

Curriculum Vitae

R. Paul Horja

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Education

Ph.D. Degree, Duke University, December 1999

Dissertation – Hypergeometric Functions and Mirror Symmetry in Toric Varieties

Advisor – Prof. David R. Morrison

European Exchange Student, Tempus Program, University of Dortmund, Germany, 1992–93

Bachelor's Degree in Mathematics, Ranked first in graduating class, University of Bucharest, Romania, June 1992

Current and Previous Appointments

Senior Research Associate, University of Miami, 2020– present

Post–Doctoral Associate, University of Miami, 2014– 2020

Researcher, University of Vienna, Austria, 2012–2014

Assistant Professor, Oklahoma State University, September 2005–2012

Visiting Assistant Professor, University of British Columbia, and Research Fellow at the Pacific Institute for the Mathematical Sciences (PIMS), September 2007–August 2008

Marsden Research Postdoctoral Fellow, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada, August 2004–July 2005

Assistant Professor (3-year term), University of Michigan, Ann Arbor, September 2001–August 2004

Member, School of Mathematics, Institute for Advanced Study, Princeton, NJ, September 2000–June 2001

Researcher, Max–Planck–Institut Für Mathematik, Bonn, Germany, May 2000–December 2000

Lecturer in Mathematics, Duke University, January 2000–April 2000

Selected Awards and Fellowships

MDA904-10-1-0190 NSA funded proposal *Categorical Structures in Algebraic Geometry*, PI: Richard Paul Horja

2007-2008 Research Fellowship at the Pacific Institute for the Mathematical Sciences (PIMS)

2007 Faculty Summer Research Award, Oklahoma State University

Dean's Incentive Grant, Oklahoma State University, Summers 2006, 2007

Marsden Research Postdoctoral Fellowship, Fields Institute for Research in Mathematical Sciences, Toronto, Canada, 2004–2005 Thematic Program “Geometry of String Theory”

Institute for Advanced Study, Princeton, NJ, 2000–2001 stay supported by NSF grant DMS 97-29992

European Tempus Program Scholarship, 1992–93

First Prize in the Balkan Mathematical Olympiad, 1986

Publications (the authors are listed in alphabetical order)

R. Paul Horja, Ludmil Katzarkov, *Discriminants, spherical functors and schobers over toric DM stacks*, in preparation.

Lev A. Borisov, R. Paul Horja, *The categorification of the better behaved Gelfand–Kapranov–Zelevinski hypergeometric system*, in preparation.

R. Paul Horja, *Generalized Landau–Ginzburg models and exact categories*, in preparation.

R. Paul Horja, Ludmil Katzarkov, *Discriminants and toric K-theory*, preprint (2022), submitted for publication, [arXiv:2205.00903](https://arxiv.org/abs/2205.00903)

Lev A. Borisov, R. Paul Horja, *Applications of homological mirror symmetry to hypergeometric systems: duality conjectures*, *Adv. Math.*, **271** (2015), 153–187, [arXiv:1308.2238](https://arxiv.org/abs/1308.2238).

R. Paul Horja, *Toric Deligne–Mumford stacks and the better behaved version of the GKZ hypergeometric system*, invited contribution to the volume “Strings, Gauge Fields, and the Geometry Behind— The Legacy of Maximilian Kreuzer”, 329–348, World Scientific, Singapore, 2013, [arXiv:1205.0025](https://arxiv.org/abs/1205.0025).

Lev A. Borisov, R. Paul Horja, *On the better behaved version of the GKZ hypergeometric system*, *Math. Annalen*, **357** (2013), 585–603, [arXiv:1011.5720](https://arxiv.org/abs/1011.5720).

Lev A. Borisov, R. Paul Horja, *Mellin–Barnes integrals as Fourier–Mukai transforms*, *Adv. Math.*, **207** (2006), 876–927, [math.AG/0510486](https://arxiv.org/abs/math/0510486).

Lev A. Borisov, R. Paul Horja, *On the K-theory of smooth toric DM stacks*, Snowbird lectures on string geometry, 21–42, *Contemp. Math.*, **401**, Amer. Math. Soc., Providence, RI, 2006, [math.AG/0503277](https://arxiv.org/abs/math/0503277).

- Paul S. Aspinwall, R. Paul Horja, Robert L. Karp, *Massless D-Branes on Calabi-Yau Three-folds and Monodromy*, Comm. in Math. Physics, **259** (2005), 45–69, [hep-th/0209161](#).
- R. Paul Horja, *Derived category automorphisms from mirror symmetry*, Duke Mathematical Journal, **127** (2005), 1–34, [math.AG/0103231](#).
- R. Paul Horja, *Hypergeometric functions and mirror symmetry in toric varieties*, Thesis (Ph.D.), Duke University, 1999, 120 pp, ProQuest LLC, Ann Arbor, MI, [math.AG/9912109](#).
- L. Niculescu, A. Bumbacea, A. Catana, P. Horja, G. Niculescu, N. Oprea, C. Zara, *Methods for solving problems in geometry. (Metode de rezolvare a problemelor de geometrie)*, (Romanian), București, Editura Universității București (ISBN 973-575-292-1), (1998), 376 pp.
- Paul Horja, *On the number of geodesic segments connecting two points on manifolds of non-positive curvature*, Trans. Amer. Math. Soc. **349** (1997), 5021–5030.
- G. Craciun, P. Horja, M. Prunescu, T. Zamfirescu, *Most homeomorphisms of the circle are semiperiodic*, Arch. Math. (Basel) **64** (1995), 452–458.
- V. Boskoff, P. Horja, *The characterization of some spectral Barbilian spaces using the Tzitzeica construction*, Stud. Cercet. Mat. **46** (1994), 503–514.

Selected Invited Talks

- Conference on Geometry, Topology, Group Actions, and Singularities in the Americas, University of Miami, October 24, 2022
- Conference on Geometry and Physics, Sunny Beach, Bulgaria, July 18, 2022
- Homological Mirror Symmetry Conference, University of Miami, April 8, 2022
- Groupe de Travail on differential equations, IHES, Paris, March 9, 2022
- The 14th International Conference on Discrete Mathematics: Discrete Geometry and Graph Theory, University of Bucharest, Romania, August 30- September 3, 2021
- Recent Applications of the Theory of O-Minimal Structures to Various Questions in Hodge Theory, IMSA Conference, University of Miami, November 13-20, 2020
- Monodromy and Hypergeometric Functions International Conference, Galatasaray University, Istanbul, Turkey, February 17-21, 2020
- Hypergeometric functions and mirror symmetry, Graduate School of Mathematical Sciences, University of Tokyo, December 17-19, 2018
- Algebraic Geometry in Mexico 2018, Puerto Escondido, Oaxaca, Mexico, December 3-7, 2018
- International Congress of Mathematicians 2018 Satellite Meeting, A Pan-Hemispheric Celebration of Mathematics in Miami, University of Miami, July 26-29, 2018

Workshop on Fukaya Categories: Coefficients, Skeleta, Stability conditions, July 2-7, 2018, Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France

Workshop on Picard-Fuchs Equations and Hypergeometric Motives, March 26-29, 2018, The Hausdorff Research Institute for Mathematics, University of Bonn, Germany

Conference on mirror symmetry and applications, December 12-19, 2017, Higher School of Economics, Steklov Mathematical Institute, Moscow, Russia

The 13th International Conference on Discrete Mathematics: Discrete Geometry and Convex Bodies, September 5, 2017, University of Bucharest, Romania

Workshop on “Advances in Birational Geometry”, May 16, 2017, Erwin Schrödinger International Institute for Mathematical Physics, Vienna, Austria

Algebraic Geometry in Mexico, October 31 - November 6, 2016, Institute for Geometry and Physics Miami-Cinvestav-Campinas, Los Cabos, Mexico

Warwick EPSRC Symposium: Homological Mirror Symmetry and Hodge Theory, June 29 June-July 3, 2015, Mathematics Institute, University of Warwick

Workshop on Wall Crossing, Quantum Integrable Systems, and TQFT, November 17-21, 2014, Simons Center for Geometry and Physics

Ovidius University, Constanta, Romania, Geometry Seminar, July 2014

University of Washington, Seattle, Algebra Seminar, February 2014

Workshop on “Birational Geometry and Geometric Invariant Theory”, May 21-24, 2013, Erwin Schrödinger International Institute for Mathematical Physics, Vienna, Austria

Conference on Homological Mirror Symmetry, January 28-February 1, 2013, University of Miami

Homological Projective Duality and Quantum Gauge Theory, November 12-16, 2012, Kavli Institue for the Physics and Mathematics of the Universe, University of Tokyo, Japan

Birational Geometry and Derived Categories, August 1-6, 2012, University of Vienna, Austria

Western Washington University, Colloquium, April 2012

2012 Spring Central AMS Section Meeting, March 31-April 2, 2012, University of Kansas

Rutgers University, Seminar on geometry, symmetry, and physics, November 2011

Mirror Symmetry in the Midwest Conference, November 3-6, 2011, Kansas State University

2011 Fall Western AMS Section Meeting, October 22-23, 2011, University of Utah

Conference on Homological Mirror Symmetry and Category Theory, July 11-15, 2011, Split, Croatia

Meeting on “Strings and Cats”, June 29-July 1, 2011, University of Vienna, Austria

The Memorial Conference for Maximilian Kreuzer, June 25-28, 2011, Erwin Schrödinger International Institute for Mathematical Physics, Vienna, Austria

Workshop on Derived Categories, Isaac Newton Institute of Mathematical Sciences, Cambridge University, UK, April 4-15, 2011

University of Washington, Seattle, Algebraic Geometry Seminar, June 2009

Series of talks at the Pacific Institute for the Mathematical Sciences (PIMS), University of British Columbia, Spring 2008

University of Washington, Seattle, Algebraic Geometry Seminar, March 2008

2007 AMS Fall Eastern Meeting, Rutgers University, New Brunswick, NJ, October 6, 2007

University of British Columbia, Algebraic Geometry and Donaldson-Thomas invariants Seminars, October 2007, April 2008

AMS-IMS-SIAM 2007 Summer Research Conference, Derived Categories in Mathematics and Physics, Snowbird, Utah, June 20, 2007

Utrecht University, The Netherlands, Algebraic Geometry Seminar, May 2007

ESI Research Conference on Homological Mirror Symmetry, Erwin Schrödinger International Institute for Mathematical Physics, Vienna, July 17, 2006

University of Wisconsin, Madison, Algebraic Geometry Seminar, March 2006

University of Massachusetts, Amherst, Colloquium, February 2006

Ohio State University, Colloquium, February 2006

Workshop on Convex and Algebraic Geometry, Oberwolfach, Germany, February 1, 2006

Mini-Workshop on Heterotic Strings, Derived Categories, and Stacks, Oberwolfach, Germany, November 15, 2005

Workshop on D-modules and Hypergeometric Functions, Lisbon, Portugal, July 11–14, 2005

Queens University, Kingston, Ontario, Canada, Colloquium, April 2005

Workshop on Arithmetic and Geometry of Higher Dimensional Varieties with Special Emphasis on Calabi-Yau Varieties and Mirror Symmetry, Toronto, March 5–6, 2005

University of Western Ontario, London, Ontario, Canada, Algebra seminar, January 2005

The Fields Institute, String Theory Seminar, Toronto, Ontario, Canada, October 2004

Workshop on Derived Categories, Quivers and Strings, Edinburgh, UK, August 2–6, 2004

The AMS-IMS-SIAM Summer Research Conference, Conference on String Geometry, Snowbird, Utah, June 5-11, 2004

Special Session in “Algebraic Geometry and Mirror Symmetry” at the AMS Meeting 997 at Rider University, Lawrenceville, NJ, April 17-18, 2004

Johns Hopkins University, Algebraic and Complex Geometry Seminar, March 2004

Princeton University, Geometry, Representation, and Moduli Seminar, February 2004

Northwestern University, Geometry and Physics Seminar, January 2004

University of Illinois at Urbana–Champaign, Math–Physics Seminar, November 2003

The 2003 School and Workshop on Algebraic Geometry and Physics, Salamanca, Spain, June 2003

Université Paris VII, Jussieu Algebraic Geometry Seminar, May 2003

University of Utah, String Geometry Seminar, February 2003

University of Illinois at Chicago, Colloquium, November 2002

The 2002 Workshop on Algebraic Geometry and Physics, Genova, Italy, June 2002

Boston University, Geometry Seminar, May 2002

Indiana University, Geometry Seminar, March 2002

University of Minnesota, Algebraic Geometry Seminar, December 2001

Ohio State University, Algebraic Geometry Seminar, November 2001

University of Michigan, Algebraic Geometry Seminar, April 2001

Duke University, Algebraic Geometry Seminar, April 2001

Institute for Advanced Study, Princeton, Members Seminar, April 2001

Max–Planck–Institut Für Mathematik, Bonn, Germany, Geometry and Physics Seminar, May 2000

University of Oxford, The Mathematical Institute, Oxford, UK, Colloquium, January 2000

Duke University, Geometry/Topology Seminar, Spring 1999

Cornell University, Geometry Seminar, Spring 1995

Other Longer Academic Visits Supported by External Funding and Professional Activities

Miniprogram in Geometry, Topology, and Strings, Kavli Institute for Theoretical Physics, University of California, Santa Barbara, July–August 2003

Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France, May–June 2003

Program in Higher Dimensional Complex Geometry, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, June 2002

Summer Institute in Quantum Field Theory and Algebraic Geometry, IAS/Park City Mathematics Institute, July 2001

Duality Workshop: A Math–Physics Collaboration, Institute for Theoretical Physics, University of California, Santa Barbara, June 2001

Clay Mathematical Institute in Mirror Symmetry, Harvard University, June 2000

Workshop on Geometry and Physics, Institute for Theoretical Physics, University of California, Santa Barbara, July–August 1999

Winter School in Mirror Symmetry and Lagrangian Fibrations, Harvard University, January 1999

Summer School in Symplectic Geometry and Topology, IAS/Park City Mathematics Institute, 1997

Quantum Field Theory Program, IAS, Princeton, 1996–97

Santa Cruz Algebraic Geometry Conference, July 1995

Summer School in Geometry, Perugia, Italy, August 1992

I reviewed for the Mathematical Reviews and I refereed papers for the Journal of the AMS, Proceedings of the AMS, Journal of Algebraic Geometry, Crelle’s Journal, the Duke Mathematical Journal, Advances in Mathematics, Advances in Theoretical and Mathematical Physics.

Teaching Experience

Discrete Mathematics, University of Miami, Fall 2019

Calculus I, University of Miami, Spring 2018, Fall 2017, Fall 2015, Fall 2014.

Calculus II, University of Miami, Spring 2017, Fall 2019, Spring 2020; Oklahoma State University, Fall 2011, Fall 2009, Fall 2008, Spring 2010

Vector Calculus (Calculus III), University of Miami, Spring 2015, Fall 2014; Oklahoma State University, Spring 2011, Spring 2009, Fall 2008, Fall 2006, Fall 2005; University of Michigan, Winter 2004, Winter 2003

Introductory Linear Algebra for Undergraduates, University of Miami, Fall 2015, Spring 2020; Oklahoma State University, Spring 2006; University of Michigan, Winter 2002

Graduate Advanced Linear Algebra, Oklahoma State University, Fall 2010.

Differential Equations, Oklahoma State University, Fall 2009, Spring 2010, Fall 2010

Introductory Partial Differential Equations for Undergraduates, University of British Columbia, Summer 2008

One Variable Calculus, University of British Columbia, Fall 2007

Graduate Algebraic Geometry, Oklahoma State University, Spring 2007

Introductory Linear Algebra for Undergraduates, Oklahoma State University, Spring 2006;
University of Michigan, Winter 2002

Introduction to Modern Algebra, University of Michigan, Winter 2004

Honors Vector Calculus, University of Michigan, Fall 2003

Advanced Calculus for Undergraduates, University of Michigan, Fall 2003

Honors Ordinary Differential Equations, University of Michigan, Winter 2003

Honors One Variable Calculus, University of Michigan, Fall 2002

Introductory Linear Algebra for Graduate Students, University of Michigan, Fall 2002

One Variable Laboratory Calculus, University of Michigan, Fall 2001

Laboratory Calculus, Duke University, Spring 1998, Fall 1997, Fall 1995

One Variable Calculus, Duke University, Fall 1999, Fall 1998

Vector Calculus, Duke University, Spring 1996

Teaching Assistant, University of Dortmund, Germany, 1992–93