Nikolaos Eptaminitakis

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Education

PhD in Mathematics — *University of Washington, Seattle*
Advisers: Prof. C. Robin Graham & Prof. Gunther Uhlmann.
2014-2020
Thesis title: Geodesic X-Ray Transform on Asymptotically Hyperbolic Manifolds

MSc in Mathematics — *University of Washington, Seattle*
2018

BSc (Ptychion) in Mathematics — *Aristotle University of Thessaloniki*
2009 - 2013

Employment

Institute of Differential Geometry, Leibniz University Hannover — 2022-Present
Wissenschaftlicher Mitarbeiter (Postdoc) — *Hannover, Germany*

Department of Mathematics, Purdue University — 2020-2022
Golomb Visiting Assistant Professor (Postdoc) — *West Lafayette, IN*

Department of Mathematics, University of Washington — 2019-2020
Lead TA — *Seattle, WA*
Administrative responsibility for training all incoming Teaching Assistants (TAs), supervising the TA Mentor team, and mentoring new TAs.

Department of Mathematics, University of Washington — 2014-2019
Teaching Assistant/Research Assistant — *Seattle, WA*

Fellowships, Honors, Awards

Travel Grant "Contacts, Networks, Careers" — *2024 and 2025*
Graduiertenakademie, Leibniz Universität Hannover
Awarded for conference participation outside Europe

Travel Grant "Contacts, Networks, Careers" — *2023*
Graduiertenakademie, Leibniz Universität Hannover
Awarded for conference participation in Germany

Excellence in Teaching Award — *2019*
Department of Mathematics, University of Washington

Graduate Fellowship — *2018*
Department of Mathematics, University of Washington

Academic Merit Award — *2014*
Department of Mathematics, University of Washington

Nikolaos Danikas Award — *2013*
Department of Mathematics, Aristotle University of Thessaloniki

Thomas Papamichailides Fellowship *2011-2013*
Aristotle University of Thessaloniki

Honorary Scholarship *2009 & 2011*
State Scholarships Foundation

Scholarship *2010*
State Scholarships Foundation

The Great Moment for Education Fellowship *2009*
Eurobank

Academic Visits

Mathematical Sciences Research Institute *August - December 2019*
Program Associate, Microlocal Analysis. *Berkeley, CA*

Stanford University *February - March 2019*
Visiting Graduate Student *Palo Alto, CA*

Karlsruhe Institute of Technology (KIT) *April-August 2012*
LLP-Erasmus Exchange Program *Karlsruhe, Germany*

Research Interests

Geometric Inverse Problems, Microlocal and Singular Analysis, Differential Geometry, Partial Differential Equations.

Publications

1. Asymptotically Hyperbolic Manifolds with Boundary Conjugate Points but No Interior Conjugate Points
With C. Robin Graham
J. Geom. Anal. (2021) 31:6819-6844, arXiv:1912.04856

2. Local X-Ray Transform on Asymptotically Hyperbolic Manifolds via Projective Compactification
With C. Robin Graham
New Zealand Journal of Mathematics (2021) 52:733-763. arXiv:2111.13631

3. Stability Estimates for the X-Ray Transform on Simple Asymptotically Hyperbolic Manifolds
Pure Appl. Anal. 4 (2022), no. 3, 487-516, arXiv:2104.01674

4. The Solid-Fluid Transmission Problem
With Plamen Stefanov
Trans. Amer. Math. Soc. 377 (2024), no. 4, 2583–2633, arXiv:2111.03218

5. Weakly Nonlinear Geometric Optics for the Westervelt Equation and Recovery of the Nonlinearity
With Plamen Stefanov
SIAM J. Math. Anal. 56, No. 1, 801-819 (2024), arXiv:2208.13945

6. The Covariance Metric in the Blaschke Locus
With Xian Dai
J. Geom. Anal. 34, No. 5, Paper No. 145 (2024), arXiv:2301.05289

7. The hyperbolic X-ray transform: new range characterizations, mapping properties and functional relations
With François Monard and Yuzhou Zou
Accepted, Inverse Problems and Imaging, arXiv:2405.02521

1. The DC Kerr Effect in Nonlinear Optics
With Plamen Stefanov
Under Review, arXiv:2505.01392

Invited Talks

12th Applied Inverse Problems Conference, Rio de Janeiro *Title: Tensor Tomography on the Hyperbolic Disk*	*July 31, 2025*
Geometric and Harmonic Analysis Seminar, Paderborn University *Title: The Geodesic X-Ray Transform on the Hyperbolic Disk*	*May 27, 2025*
Harmonic Analysis & PDE Seminar, University of Bonn *Title: Inverse Problems for Nonlinear Hyperbolic PDEs with Geometric Optics* *— the Westervelt equation and the DC Kerr system*	*May 23, 2025*
Analysis Meeting, Aristotle University of Thessaloniki *Title: Range Characterizations and Functional Relations* *for the X-ray Transform on Hyperbolic Space*	*December 23, 2024*
Differential Geometry Seminar, University of Kiel *Title: The Blaschke Locus and the Covariance Metric*	*December 12, 2024*
Summer School: Geometric Inverse Problems **and Inverse Problems for Elliptic Equations, Santa Cruz, CA** *Title: The Hyperbolic X-Ray Transform: Range Characterizations,* *Functional Relations and Mapping Properties*	*August 20, 2024*
Analysis Meeting, Aristotle University of Thessaloniki *Title: The Method of Weakly Nonlinear Geometric Optics for the Westervelt Equation*	*December 22, 2023*
11th Applied Inverse Problems Conference, Göttingen *Title: Weakly nonlinear geometric optics for the Westervelt equation*	*September 5, 2023*
Analysis and PDE Seminar, University of Bonn *Title: The Solid-Fluid Transmission Problem*	*December 9, 2022*
Geometrical Inverse Problems Workshop, Linz, Austria *Title: Stability for the X-Ray Transform on Asymptotically Hyperbolic Manifolds*	*November 10, 2022*
Second Congress of Greek Mathematicians, Athens, Greece *Title: Inverse Problems for the X-Ray Transform on Asymptotically Hyperbolic Manifolds*	*July 6, 2022*
Conformal Geometry, Analysis, and Physics Conference, Seattle, WA *Title: Stability for the X-ray Transform on Asymptotically Hyperbolic Manifolds*	*June 13, 2022*
Inverse Problems: Modeling and Simulation Conference, Malta *Title: The Solid-Fluid Transmission Problem*	*May 25, 2022*
Geometry Seminar, University of Texas at Dallas *Title: Local Geodesic X-Ray Transform on Asymptotically Hyperbolic Manifolds*	*March 7, 2022*
Zoom International Inverse Problems Seminar *Title: The Solid-Fluid Transmission Problem*	*February 17, 2022*
Spectral and Scattering Theory Seminar, Purdue University *Title: The Solid-Fluid Transmission Problem*	*December 6, 2021*
PDE Seminar, Purdue University *Title: Stability for the X-Ray Transform on Asymptotically Hyperbolic Manifolds*	*March 18, 2021*

Geometry Seminar, Aristotle University of Thessaloniki   *January 26, 2021*
Title: Simple and Non-Simple Asymptotically Hyperbolic Manifolds

Inverse Problems Seminar, University of California, Irvine   *February 07, 2020*
Title: Geodesic X-Ray Transform on Asymptotically Hyperbolic Manifolds

Math Colloquium, Seattle University   *January 30, 2020*
Title: Radon Transform: Classical Results, Generalizations and Applications

Graduate Student Seminar, Mathematical Sciences Research Institute   *November 11, 2019*
Title: Geodesic X-Ray Transform on Asymptotically Hyperbolic Manifolds

Geometry Seminar, Aristotle University of Thessaloniki   *June 10, 2019*
Title: Geodesic X-Ray Transform on Asymptotically Hyperbolic Manifolds

Student Analysis Seminar, Stanford University   *March 5, 2019*
Title: Geodesic X-Ray Transform on Asymptotically Hyperbolic Manifolds

Analysis Meeting, Aristotle University of Thessaloniki   *December 12, 2018*
Title: The Radon Transform and Pseudodifferential Operators

Teaching Experience

At Leibniz University Hannover (in German)

- Exercises in Analysis I (Winter 2024)

- Exercises in Analysis II (Summer 2025)

- Exercises in Geometry for Teachers (Summer 2024)

- Exercises in Complex Differential Geometry (Summer 2023)

- Exercises in Differential Topology (Winter 2022 and 2023)

Typical responsibilities include selecting exercises, administering tutorials, and grading student submissions.

At Purdue Univerisity

- MA 30300: Differential Equations and Partial Differential Equations for Engineering and the Sciences (Spring 2022)

- MA 26600: Ordinary Differential Equations (Fall 2020, Spring 2021)

Sole instructor for the courses listed above with full responsibility.

At University of Washington

- Math 120: Precalculus (Spring 2018)

- Math 324: Advanced Multivariable Calculus (Summer 2016, Winter 2017, Autumn 2017, Winter 2018, Spring 2020)

Sole instructor for the courses listed above with full responsibility.

- Math 124: Calculus with Analytic Geometry I (Autumn 2014, Winter 2015)

- Math 125: Calculus with Analytic Geometry I (Winter 2019)

- Math 126: Calculus with Analytic Geometry III (Spring 2015, Summer 2015, Winter 2016, Spring 2017, Autumn 2018)

- Math 411: Introduction to Modern Algebra for Teachers (Autumn 2016)

Teaching assistant for the courses listed above. Responsibility for administering tutorials, holding office hours, and grading student work, except for the last course in which there were no tutorials.

Mentoring Experience

Washington Directed Reading Program
Mentor for the undergraduate reading project Topology and Geometry of Surfaces (Winter 2020)
Mentor for the undergraduate reading project Mathematics of Medical Imaging (Autumn 2018 & Spring 2019)

TA Mentor Team, Department of Mathematics, University of Washington
Member of a team of six experienced TA Mentors that trained and mentored incoming graduate Teaching Assistants (Fall 2018)

Washington Experimental Mathematics Lab
Mentor for the undergraduate research project Number Theory and Noise (Spring 2017-Winter 2018)

Administrative Experience

Co-organizer of the Northern German Differential Geometry Day   *June 27, 2025*
Institute of Differential Geometry, Leibniz University Hannover

Co-organizer of the Oberseminar "Differential Geometry"   *Summer 2024-Present*
Institute of Differential Geometry, Leibniz University Hannover

Co-organizer of the Mini-Workshop "Geometry and Analysis in Hannover and Magdeburg"   *January 23-24, 2025*
Institute of Differential Geometry, Leibniz University Hannover

Departmental Service

Member of the Undergraduate Program Committee   *2019-2020*
Department of Mathematics, University of Washington

Language Proficiencies

Greek (native), English (fluent, C2), German (advanced, C1)