

# Elden Elmanto

Harvard University  
Department of Mathematics  
One Oxford Street  
SC 231  
MA 02138  
United States.

E-MAIL: [eldenelmanto@gmail.com](mailto:eldenelmanto@gmail.com)

URL: [www.eldenelmanto.com](http://www.eldenelmanto.com)

## Areas of specialization

Motivic cohomology and motivic homotopy theory •  $K$ -theory and algebraic cycles • (derived) algebraic geometry

## Employment

- July 2019- Benjamin Peirce fellow, Harvard University.
- Spring 2019 MSRI Postdoctoral fellow, Mathematical Sciences Research Institute.
- Fall 2018 Postdoctoral fellow, University of Copenhagen.

## Education

- 2018 PhD in Mathematics, Northwestern University.
- 2013 BS in Mathematics, University of Chicago.

## Awards

- 2018 MSRI Postdoctoral fellowship. Awarded a fellowship grant as a participant to the program “Derived Algebraic Geometry” at Mathematical Sciences Research Institute, Berkeley, California (January-May 2019)
- 2018 Northwestern University Department of Mathematics Best Thesis Award
- 2017 Institut Mittag-Leffler Postdoctoral Fellowship. Awarded a fellowship grant as a participant to the program “Algebro-Geometric and Homotopical Methods” at Institut Mittag-Leffler, Djursholm, Sweden (January-May 2017)

## Visiting appointments

The Centre for Advanced Study (CAS) at the Norwegian Academy of Science and Letters, Oslo, Norway. Upcoming.

Mathematical Sciences Research Institute (MSRI), Berkeley, USA. January-June 2019.

Institut Mittag-Leffler, Djursholm, Sweden. January-May 2017.

Universität Duisburg-Essen, Essen, Germany. May-July 2016 (Visiting Marc Levine).

## Publications

### JOURNAL ARTICLES

E. Elmanto, M. Hoyois, A. A. Khan, V. Sosnilo, M. Yakerson, *Framed transfers and motivic fundamental classes*, (2018), to appear in *J. Topol.* [arXiv:1809.10666](#).

E. Elmanto, H. Kolderup, *On modules over motivic ring spectra*, (2017), to appear in *Ann. K-Theory*, [arXiv:1708.05651](#).

E. Elmanto, A. A. Khan, *Perfection in motivic homotopy theory*, (2018), *Proc. Lond. Math. Soc.* **120** (2020), no. 1, 28-38.

B. Antieau and E. Elmanto, *A primer for unstable motivic homotopy theory*, *Surveys on Recent Developments in Algebraic Geometry*, *Proc. Sympos. Pure Math.* **95** (2017), pp. 305 – 370.

I. Kriz and E. Elmanto *Some nontrivial examples of the Baldwin–Ozsváth–Szabó twisted spectral sequence and Heegaard–Floer homology of branched double covers*, *New York J. Math* **22** (2016), 363-378.

### PREPRINTS

E. Elmanto, M. Hoyois, R. Iwasa, S. Kelly, *Milnor excision for motivic spectra* (2020), [arXiv:2002.11647](#).

T. Bachmann, E. Elmanto *Notes on motivic infinite loop space theory* (2019), [arXiv:1912.06530](#).

T. Bachmann, E. Elmanto *Voevodsky’s slice conjectures via Hilbert schemes* (2019), [arXiv:1912.01595](#).

E. Elmanto, J. Shah *Scheiderer motives and equivariant higher topos theory* (2019), [arXiv:1912.11557](#).

B. Antieau, E. Elmanto *Étale Descent for Semiorthogonal Decompositions* (2019), [arXiv:1912.08970](#).

T. Bachmann, E. Elmanto, M. Hoyois, A. A. Khan, V. Sosnilo, M. Yakerson, *On the infinite loop spaces of algebraic cobordism and the motivic sphere* (2019), [arXiv:1908.02262](#).

E. Elmanto, M. Hoyois, A. A. Khan, V. Sosnilo, M. Yakerson, *Modules over Algebraic Cobordism* (2019), [arXiv:1908.02162](#).

D. Carchedi, E. Elmanto, *Relative étale realizations of motivic spaces and Dwyer–Friedlander K-Theory of noncommutative schemes*, (2018), [arXiv:1810.05544](#).

E. Elmanto *Motivic contractibility of the space of rational Maps (Thesis)*, (2018), available at [www.eldenelmanto.com](http://www.eldenelmanto.com).

E. Elmanto, M. Levine, M. Spitzweck, P. A. Østvær, *Algebraic cobordism and étale Cohomology*, (2017), [arXiv:1711.06258](#).

E. Elmanto, M. Hoyois, A. A. Khan, V. Sosnilo, M. Yakerson, *Motivic infinite loop spaces*, (2017),

arXiv:1711.05248.

#### IN PREPARATION

T. Bachmann, E. Elmanto, J. Heller, *Motivic colimits* (2020), In preparation.

T. Bachmann, E. Elmanto, J. Heller, *Mod 2 power operations on normed motivic spectra* (2020), In preparation.

T. Bachmann, E. Elmanto, J. Heller, *Splitting results for some normed motivic spectra* (2020), In preparation.

T. Bachmann, E. Elmanto, P. A. Østvær, *Motivic invariants are eventually étale local* (2020), In preparation.

E. Elmanto, A. Mathew, J. Witaszek, *On the  $K$ -theory of universal homeomorphisms* (2020), in preparation.

E. Elmanto, R. Haugseng, *The universal property of bispans* (2020), in preparation.

#### INVITED CONFERENCE TALKS

*Algebraic Cobordism and the Moduli Stack of Varieties* at Cascade Topology Seminar, Portland, USA, 12 May 2019.

*Power Operations On Normed Motivic Spectra* at Institut Mittag-Leffler, Stockholm, Sweden, 09 May 2019.

*Contractions (expository)* at Humboldt Universität Berlin Arbeitsgemeinschaft on Motives, Foliations and the Conservativity Conjecture, Berlin, Germany, September 28 2018.

*Topological Periodic Cyclic Homology of Smooth  $\mathbb{F}_p$ -algebras (expository)* at Oberwolfach Arbeitsgemeinschaft on Topological Cyclic Homology, Oberwolfach, Germany, April 5 2018.

*Motivic Contractibility of the Space of Rational Maps* at AMS Sectional Meeting on Motivic Homotopy Theory, Portland, USA, April 14 2018.

*Motivic Contractibility of the Space of Rational Maps* at International Workshop in Algebraic Topology, Shenzhen, China, June 9 2018.

#### INVITED SEMINAR TALKS

*TBD*, Wuppertal Topology Seminar, June 8 2020.

*TBD*, UMass Amherst Representation Theory Seminar, 27 April 2020.

*Excision results for motivic cohomology*, Duke Geometry and Topology Seminar, 13 April 2020.

*Excision results for motivic cohomology*, MIT/Harvard Algebraic Geometry Seminar, 24 March 2020.

*Genuine Stabilization of  $G$ -Topoi and Motivic Homotopy Theory*, Minnesota Topology Seminar, 28 October 2019.

*On the  $K$ -theory of Universal Homeomorphisms*, MIT Topology Seminar, 07 October 2019.

*Excision and Descent for Motivic Spectra*, at SUNY-Albany Algebra/Topology Seminar, 26 September 2019.

*Étale Descent for Semiorthogonal Decompositions* at University of Southern California, 18 March 2019.

*On the Motivic Sphere Spectrum and Hilbert Schemes* at Institute for Basic Science Korea, 05 March 2019.

*Spaces of Algebraic Cobordism and Derived Algebraic Geometry* at Mathematical Sciences Research Institute, 15 February 2019.

*Spaces of Algebraic Cobordism and Derived Algebraic Geometry* at Northwestern University, 11 February 2019.

*Perfection in Motivic Homotopy Theory* at Universitetet i Oslo, 21 January 2019.

*Motivic Contractibility of the Space of Rational Maps* at Universität Duisburg-Essen Motives Seminar, 14 January 2019.

*Perfection in Motivic Homotopy Theory* at Universität Regensburg, 18 December 2018.

*Stable Profinite Homotopy Theory (after Quick and Lurie)* at Norwegian University of Science and Technology, 19 November 2018.

*Power Operations on Normed Motivic Spectra* at Universitetet i Oslo, 17 October 2018.

*Motivic Fundamental Classes and Framed Motives* at Institut Fourier Algebraic Geometry Seminar, 8 October 2018.

*Motivic Landweber Exact Theories and Étale Cohomology* at Freie Universität Berlin, 19 July 2018.

*Hilbert Schemes and the Motivic Sphere Spectrum* at George Mason University TADS Seminar, 2 March 2018.

*Infinite Loop Spaces in Algebraic Geometry* at University of Western Ontario Topology Seminar, 29 January 2018.

*Infinite Loop Spaces in Algebraic Geometry* at University of Copenhagen Algebra/Topology Seminar, 15 January 2018.

*Infinite Loop Spaces in Algebraic Geometry* at University of Chicago Topology Seminar, 28 November 2017.

*Infinite Loop Spaces in Algebraic Geometry* at Notre Dame Topology Seminar, 14 November 2017.

*Infinite Loop Spaces in Algebraic Geometry* at University of Illinois Urbana-Champaign Topology Seminar, 14 October 2017.

*Infinite Loop Spaces in Algebraic Geometry* at Ohio State  $K$ -Theory and Motivic Homotopy Seminar, 2 October 2017.

*Infinite Loop Spaces in Algebraic Geometry* at Georgia Tech Algebra Seminar, 2 October 2017.

*Infinite Loop Spaces in Algebraic Geometry* at Johns Hopkins University Topology Seminar, 25 September 2017.

*Infinite Loop Spaces in Algebraic Geometry* at University of Illinois at Chicago  $K$ -theory Seminar, 20 September 2017.

*Infinite Loop Spaces in Algebraic Geometry* at USC/UCLA joint Algebraic Geometry Seminar, 12 September 2017.

*Motivic Landweber Exact Theories and Étale Cohomology* at University of Southern California Algebra Seminar, 11 September 2017.

*Motivic Landweber Exact Theories and Étale Cohomology* at National University of Singapore Topology Seminar, 16 March 2017.

#### SELECTED EXPOSITORY TALKS

*The Geisser-Levine Theorem:  $p$ -adic  $K$ -theory in characteristic  $p$*  at Current Notions Seminar at Harvard, February 2020.

*Perfections in Mixed Characteristics* at Prismatic Cohomology Seminar at MSRI, April 2019.

*$p$ -adic algebraic  $K$ -Theory* at Algebraic  $K$ -Theory Learning Seminar at Northwestern University, September 2017.

*Slices of Motivic Landweber Exact Theories* at Universität Duisburg-Essen Motives Seminar, July 2016.

*Proof of Gabber's Presentation Lemma* at University of Southern California  $K$ -theory Summer School, August 2015.

*Friedlander's Proof of the Adams Conjecture via Étale Homotopy Theory* (qualifying exam). Committee: John Francis, Paul Goerss, Andrei Suslin, March 2015.

*Voevodsky's Proof of the Milnor Conjectures* at Northwestern University (3 lectures), November-December 2014.

*Introduction to Étale Cohomology* at Northwestern Pre-Talbot Seminar, March 2014.

*Motivic Cohomology of Quadrics* at Northwestern Student Topology Seminar, February 2014.

## Service to the profession

Referee for Contemp. Math., Math. Z., J. Top., ANT, JEMS

Quick opinion for Selecta Math.

Course assistant for Berlin Summer School in Motivic Homotopy Theory (2018).

Organizer (with Benjamin Antieau and Jeremiah Heller) for "Vitamin  $K_1$ : Kerz-Strunk-Tamme's Proof of Weibel's Conjecture"; organizer for a "learning-by-doing" style seminar (2018).

## Service to the department

Organizer of the "Thursday Seminar" at Harvard University. Topic: *Motivic Infinite Loop Spaces*, 2018.

Organizer of the Graduate Learning Seminar at Københavns Universitet. Topic:  *$p$ -adic Hodge Theory*, 2018.

Organizer of the Algebraic  $K$ -Theory Learning Seminar at Northwestern University. Topic: *Topological Cyclic Homology*, 2017.

Organizer of the Algebraic  $K$ -Theory Learning Seminar at Northwestern University. Topic: *Rota-*

*tion Invariance in Algebraic K-Theory*, 2016.

Mentor for the “Buddy Program” at Northwestern University. Helped incoming graduate students with adjusting to graduate student life, 2015-2016.

## Teaching

### HARVARD UNIVERSITY

- 2019 Linear algebra (proof based), fall semester, instructor.
- 2019 Reading class with Lucy Chen (Harvard graduate student): algebraic  $K$ -theory, fall semester.
- 2020 Algebraic cobordism (graduate topics class), spring semester, instructor.
- 2020 Linear algebra and differential equations (computational), fall semester, instructor.

### UNIVERSITY OF COPENHAGEN

- 2018 Topics in Topology (with Lars Hesselholt), fall semester, teaching assistant.

### NORTHWESTERN UNIVERSITY

- 2016 Abstract algebra-I, fall quarter, teaching assistant.
- 2016 Differential geometry, fall quarter, teaching assistant.
- 2015 Abstract algebra-I, fall quarter, teaching assistant.
- 2015 Differential calculus, fall quarter, teaching assistant.
- 2015 Abstract algebra-III, spring quarter, teaching assistant.
- 2015 Graduate commutative algebra, spring quarter, teaching assistant.
- 2015 Abstract algebra-II, winter quarter, teaching assistant.
- 2015 Linear algebra, winter quarter, teaching assistant.
- 2014 Abstract algebra-I, fall quarter, teaching assistant.
- 2014 Differential calculus, fall quarter, teaching assistant.

### EXTERNAL MATHEMATICS OUTREACH

- 2011 Young Scholar’s Program (advanced math program for high school students), summer, teaching assistant, ran by Paul J. Sally Jr.
- 2012 Collegiate Scholar’s Program (advanced math program for high school students), summer, teaching assistant, ran by Paul J. Sally Jr.
- 2013 SESAME Program (certification program for middle school mathematics teachers), summer, teaching assistant, ran by Paul J. Sally Jr.