

Shane Kelly

CONTACT INFORMATION Tokyo Institute of Technology `shanekelly at math dot titech dot ac.jp`
Department of Mathematics <http://www.math.titech.ac.jp/~shanekelly/>
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Tokyo 152-8551, Japan

RESEARCH INTERESTS Arithmetic algebraic geometry (specifically motivic cohomology);
Birational geometry, singularities (via differential forms in positive characteristic);
Modular representation theory (via stratified mixed Tate motives);
Tensor triangulated geometry (in motivic homotopy theory)

EMPLOYMENT

2018–present (Tenured) **Associate Professor**
Tokyo Institute of Technology

2016–2018 **Wissenschaftlicher Mitarbeiter**
FU Berlin, in Hélène Esnault’s research group

2015–2016 **Akademischer Mitarbeiter**
Universität Freiburg, in Annette Huber’s research group

2013–2015 **JSPS Postdoctoral Fellowship**
Tokyo Institute of Technology; Host researcher: Shuji Saito

2012–2013 **Post-doctoral Researcher**
Universität Duisburg–Essen, in Marc Levine’s research group

EDUCATION

Australian National University,
Université de Paris-Nord 13
Ph.D. (Mathematics)
Title: Triangulated categories of motives in positive characteristic
Advisors: Denis-Charles Cisinski, Amnon Neeman
arXiv:1305.5349

Université de Paris-Sud 11
M2 (Masters in Mathematics)

Università degli studi di Padova
Laurea Specialistica con 110 e lode (Masters in Mathematics)

University of Western Australia
Bachelor of Computer and Mathematical Sciences with First Class Honours

PUBLICATIONS

- S.Kelly, S.Saito, “Smooth blowup square for motives with modulus”
(2019) *arXiv:1907.12759*.
- S.Kelly, “A better comparison of cdh- and ldh-cohomologies”
(2019) *Nagoya Mathematical Journal*, special issue celebrating Shuji Saito’s 60th birthday.
- J.N.Eberhardt, S.Kelly, “Mixed Motives and Representations of Algebraic Groups in Equal Characteristic”
(2019) *Selecta Mathematica* 25:30 *arXiv:1609.05956*.
- S.Kelly, M.Morrow, “K-theory of valuation rings”
(2018) *Submitted arXiv:1810.12203*.
- S.Kelly, “Un isomorphisme de Suslin”
(2018) *Bull.Soc.Math.Fr.*, 146, fascicule 4, pp 633-647. *arXiv:1407.5772*.
- S.Kelly, “Voevodsky motives and ldh descent”
(2017) *Astérisque* 391.
- A.Huber, S.Kelly, “Differential forms in positive characteristic II: cdh-descent via functorial Riemann-Zariski spaces”
(2017) *Algebra Number Theory*, 12, no. 3, 649–692. *arXiv:1706.05244*.
- A.Huber, S.Kebekus, S.Kelly, “Differential forms in positive characteristic avoiding resolution of singularities”
(2017) *Bull.Soc.Math.Fr.*, 145, fascicule 2, pp 305-343. *arXiv:1407.5786*.
- M.Hoyois, S.Kelly, P.-A.Østvær, “The motivic Steenrod algebra over perfect fields”
(2017) *J.Eur.Math.Soc.*, Volume 19, Issue 12, pp 3813-3849. *arXiv :1305.5690*.
- S.Kelly, “Some observations about motivic tensor triangulated geometry over a finite field”
Surveys around Ohkawa’s theorem on Bousfield classes (Accepted)arXiv:1608.02913.
- S.Kelly, S.Saito, “Weight homology of motives”
(2017) *Int.Math.Res.Not.* (13):3938-3984. *arXiv:1411.5831*.
- O.Gabber, S.Kelly, “Points in algebraic geometry”
(2015) *J.Pure Appl.Algebr.*, Volume 219, Issue 10, pp 4667–4680 *arXiv: 1407.5782*.
- S.Kelly, “Vanishing of Negative K -theory in positive characteristic”
(2014) *Compositio Mathematica*, 150, pp 1425-1434 *arXiv:1112.5206*
- Undergraduate:
- M.Giudici, S.Kelly, “Characterizing a family of elusive groups”
(2009) *Journal of Group Theory*, 12(1)
- S.Kelly, “Constructions of intriguing sets of polar spaces from field reduction and derivation”
(2007) *Designs, Codes and Cryptography*, 43(1).
- J.Bamberg, M.Law, T.Penttila, S.Kelly, “Tight Sets and m -Ovoids of Polar Spaces”
(2007) *J. Combin. Theory Ser. A*, 114(7).

RECENT INVITED
TALKS

- Sep 2019 “A motivic formalism in representation theory” **Kanazawa University**, Mathematical Society of Japan Autumn Meeting 2019.
- Sep 2019 “A motivic formalism in representation theory” **Niseko**, Regulators in Niseko 2019.
- Jun 2019 “A motivic formalism in representation theory” **Mathematisches Forschungsinstitut Oberwolfach**, Workshop: Algebraic K-theory.
- Jun 2019 “A motivic formalism in representation theory” **Centre de Recerca Matemàtica, Barcelona**, IRTATCA Follow-up conference.
- Feb 2019 “K-theory of valuation rings” **Tokyo University**, International Workshop on motives in Tokyo, 2019.
- Dec 2018 “A motivic formalism in representation theory” **Hakodate**, Hakodate workshop on arithmetic geometry 2018.
- Oct 2018 “A motivic formalism in representation theory” **Tohoku University**, Algebraic Geometry Seminar.
- Mar 2018 “A more streamlined comparison of cdh and ldh cohomology” **Tokyo University**, Motives in Tokyo on the occasion of Shuji Saito’s 60th Birthday.
- Jan 2018 “A blowup formula for motives with modulus” **Ben-Gurion University**, Algebra, Geometry and Number Theory Seminar.
- June 2017 “Towards the TT-spectrum of the motivic stable homotopy category” **HIM Bonn**, Workshop: K-theory and related fields.
- Apr 2017 “Descente par éclatements en motifs, et formes différentielles” **Université de Bordeaux**, Séminaire de Théorie des Nombres.
- Feb 2017 “A motivic formalism in representation theory” **Tokyo University**, International Workshop on motives in Tokyo.
- Jan 2017 “Tensor triangulated geometry of motives” **Universität München**, Oberseminar Arithmetische und Algebraische Geometrie.
- Jan 2017 “Voevodsky motives, ldh descent, and differential forms” **FU Berlin**, Guest seminar Arithmetic Geometry.
- Dec 2016 “Un formalisme motivique dans la théorie des représentations” **l’Institut Henri Poincaré**, Conférence de clôture du projet ANR Gatho.
- Dec 2016 “Some observations about motivic tensor triangulated geometry over a finite field” **Universitat de Barcelona**, Algebra and Geometry Meeting.
- Nov 2016 “A motivic formalism in representation theory” **Università degli studi di Milano**, Workshop Around Motives.
- May 2016 “cdh differential forms in positive characteristic” **Johannes Gutenberg-Universität Mainz**, SFB/TRR45 Kolloquium.
- April 2016 “Motivic homology theories” **Universität Duisburg–Essen**, Algebra, Geometry and Number Theory Seminar.
- Mar 2016 “Motivic cohomology vs étale cohomology” **Freie Universität Berlin**, A day of seminar talks on motivic homotopy theory in Berlin.

TEACHING	<p>Spring Semester 2019: (Pro)Étale cohomology</p> <p>Winter Semester 2018/2019: Algebraic cycles</p> <p>Winter Semester 2018/2019: (Pro)Étale cohomology</p> <p>Winter Semester 2017/2018: Mathematics of data science</p> <p>Summer Semester 2017: Topological data analysis</p> <p>Summer Semester 2017: Infinity categories</p> <p>Winter Semester 2016/2017: Linear codes</p>
HONORS AND AWARDS	<p>2018 Tokyo Institute of Technology School of Science Young Researcher Award</p> <p>2009-2012 ANU Vice-Chancellor’s Scholarship for Doctoral Study. <i>This scholarship was offered by the University to the top 7 domestic students enrolling in a Doctor of Philosophy or Professional Doctorate by Research at the Australian National University.</i></p> <p><u>Undergraduate:</u></p> <p>2006 H.C. Levey Memorial Prize</p> <p>2004 Applied Probability Trust Richard Tweedie Memorial Prize</p> <p>2003 Abraham Wald Prize</p>
CONFERENCE ORGANISATION	<p>2016 “Differential forms in algebraic geometry”, Universität Freiburg, co-organised with M.Blickle, A.Huber, and S.Kebekus</p>
GRANTS	<p>2019-2023 Grant-in-Aid for Early-Career Scientists</p> <p>2013-2015 Grant-in-aid. With Shuji Saito.</p>
REFEREE WORK	<p>Algebra & Number Theory, Compos.Math., Duke Math.J., Homology, Homotopy Appl., J.Reine Angew.Math., Math.Res.Lett., Selecta Mathematica.</p>
LANGUAGES	<p>English native</p> <p>French fluent</p> <p>Italian fluent</p> <p>Japanese よちよち歩き</p>
OTHER	<p>Western Australian Conservatorium of Music</p> <p>Bachelor of Music (2001)</p>