Semyon Klevtsov **CV**

CONTACT INFORMATION

Mathematical Institute
University of Cologne
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RESEARCH AREA

Mathematical physics, Quantum field theory, Integer and fractional quantum Hall effect, Random matrices, Beta ensembles, Random metrics and random surfaces, Kähler geometry, Bergman kernels, String theory.

EDUCATION

PhD, Rutgers University, USA. Advisor: Michael R. Douglas 2009

MS in Physics (summa cum laude), Moscow State University, Russia 2003

EMPLOYMENT

University of Cologne, Germany

DFG Principal Investigator 1.1.2018 – 31.12.2019

Postdoc (w/ Humboldt Fellowship 1.11.2013 – 31.10.2015) 1.10.2012 – 31.12.2017

Université Libre de Bruxelles, Belgium

Postdoctoral Fellowship 1.10.2009 – 30.9.2012

AWARDS, GRANTS, FELLOWSHIPS

DFG (German Research Foundation) grant, PI
Geometry and large N Limits in quantum Hall states 2018 – 2019

Invited contribution to the *Emerging Talents* special issue of *J. Phys. A* 2017

Max Delbrück Prize for Junior Researchers, University of Cologne 2015

Grant NSF DMS-1541126, Co-PI 2015

Alexander von Humboldt Foundation Fellowship 2013 – 2015

Rutgers University Graduate Fellowship 2004 – 2006

TEACHING EXPERIENCE

Lecturer, University of Cologne, Mathematical Institute

Riemann surfaces Fall 2018

Complex geometry Spring 2017

Teaching assistant, Rutgers University, Department of Physics and Astronomy

General physics Spring, Summer, Fall 2007

Analytical physics I and II Fall 2005, Summer, Fall 2006

Teaching instructor, Moscow State University, Dept. of Mechanics and Mathematics

Electrodynamics and General relativity Spring 2004

Service

Coorganizer, Workshop on New directions in mathematics of Coulomb gases and quantum Hall effect, Institut Mittag-Leffler, Stockholm, 1 – 7.7.2019

Coorganizer, Workshop on Geometric aspects of the quantum Hall effect, University of Cologne, 14 – 18.12.2015

Coorganizer, Program on Large N limit problems in Kähler geometry, Simons Center for Geometry and Physics, Stony Brook, 20.4 – 19.6.2015

Coorganizer, Workshop "Quantum geometry, stochastic geometry, random geometry, you name it", Simons Center for Geometry and Physics, Stony Brook, 15 – 19.6.2015

Coorganizer, Workshop on Manifolds of Metrics and Probabilistic Methods in Analysis and Geometry, Centre de recherches mathématiques, Montréal, 2 – 6.7.2012

Board member, Quantum matter and materials collaboration, University of Cologne

Board member, Forum Classical and quantum dynamics of interacting particle systems, University of Cologne

PhD defence committee member:

Rapporteur, Ms. Laetitia Leduc (ENS, Paris)	21.3.2016
Examinateur, Ms. Corinne de Lacroix (Paris VI)	28.9.2017

Invited talks

Lecture series

Lecture course, "Quantum Hall, Bergman kernel and Kähler metrics" (5h), School on geometry and quantization, ICMAT, Madrid, 7 – 11.9.2015

Lectures on "Geometry of Quantum Hall effect", part 1, 2, Simons Center for Geometry and Physics, Stony Brook, 29.4 and 28.5.2015

Colloquium

SCGP Weekly Talk: "Kähler geometry in physics and probability", Simons Center for Geometry and Physics, Stony Brook, 16.6.2015

Conferences and workshops

Workshop Random geometries and multifractality in condensed matter and statistical mechanics, International Institute of Physics, Natal, Brasil, 24.6 – 2.7.2019

Workshop Quantization in symplectic geometry, University of Cologne, 15 – 19.7.2019

Workshop Probability and quantum field theory: discrete models, CFT, SLE and constructive aspects, IGESA, Porquerolle, France, 10 – 21.6.2019

Workshop Optimal point configurations and potential theory, CIEM, Cantabria, Spain, 8 – 11.4.2019

Workshop Classical and quantum dynamics of interacting particle systems, University of Cologne, 1 – 2.10.2018

Workshop Around quantum chaos, Banff, 15 – 20.7.2018

Workshop Geometric correspondences of gauge theories, SISSA, Trieste 11 – 17.7.2018

Conference Quantization and moduli spaces, Luxembourg, 4 – 8.6.2018

Conference Interfaces between geometric analysis and mathematical physics, Mittag-Leffler Institute, Stockholm, 7 – 11.5.2018

Conference Humboldt Kolleg: At the confluence of analysis, geometry and modern mathematical physics, Lebanese University, Beirut, 15 – 17.2.2018

Workshop Quantum geometry, duality and matrix models, Moscow, 22 – 28.8.2016

Workshop Probabilistic methods in spectral geometry and PDE, Centre de recherches mathématiques, Montréal, 22 – 26.8.2016

Workshop New trends in integrable models, International Institute of Physics, Natal, Brasil, 15.8-26.11.2016

Conference Interfaces between geometric analysis and mathematical physics, Mittag-Leffler Institute, Stockholm, 4 – 8.7.2016

Workshop Geometry of quantum states in condensed matter systems, Simons Center for Geometry and Physics, Stony Brook, 18 – 22.4.2016

Taipei Conference on complex geometry, 19 – 23.12.2015

Workshop on Geometric aspects of the Quantum Hall Effect, University of Cologne, 14 – 18.12.2015

Workshop Quantum geometry, duality and matrix models, Moscow, 24 – 30.8.2015

Workshop Non-hermitean random matrices: 50 years after Ginibre, Yad Hashmona, Israel, 22 – 27.10.2014

Workshop Geometric aspects of quantum states in condensed matter, International Institute of Physics, Natal, Brazil, 18 – 29.8.2014

Workshop Symmetries and universality in mesoscopic systems, Bad Honnef, Germany, 29.5 – 1.6.2014

Workshop Symmetries and universality in mesoscopic systems, Germany, 17 – 21.2.2013

Workshop on manifolds of metrics and probabilistic methods in analysis and geometry, Centre de recherches mathématiques, Montréal, 2 – 6.7.2012

Workshop on the geometry of quantization, University of Cologne, 26 – 27.11.2010

Conference on topological strings, modularity and non-perturbative physics, Erwin Schrödinger Institute, Vienna, 19 – 28.7.2010

Workshop on geometric methods in mathematical physics, SISSA, Trieste, 4 – 10.7.2010

Workshop Topological complexity of random sets, American Institute of Mathematics, Palo Alto, 10 – 14.8.2009

Workshop Random functions, random surfaces and interfaces, Centre de recherches mathématiques, Sainte Adèle, Canada, 4 – 9.1.2009

Seminars

Theoretical physics seminar, Uppsala University, 5.12.2018
Condensed matter seminar, Max-Planck-Institut, Dresden, 20.9.2018
Seminar of the UoC Forum "Interacting particle systems", University of Cologne, 5.2.2018
Seminar on algebra, geometry and physics, Max-Planck-Institut, Bonn, 16.1.2018
Séminaire Groupes de Lie et espaces des modules, University of Geneva, 2.5.2017
Analysis seminar, Courant Institute, New York University, 9.3.2017
Analysis seminar, Department of Mathematics, Northwestern University, 27.2.2017
Seminar of the Kadanoff center of theoretical physics, University of Chicago, 21.2.2017
Seminar of the Geometry of quantum Hall states program, SCGP, 3.6.2016 and 8.6.2016
Weizmann Institute seminar, 10.3.2016
Theoretical condensed matter seminar, University of Oxford, 2.3.2016
Seminar semiklassische Analysis, University of Cologne, 7.12.2015 and 18.1.2016
Complex systems seminar, Queen Mary, University of London, 19.11.2015
Algebraic geometry seminar, University of Cambridge, 18.11.2015
Séminaire Opérateurs de Dirac, Département de Mathématiques Orsay, Paris, 14.10.2015
Séminaire de physique théorique, IHES, Paris, 13.10.2015
Séminaire de physique mathématique, Saclay, Paris, 12.10.2015
Leibniz Group seminar, University of Cologne, 12.3.2015
Joint seminar in theoretical high energy physics, Neve Shalom, Israel, 28.10.2014
Mathematical physics seminar, HSE, Department of Mathematics, Moscow, 4.6.2014
Leibniz Group seminar, University of Cologne, 9.5.2014
Quantum anomalies program seminar, SCGP, Stony Brook, 21.4.2014
Analysis seminar, Dept. of Mathematics, Northwestern University, 12.2.2014
Seminar of the Kadanoff center of theoretical physics, University of Chicago, 7.2.2014
International Institute of Physics seminar, Natal, Brazil, 29.8.2013
Leibniz Group seminar, University of Cologne, 6.12.2012
Seminar semiklassische Analysis, University of Cologne, 27.11.2012
Séminaire de matrices, cordes et géométries aléatoires, Saclay, Paris, 6.1.2012
Institut Henri Poincaré seminar, Paris, 5.1.2012
Seminar semiklassische Analysis, University of Cologne, 6.12.2011
Laboratoire Charles Coulomb seminar, Université Montpelier, 4.9.2011
Seminar of the Albert Einstein Institute, Potsdam, 23.8.2011
Joint seminar in high energy physics, Brussels, 4.5.2011
Summer school on canonical metrics on Kähler manifolds, Germany, 13 – 17.9.2010
Oberseminar Geometrie, Topologie und Analysis, University of Cologne, 20.11.2009
Complex geometry seminar, John Hopkins University, 1.4.2009
IAS/Princeton University high energy theory seminar, Princeton, 30.3.2009
High energy physics seminar, CUNY, New York, 20.2.2009
Institut Henri Poincaré seminar, Paris, 13.9.2007

IN PRESS

1. S. Klevtsov, *Laughlin states on higher genus Riemann surfaces*, Commun. Math. Phys., arXiv:1712.09980

2. D. Coman, S. Klevtsov and G. Marinescu, *Bergman kernel asymptotics for singular metrics on punctured Riemann surfaces*, Indiana Univ. Math. J., arXiv:1612.09197

PUBLISHED

3. S. Klevtsov, *Lowest Landau level on a cone and zeta determinants,* invited contribution to the J. Phys. A special issue "Emergent talents", J. Phys. A **50** (2017) 234003, arXiv:1609.08587

4. S. Klevtsov, *Geometry and large N limits in Laughlin states,* Lectures at the School on Geometry and Quantization, ICMAT, Madrid, 7 – 11.9.2015; Travaux Math. **24** (2016) 63–127, arXiv:1608.02928

5. S. Klevtsov, X. Ma, G. Marinescu and P. Wiegmann, *Quantum Hall effect and Quillen metric*, Commun. Math. Phys. **349** (2017) 819–855, arXiv:1510.06720

6. S. Klevtsov and S. Zelditch, *Heat kernel measures on random surfaces*, Adv. Theor. Math. Phys. **20** no. 1 (2016) 135–164, arXiv:1505.05546

7. S. Klevtsov and P. Wiegmann, *Geometric adiabatic transport in quantum Hall states*, Phys. Rev. Lett. **115** (2015) 086801, arXiv:1510.06720

8. F. Ferrari and S. Klevtsov, *FQHE on curved backgrounds, free fields and large N*, JHEP **12** (2014) 086, arXiv:1410.6802

9. S. Klevtsov and S. Zelditch, *Stability and integration over Bergman metrics*, JHEP **07** (2014) 100, arXiv:1404.0659

10. A. Bilal, F. Ferrari and S. Klevtsov, *2D quantum gravity at one loop with Liouville and Mabuchi actions*, Nucl. Phys. B **880** (2014) 203–224, arXiv:1310.1951

11. S. Klevtsov, *Random normal matrices, Bergman kernel and projective embeddings*, JHEP **01** (2014) 133, arXiv:1309.7333

12. F. Ferrari, S. Klevtsov and S. Zelditch, *Random Kähler metrics*, Nucl. Phys. B **869** (2013) 89–110, arXiv:1107.4575

13. F. Ferrari, S. Klevtsov and S. Zelditch, *Simple matrix models for random Bergman metrics*, J. Stat. Mech. (2012) P04012, arXiv:1112.4382

14. F. Ferrari, S. Klevtsov and S. Zelditch, *Gravitational actions in two dimensions and the Mabuchi functional*, Nucl. Phys. B **859** (2012) 341–369, arXiv:1112.1352

15. F. Ferrari, S. Klevtsov and S. Zelditch, *Random geometry, quantum gravity and the Kähler potential*, Phys. Lett. B **705** (2011) 375–378, arXiv:1107.4022

16. M. R. Douglas and S. Klevtsov, *Bergman kernel from path integral*, Commun. Math. Phys. **293** (2010) 205–230, arXiv:0808.2451

17. S. Klevtsov, *On vertex operator construction of quantum affine algebras*, Theor. Math. Phys. **154**, 2 (2008) 201–208, arXiv:hep-th/0110148

18. D. Gal'tsov, S. Klevtsov and D. Orlov, *D-instanton on the linear-dilaton background*, Phys. Atom. Nucl. **70** (2007) 1568–1571

19. D. Gal'tsov, S. Klevtsov, D. Orlov and G. Clement, *More on general p-brane solutions*, Int. J. Mod. Phys. A **21** (2006) 3575–3604, arXiv:hep-th/0508070

20. D. Gal'tsov, S. Klevtsov and D. Orlov, *Cylindrical D-instantons*, Grav. Cosmol. **11** (2005) 127–131

PREPRINTS, PROCEEDINGS

21. M. R. Douglas and S. Klevtsov, *Balanced metrics and black holes*, arXiv:0811.0367

22. S. Klevtsov, *Connecting SLE and minisuperspace Liouville gravity*, arXiv:0709.3664

23. S. Klevtsov, *Bergman kernel from the lowest Landau level*, Nucl. Phys. B **192–193** Proc. Suppl. (2009) 154–155

24. S. Klevtsov, *Yang-Mills theory from string field theory on D-branes*, Proc. of Cargese School "Progress in String, Field and Particle Theory" (2002) 425–428