

SPYROS ALEXAKIS

Contact Information:

Department of Mathematics
University of Toronto
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- Education** **Princeton University**, Princeton, NJ
Ph.D. in Mathematics, May 2005
Thesis advisor: Prof. Charles Fefferman
Dissertation title: Local and Global Aspects of Conformal Geometry
University of Athens, Greece
B.A. summa cum laude in Mathematics, 1996-1999
(completed undergraduate studies in three rather than the regular four years)
- Research Interests** Differential Geometry, Geometric Analysis, General Relativity.
- Employment** Tenure-track Assistant Professor, Mathematics department,
University of Toronto (Appointed Fall 2008–on leave until Fall 2010).
Clay Research Fellow, Clay Mathematics Institute, (2008-2010).
Instructor, Mathematics Department, Princeton University (2005-2008).
Lecturer, Mathematics Department, Princeton University (2004-2005).
- Visiting positions.** ETH Zürich, Clay Postdoctoral fellow, fall 2009.
MIT, Clay Postdoctoral Fellow, academic year 2008-2009.
University of Tokyo, Japan, July-August 2008.
Mathematical Sciences Research Institute, postdoctoral fellow,
Berkeley, Spring 2007
- Awards and Honors** **Sloan Fellowship:**
Fall 2010–Fall 2013.
Plenary Address, AMS Southeastern Sectional Meeting:
Florida Atlantic University, November 2009.
Clay Research Fellowship
Clay Mathematics Institute, 2008-2010.
Clay Liftoff Fellowship
Clay Mathematics Institute, summer 2005.
Finalist, AIM Five-year fellowship
American Institute of Mathematics, 2005.
Charlotte E. Procter Honoric Fellowship
Princeton University, 2003-2004
- Research Awards:** NSERC Accelerator Grant, awarded April 2010, duration 2010-2014,
Total award 120K
NSERC Discovery Grant, awarded April 2010, duration 2010-2015,
Total award 150K.
Sloan Research Fellowship, awarded February 2010,
duration 2010-2012 (+2 year extension), Total award 50K USD.

Invited Talks Conference on Geometric Singularities:
MFO Oberwolfach, Germany, May 2012.

Conference on Geometric Analysis:
Goethe-Universität, Frankfurt, Germany, March 2012.

Conference on “The Geometry of differential equations”,
Australian National University, September 2011.

University of Athens, Greece:
Analysis Seminar, June 2011

University of Athens, Greece:
Colloquium, June 2011.

Centre International de Rencontres Mathématiques, Luminy, France:
Geometric Analysis Conference, January 2011.

XVIIth Southeastern Geometry Seminar:
University of Tennessee, December 2010.

York University:
Analysis Seminar, December 2010.

University of Crete:
Analysis seminar, July 2010.

Banff International Research Station:
Workshop on Geometric Analysis and General Relativity, June 2010.

Perimeter Institute, Waterloo Canada:
Workshop on “Connections in Geometry and Physics”, May 2010.

Michigan State University:
Colloquium, April 2010.

Banff International Research Station:
Workshop on Geometric Scattering Theory and Applications, March 2010.

Stanford University: Geometry Seminar, February 2010.

University of Alabama, Birmingham: Colloquium, February 2010.

Simons Center for Geometry and Physics, Stony Brook, NY:
Workshop in General Relativity, November 2009 (unable to attend).

Plenary Address, AMS Southeastern Sectional Meeting:
Florida Atlantic University, November 2009.

ETH Zürich, Switzerland:
Analysis Seminar, November 2009.

University of Warwick, UK:
Analysis Seminar, October 2009.

Mini-Symposium on Nonlinear PDE, Maxwell Institute,
Centre for Analysis and Nonlinear PDEs, Edinburgh, October 2009.

Conference on Mathematical Aspects of General Relativity:
Mathematisches Forschungsinstitut Oberwolfach, Germany, October 2009.

“Hot topics” Workshop, Mathematical Sciences Research Institute,
Berkeley California, September 2009.

Workshop on the Geometry of Einstein manifolds:
University of Nantes, July 2009.

Cambridge University: Geometric Analysis and
Nonlinear PDEs seminar, June 2009.

Oxford University: General Relativity Seminar, June 2009.

International Conference on Complex analysis and Dynamical Systems IV:
General Relativity section, Nahariya, Israel, May 2009.

Johns Hopkins University: Complex Geometry Seminar, February 2009.
Harvard University: Differential Geometry Seminar, February 2009.
Princeton University: Analysis Seminar, October 2008.
University of Rochester: Analysis Seminar, October 2008.
USTC, Hefei, China:
International Conference on PDEs in Conformal and Kähler Geometry, July 2008
Hayama Symposium on Complex Analysis in Several Variables:
Hayama, Japan July 2008.
AMS Eastern Sectional Meeting, NY:
Workshop on Isoperimetric problems and PDE, March 2008.
McMaster University:
Geometry and Topology Seminar, March 2008.
MIT: Geometry Seminar, February 2008.
University of California, San Diego: Colloquium, January 2008.
Northwestern University: Colloquium, January 2008.
University of Toronto: Colloquium, January 2008.
Vanderbilt University: Special Lecture, January 2008.
University of Wisconsin, Madison: Geometric Analysis Seminar, December 2007.
Rice University: Special Lecture, December 2007.
University of Minnesota: Differential Geometry Seminar, December 2007.
University of Minnesota: Special Colloquium, December 2007.
Princeton University:
Geometric Analysis Seminar, September 2007.
University of Nice, France:
Conference in Geometric Analysis: Conformal, CR, microlocal, June 2007.
Midwest Geometry Conference, University of Iowa, May 2007 (plenary lecture).
Stanford University:
Workshop on Asymptotic structures in geometric analysis, March 2007.
Mathematical Sciences Research Institute:
Postdoctoral Seminar, March 2007.
University of Athens, Greece:
Geometry and Analysis Seminar, December 2006.
Trinity College Dublin, Ireland: PDE Seminar, May 2006.
MIT: Differential Geometry Seminar, May 2006.
Isaac Newton Institute, Cambridge:
Workshop on the Einstein Constraint equations, December 2005
Banff International Research Station:
Workshop on Conformal Geometry, August 2004
National University of Singapore:
Workshop on Geometric Partial Differential Equations, June 2004
CUNY: Differential Geometry and Analysis Seminar, February 2004
AMS Annual Meeting, Phoenix:
Workshop on Nonlinear PDEs and Conformal Geometry, January 2004
American Institute of Mathematics:
Workshop on Conformal structures in Geometry, Analysis and Physics, August 2003
University of Washington, Seattle:
Differential Geometry and PDE Seminar, May 2003
Princeton University: Geometric Analysis Seminar, November 2002

- Accepted Publications** The decomposition of Global Conformal Invariants (470 pages), accepted for publication in the *Annals of Math. Studies*, Princeton University Press.
- The decomposition of Global Conformal Invariants V, (87 pages), accepted for publication in the *Pacific Jour. of Math.*
- The decomposition of global conformal invariants IV:
A proposition on local Riemannian invariants,
Advances in Mathematics, **225** (2011), 515-597.
- The decomposition of global conformal invariants: Some Technical Proofs I,
SIGMA **7** (2011), 41 pages.
- Uniqueness of smooth stationary black holes in vacuum:
Small perturbations of the Kerr spaces, (joint with A. Ionescu, S. Klainerman),
Comm. Math. Phys. **299**, (No. 1), (2010), (89-127).
- Hawking's local rigidity theorem without analyticity,
(joint with A. Ionescu, S. Klainerman),
Geom. Funct. Anal. **20**, No. 4, (2010), (845-869).
- Renormalized area and properly embedded minimal surfaces in hyperbolic 3-manifolds,
(joint with R. Mazzeo) *Comm. Math. Phys.* **297**, No. 3, (2010), (621-651).
- On the Decomposition of Global conformal invariants I,
Annals of Math., **170**, No.3, (2009), 1241-2306.
- On the Decomposition of Global conformal invariants II,
Advances in Mathematics, **206**, (2006), 466-502.
- On Conformally Invariant Differential Operators in Odd Dimensions*,
(Announcement), Proc. Natl. Acad. Sci. **100**, 4409-4410, 2003
- Non-Refereed Publications** Unique continuation for the vacuum Einstein equations
(20 pages), arXiv:0902.1131.
- On Conformally Invariant differential operators,
math.DG/0608771, (50 pages).
- Workshop organization** Banff International Research station:
5-day workshop on Conformal and CR geometry, August 2012.
- Workshop on General Relativity and related PDEs,
AMS Southeastern Sectional Meeting, Boca Raton FL,
November 2009, co-organizer.
- NSF Research Training Group in Analysis and Geometry,
Princeton University:
Scientific Coordinator, summer 2006 and summer 2007.
Coorganizer, summer 2008.
- Teaching Experience** MAT195 (EngSci, Univ. of Toronto): Calculus II.
Instructor, Spring 2011.
- MAT457/MAT1000, MAT458/MAT1001: Real Analysis I and II,
(Univ. of Toronto, Instructor, Fall 2010 and Spring 2011
- MAT303: Ordinary Differential Equations (Princeton).
Course Head and Instructor, Fall 2006.
- MAT202: Introduction to Linear Algebra (Princeton)
Instructor, Spring 2006.
- MAT104: Introduction to Calculus (Princeton)
Instructor, Spring 2008, Fall 2007, Fall 2005, Fall 2004.
Reviewer, Spring 2008, Fall 2007, Fall 2006, Fall 2005.
- MAT 201: Multi-variable Calculus (Princeton)
Instructor, Spring 2005.

**Student and
Postdoc
Supervision**

Dezhong Chen: NSERC-funded PDF, 2010-2012.

Arick Shao: Incoming PDF 2011–2014

Jesse Gell-Redman: Incoming PDF 2012–2014.

Greg Fournodavlos:

Incoming graduate student, 2011-2016.