

## Alexey Zykin

National Research University Higher

School of Economics

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Born 13/06/1984

Russian

Single

Languages: Russian,

English, French

### Research interests:

- Zeta-functions and  $L$ -functions (modularity, special values, behaviour in families, Brauer–Siegel type results, distribution of zeroes);
- Algebraic geometry over finite fields (points on curves and varieties over finite fields, zeta functions, relations to coding theory);
- Families of fields and varieties, asymptotic theory (infinite number fields and function fields, limit zeta-functions);
- Abelian varieties and Elliptic Curves (Jacobians among abelian varieties, families of abelian varieties over global fields).

### Main publications and preprints:

- *Asymptotic properties of zeta functions over finite fields*, preprint;
- *Arithmetic, Geometry, Cryptography and Coding Theory* (editor, together with Y. Aubry and C. Ritzenthaler), Contemporary Mathematics, Vol. 574 (2012), 183 pp;
- *On logarithmic derivatives of zeta functions in families of global fields* (with P. Lebacque), International Journal of Number Theory, Vol. 7, Num. 8 (2011), 2139–2156;
- *Asymptotic methods in number theory and algebraic geometry* (with P. Lebacque), Publications Mathématiques de Besançon, 2011, 47–73;
- *Asymptotic properties of Dedekind zeta functions in families of number fields*, Journal de Théorie des Nombres de Bordeaux, **22**, no. 3 (2010), 689–696;
- *Jacobians among abelian threefolds: a formula of Klein and a question of Serre* (with G. Lachaud and C. Ritzenthaler), Math. Res. Lett. **17** (2010), no. 2, 323–333;
- *On the Brauer–Siegel theorem for families of elliptic surfaces over finite fields* (in Russian), Mat. Zametki, 2009, **86:1**, 148–150;
- *On the generalizations of the Brauer–Siegel theorem*, proceedings of the Conference AGCT 11 (2007), Contemp. Math. series, **487**(2009), 195–206;
- *Brauer–Siegel and Tsfasman–Vladut theorems for almost normal extensions of global fields*, Moscow Mathematical Journal, Vol. **5** (2005), Num. 4, 961–968.

## Academic Employment

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- 02.2012 — **Laboratory Head**, Laboratory of Algebraic Geometry and its applications, HSE;
- 01.2011 — **Researcher**, Poncelet French–Russian Laboratory;
- 02.2010 — **Researcher**, Institute for Information Transmission Problems of the Russian Academy of Sciences;
- 09.2009 — **Associate Professor**, Mathematical Department of the National Research University Higher School of Economics;
- 02.2011 — 01.2012 **Researcher**, Laboratory of Algebraic Geometry and its applications, HSE.

## Education

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- 2006 — 2009 **Ph. D, Institut de Mathématiques de Luminy.**  
Thesis: *Propriétés asymptotiques des corps globaux.*  
Advisors: S. Vladuts and M. Tsfasman.  
The thesis was defended on the 4th of June 2009 in Marseille.  
Jury: M. Balazard, M. Hindry (referee), G. Lachaud (president), E. Royer, R. Schoof (referee, absent), M. Tsfasman (advisor), S. Vladuts (advisor).
- 2005 — 2010 **Ph. D studies, Mathematical Institute of the Russian Academy of Sciences, Independent University of Moscow.**  
Thesis: *Asymptotic properties of global fields.*  
Advisors: M. Tsfasman, A. Sergeev.  
The thesis was defended on the 14th of October 2010 in Moscow.
- 2001 — 2006 **Specialist degree in Mathematics (Master’s of Sciences equivalent), Moscow State University, Faculty of Mechanics and Mathematics.** Advisors: M. Tsfasman, V. Iskovskih.
- 2000 — 2005 **Specialist degree in Mathematics (Master’s of Sciences equivalent), Independent University of Moscow.** Advisor: M. Tsfasman.
- 1998 — 2001 **Moscow Mathematical Highschool number 57.**

## Conference Talks

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- 2011.06 “Arithmetic days in Moscow”, Moscow, Russia. Talk: *Asymptotic properties of zeta functions*.
- 2010.06 “Colloque des Jeunes Chercheurs en Théorie des Nombres”, Strasbourg, France. Talk: *Jacobiennes parmi les variétés abéliennes de dimension 3*.
- 2009.12 “Théorie des Nombres et Applications”, CIRM, Marseille, France. Talk: *Asymptotic properties of zeta functions*.
- 2009.07 “Journées Arithmétiques”, Saint-Etienne, France. Talk: *On the Euler–Kronecker constant and limit zeta functions*.
- 2009.03 “Arithmetic, Geometry, Cryptography and Coding Theory”, CIRM, Marseille, France. Talk: *On the asymptotic properties of zeroes of  $L$ -functions*.
- 2008.12 “Zeta Functions-2”, IUM, Laboratoire Poncelet, Moscow, Russia. Talk: *On the Euler–Kronecker constant and limit zeta functions*.
- 2007.11 “Arithmetic, Geometry, Cryptography and Coding Theory”, CIRM, Marseille, France. Talk: *On the Brauer–Siegel Theorem for Varieties over Global Fields*.
- 2007.07 “Global Fields”, IUM, Laboratoire Poncelet, Moscow, Russia. Talk: *Asymptotic problems in the theory of global fields*.
- 2006.09 “Zeta Functions”, IUM, Laboratoire Poncelet, Moscow, Russia. Talk: *The generalized Brauer–Siegel theorem*.
- 2005.09 “Arithmetic, Geometry and Coding Theory”, CIRM, Marseille, France. Talk: *The generalized Brauer–Siegel theorem*.

## Some seminar Talks

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- 2012.06 Number Theory Seminar, Institut Fourier, Grenoble, France. Talk: *Propriétés asymptotiques des fonctions zêta.*
- 2011.11 Seminar of the Laboratory of Algebraic Geometry and its Applications, Moscow, Russia. Talk: *Jacobians and abelian varieties over non algebraically closed fields* (in Russian).
- 2011.02 Seminar of the Moscow Mathematical Society, Moscow, Russia. Talk: *Asymptotic problems in number theory and limit zeta-functions* (in Russian).
- 2010.01 Seminar of the Institute for Information Transmission Problems, Moscow, Russia. Talk: *Asymptotic properties of global fields* (in Russian).
- 2009.05 Algebraic Geometry Seminar, Mathematical Institute of the Russian Academy of Sciences, Moscow, Russia. Talk: *Jacobians and abelian threefolds* (in Russian).
- 2008.12 Number Theory Seminar, Institut Fourier, Grenoble, France. Talk: *Jacobiennes parmi les variétés abéliennes de genre 3.*
- 2008.11 Algebraic Geometry Seminar, Bar-Ilan University, Tel-Aviv, Israel. Talk: *Jacobians among abelian threefolds.*
- 2007.11 Number Theory Seminar, Institut de Mathématiques de Luminy, Marseille, France. Talk: *Sur le Théorème de Brauer–Siegel pour des Variétés sur des Corps Globaux.*

## Other scientific visits

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- 2011.07 Scientific visit to the National Center for Theoretic Sciences, Taiwan.  
Invitation by W. Li.
- 2010.06 Scientific visit to the Mathematical Department of Besançon, France.  
Invitation by C. Maire.
- 2009.03 Scientific visit to the Mathematical Laboratory of the Blaise Pascal  
University, Clermont-Ferrand. Invitation by E. Royer.
- 2009.01 Winter School “Quantum chaos”, Institut de Mathématiques de Bor-  
deaux, Bordeaux, France.
- 2008.09 Summer School “ $p$ -adic Cohomology”, Institut für Mathematik,  
Mainz, Germany.
- 2006.07 Summer School “Motives and related topics”, Institut des Hautes  
Etudes Scientifiques, Paris, France.
- 2005.07 Summer School “Number fields and curves over finite fields”, Crete,  
Greece.
- 2005.07 Summer School “Algebraic groups”, Georg-August-Universität,  
Göttingen, Germany.
- 2005.06 Conference “Gauss-Dirichlet”, Georg-August-Universität, Göttin-  
gen, Germany.
- 2005.01 Exchange “École Normale Supérieure de Paris” — “Independent  
University of Moscow”, Paris, France
- 2004.06 Conference “Arithmetic geometry”, Euler International Mathemat-  
ical Institute, St. Petersburg, Russia.
- 2004.01 Winter School, Weizmann Institute of Science, Rehovot, Israel.
- 2003.05 Conference “Arithmetic, Geometry and Coding Theory”, CIRM,  
Marseille, France.
- 2003.05 Summer School “Algebraic geometry and information theory”,  
CIRM, Marseille, France.

## Organized Conferences

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- 2012.07 Summer school “Algebra and Geometry” (together with F. Bogomolov, A. Tikhomirov and S. Tikhomirov), Yaroslavl, Russia.
- 2012.04 “Arithmetic days” (together with I. Fesenko and I. Zhukov), IUM, Laboratoire Poncelet, Moscow, Russia.
- 2011.10 “Global Fields” (together with M. Tsfasman and P. Lebacque), IUM, Laboratoire Poncelet, Moscow, Russia.
- 2011.08 Summer school “Algebra and Geometry” (together with M. Verbitsky, A. Tikhomirov and S. Tikhomirov), Yaroslavl, Russia.
- 2011.03 “Arithmetic, Geometry, Cryptography and Coding Theory” (together with Y. Aubry and C. Ritzenthaler), CIRM, Marseille, France.
- 2010.06 “Zeta Functions-3” (together with M. Tsfasman and M. Balazard), IUM, Laboratoire Poncelet, Moscow, Russia.
- 2007.07 “Global Fields” (together with M. Tsfasman), IUM, Laboratoire Poncelet, Moscow, Russia.

## Organized seminars

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- 2009 — Number Theory Seminar (together with M. Tsfasman), IUM—Laboratoire Poncelet—IITP, Moscow, Russia.
- 2009 — 2010 “Monstrous Moonshine” (together with E. Smirnov), Mathematical Department of HSE, Moscow, Russia.
- 2008 — 2009 “Abelian varieties” (together with C. Ritzenthaler), Luminy Mathematical Institute, Marseille, France.
- 2007 — 2008 “Complex multiplication” (together with C. Ritzenthaler and D. Kohel), Luminy Mathematical Institute, Marseille, France.
- 2006 — 2007 “Algebraic Surfaces” (together with F. Edoukou), Luminy Mathematical Institute, Marseille, France.
- 2005 — 2006 “Automorphic forms” (together with W. Zudilin), Moscow State University, Russia.

## Teaching experience

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- 2009 — Algebra, Calculus, Geometry, Topology, Discrete Mathematics exercise sessions at the Mathematical Department of HSE.
- 2010 — 2012 Number theory courses at the Mathematical Department of HSE and at the Independent University of Moscow (IUM).
- 2010 Algebraic geometry and commutative algebra exercise sessions, “Math in Moscow” mathematical program for foreign students, IUM.
- 2003 — 2008 Algebra, Calculus and Number Theory exercise sessions at IUM.
- 2005 — 2006 Tutorship in the “Math in Moscow” mathematical program for foreign students, IUM.

**Prizes, Awards, Fellowships :**

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2012	Simons-IUM Fellowship;
2011	Moscow Mathematical Society Prize;
2011	“Dynasty” foundation fellowship;
2006 — 2009	Grant of the French Government for a joint French—Russian Ph.D. program;
2004 — 2005	Petrovsky Fellowship (IUM).

**Reviewer:**

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2010 —	Mathematical Reviews;
2010 —	“Finite Fields and Applications”;
2009 —	Moscow Mathematical Journal;
2008 —	Zentralblatt MATH.