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RESEARCH AREAS

Cohomology of algebraic varieties, especially motivic cohomology and algebraic K-theory, and their relation to algebraic cycles.

Employment

2016–
UNIVERSITÄT REGENSBURG
Wissenschaftlicher Mitarbeiter

Education

2013–2016
Dr. rer. nat., *summa cum laude* in Mathematics
Universität Duisburg-Essen, Essen
Thesis: Motivic homotopy theory in derived algebraic geometry
Advisor: Marc Levine
Co-advisor: Denis-Charles Cisinski

2011–2013
M.Sc. in Mathematics
Freie Universität Berlin, Berlin
Thesis: Perfect correspondences and Chow motives
Advisor: Hélène Esnault

2007–2011
B.Sc. in Mathematics
University of Maryland, Baltimore County, Baltimore

2009–10
“Math in Moscow” exchange program
Independent University of Moscow, Moscow

Visiting positions

July – Sept. 2017
MAX PLANCK INSTITUTE FOR MATHEMATICS
Post-doctoral fellow

Jan. – Apr. 2017
INSTITUT MITTAG–LEFFLER
Post-doctoral fellow

Preprints

Motivic infinite loop spaces, with Elden Elmanto, Marc Hoyois, Vladimir Sosnilo, Maria Yakerson
(in preparation)

Brave new motivic homotopy theory III: the six operations
(in preparation)

2017 *Brave new motivic homotopy theory II: homotopy invariant K-theory*, with Denis-Charles Cisinski
arXiv:1705.03340 (27 pages)

2016 *Brave new motivic homotopy theory I: the localization theorem*
arXiv:1610.06871 (66 pages, submitted)

2014 *On derived categories and noncommutative motives of varieties*
arXiv:1401.7222 (7 pages)

Conference and workshop talks

Mar. 2017 *Homotopy K-theory of E_∞ -ring spectra*
Annual Meeting (Jahrestagung) of the DFG-SPP 1786, Bergische Universität Wuppertal

Aug. 2016 *A^1 -homotopy invariance in spectral algebraic geometry*
Alpine Algebraic and Applied Topology Conference, Saas-Almagell

June 2016 *Virtual fundamental classes via stable homotopy theory*
Homotopical approaches to categories and geometry, Universität Freiburg

Sept. 2014 *Derived categories and motives of varieties*
Vector Bundles on Algebraic Curves (VBAC) 2014, Freie Universität Berlin

Seminar talks

August 2017 *Motivic infinite loop spaces*
K-theory trimester seminar, Hausdorff Institute for Mathematics

July 2017 *Motivic cohomology of algebraic varieties*
MPI-Oberseminar, Max-Planck-Institut für Mathematik

May 2017 *Gysin maps and recognition of infinite loop spaces in motivic homotopy theory*
Oberseminar, Universität München

Dec. 2016 *Virtual fundamental classes via motivic homotopy theory*
Arbeitsgruppenseminar U. Bunke, Universität Regensburg

Nov. 2016 *Virtual fundamental classes via motivic homotopy theory*
Topology Seminar, Universität Wuppertal

Nov. 2016 *Virtual fundamental classes via motivic homotopy theory*
Mittagsseminar zur Arithmetik, Universität Münster

Nov. 2016 *Brave new motivic homotopy theory*
SFB-Seminar, Universität Regensburg

Sept. 2016 *Brave new motivic homotopy theory*
Universitetet i Oslo, Topology Seminar

Feb. 2016 *Motives and algebraic cycles in derived algebraic geometry*
Séminaire d'arithmétique, ENS Lyon

May 2014 *Orlov's theorem via noncommutative motives*
Algebra and number theory seminar, Universität Augsburg

May 2014 *Orlov's theorem via noncommutative motives*
Antwerp algebra seminar, Universiteit Antwerpen

July 2013 *DG categories of coherent sheaves and motives of varieties*
Graduate college colloquium, Universität Regensburg

Selected expository talks

- June 2017 *The localization and relative purity theorems of Morel–Voevodsky*
Oberseminar “Motivic sheaves”, Universität Regensburg
- Dec. 2016 *Motivic cohomology and motivic Eilenberg–MacLane spectra*
Oberseminar über den Hopkins–Morel–Hoyois–Isomorphismus, Universität Regensburg
- June 2016 *Derived de Rham algebras mod p^n I*
Research Seminar Arithmetic Geometry, Universität Duisburg-Essen
- June 2016 *The motivic cohomology of chromatic quotients of MGL*
Motives seminar, Universität Duisburg-Essen
- Nov. 2015 *K-theory of finite fields, II: Rational and mod p homology of $BGL(\mathbb{F}_q)$*
Student seminar: K-theory of fields, Universität Duisburg-Essen
- Nov. 2015 *Motivic cohomology, purity, and Voevodsky’s contraction*
Motives seminar, Universität Duisburg-Essen
- Nov. 2015 *Betti realization and Morel’s A^1 -connectivity theorem*
Motives seminar, Universität Duisburg-Essen
- May 2015 *Failure of the integral Hodge conjecture*
Motives seminar, Universität Duisburg-Essen
- Jan 2015 *The existence theorem*
Research seminar: Class field theory for varieties over finite fields, Universität Duisburg-Essen
- Dec. 2014 *Applications: the theorem of the fixed part following Deligne, and the Abel–Jacobi map following Arapura*
Student seminar: Hodge theory, Universität Duisburg-Essen
- Oct. 2014 *Beilinson–Deligne cohomology*
Motives seminar, Universität Duisburg-Essen
- Mar. 2014 *Introduction to algebraic cobordism and oriented theories*
MIT Talbot Workshop: Motivic homotopy theory, Pigeon Forge
- Jan. 2014 *Symmetric spectra and non-effective motives*
Learning seminar on motives, Universität Duisburg-Essen
- Jan. 2014 *Effective motives*
Learning seminar on motives, Universität Duisburg-Essen
- Dec. 2013 *Properties of the intersection product, part 2*
Student seminar: Intersection theory, Universität Duisburg-Essen
- Nov. 2013 *$(\infty, 1)$ -Categories*
Winter school: Derived algebraic geometry, Flumserberg
- Nov. 2013 *DG-categories, II*
Learning seminar on motives, Universität Duisburg-Essen
- May 2013 *Sites, sheaves and the comparison lemma of Beilinson*
Research seminar: p -adic periods and derived de Rham cohomology, FU Berlin

Teaching

- WS 2017/18 *Descent in algebraic K-theory*
Lecture course, Universität Regensburg
- WS 2017/18 *Galois theory*
Seminar, Universität Regensburg
- WS 2016/17 – SS 2017 *Higher category theory and homotopical algebra*
Master course (exercise sessions), Universität Regensburg
- SS 2016 *Algebraische Geometrie 2*
Master course (exercise sessions), Universität Duisburg-Essen

WS 2015/16 *Algebraische Topologie 2*
Master course (exercise sessions), Universität Duisburg-Essen

Service

May 2016 Co-organization of a mini-course on motives and derived algebraic geometry (with Peter Arndt)
Universität Duisburg-Essen
URL: <http://www.preschema.com/motives-dag-2016/>

WS 2015/16 Co-organization of a learning seminar on geometric Langlands following Gaitsgory (with Niels Uittenbosch)
Universität Duisburg-Essen

WS 2013/14 Co-organization of a learning seminar on motives (with Jin Cao and Brad Drew)
Universität Duisburg-Essen

2014- Technical administration of, and writing contributions to, the “nLab” wiki project
URL: <http://ncatlab.org>

2010- Contributions to the “MathOverflow” question-answer forum
URL: <http://mathoverflow.net/users/2503/adeel-khan>

Languages

English (native)
Urdu (native)
Russian (fluent)
German (conversational)
French (basic)