
CURRICULUM VITAE
ILARION VICTOR MELNIKOV

- BORN: November 15, 1976, Moscow, USSR; CITIZENSHIP: USA

- CURRENT ADDRESS

Department of Physics and Astronomy Tel: +1 540 568 5141
James Madison University Email: melnikix@jmu.edu
Harrisonburg, VA 22807 Web: <http://csma31.csm.jmu.edu/physics/melnikix/>
USA

- EMPLOYMENT HISTORY

August 2015—present: Assistant Professor
Department of Physics and Astronomy, James Madison University, Harrisonburg, VA, USA.

August 2014—August 2015: Post-Doctoral Research Associate
Department of Mathematics, Harvard University, Cambridge, MA, USA.

September 2013—August 2014: Post-Doctoral Research Associate
The Mitchell Institute, Texas A&M University, College Station, TX, USA.

September 2008— August 2013: Junior Scientist
Max Planck Institute for Gravitational Physics, Golm, Germany.

August 2005—August 2008: Post-Doctoral Research Associate
The Enrico Fermi Institute, University of Chicago, Chicago, IL, USA.

- ACADEMIC HISTORY

Ph.D. (Physics): Duke University, Durham, NC, USA, viva date: April 4, 2005.
Thesis advisor: Professor M. Ronen Plesser.
Thesis title: Applications of topological field theory to string propagation on non-trivial backgrounds.

M.A.: Duke University, Durham, NC, USA, May 2003.

B.A. (Physics, *summa cum laude*): Cornell University, Ithaca, NY, USA, May 1999.
Thesis advisor: Professor Eberhard Bodenschatz.
Thesis title: Investigations in Rayleigh-Bénard convection.

- FELLOWSHIPS AND PRIZES

NSF Postdoctoral Fellowship in Mathematical Sciences, 2005 (declined)
James B. Duke Fellowship, Duke University, 1999
NSF Graduate Fellowship in Physics, 1999
Finalist in the APS Apker Award, 1999
Yennie Prize in Physics at Cornell University, 1999
IBM Undergraduates in Computational Science Award, 1998
Barry M. Goldwater Scholarship, 1997

- GRANTS RECEIVED

Together with L. Anderson and J. Gray, I applied for and received a 4-VA grant (\$20K total) to foster scientific collaboration between Virginia Tech and JMU.

Together with K. Becker and M. Becker, I applied for and received a grant from the Mitchell Foundation to hold a workshop at the Mitchell Institute, April 28-May 2nd, 2014.

Together with J. Distler, J. Knapp, and M. Kreuzer, I applied for and received a grant from the European Science Foundation for 10K EU to support a workshop held June 20-24, 2011 at the Erwin Schrödinger Institute, Vienna.

- TEACHING EXPERIENCE

Instructor for *Quantum Field Theory I*, Duke University, Spring Semester, 2005.

Instructor for *Toric Varieties and Algebraic Geometry*, an informal course for physics graduate students, University of Chicago, Spring 2007.

Lecturer at the *Helmholtz International Summer School on Modern Mathematical Physics*, July 20-29, 2009, Dubna, Russia.

Lecturer at the *String Steilkurs-Part II: Advanced Topics in String Theory*, Golm, 28.09.09–2.10.09.

Lecturer at the IMPRS graduate seminar on Donaldson Theory, Golm, 19.02.10.

Lecturer at the *School on Mathematical String Theory*, Virginia Tech, 21.6-2.7.10.

Lecturer for Mini-course on Topological Field Theory, Leibniz University, Hannover, 04.04.11-09.04.11.

Lecturer at the IMPRS graduate student retreat, Motzen resort, Berlin, 18.07.11.

Lecturer at the pre-String Math 2012 summer school, Bonn, 02.07.12–06.07.12.

Lecturer at the IMPRS graduate seminar on Complex Geometry, Golm, 24.05.13.

Instructor for *Representation theory*, an informal course for particle theory graduate students, Texas A&M, Spring 2014.

- SERVICE

Reviewer for AMS MathSciNet, *Journal of High Energy Physics*, *Communications in Mathematical Physics*, *Physical Review D*, *Physical Review Letters*.

Co-Organizer of workshops on (0,2) QFT and heterotic strings:

28.04.-02.05.14, Mitchell Institute, Texas A&M University, USA;

20.06.-24.06.11, Erwin Schrödinger Institute, Austria;

07.03-12.03.10, Banff International Research Station, Canada;

17.08-21.08.09, MPI-AEI, Golm, Germany.

- REFERENCES

Professor Paul S. Aspinwall
Department of Mathematics
Duke University
Durham, NC 27708-0320, USA
Tel: ++ 1 919 660 2874
psa@cgtp.duke.edu

Professor Ron Donagi
Department of Mathematics
University of Pennsylvania
Philadelphia, PA 19104-6395
Tel: ++ 1 215 898 8465
donagi@math.upenn.edu

Professor Sergei Gukov
Department of Physics
Caltech 452-48
Pasadena, CA 91125, USA
Tel: ++ 1 626 395-6688
gukov@theory.caltech.edu

Professor Ruben Minasian
Institut de Physique Théorique
CEA/ Saclay
91191 Gif-sur-Yvette Cedex, France
Tel: ++ 33 1 69 08 74 66
ruben.minasian@cea.fr

Professor David R. Morrison
Department of Mathematics
University of California
Santa Barbara, CA 93106, USA
drm@math.ucsb.edu

Professor M. Ronen Plesser
Department of Physics
Duke University
Durham, NC 27708-0305, USA
Tel: ++ 1 919 660 9668
plesser@cgtp.duke.edu

Professor Savdeep Sethi
Enrico Fermi Institute
University of Chicago
Chicago, IL 60637, USA
Tel: ++ 1 773 834-4434
sethi@uchicago.edu

Professor Stefan Theisen
Albert Einstein Institute
Max Planck Institute
D-14476 Golm, Germany
Tel: ++ 49 331 567-7314
Stefan.Theisen@aei.mpg.de

- COMPUTATIONAL SKILLS proficient user of Maple, as well as C and FORTRAN programming languages; experience with Macaulay2; experience with parallel computing

- SELECTED INVITED TALKS

05.30.16, (0,2) in Paris meeting.

05.26.16, Paris String Seminar (at Institut Henri Poincaré)

06.05.15, String theory seminar, MIT.

23.03.15, String theory seminar, Brandeis University.

16.03.15, GASC Seminar, Department of Mathematics, Northeastern University.

06.03.15, Recent Advances in String Theory, FRG Workshop, Brandeis University.

29.01.15, Colloquium, James Madison University.

23.10.14, SiTP seminar, Stanford University.

17.10.14, High energy theory seminar, Caltech.

25.04.14, Department of Mathematics, Texas A&M.

08.04.14, Department of Mathematics, Harvard.

04.03.14, Enrico Fermi Institute, University of Chicago.

18.02.14, Theory group seminar, UT Austin.

24.11.13, String Geometry and Beyond Workshop, Soltis Center, Costa Rica.

01.11.13, High energy theory seminar, Caltech.

21.10.13, Physics around mirror symmetry workshop at the Perimeter Institute.

18.07.13, String Phenomenology 2013 (DESY, Hamburg).

30.05.13, Paris String Seminar (at Institut Henri Poincaré).

10.05.13, String Math UK meeting at University of Surrey.

21.02.13, String theory seminar at Queen Mary University of London.

19.02.13, Fields, strings and geometry seminar at University of Surrey.
11.12.12, Geometry seminar at University of Freiburg.
04.12.12, String theory and generalized geometry, BIRS workshop.
28.11.12, University of Alberta physics and geometry seminar.
14.05.12, String theory for mathematicians, workshop at the SCGP, CUNY Stonybrook.
24.04.12, Particle theory seminar, University of Heidelberg.
24.03.12, Southern regional math/strings meeting, Duke University.
31.10.11, Algebraic geometry seminar, University of Nebraska, Lincoln.
27.10.11, High energy theory seminar, UCSB.
19.10.11, EFI theory seminar, University of Chicago.
07.10.11, Southern regional math/strings meeting, Duke University.
03.10.11, Center for Neutrino Physics, Virginia Tech.
10.10.11, Mathematics and Physics seminar, University of Pennsylvania.
16.11.10, SFB “Space-Time-Matter” Colloquium, Berlin.
11.11.10, DESY theory seminar.
03-04.10.10, Oberwolfach workshop on “Higher Dimensional Elliptic Fibrations.”
27.05.10, DAMTP, University of Cambridge.
17.03.10, STRINGS 2010, Texas A&M.
10.12.09, LMU, München.
17.08.09, Workshop on (0,2) mirror symmetry and sheaf cohomology, MPI-AEI, Golm.
16.06.09, Geometry and combinatorics seminar, University of Hamburg.
13.05.09, The Paris String Seminar (at Institut Henri Poincaré).
04.05.09, Mathematical Institute, University of Oxford.
21.04.09, Bethe Center for Theoretical Physics, University of Bonn.
20.01.09, CERN theory seminar.
25.04.08, University of Pennsylvania.
04.04.08, Mathematics and Physics seminar, Texas A&M.
12.12.07, SLAC Theory Seminar, Stanford University.
28.06.06, Workshop on Calibrations at the AIM Research Conference Center, Palo Alto.
08.12.04, SLAC Theory Seminar, Stanford University.
08.12.04, Theory group, University of Amsterdam.
11.10.04, Enrico Fermi Institute, University of Chicago.
07.98, Emil Warburg Seminar, University of Bayreuth.

• PUBLICATIONS

- [35] I. C. Davenport & I. V. Melnikov, *Landau–Ginzburg skeletons*, arXiv:1608.04259.
- [34] I. V. Melnikov, *Relevant deformations and c -extremization*, arXiv:1602.04221.
- [33] F. Apruzzi, F. Hassler, J. Heckman & I. V. Melnikov, *UV completions for non-critical strings*, arXiv:1602.04221.
- [32] K. Becker, M. Becker, I. V. Melnikov, D. Robbins & A.B. Royston, *Some tree-level string amplitudes in the NSR formalism*, JHEP **1512:010** arXiv:1507.02172.
- [31] D. Kutasov, T. Maxfield, I. V. Melnikov & S. Sethi, *Constraining de Sitter space in string theory*, PRL **115**, 071305, arXiv:1504.00056.
- [30] R. Donagi, Z. Lu, I. V. Melnikov, *Global aspects of $(0,2)$ moduli space: toric varieties and tangent bundles*, Commun.Math.Phys.**338**, 1197-1232, arXiv:1409.4353.
- [29] M. Bertolini, I. V. Melnikov & M. R. Plesser, *Accidents in $(0,2)$ Landau-Ginzburg models*. JHEP **1412:157** arXiv:1405.4266.
- [28] I. V. Melnikov, R. Minasian & S. Sethi, *Heterotic fluxes and supersymmetry*. JHEP **1406:174**, arXiv:1403.4298, 2014.
- [27] J. McOrist, I. V. Melnikov & B. Wecht, *Global symmetries and $N=2$ SUSY*. arXiv:1312.3506, 2013.
- [26] M. Bertolini, I. V. Melnikov & M. R. Plesser, *Hybrid conformal field theories*. JHEP **1405:043**, arXiv:1307.7063, 2013.
- [25] I. V. Melnikov, C. Quigley, S. Sethi & M. Stern, *Target spaces from chiral gauge theories*. JHEP **1302:111**, arXiv:1212.1212, 2012.
- [24] I. V. Melnikov, S. Sethi & E. Sharpe, *Recent developments in $(0,2)$ mirror symmetry*. SIGMA **8**, 068, arXiv:1209.1134, 2012 [invited review article].
- [23] I. V. Melnikov, R. Minasian & S. Theisen, *Heterotic flux backgrounds and their IIA duals*. JHEP **1407:023**, arXiv:1206.1417, 2012.
- [22] I. V. Melnikov & E. Sharpe, *On marginal deformations of $(0,2)$ non-linear sigma models*. Phys. Lett. **B705**, 529-534, arXiv:1110.1886, 2011.
- [21] J. McOrist & I. V. Melnikov, *Old issues and linear sigma models*. ATMP **16**, 251-288, arXiv:1103.1322, 2011.
- [20] I. V. Melnikov & R. Minasian, *Heterotic sigma models with $N=2$ space-time supersymmetry*. JHEP **1109:065**, arXiv:1010.5365, 2011.
- [19] P. S. Aspinwall, I. V. Melnikov & M. R. Plesser, *$(0,2)$ elephants*. JHEP **1201:060**, arXiv:1008.2156, 2010.
- [18] I. V. Melnikov & M. R. Plesser, *A $(0,2)$ mirror map*. JHEP **1102:001**, arXiv:1003.1303, 2010.
- [17] M. Kreuzer, J. McOrist, I. V. Melnikov & M. R. Plesser, *$(0,2)$ deformations of linear sigma models*. JHEP **1107:044**, arXiv:1001.2104, 2010.
- [16] I. Adam, I. V. Melnikov & S. Theisen, *A non-relativistic Weyl anomaly*. JHEP **0909:130**, arXiv:0907.2156, 2009.
- [15] I. V. Melnikov, *$(0,2)$ Landau-Ginzburg models and residues*. JHEP **0909:118**, arXiv:0902.3908, 2009.
- [14] J. McOrist & I. V. Melnikov, *Summing the instantons in half-twisted linear sigma models*. JHEP **0902:026**, arXiv:0810.0012, 2009.

- [13] J. McOrist & I. V. Melnikov, *Half-twisted correlators from the Coulomb branch*. JHEP **0804:071**, arXiv:0712.3272, 2008.
- [12] I. V. Melnikov & S. Sethi, *Half-twisted (0,2) Landau-Ginzburg models*. JHEP **0803:040**, arXiv:0712.1058, 2008.
- [11] N. Halmagyi, I. V. Melnikov & S. Sethi, *Instantons, hypermultiplets, and the heterotic string*. JHEP **0707:086**, arXiv:0704.3308, 2007.
- [10] I. V. Melnikov, *Non-local observables in the A-model*. JHEP **0706:050**, arXiv:hep-th/0701186, 2007
- [9] I. V. Melnikov & M. R. Plesser, *A-model correlators from the Coulomb branch*. JHEP **0602:044**, arXiv:hep-th/0507187, 2006.
- [8] I. V. Melnikov & M. R. Plesser, *The Coulomb branch in gauged linear sigma models*. JHEP **0506:013**, arXiv:hep-th/0501238, 2005.
- [7] C. Haase & I. V. Melnikov, *The reflexive dimension of a lattice polytope*. Annals of Combinatorics **10**, 211-217, arXiv:math.CO/0406485, 2004.
- [6] P. .S. Aspinwall & I. V. Melnikov, *D-branes on vanishing del Pezzo surfaces*. JHEP **0412:042**, arXiv:hep-th/0405134, 2004.
- [5] I. V. Melnikov, M. R. Plesser & S. Rinke, *Supersymmetric boundary conditions for the $N = 2$ sigma model*. Prepared for the 3rd International Symposium on Quantum Theory and Symmetries (QTS3), Cincinnati, Ohio, 10-14 Sep. 2003, arXiv:hep-th/0309223, 2003.
- [4] I. V. Melnikov, D. A. Egolf, S. Jeanjean, B. Plapp & E. Bodenschatz, *Invasion of spiral defect chaos into straight rolls in Rayleigh-Bénard convection*. in Stochastic Dynamics and Pattern Formation in Biological and Complex Systems, ed. S. Kim, K. J. Lee, T. K. Lim & W. Sung. AIP Conference Proceedings, Vol 501(1), 36-42, 2000.
- [3] D. A. Egolf, I. V. Melnikov, W. Pesch & R. E. Ecke, *Mechanisms of extensive spatiotemporal chaos in Rayleigh-Bénard convection*. Nature **404**, 733, 2000.
- [2] D. A. Egolf, I. V. Melnikov & R. P. Springer, *Weak non-leptonic Ω^- decay in chiral perturbation theory*. Phys. Lett. **B451**, 267-274, arXiv:hep-ph/9809228, 1999.
- [1] D. A. Egolf, I. V. Melnikov & E. Bodenschatz, *Importance of local properties in spiral defect chaos*. Phys. Rev. Lett. **80(15)**, 3228, 1998.