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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, research program “Algebraic-geometric and homotopical methods”

Feb. 2018
FREIBURG INSTITUTE FOR ADVANCED STUDIES
Short-term visitor, research focus “Cohomology in algebraic geometry and representation theory”

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

November 2017 *TBA*
Topology seminar, EPFL Lausanne

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 Uit de Bos)
 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)