

## Curriculum Vitæ

### Personal Information

Name **Yonatan Harpaz**.  
Contact [harpaz@math.univ-paris13.fr](mailto:harpaz@math.univ-paris13.fr).  
Homepage <https://www.math.univ-paris13.fr/~harpaz/>.

### Positions

2017– **CNRS Researcher**, *Laboratoire Analyse, Géométrie et Applications*, University of Paris 13.  
2016–2017 **Postdoctoral Researcher**, *Institut des Hautes Études Scientifiques*.  
2014–2016 **Postdoctoral Researcher under FSMP fellowship**, *Département de Mathématiques et Applications*, École Normale Supérieure.  
2013–2014 **Postdoctoral Researcher**, *Institute for Mathematics, Astrophysics and Particle Physics*, Radboud University Nijmegen.

### Education

2016 **Habilitation à diriger des recherches (HDR)**, University of Paris-Sud.  
**Dissertation:** *Des relations complémentaires entre homotopie, géométrie et arithmétique*  
**Composition of Jury:**  
Christian Ausoni  
Tim Browning  
Antoine Chambert-Loir  
Jean-Louis Colliot-Thélène  
Frédéric Déglise  
Vincent Franjou  
David Harari.  
2008–2013 **Ph.D., Mathematics**, Einstein Institute of Mathematics, The Hebrew University of Jerusalem, advisor: Prof. Emmanuel Farjoun.  
**Dissertation:** *Quasi-unital  $\infty$ -Categories*.  
2005–2008 **M.Sc. Mathematics (with honors)**, The Hebrew University of Jerusalem, advisor: Prof. Emmanuel Farjoun.  
**Dissertation:** *The Quillen Complex and Equivariant Algebraic Topology*.

### Scholarships and financial support

2020 **ERC starting grant**, European Committee.  
2019 **Projets Exploratoires Premier Soutien (PEPS)**, CNRS.  
2014–2016 **Postdoctoral fellowship**, Fondation Sciences Mathématiques de Paris.  
2009 **MIT Visiting Student scholarship**, Department of Mathematics, advisor: Prof. Mark Behrens (two months).  
2007 **The Klein Award for Excellent Research Students**, The Hebrew University of Jerusalem.

### Ph.D Students

**Aleksandar Miladinovic**.  
**Jules Magois**, *co-supervision with Antoine Chambet-Loir*.  
**Victor Saunier**.

### Papers

Submitted

- 2021 *Appendix to: Stable Moduli spaces of hermitian forms (F. Hebestreit, W. Steimle).*
- 2021 **Rational points on elliptic surfaces and squares represented by products of quadratic forms.**
- 2021 **Supersolvable descent for rational points**, with Olivier Wittenberg.
- 2021 **Rational points on fibrations with few non-split fibres**, with Olivier Wittenberg and Dasheng Wei.
- 2021 **Hermitian K-theory for stable  $(\infty)$ -categories IV: Poincaré motives**, with Baptiste Calmès, Emanuele Dotto, Fabian Hebestreit, Markus Land, Kristian Moi, Denis Nardin, Thomas Nikolaus and Wolfgang Steimle.
- 2021 **Hermitian K-theory for stable  $(\infty)$ -categories III: Grothendieck-Witt groups of rings**, with Baptiste Calmès, Emanuele Dotto, Fabian Hebestreit, Markus Land, Kristian Moi, Denis Nardin, Thomas Nikolaus and Wolfgang Steimle.
- 2021 **Hermitian K-theory for stable  $(\infty)$ -categories II: Cobordism categories and additivity**, with Baptiste Calmès, Emanuele Dotto, Fabian Hebestreit, Markus Land, Kristian Moi, Denis Nardin, Thomas Nikolaus and Wolfgang Steimle.
- 2021 **Cartesian Fibrations of  $(\infty, 2)$ -categories**, with Andrea Gagna and Edoardo Lanari.
- 2021 **Bilimits are bifinal objects**, with Andrea Gagna and Edoardo Lanari.
- 2020 **Fibrations and lax limits of  $(\infty, 2)$ -categories**, with Andrea Gagna and Edoardo Lanari.
- 2020 **On  $k$ -invariants for  $(\infty, n)$ -categories**, with Joost Nuiten and Matan Prasma.

Accepted

- 2021 **Hermitian K-theory for stable  $(\infty)$ -categories I: Foundations**, with Baptiste Calmès, Emanuele Dotto, Fabian Hebestreit, Markus Land, Kristian Moi, Denis Nardin, Thomas Nikolaus and Wolfgang Steimle, *Selecta Mathematica*, to appear.
- 2020 **On the equivalence of all models for  $(\infty, 2)$ -categories**, with Andrea Gagna and Edoardo Lanari, *Journal of the London Mathematical Society*, to appear.
- 2020 **The Massey vanishing conjecture for number fields**, with Olivier Wittenberg, *Duke Mathematical Journal*, to appear.
- 2020 *Appendix to: Number fields with prescribed norms (C. Frei, D. Loughran and R. Newton)*, with Olivier Wittenberg, *Commentarii Mathematici Helvetici*, to appear.

Published

- 2021 **Gray tensor products and lax functors of  $(\infty, 2)$ -categories**, with Andrea Gagna and Edoardo Lanari, *Advances in Mathematics*, 391, 2021.
- 2020 **Zéro-cycles sur les espaces homogènes et problème de Galois inverse**, with Olivier Wittenberg, *Journal of the American Mathematical Society*, 33.3, 2020, p. 775–805.
- 2020 **Ambidexterity and the universality of finite spans**, *Proceedings of the London Mathematical Society*, 121.5, 2020, p. 1121–1170.
- 2020 **Lax limits of model categories**, *Theory and Applications of Categories*, 35.25, 2020, p. 959–978.
- 2019 **Integral points on conic log K3 surfaces**, *Journal of the European Mathematical Society*, 21.3, 2019, p. 627–664.
- 2019 **Second descent and rational points on Kummer surfaces**, *Proceedings of the London Mathematical Society*, 118.3, 2019, p. 606–648.
- 2019 **Tangent categories of algebras over operads**, with Joost Nuiten and Matan Prasma, *The Israel Journal of Mathematics*, 234, 2019, p. 691–742.

- 2019 **Quillen cohomology for  $(\infty, 2)$ -categories**, with Joost Nuiten and Matan Prasma, *Higher Structures*, 3.1, 2019, p. 17–66.
- 2019 **The tangent bundle of a model category**, with Joost Nuiten and Matan Prasma, *Theory and Applications of Categories*, 34.33, 2019, p. 1039–1072.
- 2018 **The cotangent complex and Quillen cohomology of enriched categories**, with Joost Nuiten and Matan Prasma, *Journal of Topology*, 11.3, 2018, p. 752–798.
- 2017 **Geometry and arithmetic of certain log K3 surfaces**, *Annales de l'Institut Fourier*, 67.5, 2017, p. 2167–2200.
- 2017 **Pro-categories in homotopy theory**, with Ilan Barnea and Geoffroy Horel, *Algebraic and Geometric Topology*, 17.1, 2017, p. 567–643.
- 2017 **An integral model structure and truncation theory for coherent group actions**, with Matan Prasma, *Israel Journal of Mathematics*, 221.2, 2017, p. 511–561.
- 2016 **Hasse principle for Kummer varieties**, with Alexei Skorobogatov, *Algebra and Number Theory*, 10.4, 2016, p. 813–841.
- 2015 **On the Fibration Method for Zero-Cycles and Rational Points**, with Olivier Wittenberg, *Annals of Mathematics*, 183.1, 2015, p. 229–295.
- 2015 **The Grothendieck Construction for Model Categories**, with Matan Prasma, *Advances in Mathematics*, 281, 2015, p. 1306–1363.
- 2015 **Quasi-unital  $\infty$ -Categories**, *Algebraic and Geometric Topology*, 15.4, p. 2303–2381.
- 2014 **The Hardy-Littlewood Conjecture and Rational Points**, with Alexei Skorobogatov and Olivier Wittenberg, *Compositio Mathematica*, 150, p. 2095–2111.
- 2014 **Singular Curves and the Étale Brauer-Manin Obstruction for Surfaces**, with Alexei Skorobogatov, *Annales Scientifiques de l'École Normale Supérieure*, 47, p. 765–778.
- 2013 **Homotopy Obstructions to Rational Points**, with Tomer Schlank, In: Alexei Skorobogatov (Ed.), *Torsors, étale Homotopy and Applications to Rational Points*, LMS Lecture Notes Series 405, Cambridge University Press, p. 280–413.

#### Preprints

- 2013 **The section conjecture for graphs and singular curves**, arXiv:1304.7213.
- 2012 **The cobordism hypothesis in dimension 1**, arXiv:1210.0229.

### Academic Collaboration and Organization

- 06/2019 **Minicourse organizer and lecturer**, *Rational points on elliptic fibrations*, Reinventing Rational Points (special semester), Institut Henri Poincaré, Paris.
- 03/2015 **Assistant to J.-L, Colliot-Thélène**, *The local-global principle for rational points and zero-cycles*, Arizona Winter School (minicourse), University of Arizona.
- 09/2013 **Workshop co-organizer and lecturer**, *The homotopy theory of  $\infty$ -categories*, Université Catholique de Louvain, Louvain-La-Neuve.
- 07-08/2012 **Minicourse co-organizer and lecturer**, *Étale Homotopy theory and Diophantine equations*, Centre Interfacultaire Bernoulli, École Polytechnique Fédérale de Lausanne, Switzerland.
- 2011 **Research seminar co-organizer**, *The cobordism hypothesis*, The Hebrew University of Jerusalem (with David Kazhdan and Emmanuel Farjoun).
- 2009 **Summer school co-organizer**, *Rational points on algebraic varieties*, The Hebrew University of Jerusalem (with Tomer Schlank).

### Teaching Experience

- 2020 **Master course**, *Little cube algebras and factorization homology*, University of Paris 13.
- 2019 **Master course**, *Little cube algebras and factorization homology*, University of Paris 13.
- 2014 **Master course**, *Simplicial Homotopy Theory*, Radboud University Nijmegen.

- 2011 **Teaching assistant**, *Basic Notions in Algebraic Topology*, The Hebrew University of Jerusalem.
- 2010 **Teaching assistant**, *Algebraic Structures 1*, The Hebrew University of Jerusalem.
- 2010 **Teaching assistant**, *Differential Equations*, The Hebrew University of Jerusalem.
- 2009 **Teaching assistant**, *Basic Notions in Algebraic Topology*, The Hebrew University of Jerusalem.
- 2009 **Teaching assistant**, *Complex Functions*, The Hebrew University of Jerusalem.
- 2008 **Teaching assistant**, *Basic Notions in Differential Geometry*, The Hebrew University of Jerusalem.
- 2007 **Teaching assistant**, *Applied Mathematics*, The Hebrew University of Jerusalem.
- 2007 **Teaching assistant**, *Linear Algebra for Physicists*, The Hebrew University of Jerusalem.

## Selected talks

- 06/2021 **Relative L-theory and cyclic homology**, *Manifolds and K-theory: the legacy of Andrew Ranicki*, University of Edinburgh.
- 05/2021 **The Massey vanishing conjecture for number fields**, *Séminaire Homotopie en Géométrie Algébrique*, Université de Toulouse.
- 02/2021 **The homotopy theory of quadratic forms**, *SFB lecture*, University of Regensburg.
- 09/2020 **New perspectives in hermitian K-theory (three talks)**, *New perspectives on K- and L-theory*, University of Münster.
- 06/2019 **Squares represented by a product of three ternary quadratic forms, and a homogeneous variant of a method of Swinnerton-Dyer**, *Rational points on irrational varieties*, Institut Henri Poincaré.
- 05/2019 **Supersolvable descent**, *XXIXèmes Rencontres Arithmétiques de Caen: arithmétique des corps et géométrie arithmétique*, Île de Tatihou.
- 04/2018 **Ambidexterity and the universality of finite spans**, *Séminaire de topologie algébrique*, Université de Paris 13.
- 03/2018 **Zéro-cycles sur les espaces homogènes et problème de Galois inverse**, *Séminaire théorie de nombres de Bordeaux*, Université de Bordeaux.
- 03/2018 **Zéro-cycles sur les espaces homogènes et problème de Galois inverse**, *Séminaire théorie de nombres de Jussieu*, Université de Paris 7.
- 01/2018 **Ambidexterity and the universality of finite spans**, *Séminaire de topologie*, Université de Lille.
- 10/2017 **Cohomology of higher categories**, *Réunion annuelle du GdR topologie algébrique et applications*, Université de Paris 7.
- 10/2017 **Quillen obstruction theory**, *Séminaire Homotopie en Géométrie Algébrique*, Université de Toulouse.
- 07/2017 **Zero-cycles on homogeneous spaces**, *Rational points 2017*, Franken-Akademie Schloss Schney.
- 06/2017 **Quillen cohomology of enriched categories**, *Séminaire de topologie, géométrie et algèbre*, Université de Nantes.
- 09/2016 **Second 2-descent and rational points on Kummer surfaces**, *Rational Points and Algebraic Geometry*, Centre International de Rencontres Mathématiques, Luminy.
- 01/2016 **Abstract representation theory and the cotangent complex formalism**, *Congrès national de la Société Mathématique de France*, Université François Rabelais, Tours.
- 05/2016 **The cotangent complex formalism**, *Séminaire de Physique Mathématique et de Topologie Algébrique*, Université de Angers, Angers.
- 04/2016 **Integral points on log K3 surfaces**, *Séminaire Variétés Rationnelles*, ENS, Paris.

- 04/2016 **Pro-categories in homotopy theory**, *Séminaire de Topologie*, Université de Lille, Lille.
- 03/2016 **The cobordism hypothesis in dimension 1**, *Séminaire de Topologie, Géométrie et Algèbre*, Université de Nantes, Nantes.
- 03/2016 **Integral points on log K3 surfaces**, *Séminaire d'Arithmétique et de Géométrie Algébrique*, Université Paris-Sud, Orsay.
- 01/2016 **Pro-categories in homotopy theory**, *Séminaire de Topologie Algébrique*, Université Paris 13, Paris.
- 09/2015 **Rational points on fibered varieties**, *Workshop on Interactions between Arithmetic and Homotopy*, Royal Imperial College, London.
- 07/2015 **The Hasse principle for generalized Kummer varieties**, *Göttingen-Hannover Number Theory Workshop*, Leibniz University of Hannover, Hannover.
- 01/2015 **The descent-fibration method for integral points**, *Arithmetic geometry, Chow groups and rational points*, The Euler Institute, St. Petersburg.
- 05/2015 **The descent-fibration method for integral points**, *Heilbronn seminar*, University of Bristol, Bristol.
- 02/2015 **On the fibration method**, *seminar Variétés Rationnelles*, Institut Henri Poincaré, Paris.
- 01/2014 **Model fibrations and the Grothendieck correspondence for model categories**, *Higher Geometric Structures along the Lower Rhine V*, Radboud University Nijmegen, Nijmegen.
- 10/2013 **From linear equations in primes to the fibration method**, *The Intercity Number Theory Seminar*, University of Groningen, Groningen.
- 01/2013 **The section conjecture for graphs and applications for singular curves**, *London-Paris Number Theory Seminar*, Imperial College, London.
- 03/2013 **The Hasse principle for singular curves with applications for smooth surfaces**, *Seminar Variétés Rationnelles*, Institut Henri Poincaré, Paris.
- 12/2012 **The Brauer-Manin obstruction for singular curves and applications for surfaces**, *RatPAC Seminar*, Centre Interfacultaire Bernoulli (EPFL), Lausanne.
- 11/2012 **Quasi-unital  $\infty$ -categories and the cobordism hypothesis in dimension 1**, *Algebraic Topology Seminar*, Radboud University, Nijmegen.
- 09/2012 **Étale homotopy theory**, *Workshop on Cohomological Methods in Arithmetic Geometry*, Institut für Mathematik, Zurich.
- 05/2012 **Étale homotopy and Diophantine equations**, *Workshop on Arithmetic Geometry and Homotopy Theory*, Imperial College, London.
- 05/2012 **Higher categories and the cobordism hypothesis**, *Weekly Mathematics Colloquium*, Haifa University.
- 01/2012 **Homotopy obstructions to rational points**, *Joint Mathematics Meeting, AMS Special Session on Rational Points on Varieties*, Boston.