

Curriculum Vitæ of Anton Leykin

School of Mathematics, Georgia Institute of Technology
686 Cherry Street, Atlanta, GA 30332-0160, USA
leykin@math.gatech.edu

RESEARCH INTERESTS

Numerical and symbolic algebraic computation, computational algebraic geometry, algorithms in algebraic analysis, parallel algorithms.

EDUCATION

1997-2003 Ph.D., School of Mathematics, University of Minnesota, Minneapolis.
Advisor : Gennady Lyubeznik.

1992-1997 Diploma with Honors, Department of Mathematics and Mechanics, Kharkov State University, Kharkov, Ukraine.

EMPLOYMENT

2013+ *Associate Professor*, School of Mathematics, Georgia Institute of Technology.

2009-2013 *Assistant Professor*, School of Mathematics, Georgia Institute of Technology.

2008-2009 *Visiting Assistant Professor*, Department of Mathematics, Statistics and Computer Science, University of Illinois at Chicago.

2006-2008 *Postdoctoral Associate*, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis.

2003-2006 *Research Assistant Professor*, Department of Mathematics, Statistics and Computer Science, University of Illinois at Chicago.
Postdoctoral mentor : Jan Verschelde.

RECENT PUBLICATIONS (2012+)

- [1] Anton Leykin and Josephine Yu. Beyond polyhedral homotopies. *arXiv preprint arXiv:1706.03520*.
- [2] Timothy Duff, Cvetelina Hill, Anders Jensen, Kisun Lee, Anton Leykin, and Jeff Sommars. Solving polynomial systems via homotopy continuation and monodromy. *arXiv preprint arXiv:1609.08722*.
- [3] Anton Leykin, Jose Israel Rodriguez, and Frank Sottile. Trace test. *arXiv preprint arXiv:1608.00540*.

- [4] Robert Krone, Anton Leykin, and Andrew Snowden. Hilbert series of symmetric ideals in infinite polynomial rings via formal languages. *Journal of Algebra*, 2017.
- [5] Christopher J Hillar, Robert Krone, and Anton Leykin. Equivariant Gröbner bases. *To appear in Advanced Studies in Pure Mathematics*, 2017.
- [6] Robert Krone and Anton Leykin. Numerical algorithms for detecting embedded components. *Journal of Symbolic Computation*, 82:1–18, 2017.
- [7] Anton Leykin and Daniel Plaumann. Determinantal representations of hyperbolic curves via polynomial homotopy continuation. *To appear in Mathematics of Computation*, 2017.
- [8] Robert Krone and Anton Leykin. Eliminating dual spaces. *Journal of Symbolic Computation*, 79:609–622, 2017.
- [9] Anders Jensen, Anton Leykin, and Josephine Yu. Computing Tropical Curves via Homotopy Continuation. *Exp. Math.*, 25(1):83–93, 2016.
- [10] Jan Draisma, Rob Eggermont, Robert Krone, and Anton Leykin. Noetherianity for infinite-dimensional toric varieties. *Algebra Number Theory*, 9(8):1857–1880, 2015.
- [11] Uli Walther. Survey on the D -module f^s . *Commutative Algebra and Noncommutative Algebraic Geometry*, 1:391, 2015. With appendix by Anton Leykin.
- [12] Thomas Kahle, Robert Krone, and Anton Leykin. Equivariant lattice generators and Markov bases. In *International Symposium on Symbolic and Algebraic Computation*, 2014.
- [13] Carlos Beltrán and Anton Leykin. Robust certified numerical homotopy tracking. *Foundations of Computational Mathematics*, pages 1–43, 2013.
- [14] Carlos Beltrán and Anton Leykin. Certified numerical homotopy tracking. *Experimental Mathematics*, 21(1):69–83, 2012.

SOFTWARE

Contributions to the core of *Macaulay2* and the packages of this computer algebra system. The major packages are:

- *MonodromySolver* (with Duff, Hill, Jensen, Lee, Sommars). A polynomial system solver that uses homotopy continuation and monodromy.
- *NumericalAlgebraicGeometry* (a.k.a., *NAG4M2*). An implementation of methods of numerical algebraic geometry.
- *Dmodules* (with Tsai). This package implements a number of algorithms coming from the theory of algebraic D -modules.

AWARDS

2017 Cullen-Peck Scholar Award (College of Sciences, Georgia Tech)

2014 Hesburgh Award Teaching Fellow (CETL, Georgia Tech)

2012 NSF CAREER award (National Science Foundation, USA)

2003 Excellent Thesis Award (School of Mathematics, University of Minnesota)

RECENT PROFESSIONAL SERVICE (2012+)

2018 - Organizer of the ICERM Semester Program on “Nonlinear Algebra” (Providence, RI).

2017+ Member of the advisory board of *MEGA* (Effective Methods in Algebraic Geometry).

2017 - Local organizer of *SIAM AG 2017* (Atlanta, GA).

2017 - Member of the program committee of *ISSAC 2017* (Kaiserslautern, Germany).

August 2015 - Organizer of the minisymposium on *Core Algorithms in Algebraic Geometry* at SIAM Conference on Applied Algebraic Geometry 2015 (Daejeon, Korea).

2015 - Member of the program committee of *PASCO 2015* (Bath, United Kingdom)

2015 - Member of the program committee of *MEGA 2015* (Trento, Italy).

November 2014 - Organizer of a workshop on *Symbolic and Numerical Methods for Tensors and Representation Theory* at Simons Institute (Berkeley, CA).

2013 - Member of the program committee of *ISSAC 2013* (Boston, MA).

2013 - Organizing Committee Co-chair of *SIAM AG 2013* (Fort Collins, CO)

2012, 2013 - Program Director of the SIAM activity group in Algebraic Geometry.

Summer 2012 - Organizer and lecturer at the *IMA PI Graduate Summer Program on Algebraic Geometry for Applications* (Atlanta, GA).

GRANTS

2017-2020 NSF award “Polynomial homotopy continuation: under the hood”, (\$250,000).

2012-2017 NSF CAREER award “Algorithms and Software for Computational Algebraic Geometry” (\$470,070)

2012 IMA Participation Institutions Summer Program for Graduate Students “Algebraic Geometry for Applications” (\$70,000 in IMA funding + \$22,500 NSF Award)

2009-2012 NSF award “Algorithms and Software for Decomposition of Singular Varieties” (\$158,365)