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1 Employment

Ritt Assistant Professor, 2019 - now. Columbia University.

2 Education

PhD in mathematics, 2015 - 2019. SISSA (International School for Advanced Studies) & Landau Institute for Theoretical Physics (Chernogolovka, Russia).
 Scientific advisors Alexander Belavin and Boris Dubrovin.

MS with honors, 2010 - 2015. Lomonosov Moscow State University, Department of Mechanics and Mathematics.
 Scientific advisors Anatoly Fomenko and Anton Izosimov.

3 Visiting positions

January - May 2018. "Enumerative geometry beyond numbers", Program Associate, MSRI, Berkeley

4 Research interests

Algebraic and enumerative geometry and mathematical physics. I am particulary interested in the structures that appear from interaction between enumerative geometry and mathematical physics such as quantum cohomology and quantum K-theory. Lately I have been studying Gauged Linear Sigma Models and wall crossing for these enumerative theories. I am interested in mirror symmetry and its implications for enumerative geometry, its interplay with singularity theory including theory of primitive forms and integrable systems.

I also work on relation between enumerative theories and so-called Liouville Quantum Gravity that was recently reformulated in probabilistic approach using Gaussian multiplicative chaos.

5 Conference talks

- Integrability, Enumerative Geometry and Quantization, Stony Brook, 2022
- StringMath, Sendai, 2018 ("Gong show" short talk and poster),

- Second school-conference on string theory, integrable models and representation theoru (lecturer), HSE, Landau Institute, Skoltech (Moscow) 2017,

- Categorical and Analytic Invariants in Algebraic Geometry V, Osaka University, Osaka (2017),

- The second French-Russian Conference Random Geometry and Physics, Institut Henri Poincare (Paris) 2016,

- Finite Dimensional Integrable Systems conference, Bedlewo (Poland), 2015.

- Lomonosov conference 2014

- S. G. Krein winter mathematical school 2014

6   Teaching experience

- Ordinary Differential Equations, Columbia University, 2022

- Linear Algebra, Columbia University, 2020

- Multivariate calculus, Columbia University, 2019-2022

- Compactification problem in superstring theory and Calabi–Yau manifolds. The second school-conference on string theory, integrable models and representation theory (lecturer), HSE, Landau Institute, Skoltech (Moscow), 2017,

- Computational methods in geometry, Lomonosov Moscow State University, 2015,

- High school advanced mathematics class, Moscow, 2013.

7   Publications

- K. Aleshkin, M. Liu *Higgs-Coulomb correspondence and wall-crossing in abelian GLSMs*, 2022 preprint
- K. Aleshkin, G. Remy, *Probabilistic derivation of the higher equations of motion in Liouville CFT*, 2022 preprint
- K. Aleshkin, M. Liu. *Wall-crossing for K-theoretic quasimap invariants I*, 2022 preprint arxiv:2210.10315
- K. Aleshkin, K. Saito. *Primitive forms without higher residue structure and integrable hierarchies (I)*, Integrability, quantization, and geometry. 2021
- K. Aleshkin, A. Belavin, A. Litvinov, *JKLMR conjecture and Batyrev construction*, J. Stat. Mech. 2019

- K. Aleshkin, V. Belavin, *Open minimal strings and Gelfand-Dickey hierarchies*, J. High Energy Phys. 2019, preprint arxiv:1811.04066
- K. Aleshkin, A. Belavin, *Exact computation of the Special geometry for Calabi-Yau hypersurfaces of Fermat type*, accepted in JETP Lett., arxiv:1806.02772
- K. Aleshkin, A. Belavin, *Special geometry on the 101 dimensional moduli space of the quintic threefold*, JHEP 1803 (2018) 018, arxiv:1710.11609
- K. Aleshkin, A. Belavin, *Special geometry on the moduli space for the two-moduli non-Fermat Calabi-Yau*, Phys. Lett. B776 (2018) 139-144, arxiv:1708:08362
- K. Aleshkin, V. Belavin, C. Rim, *Minimal gravity and Frobenius manifolds: bulk correlation on sphere and disk*, JHEP 11 (2017) 169, arxiv:1708.06380
- K. Aleshkin, A. Belavin, *A new approach for computing the geometry of the moduli spaces for a Calabi-Yau manifold*, J. Phys. A51 (2018) 055403, arXiv:1706.05342
- K. Aleshkin, V. Belavin, *On the construction of the correlation numbers in Minimal Liouville Gravity*, JHEP (2016):142
- K. Aleshkin, A. Izosimov *Euler equations on the general linear group, cubic curves, and inscribed hexagons*, L'Enseignement Mathematique (2016),62(1/2), 143-170, arxiv:1504.03032
- K. R. Aleshkin, *The topology of integrable systems with incomplete fields*, Sbornik: Mathematics (2014),205(9):1264