

Adeel A. Khan

Fakultät für Mathematik
Universität Regensburg
Universitätsstr. 31
93040 Regensburg
Germany

DATE OF BIRTH: 1991-09-04
NATIONALITY: Canadian
PHONE: +49 941 943 5916
EMAIL: adeel.khan@mathematik.uni-regensburg.de
WEB PAGE: <https://www.preschema.com>

RESEARCH AREAS

Algebraic and arithmetic geometry; specifically: algebraic K-theory, motivic cohomology, and algebraic cycles.

Employment

- 2018– UNIVERSITÄT REGENSBURG
Akademischer Rat auf Zeit
- 2016–2018 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
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

- Feb. 2018 FREIBURG INSTITUTE FOR ADVANCED STUDIES
Visitor, research focus “Cohomology in algebraic geometry and representation theory”
Freiburg
- July – Sept. 2017 MAX PLANCK INSTITUTE FOR MATHEMATICS
Post-doctoral fellow
Bonn
- Jan. – Apr. 2017 INSTITUT MITTAG-LEFFLER
Post-doctoral fellow, research program “Algebro-geometric and homotopical methods”
Stockholm

Preprints

- 2018 **Formal descent theorems in algebraic K-theory**
(In preparation)
- 2018 **Fundamental classes in motivic homotopy theory**, with Frédéric Déglise, Fangzhou Jin

(In preparation)

- 2018 **Virtual Cartier divisors and blow-ups**
arXiv:1802.05702 (12 pages)
- 2017 **Motivic infinite loop spaces**, with Elden Elmanto, Marc Hoyois, Vladimir Sosnilo, Maria Yakerson
arXiv:1711.05248 (73 pages, submitted)
- 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, master's thesis)

Teaching

- SS 2018 **The Grothendieck–Riemann–Roch theorem**
Lecture course, Universität Regensburg
- WS 2017/18 **Descent in algebraic K-theory**
Lecture course, Universität Regensburg
- WS 2017/18 **Galois theory**
Tutor for 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

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

- April 2018 **Производная теория пересечений**
Seminar, Euler International Mathematical Institute
- Jan. 2018 **Derived intersection theory**
Seminar, Università di Firenze
- Jan. 2018 **Motivic infinite loop spaces**
SFB-Seminar, Universität Regensburg
- Nov. 2017 **Motivic infinite loop spaces**
Topology seminar, EPFL Lausanne
- Aug. 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

- Jan. 2018 **The Tate-valued Frobenius I**
Higher Invariants Oberseminar "Topological cyclic homology", Universität Regensburg
- Dec. 2017 **Absolute purity with rational coefficients**
Oberseminar "Motivic sheaves", Universität Regensburg
- 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 $BGL(\mathbf{F}_q)$**
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

Service

- 2017– Referee for various journals
- May 2016 Co-organization of a mini-course on motives and derived algebraic geometry (with Peter Arndt)
Universität Duisburg-Essen
URL: <https://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

Awards and grants

- 2017 **Institut Mittag-Leffler Post-doctoral Fellowship**

Languages

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