LEI ZHANG

The Chinese University of Hong Kong, Department of Mathematics

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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   *Oct. 23. 2018 - Present*
Research Assistant Professor

FREIE UNIVERSITÄT BERLIN   *Nov. 01. 2012 - Oct. 22, 2018*
Post-doc

UNIVERSITÄT DUISBURG-ESSEN   *Jul. 17. 2012 - Sep. 30. 2012*
Post-doc

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).
To appear in *Mathematische Annalen.*

(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 fudnamental group* (with Marcin Lara and Jiu-Kang Yu).
Submitted.

PROFESSIONAL SERVICES

(1) Referee of *Duke Mathematical Journal*

(2) Referee of *Mathematical Research Letters*

(3) Referee of *Journal of Topology*

(4) Referee of *American Journal of Mathematics*

(5) Referee of *Compositio Mathematica.*

(6) Referee of *The Épijournal de Géométrie Algébrique*

(7) Referee of *Algebras and Representation Theory* (Quick Review)

(8) Referee of *Tohoku Mathematical Journal*

(9) Referee of *Geometry & Topology*

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   *Sep.17, 2012 - Sep. 20, 2012*
at Universität des Saarlandes, Saarbrücken.

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

NORTH GERMAN ALGEBRAIC GEOMETRY SEMINAR   *May 15, 2014 - May 16, 2014*
at Universität Hamburg, Hamburg.

Galois Theory for Schemes.
(May 16, 2014)

ARITHMÉTIQUE DES VARIÉTÉS EN FAMILLES   *Nov. 4, 2014 - Nov. 7, 2014*
at Institut de Mathématiques de Bordeaux.

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

CURVES AND GROUPS IN FAMILIES   *May 13, 2019 - Nov. 17, 2019*
at Henri Lebesgue Center, Rennes.

Fundamental group schemes en caracteristic 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

Language	Proficiency
Mandarin Chinese:	●●●●●●●●●●
English:	●●●●●●●●◑○
German:	●●●●●●●◑○○
French:	●○○○○○○○○○