

Simon Pepin Lehalleur

Curriculum Vitae

Personal information and contact

Nationality: French

Date of birth : 9th of January 1986

Place of birth : Caen, France

Personal situation: Married, two children

Professional address:

Radboud University
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RESEARCH

Research areas

Algebraic geometry

Arithmetic geometry

Homotopy theory

Research interests

Motivic homotopy theory, relative motives, Grothendieck operations formalism

Relative 1-motives, abelian schemes, Picard schemes, Néron models and related objects

Motives of moduli spaces of bundles

Exponential motives and exponential periods

Motivic vanishing cycles and rigid-analytic motivic homotopy theory

\mathbb{A}^1 -enumerative geometry and Grothendieck-Witt Euler characteristics

Research positions

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| Postdoc (research group of Prof. Ben Moonen, Radboud University Nijmegen) | 2020- |
| Principal Investigator SPP 1786 (Wissenschaftlicher Mitarbeiter) (research group of Prof. Hélène Esnault, Freie Universität Berlin) | 2019- |
| Postdoc (Wissenschaftlicher Mitarbeiter) (research group of Prof. Hélène Esnault, Freie Universität Berlin) | 2018- |
| Einstein fellowship postdoctoral position (research group of Prof. Hélène Esnault, Freie Universität Berlin) | 2016-2018 |

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| Ph.D. with Prof. Joseph Ayoub (Universität Zürich), defended 6th of November 2015 Title: “An abelian category of relative 1-motives” | 2011-2015 |
| 2 years as a Ph.D. student in Paris 13 under the supervision of Prof. Jörg Wildeshaus | 2009-2011 |

Publications

Subgroups of maximal rank of reductive groups, in “Autour des schémas en groupes”, *Panoramas et Synthèses* 47, 2015

On the relative motive of a commutative group scheme (with G.Ancona and A.Huber), *Algebraic geometry*, vol. 3 issue 2, 2016

Triangulated categories of relative 1-motives, *Advances in Mathematics*, vol. 347, 2019

Constructible 1-motives and exactness of realisation functors, accepted for publication in *Documenta Mathematica*

On the Voevodsky motive of the moduli stack of vector bundles on a curve (with V.Hoskins), accepted for publication in the *Quarterly Journal of Mathematics*

Preprints (available on the arxiv and on my webpage)

A formula for the Voevodsky motive of the moduli stack of vector bundles on a curve (with V.Hoskins), arXiv:1809.02150

On the Voevodsky motive of the moduli space of Higgs bundles on a curve (with V.Hoskins), arXiv:1910.04440

Invited research visits

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| Tokyo Institute of Technology, Tokyo | 09/2018 |
| Mittag-Leffler Institute, Stockholm | 01/2017 |
| Tata Institute, Mumbai | 10/2016 |

Lecture series/minicourses

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| Triangulated categories of motivic sheaves, University of Freiburg | 02/2020 |
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Conference talks

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| A motivic non-abelian Hodge theory, Higgs bundles and relative topics, online | 05/2020 |
| On the motive of the moduli space of Higgs bundles, SPP Jahrestagung, Essen | 10/2019 |
| A formula for the motive of the moduli stack of vector bundles, GLEN, Manchester | 03/2019 |
| Foliated cohomology at the generic point, Motives, Foliations and the Conservativity conjecture, Berlin | 09/2018 |
| E-localisation, Motives, Foliations and the Conservativity conjecture, Berlin | 09/2018 |
| E-localisation, Conservativity conjecture workshop (Harumura) | 09/2018 |
| The Voevodsky motive of the moduli stack of vector bundles, NoGAGS Berlin | 11/2017 |
| Reductive group schemes, Workshop on equivariant and motivic homotopy, Osnabrück | 10/2017 |
| The motivic t-structure for relative 1-motives, Annual Meeting of the SPP 1786 | 03/2017 |
| The motivic t-structure for relative 1-motives, Conference “Generalizations of \mathbb{A}^1 -Homotopy Invariance in Algebraic Geometry and Homotopy Theory” | 04/2016 |

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| An introduction to motivic homotopy theory, Motivic Homotopy theory day, FU Berlin | 03/2016 |
| The Borel-De Siebenthal theorem, Luminy (SGA3 summer school) | 09/2011 |

Seminar talks

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| Motives of moduli spaces of bundles on curves, Jussieu (Paris) | 10/2020 |
| Motives of moduli spaces of bundles on curves, Purdue | 10/2020 |
| Constructible 1-motives, Amsterdam | 02/2020 |
| A formula for the Voevodsky motive of the moduli stack of vector bundles, Berlin | 10/2018 |
| A formula for the Voevodsky motive of the moduli stack of vector bundles over a curve, Tokyo Institute of Technology | 09/2018 |
| Triangulated categories of relative 1-motives, University of Illinois Urbana Champaign | 03/2018 |
| The Voevodsky motive of the moduli stack of vector bundles, University of Illinois Chicago | 03/2018 |
| Constructible 1-motives, KTH Stockholm | 02/2018 |
| On the motive of the stack of vector bundles on a curve, Oxford University | 02/2018 |
| The Voevodsky motive of the moduli stack of vector bundles, FU Berlin | 02/2017 |
| The motivic t-structure for relative 1-motives, Rennes | 11/2016 |
| Relative 1-motives, Tata Institute Mumbai | 10/2016 |
| Triangulated categories of 1-motivic sheaves, Singapore | 08/2016 |
| The motivic t-structure for relative 1-motives, Regensburg | 01/2016 |
| The motivic t-structure for relative 1-motives, Freiburg (Oberseminar) | 10/2015 |
| Deligne 1-motives in the triangulated categories of mixed motives, Paris Réga | 12/2012 |

RESEARCH GRANTS

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| SPP 1786, Project “Exponential motivic homotopy theory, foliations and applications”, Principal investigator, 213 600 EUR | 2018-2020 |
| Forschungskredit: Candoc, Principal investigator, University of Zürich, 55200 CHF | 2013-2014 |

STUDENT SUPERVISION

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|-------------------------------------------------------------------------------------------------------------------------------|------|
| Bachelor thesis on “Representations of compact groups and the Peter-Weyl theorem”, Roel Gisolf (UvA) | 2020 |
| Master thesis on “Relative Galois theory of ∞ -topoi and the relative Étale homotopy type”, Louis Martini (F.U Berlin) | 2019 |
| Master thesis on “Galois representations attached to modular forms of weight 2”, Dimitri Loutchko (F.U Berlin) | 2019 |
| Master thesis on “Model categories and unstable \mathbb{A}^1 -homotopy category”, Viktor Tabakov (F.U Berlin) | 2019 |
| Bachelor thesis on “The Étale fundamental group and the regular inverse Galois problem”, Louis Martini (F.U Berlin) | 2018 |

TEACHING

Recent Teaching

Radboud Universiteit/University of Amsterdam (2020-)

Graduate course “Categories and Infinity-categories” WS20

Freie Universität Berlin (2016-2019)

Student seminar “Categories and infinity-categories” WS18

Teaching assistant for “Local Class Field Theory” WS18

Student seminar “Differential Galois Theory” SS18

Teaching assistant for “Complex Analysis” SS18

Graduate course “Models of curves and abelian varieties” SS17

University of Zürich (2011-2015):

Linear Algebra I-II (Bachelor course, Universität Zürich, in German) WS14-SS15

Programming in Python (Bachelor course, Universität Zürich) Winter semester 2013

Differential forms in topology (Masters course, Universität Zürich) Spring semester 2013

Algebraic Geometry (Masters course, Universität Zürich) Winter semester 2012

Probability and statistics for science students (Bachelor course, University Zürich, in German) Spring semester 2012

Linear Algebra and Geometry for teaching students (Bachelor course, University Zürich, in German) Winter semester 2011

Université Paris XIII: (2009-2011):

Mathematics for Computer science (Bachelor course for computer science students, Paris XIII, in French) Spring semester 2011

Linear Algebra (Bachelor course, Paris XIII, in French) Winter semester 2010

ORGANISATION AND SERVICE

Conference organisation

Co-organisation of Arbeitsgemeinschaft “Motives, Foliations and the Conservativity Conjecture” (Humboldt University) 24/09/18-28/09/18

Co-organisation of summer school “Motives for periods” (FU Berlin) 28/08/2017-1/09/2017

Seminar organisation

Organised seminar on “Hilbert schemes of points on surfaces” Spring 2020

Supervised seminar on “Motivic Galois groups and periods” in Prof. Esnault’s research group 2016

Co-organised the Graduate Colloquium of the Graduate School of Mathematics of Zürich 2013-2014

PhD defense committees

Matej Filip (FU Berlin) 09.03.2018

Irem Portakal (FU Berlin) 27.04.2018

Eva Martinez (FU Berlin)

29.06.2018

Hiring committees

Hiring committees for several postdocs in the research group of Prof. Esnault

2016-2019

Referee work

Refereed for Advances in Mathematics, Annales scientifiques de l'ENS, Tohoku mathematical journal, Mémoires de la Société Mathématique de France.

Zentralblatt and Mathreviews

Reviewed 8 papers for Zentralblatt and Mathreviews.

EDUCATION

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| Master in mathematics with distinction in University Paris 7 Denis Diderot | 2008 |
| “Agrégation de Mathématiques” | 2007 |
| Bachelor in mathematics with distinction, université Paris 11 Orsay | 2006 |
| Passed the competitive examination to enter the Ecole Normale Supérieure | 2005 |
| Participated in the International Mathematical Olympiads | 2003 |
| “Concours Général de mathématiques”, Paris, 3rd place | 2003 |

LANGUAGES

Languages

French : native

English : written, spoken (fluent)

Spanish : written, spoken (near-fluent)

German : written, spoken (B2)