

Curriculum Vitae

MAJID HADIAN-JAZI

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Mathematics 253-37

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Research Interests

- Arithmetic Algebraic Geometry;
- Motivic (Co)Homology Theories.

Education

- **Ph.D. in Mathematics** (supervised by the Fields medalist **Prof. Dr. Faltings**) specializing in Arithmetic Algebraic Geometry (2007-2010); Max-Planck Institute for Mathematics, Bonn, Germany
Thesis Title: Motivic Fundamental Groups and Integral Points
- **M.Sc. in Mathematics** (supervised by **Prof. Shahshahani**) specializing in Number Theory (2004-2006); Sharif University of Technology, Tehran, Iran (**GPA : 19.72/20**)
Thesis Title: Rational Points on Elliptic Curves
- **B.Sc. in Mathematics** (2000-2004); Sharif University of Technology, Tehran, Iran (**GPA : 18.86/20**)

Post-Education

- **2014-present** : Scott-Russell-Johnson Research Assistant Professor at California Institute of Technology (Caltech), Pasadena, California, USA;
- **2012-2014** : Research Assistant Professor at University of Illinois at Chicago (UIC), Chicago, Illinois, USA;
- **2010-2012** : Wissenschaftlicher Mitarbeiter (Research Assistant) at University of Duisburg-Essen, Essen, Germany.

Publications

- Selected Publications

1. Motivic Fundamental Groups and Integral Points. *Duke Mathematical Journal*, Vol. 160, Num. 3, 503 – 565 (2011);
2. Algebraic cycles satisfying the Maurer-Cartan equation and the unipotent fundamental group of curves. *Journal of K-Theory*, Vol. 11, Issue 02, 351 – 392 (2013);
3. On a Motivic Method in Diophantine Geometry. The Arithmetic of Fundamental Groups PIA – 2010. *Contributions in Mathematical and Computational Sciences*, Vol. 2, 127 – 146 (2012).

- Other Publications and Preprints

4. On Selmer rank parity of twists (with M. Weidner). Submitted ([pdf](#));
5. Dense PGL-orbits in products of Grassmannians (with I. Coskun & D. Zakharov). *Journal of Algebra*, Vol. 429, 75 – 102 (2015);
6. On matching property for groups and field extensions (with M. Aliabadi & A. Jafari). To appear in *Journal of Algebra and its Applications* ([pdf](#));
7. On a geometric interpretation of the (cyclotomic) pentagon relation. Preprint ([pdf](#));
8. Unit Action and the Geometric Zero-Divisor Ideal Graph. *Communications in Algebra*, Vol. 40, Issue 8, 2920 – 2931 (2012);
9. On commuting graphs of semisimple rings (with S. Akbari, M. Ghandehari & A. Mohammadian). *Linear Algebra and its Applications*, Vol. 390, 345 – 355 (2004).

- Books and Lecture Notes

10. Lectures on Etale Fundamental Groups ([pdf](#));
11. Cycles, Motives, and Arithmetic Applications (Book ~ 250 pages). To be published in Monographs in Mathematics Series, Springer.

Awards

- Scholarship by the Research School on Moduli Spaces at Max-Planck Institute for Mathematics, Bonn, Germany (2007-2010);
- The Scientific Award of National Foundations for the Elites in Level One. Awarded by Iran's Vice-President in Scientific and Technology Affairs, 2004;
- Ranked 1st among graduate students of the M.Sc. degree program in Mathematics, Sharif University of Technology, Tehran, Iran, 2006;
- Ranked 1st among graduate students of the B.Sc. degree program in Mathematics, Sharif University of Technology, Tehran, Iran, 2004;
- Gold Medal : 8th International Olympiad in Mathematics, Isfahan, Iran, 2003;

- Gold Medal : National Olympiad in Mathematics, Tehran, Iran, 2003;
- Silver Medal : 9th International Mathematics Competition for University Students (IMC), Warsaw, Poland, 2002;
- Gold Medal : 26th National Mathematics Olympiad for University Students, Zanjan, Iran, 2002;
- Silver Medal : National Olympiad in Informatics, Tehran, Iran, 1999;
- Student at National Organization for Development of Exceptional Talents (NODET), Tehran, Iran, 1993 – 2000.

Selected Lectures

- **University of California at San Diego (UCSD) – USA**
 - On a motivic method in Diophantine geometry, Apr. 23rd, 2015
- **University of California at Los Angeles (UCLA) - USA**
 - On a motivic method in Diophantine geometry, Feb. 2nd, 2015
- **California Institute of Technology (Caltech) - USA**
 - Universal unipotent local systems and Maurer-Cartan systems of algebraic cycles, Feb. 9th, 2015
 - On a motivic method in Diophantine geometry, Jan. 29th, 2015
- **Institute for Advanced Study (IAS) / Princeton University - USA**
 - On a motivic method in Diophantine geometry, Mar. 27th, 2014
- **University of Wisconsin at Madison (UWM) - USA**
 - On a motivic method in Diophantine geometry, Jan. 23rd, 2014
- **University of Michigan - USA**
 - On some arithmetic aspects of fundamental groups, Nov. 4th, 2013
- **University of Illinois at Chicago (UIC) - USA**
 - On a geometric interpretation of the pentagon relation, Sep. 24th, 2013
 - Universal unipotent local systems and Maurer-Cartan systems of algebraic cycles, Oct. 31st, 2012
 - Motivic methods in Diophantine geometry, Oct. 2nd, 2012
- **Duke University - USA**
 - On a motivic method in Diophantine geometry, Mar. 27th, 2013

- **University of Chicago - USA**
 - On a motivic method in Diophantine geometry, Oct. 16th, 2012
- **Northwestern University - USA**
 - On a motivic method in Diophantine geometry, Oct. 1st, 2012
- **University of Zurich (UZH) - Switzerland**
 - A motivic approach to non-abelian Chabauty method, Mar. 26th, 2012
- **Max-Planck Institute for Mathematics (Mathematische Arbeitstagung) - Germany**
 - Motivic Fundamental Groups and Integral Points, Jun. 30th, 2011
- **Lorentz Center (International Center for workshops in the Sciences) - Netherlands**
 - Categories of Motives, May 23rd, 2011
 - Motivic Fundamental Groups and Integral Points, May 25th, 2011
 - On Motivic Fundamental Group of Curves, May 27th, 2011
- **Institute for Research in Fundamental Sciences - Iran**
 - Geometry, Symmetry, and Periods of Algebraic Varieties, Dec. 20th, 2010
 - Motivic Fundamental Groups and Integral Points, Dec. 21st, 2010
 - On Motivic Fundamental Group of Curves, Dec. 22nd, 2010
- **Mathematics Center Heidelberg - Germany**
 - Motivic Fundamental Groups and Integral Points, Feb. 12th, 2010

Selected Courses Taught

Undergraduate Level Courses

- **California Institute of Technology (Caltech)**
 - One Variable Calculus, 2015.
- **University of Illinois at Chicago (UIC)**
 - Abstract Algebra, 2014;
 - Linear Algebra, 2014;

- Real Analysis, 2013;
- Multi-variable Calculus (3 times), 2012 – 2013.

Graduate Level Courses

- **California Institute of Technology (Caltech)**
 - Algebraic Number Theory, 2014;
 - Local Class Field Theory, 2015.
- **University of Illinois at Chicago (UIC)**
 - Etale Fundamental Groups, 2014.

Research Level Courses

- **California Institute of Technology (Caltech)**
 - Algebraic Cycles and Motives, 2015.
- **University of Illinois at Chicago**
 - Algebraic cycles and motives (2 semester course), 2012 – 2013.
- **University of Duisburg-Essen**
 - Milnor Conjecture, 2012;
 - Algebraic cycles and motives, 2011;
 - Compactifications of Moduli of Abelian Varieties, 2010.

Lecture Series

- **Max-Planck Institute for Mathematics (MPIM)**
 - Introduction to Crystalline Cohomology, 2009;
 - Iwasawa Theory and the Main Conjecture, 2008;
 - Intersection Theory on Moduli Spaces of Curves, 2008;
 - Quillen's higher K-groups, 2007.
- **Sharif University of Technology**
 - Moduli Spaces of Curves, 2007;
 - Class Field Theory and Complex Multiplication, 2007;
 - Rational Points on Elliptic Curves, 2006;
 - Random Trees and Moduli of Curves, 2005.

Selected Grants

- Grant from Isaac Newton Institute for Mathematics for participation in the program “Non-abelian Geometry” in Cambridge, UK, 2009;
- Grant from Mathematical Sciences Research Institute (MSRI) for participation in the workshop “Modern Moduli Theory” in Berkeley, CA, USA, 2009;
- Invited by Mathematisches Forschungsinstitut Oberwolfach to participate in the workshop “Arithmetic Algebraic Geometry” in Oberwolfach, Germany, 2008;
- Grant from Clay Institute for participation in the summer school “Arithmetic Geometry” in Gottingen, Germany, 2006.

Other Activities

- Refereeing research article for *Compositio Mathematica*
- Mentoring Undergraduate Research Project
 - Matthew Weidner, California Institute of Technology (Caltech), 2014-15
Title: Ranks of quadratic twists of certain elliptic curves;
 - David Lichko, California Institute of Technology (Caltech), 2014-15
Title: Reciprocity laws for cubic number fields.
- Serving on Ph.D. Defense Committee
 - Liubomir Chiriac, California Institute of Technology (Caltech), 2015;
 - Holly Krieger, University of Illinois at Chicago (UIC), 2013;
 - Paul Reschke, University of Illinois at Chicago (UIC), 2013.
- Serving on Ph.D. Candidacy Examination Committee
 - Emad Nasrollahpour, California Institute of Technology (Caltech), 2015;
 - Maria Nastasescu, California Institute of Technology (Caltech), 2014.
- California Institute of Technology (Caltech)
 - Co-organizing the Number Theory Seminar, 2014 – present.
- University of Illinois at Chicago (UIC)
 - Co-organizing the Number Theory seminar, 2012 – 2014;

- Mentoring Problem Solving Strategy Classes as part of UIC's Olympiad Project, 2012 – 2014.
- Max-Planck Institute for Mathematics (MPIM)
 - Co-organizing the workshop “Dessins D’Enfants”, 2010;
 - Co-organizing the weekly seminar Crystalline Cohomology, 2009 – 2010;
 - Editor of the Oberwolfach report on the workshop “Arithmetic Algebraic Geometry”, 2008;
 - Co-organizing the weekly seminar p-adic Hodge Theory, 2007 – 2008.

References

- Prof. I. Coskun, University of Illinois at Chicago (coskun@math.uic.edu);
- Prof. Dr. G. Faltings (Ph.D. Supervisor), MPIM (faltings@mpim-bonn.mpg.de);
- Prof. H. Gillet, University of Illinois at Chicago (henri@math.uic.edu);
- Prof. Dr. G. Harder, MPIM (harder@mpim-bonn.mpg.de);
- Prof. M. Kim, University of Oxford (minhyong.kim@maths.ox.ac.uk);
- Prof. Dr. M. Kreck, Hausdorff Institute for Mathematics (kreck@him.uni-bonn.de);
- Prof. Dr. M. Levine, University of Duisburg-Essen (marc.levine@uni-due.de);
- Prof. M. Shahshahani (M.Sc. Supervisor), Retired (mshahshahani@gmail.com).