January 14-18, 2013, Les Diablerêts.
- *Summer school on Differential Geometry and Supersymmetry*, September 10-14, 2012, Hamburg.
- *Les Houches Winter School in Mathematical Physics*, January 29 - February 3, 2012, Les Houches (France).
- *Sixth Aegean Summer School - Quantum Gravity and Quantum Cosmology*, September 12-17, 2011, Naxos (Greece).
- *Strings, Cosmology and Gravity Student Conference 2010*, November 3-5, 2010, Paris.
- *Winter school in pure and applied mathematics*, January 8-11, 2010, Montreal.

Philosophy, History and Sociology of Sciences

- *International conference on Advances in Pilot Wave Theory*, July 26-31, 2021, online.
- *Meeting of the Association for the Philosophy of Mathematical Practice*, June 30 - July 3, 2021, online.
- *Workshop on Disagreement in Mathematics*, June 19-20, 2021, online.
- *Universals' Locales*, January 8-9, 2020, Edinburgh.
- *Un siècle de Fisher : Atelier pluridisciplinaire pour une analyse critique d'un texte fondateur*, September 12-13, 2019, Paris.
- *Ecole Thématique Mathématiques et Philosophie Contemporaines*, June 27-29, 2019, Paris.
- *Masterclass in the Philosophy of Mathematical Practice*, June 19-21, 2019, Brussels.
- *Ecole Thématique Mathématiques et Philosophie Contemporaines*, June 27-30, 2018, Saint-Flour (France).
- *Historical epistemology and the disunities of the sciences*, May 24-26, 2018, Paris.
- *Congrès de la société d'histoire des sciences et des techniques*, April 19-21, 2017, Strasbourg.

Research Stays

- *SISSA, Trieste (Italy)* – two weeks (November 2017).
- *UPenn, Philadelphia* – one month (May 2017).
- *KU Leuven, Leuven* – two weeks (March 2017).
- *National and Kapodistrian University of Athens, Athens* – one month (February 2017).

Grants and Fellowships

- Grant No. 075-15-2019-1620. from the government of the Russian Federation for the establishment and development of the international research centers (two to three years subsidy)
- Fellowship from the project SINGSTAR: *Analysis on singular and non compact spaces. A C^* -algebra approach*, funded by the CNRS (eleven months fellowship).
- Fellowship UID/MAT/00144/2013 of the Portuguese Research Foundation FCT, 2017 (one year fellowship).
- PhD scholarship, 2012-2016 (4 years scholarship).
- Ecole Normale Supérieure scholarship, 2008-2012 (4 years salary).