

LEI ZHANG

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PERSONAL INFORMATION

DATE OF BIRTH	July 16, 1983
GENDER	Male

MATHEMATICAL INTERESTS

My research area is arithmetic algebraic geometry. More specifically, I am interested in Tannakian categories, fibred category and algebraic stacks, Nori fundamental groups, the pro-étale fundamental group, the homotopy sequence of various fundamental groups.

EMPLOYMENT

THE CHINESE UNIVERSITY OF HONG KONG Research Assistant Professor	<i>Oct. 23. 2018 - Present</i>
FREIE UNIVERSITÄT BERLIN Post-doc	<i>Nov. 01. 2012 - Oct. 22, 2018</i>
UNIVERSITÄT DUISBURG-ESSEN Post-doc	<i>Jul. 17. 2012 - Sep. 30. 2012</i>

EDUCATION

UNIVERSITÄT DUISBURG-ESSEN Oct. 01. 2009 - Jul. 16. 2012
 PhD student under the supervision of Professor Hélène Esnault
 THESIS TITLE: *The homotopy sequence for fundamental groups*
 Doctor's degree awarded by Fakultät für Mathematik on July 16, 2012

CAPITAL NORMAL UNIVERSITY Sep. 2006 - Jun. 2009
 Master Student under the supervision of Professor Kezheng Li
 THESIS TITLE: *Left Invariant Differential Operators*
 Master's degree awarded by College of Mathematical Science in June 2009.

CHINA UNIVERSITY OF MINING AND TECHNOLOGY Sep. 2002 - Jun. 2006
 Bachelor student in Financial Mathematics
 Bachelor's degree awarded by College of Science in June 2006.

PREPRINTS AND PUBLICATIONS

- (1) *The Homotopy Sequence for Nori's Fundamental Group.*
Journal of Algebra, Vol. 393, pp. 79 - 91, 2013.
doi: <https://doi.org/10.1016/j.jalgebra.2013.07.010>

- (2) *The Homotopy Sequence for the Algebraic Fundamental Group*.
International Mathematics Research Notices, no. 22, 6155-6174, 2013.
doi: 10.1093/imrn/rnt163
- (3) *Nori's Fundamental Group over a non-algebraically Closed Field*.
Annali della Scuola Normale Superiore di Pisa - Classe di Scienze (5), 18, no. 4, 1349–1394, 2018.
doi: 10.2422/2036-2145.201604_007
- (4) *Algebraic and Nori Fundamental Gerbes* (with Fabio Tonini).
Journal of the Institute of Mathematics of Jussieu, 1-43, 2019
doi:10.1017/S147474801700024X
- (5) *F-divided sheaves trivialized by dominant maps are essentially finite* (with Fabio Tonini).
Transactions of the American Mathematical Society, 371, 1-22, 2019.
doi: <https://doi.org/10.1090/tran/7444>
- (6) *Nori fundamental gerbe of essentially finite covers and Galois closure of towers of torsors* (with M. Antei, I. Biswas, M. Emsalem, F. Tonini).
Selecta Mathematica, 25, no. 2, Art. 18, 37 pp., 2019.
doi: <https://doi.org/10.1007/s00029-019-0449-z>
- (7) *Essentially Finite Vector Bundles on Normal Pseudo-proper Algebraic Stacks* (with Fabio Tonini).
Documenta Mathematica, 25, 159-169, 2020.
doi: 10.25537/dm.2020v25.159-169
- (8) *The arithmetic local Nori fundamental group* (with M. Romagny, F. Tonini).
To appear in *Transactions of the American Mathematical Society*.
- (9) *A crystalline incarnation of Berthelot's conjecture and Künneth formula for isocrystals* (with V. Di Proietto, F. Tonini).
To appear in *Journal of Algebraic Geometry*.
- (10) *A generalized Abhyankar's conjecture for simple Lie algebras in characteristic $p > 5$* (with S. Otabe and F. Tonini).
Submitted.
- (11) *Frobenius fixed objects of moduli* (with V. Di Proietto and F. Tonini).
Submitted.
- (12) *A theorem on meromorphic descent and the specialization of the pro-étale fundamental group* (with Marcin Lara and Jiu-Kang Yu).
Submitted.

GRANTS

- (1) General Research Fund 14301019 from University Grants Committee, *The local fundamental group*, 2020-2022.
- (2) Direct Grant 4053343 from College of Science of The Chinese University of Hong Kong, *The pro-étale fundamental group*, 11.2018-11.2020.

SELECTED TALKS

DEUTSCHEN MATHEMATIKER-VEREINIGUNG
at Universität des Saarlandes, Saarbrücken.

Sep.17, 2012 - Sep. 20, 2012

On the Homotopy Sequence of Nori's Fundamental Group.
(Minisymposia and Sections Sep.17, 2012)

NORTH GERMAN ALGEBRAIC GEOMETRY SEMINAR
at Universität Hamburg, Hamburg.

May 15, 2014 - May 16, 2014

Galois Theory for Schemes.
(May 16, 2014)

ARITHMÉTIQUE DES VARIÉTÉS EN FAMILLES
at Institut de Mathématiques de Bordeaux.

Nov. 4, 2014 - Nov. 7, 2014

Nori's Fundamental Group with a Geometric Point.
(Nov. 5, 2014)

CURVES AND GROUPS IN FAMILIES
at Henri Lebesgue Center, Rennes.

May 13, 2019 - Nov. 17, 2019

Fundamental group schemes in characteristic p .
(May, 2019)

TEACHING EXPERIENCE

- (1) MATH1030E - *Linear Algebra I*, The Chinese University of Hongkong, 2020-21 Term 2.
- (2) MATH1030E - *Linear Algebra I*, The Chinese University of Hongkong, 2019-20 Term 2.
- (3) MATH1030H - *Linear Algebra I*, The Chinese University of Hongkong, summer course, 2018/2019.
- (4) Exercise session for the course *Algebraic Number Theory II*, Freie Universität Berlin, summer semester 2018.
- (5) Seminar: *Quadratische Formen* (in English *Quadratic Forms*), Freie Universität Berlin, summer semester 2018. This seminar was in German.
- (6) Course: *Crystals and Crystalline Cohomology*, Freie Universität Berlin, winter semester 2017.
- (7) Seminar: *p -adische Zahlen* (in English *p -adic Numbers*), Freie Universität Berlin, summer semester 2017. This seminar was in German.
- (8) Exercise session for the course *Algebraic Number Theory II*, Freie Universität Berlin, summer semester 2017.
- (9) Course: *Étale Cohomology*, Freie Universität Berlin, winter semester 2016-2017.
- (10) Course: *Algebraic Groups*, Freie Universität Berlin, summer semester 2016.
- (11) Seminar: *Analytic Methods in Number Theory*, Freie Universität Berlin, winter semester 2015-2016.
- (12) Exercise session for the course *Elliptic Curves*, Freie Universität Berlin, winter semester 2015-2016.
- (13) Seminar: *Quadratic Forms*, Freie Universität Berlin, summer semester 2015.

- (14) Exercise session for the course *Algebraic Number Theory II*, Freie Universität Berlin, summer semester 2015.
- (15) Exercise session for the course *Algebraic Number Theory II*, Freie Universität Berlin, winter semester 2014-2015.
- (16) Student seminar *p-adic Numbers*, Freie Universität Berlin, winter semester 2014-2015.
- (17) Teaching assistant of Prof. Dr. Hélène Esnault for the master course *Algebraic Number Theory*, Freie Universität Berlin, summer semester 2014.
- (18) Teaching assistant of Prof. Dr. Hélène Esnault for the master course *Commutative Algebra I*, Freie Universität Berlin, winter semester 2013-2014.
- (19) Teaching assistant of Prof. Dr. Hélène Esnault for the master course *Algebraic Number Theory II*, Freie Universität Berlin, summer semester 2013.
- (20) *Lern- und Diskussionszentren* (LuDi), Universität Duisburg-Essen, summer semester 2012.
- (21) Teaching assistant of Prof. Dr. Hélène Esnault and Prof. Dr. Moritz Kerz for the master course *Algebraic Geometry III*, Universität Duisburg-Essen, summer semester 2011.

STUDENTS

- (1) 2020, Li Kin Lok, bachelor thesis: *Integral closure of finitely generated algebra*, The Chinese University of Hong Kong.
- (2) 2018, Ragnarsson Amazeen, master thesis: *Étale and proétale fundamental groups*, Freie Universität Berlin.
- (3) 2018, Janine Schuhmann, bachelor thesis: *Klassifikation von quadratischen Form über \mathbb{Q}_p , \mathbb{Q} und \mathbb{R}* , Freie Universität Berlin.

LANGUAGE

Mandarin Chinese: 

English: 

German: 

French: 