Roman Fedorov

Curriculum Vitae
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University of Pittsburgh
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Education

1999–2005
The University of Chicago
Ph.D. in Mathematics received March 2005
M.S. in Mathematics received June 2000

1993–1999
Independent University of Moscow, Diploma with honors

1993–1998
Moscow State University, Diploma with honors

Employment

09/2021–present
University of Pittsburgh, Associate Professor
01/2017–08/2021
University of Pittsburgh, Assistant Professor

08/2016–12/2016
Max Planck Institute for Mathematics, Member

01/2014–12/2014
Max Planck Institute for Mathematics, Member

08/2011–12/2016
Kansas State University, Assistant Professor

11/2010–04/2011
Max Planck Institute for Mathematics, Member

09/2008–08/2010
Boston University, Geometry Postdoc

09/2005–08/2008
The University of Massachusetts, Amherst, Visiting Assistant Professor

Grants, Fellowships, Scholarships, Awards

2020–2023	NSF, DMS–2001516, USD 180,000
2020–2025	Simon's Collaboration, USD 42,000 (declined as incompatible with NSF)
2018	Max Planck Institute Research Fellowship, EUR 2,900

2016	Max Planck Institute Research Fellowship, EUR 14,500
2015–2018	NSF, DMS–1406532, USD 157,000
2014	Max Planck Institute Research Fellowship, EUR 34,800
2006	Max Planck Institute at Bonn, One Month Research Fellowship
1999–2001	McCormick Fellowship
1997–1998	INTAS
1997	RFFI
1996–1997	Scholarship of Moscow Mayor
1993–1998	"Soros's student" Fellowship
1993	International Mathematical Olympiad (Turkey, Istanbul), Gold Medal

Research Interests

I am working in the fields of Algebraic geometry and Representation theory. A large part of my research is related to principal bundles under actions of algebraic groups and to the geometric Langlands Program. In particular, I am interested in local questions such as the Grothendieck–Serre conjecture and purity conjectures for principal bundles. I am also studying principal bundles with connections (including singular connections), the Hitchin system, the Fourier-Mukai transforms, affine Grassmannians (which Ivan Panin and I recently applied to the Grothendieck–Serre conjecture), moduli spaces of bundles on curves, and their motivic classes. I have some results about variations of Hodge structures; I am working on some applications of M. Saito's theory of Hodge modules to the Langlands Program. Currently, I am trying to learn about $\mathbb{A}^1$-homotopy theory.

Teaching

University of Pittsburgh

2021 Abstract Algebra-I, Abstract Algebra-II (graduate courses), Calculus-III

2020 Multivariate Calculus, Putnam seminar, Calculus-I

2019 Calculus-I, Multivariate Calculus, Putnam seminar, Abstract Algebra-I (a graduate course)

2018 Introduction to algebraic geometry (a graduate course), Putnam seminar

2017 Calculus-II, Differential Equations, Abstract algebra II (a graduate course)

2011–2016, Kansas State University

General calculus and linear algebra (course coordination and recitations, 3 semesters)
Analytic geometry and calculus–I (recitations)
Abstract algebra (a graduate course)
Algebraic Topology (graduate course)
Introduction to geometric represenation theory and the Langlands program (a graduate course)
Reading course on Algebraic Geometry
Reading course on Riemann Surfaces

2008–2010, Boston University

Differential Geometry II (graduate course)
Calculus I and II
Differential Topology II (graduate course)

2005–2008, The University of Massachusetts, Amherst

Basic Math Skills for the Modern World
Calculus I
Calculus II, Honors section
Advanced multivariate calculus
Fundamental concepts of mathematics

2000–2005, The university of Chicago

Calculus

1992–1999, Moscow State 57th School

Analysis for high school students
Evening Mathematical School, Moscow, Russia

Visits

06/2019	IHES (Paris, France). One week.
06/2018	University of Vienna (Austria). One week.
05/2018	Claude Bernard University of Lyon (France). One month. Thematic trimestre: "Algebraic Groups and Geometrization of the Langlands Program".
05/2017–08/2017	University of Duisburg–Essen (Germany). Three months.
04/2015	University of Wisconsin, Madison. One week.
07/2013	University of Sheffield, United Kingdom. One week.
06/2013	Fields Institute, Toronto, Canada. One week.
12/2012	École normale supérieure, Paris, France. One week.
06/2006	Max-Planck-Institut für Mathematik, Bonn, Germany. One month.
10/1997	Institut Henri Poincaré, Paris, France. One month.

Service

2021–present	Colloquium committee
2021–present	Graduate Committee
2020	Grading Putnam Exam
2019–present	PhD advising of Ruoxi Li
2018–2019	Job search committee (tenure track position in number theory/arithmetic geometry)
2018–2019	PhD advising of Lingyu Liu
2017–present	PhD advising of Rahul Singh (PhD defense expected in 2022)
2017–2018	PhD co-advising of Dongyu Wu
2017–2018	Supervising undergraduate research of Andrew Kwon (CMU)
2016	Job search committee (tenure-track and postdoc search)
2016	Manhattan mathematical Olympiad
2015–2016	Supervising master level report of John Abou-Rached
2015	Putnam exam problem solving seminar
2015	Manhattan Mathematical circle
2014	Serving on supervisory committee for specialty examination of Jie Ren
2013	Teaching advising of a first year graduate student Joshua Brummer
2013	Manhattan Mathematical circle
2013	Serving on graduate Qualifying Exam committee
2012	Scientific co-advisor of Shizhuo Zhang
2012	Serving on supervisory committee for specialty examination of Eric Bunch
2012	Serving on supervisory committee for specialty examination of Xinli Xiao
2012	Teaching advising of a first year graduate student Andrew Ostergaard
2012	Manhattan Mathematical circle
2012	Organizing Manhattan Mathematical Olympiad
2012	Supervisory committee for specialty examination of Shizhuo Zhang
2012	Supervisory committee for specialty examination of Bryan Bischof
2011	Putnam exam problem solving seminar
2011	Manhattan Mathematical circle
2011	Chairman of Problem Committee of Moscow Mathematical Olympiad
2010	Served as a referee for “Transformation groups”
2010	Served on thesis committee of Eleanor Farrington
2009	Served as a referee for “Letters in Mathematical Physics”
2006	Putnam exam problem solving seminar
2004	Putnam exam problem solving seminar
2003	Vice chairman of Problem Committee of Moscow Mathematical Olympiad
1996	Vice chairman of Organizing Committee of Moscow Mathematical Olympiad

Invited talks and Mini-courses

4/2020
The Georgia Algebraic Geometry Symposium (postponed).

9/2019
University of Pittsburgh, colloquium. *Hitchin system and Langlands duality.*

8/2019
CIRM, Luminy, France, Summer school "Buildings and Affine Grassmannians", *Affine Grassmannians of group schemes and exotic principal bundles over* $\mathbb{A}^1$.

7/2019
Dubna, Russia, Summer school "Contemporary Mathematics", mini-course *Diophantine Approximations.*

7/2019
Bergische Universität Wuppertal. Workshop of the GRK 2240. "A conjecture of Grothendieck and Serre on principal bundles in mixed characteristic."

5/2019
Heinrich Heine Universität Düsseldorf. Mathematical Colloquium. "Principal bundles in algebraic geometry".

5/2019
University of Duisburg–Essen. Forschungseminar. "Coherent Satake functor".

4/2019
University of North Carolina, Chapel Hill. Mini-course. "Geometric Langlands Duality".

1/2019
Pennsylvania State University. Algebra and Number Theory Seminar. "A conjecture of Grothendieck and Serre on principal bundles".

12/2018
RIMS, Kyoto, Japan. Conference *D-modules, Quantum geometry, and related topics.* "Coherent Satake Functor".

08/2018
Joint work presented by *Ivan Panin* at the International Congress of Mathematics: "On Grothendieck–Serre conjecture concerning principal bundles".

05/2018
ENS Lyon, France. Conference *Algebraic Groups and Geometrization of the Langlands programm.* "Counting points on the global nilpotent cone".

05/2018
Claude Bernard University of Lyon, France. Mini-course: The conjecture of Grothendieck and Serre on principal bundles.

02/2018
University of Wisconsin, Madison. Algebra and algebraic geometry seminar. "A conjecture of Grothendieck and Serre on principal bundles in mixed characteristic".

07/2017
Dubna, Russia, Summer school "Contemporary Mathematics", mini-course *Around zeta-function.*

06/2017
Universität Duisburg–Essen, Deutschland. Oberseminar. *Motivic classes of moduli of Higgs bundles on curves.*

12/2016
Universität Augsburg, Deutschland. *The Grothendieck-Serre conjecture on principal bundles, affine Grassmannians, and failure of homotopy invariance.*

11/2016
Universität Duisburg–Essen, Deutschland. Oberseminar. *Around the Grothendieck-Serre conjecture on principal bundles.*

1/2016
University of Pittsburgh, USA. *Principal Bundles, Moduli Spaces, Landlands Duality and Motives.*

1/2016
EPFL, Lausanne, Switzerland. Workshop - Higgs bundles and Hitchin system - VBAC2016. *Motivic classes of moduli spaces of vector bundles with connections.*

6/2015
Purdue University, USA. Algebraic geometry seminar. *Partial Fourier–Mukai transform for integrable systems with applications to Hitchin fibration.*

6/2015
University of Durham, United Kingdom. Colloquium. *Principal bundles in algebraic geometry.*

6/2015
University of Warwick, United Kingdom. Warwick EPSRC Symposium: Fourier-Mukai, 34 years on. *Partial Fourier-Mukai transform for algebraically integrable systems.*

1/2015
Max Planck Institute for Mathematics, Bonn, Germany. *Hodge structures on hypergeometric D-modules.*

7/2014
University of Sheffield. United Kingdom. *Partial Fourier-Mukai transform for algebraically integrable systems.*

6/2014
Université Claude Bernard Lyon 1, France. Conference: Structure of algebraic groups. *Principal bundles over affine lines.*

5/2014
University of Ottawa, Canada. Fields workshop on Algebraic and Geometric Invariants of Linear Algebraic Groups and Homogeneous Spaces. *Mini-course: Introduction to principal homogeneous spaces.*

5/2014
Seminar Algebraic Geometry, Bonn, Germany. *Partial Fourier-Mukai transform for algebraically integrable systems.*

5/2014
University of Sheffield, UK. *A conjecture of Grothendieck and Serre about principal bundles.*

3/2014
University of Luxembourg. General Mathematics Seminar. *A conjecture of Grothendieck and Serre and affine Grassmannians.*

3/2014
École polytechnique fédérale de Lausanne, Switzerland. *Partial Fourier-Mukai transform for algebraically integrable systems.*

2/2014
University of Mainz, Germany. *On geometric Langlands correspondence.*

2/2014
University of Cologne, Germany. *Partial Fourier-Mukai transform for integrable systems.*

2/2014
Workshop "Langlands Correspondence and Constructive Galois Theory", Oberwolfach, Germany. *Partial Fourier–Mukai transform for algebraically integrable systems.*

2/2014
University of Strasbourg, Strasbourg, France. *Partial Fourier–Mukai transform for algebraically integrable systems.*

1/2014
Max Planck Institute for Mathematics, Bonn, Germany. *A conjecture of Grothendieck and Serre and affine Grassmannians.*

12/2013
University of Wisconsin, Madison. Algebraic geometry seminar. *A conjecture of Grothendieck and Serre and affine Grassmannians.*

10/2013
University of Washington, Seattle. Algebra and algebraic geometry seminar. *Principal bundles on curves and affine Grassmannians* and *A conjecture of Grothendieck and Serre and affine Grassmannians.*

07/2013
Dubna, Russia, Summer school "Contemporary Mathematics", mini-course *Categories and principal bundles, or 'What is the difference between an isomorphism and a canonical isomorphism?'.*

06/2013
Fields institute, Toronto, Canada. Conference on Torsors, Nonassociative Algebras and Cohomological Invariants. *A conjecture of Grothendieck and Serre and affine Grassmannians.*

12/2012
Université Paris Sud 11, *On a conjecture of Grothendieck and Serre concerning principal bundles.*

12/2012
University of Strasbourg, *On a conjecture of Grothendieck and Serre concerning principal bundles.*

11/2012
Kansas State University, Algebra seminar, *On Grothendieck-Serre conjecture concerning principal bundles.*

10/2012
Kansas State University, M-seminar, *Hitchin systems.*

07/2012
Dubna, Russia, Summer school "Contemporary Mathematics", *mini-course "Curves: real, complex, over finite fields".*

04/2012
Central Section AMS meeting, Lawrence, KS, *Irregular Knizhnik-Zamolodchikov-Bernard systems and the Casimir connection.*

11/2011
The University of Miami, Miami, Florida, *Categorical geometric Langlands duality.*

07/2011
Dubna, Russia, Summer school "Contemporary Mathematics", *mini-course "Zeta-function: From Euler to the Birch and Swinnerton-Dyer conjecture".*

04/2011
Korteweg-de-Vries Institute for Mathematics, Amsterdam, the Netherlands, *Categorical geometric Langlands duality.*

04/2011
Trinity College, Dublin, Ireland, *Categorical geometric Langlands duality.*

03/2011
The University of Strasbourg, France, *Categorical geometric Langlands duality.*

03/2011
Independent University of Moscow, Russia, *Hurwitz numbers, Schur-Weyl duality, differential operators and KP-hierarchy.*

12/2010
Kansas State University, *Categorical geometric Langlands duality.*

07/2010
Dubna, Russia, Summer school "Contemporary Mathematics", *mini-course "Invariant theory".*

03/2009
MIT, Noncommutative Algebra Seminar, *Non-highest weight representations of affine Kac-Moody algebras, DMT connection, and irregular Wakimoto modules.*

03/2009
Boston University, Geometry seminar, *Irregular Wakimoto modules and DMT connection.*

02/2009
The University of North Carolina at Chapel Hill, Physically Inspired Mathematics seminar, *Non-highest weight representations of Kac-Moody algebras and D-modules on Cartan subalgebras.*

01/2008
Boston University, Geometry Seminar, *Langlands Transform and Painleve Equations.*

11/2007
The University of Pennsylvania, Math-Physics Joint Seminar, *Deformations of algebro-geometric solutions of Kadomtsev-Petviashvili equations and Frobenius manifolds.*

04/2007
Northeastern University, Geometry–Algebra–Singularities–Combinatorics Seminar, *Isomonodromic deformations and affine Lie groups.*

02/2007
Massachusetts Institute of Technology, Infinite-Dimensional Algebra Seminar, *Frobenius manifold structures on the spaces of abelian integrals.*

02/2007
The University of Massachusetts, Amherst, Valley Geometry Seminar, *Frobenius manifold structures on the spaces of abelian integrals.*

05/2006
California University of Technology, Algebraic Geometry seminar, *Moduli spaces, Frobenius manifolds, and Whitham equations.*

02/2006
The University of Massachusetts, Quantum Field Theory seminar, *Series of talks on Renormalization.*

04/2004
Northwestern University, Algebra seminar, *Algebraic and hamiltonian approaches to isostokes deformations.*

07/2004
Dubna, Russia, Summer school "Contemporary Mathematics", *mini-course "ζ-functions".*

07/2003
Dubna, Russia, Summer school "Contemporary Mathematics", *mini-course "Knots".*

06/2003
The University of Sheffield, United Kingdom, departmental colloquium, *Loop groups and integrable systems.*

05/2003
Independent University of Moscow, Riemanian Surfaces, Lie algebras, and Mathematical Physics seminar, *Littlewood–Richardson coefficients, Horn's conjecture, and toric bundles on* $\mathbb{C}P^2$.

03/2003
Moscow State University, Dynamical Systems seminar, *Upper bounds for the number of orbital topological types of planar polynomial vector fields 'modulo' limit cycles.*

03/2003
Independent University of Moscow, Riemanian Surfaces, Lie algebras and Mathematical Physics seminar, *Introduction to schemes and stacks.*

11/2002
Cornell University, Dynamical Systems Seminar, *Lower bounds for the number of orbital topological types of planar polynomial vector fields 'modulo' limit cycles.*

07/2002
Summer school "Contemporary Mathematics", Dubna, Russia, *mini-course "Algebraic number theory".*

07/2001
Summer school "Contemporary Mathematics", Dubna, Russia, *mini-course "Galois theory".*