

# Monika Pichler

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## CONTACT INFORMATION

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## EDUCATION

### Northeastern University, Boston, MA

Ph.D., Mathematics May 2019

Dissertation: *Inverse boundary value problems for Maxwell's equations*

**Advisor: Prof. Ting Zhou**

Graduate Certificate in Biotechnology December 2018

### State University of New York at Buffalo, Buffalo, NY

Doctoral coursework, Mathematics (transferred) August 2013 - May 2014

### Technische Universität (TU) Wien, Vienna, Austria

M.S., Mathematics in Science and Technology June 2013

Thesis: *Boundary behavior of singular integrals*

Advisor: Prof. Harald Woracek

Graduated *cum laude*

B.S., Mathematics in Science and Technology September 2011

Thesis: *The quantum-hydrodynamic model for semiconductors in thermal equilibrium*

Advisor: Prof. Ansgar Jüngel

Graduated *cum laude*

## RESEARCH EXPERIENCE

**Graduate Student Researcher** Sep. 2014 to May 2019

Department of Mathematics, Northeastern University

Advisor: Dr. Ting Zhou

*Research Focus:*

Analysis of partial differential equations

Well-posedness of boundary value problems for Maxwell's equations

Inverse boundary value problems for Maxwell's equations

Uniqueness of solutions to inverse problems in settings with full or partial boundary data, on bounded and unbounded domains

**Graduate Student Researcher** Aug. 2013 to May 2014

Department of Mathematics, State University of New York at Buffalo

*Research Focus:*

Inverse scattering transform (IST) for the nonlinear Schrödinger equation

Long-time asymptotic analysis of solutions constructed using IST

JOURNAL  
PUBLICATIONS  
(2)

1. M.P., Gino Biondini: On the focusing non-linear Schrödinger equation with non-zero boundary conditions and double poles. *IMA J Appl Math* 2017; 82 (1): 131-151.
2. M.P.: An inverse problem for Maxwell's equations with Lipschitz parameters. *Inverse Problems* 2018, 34(2):025006; <https://doi.org/10.1088/1361-6420/aaa352>

PREPRINTS

1. M.P.: Inverse problems for Maxwell's equations in a slab with partial boundary data. <https://arxiv.org/abs/1806.08772>

OTHER  
EXPERIENCE

**Fellow, Insight Health Data Science**

Jan. 2019 to Apr. 2019

Boston, MA

Consulted with Multiply Labs to build algorithm to find combinations of prescription drugs by indication and delivered query tool in web application using Dash

TEACHING  
EXPERIENCE

**Department of Mathematics, Northeastern University**

**Instructor:**

MATH 1215 *Mathematical Thinking*

Fall 2015, Spring 2016, Fall 2016, Spring 2017

MATH 2341 *Differential Equations and Linear Algebra*

Summer 2017

**Teaching Assistant:**

MATH 2321 *Calculus 3 for Science/Engineering*, Fall 2014, Spring 2015

MATH 2331 *Linear Algebra*, Summer 2015

MATH 1241 *Calculus 1*, Fall 2017

MATH 4525 *Applied Analysis*, Spring 2019

MATH 7206 *Inverse Problems: Radon Transform, X-Ray Transform, and Applications*, Spring 2019

**Department of Mathematics, State University of New York at Buffalo**

**Teaching Assistant:**

MTH 122 *Survey of Calculus and Its Applications II*, Fall 2013

MTH 131 *Mathematical Analysis for Management*, Fall 2013, Spring 2014

MTH 241 *College Calculus 3*, Spring 2014

INSTITUTES AND  
WORKSHOPS (8)

- Heidelberg Laureate Forum** September 2018  
University of Heidelberg, Germany  
*Awarded travel grant from Oak Ridge Associated Universities (ORAU)*
- Novel Optical Materials Workshop** March 2017  
Institute for Mathematics and its Applications (IMA), Minneapolis, MN  
*Awarded travel grant from IMA*
- Harmonic Analysis and Elliptic Equations on Real Euclidean Spaces and on Rough Sets Summer Program** June 2016  
Mathematical Science Research Institute (MSRI), Berkeley, CA  
*Awarded travel grant from MSRI*
- Applied Inverse Problems Summer Program** May 2015  
University of Helsinki, Finland  
*Awarded travel grant from NSF grant administered at University of Washington*
- Dispersive Partial Differential Equations Summer Program** June 2014  
Mathematical Science Research Institute, Berkeley, CA  
*Awarded travel grant from MSRI*
- Studying Abroad ERASMUS Programme** April 2012 to Aug. 2012  
University of Bremen, Germany  
*Scholarship funded by the European Union*
- Metaheuristics for Global Optimization Spring Program** March 2012  
ATHENS Programme, Warsaw University of Technology, Poland  
*Awarded travel grant from ATHENS Programme*
- When Mathematics Meets Nanosciences Summer Program** June 2011  
University of L'Aquila, Italy  
*Awarded travel grant from University of L'Aquila*

CONFERENCE  
TALKS (3)

*Two partial data inverse problems for Maxwell's equations in a slab.* AMS Fall Central Sectional Meeting, University of Michigan, Ann Arbor, MI, October 2018

*Inverse Problems for Maxwell's Equations in a Slab with Partial Boundary Data.* SIAM Conference on Mathematics of Planet Earth (MPE18), Philadelphia PA, September 2018

*An inverse problem for Maxwell's equations with Lipschitz parameters.* AMS Spring Eastern Sectional Meeting, Northeastern University, Boston MA, April 2018

POSTERS (2)

*The Inverse Problem for Maxwell's Equations on a Bounded Lipschitz Domain with Lipschitz Parameters.* Heidelberg Laureate Forum, Heidelberg, Germany, September 2018

*The Inverse Problem for Maxwell's Equations on a Bounded Lipschitz Domain with Lipschitz Parameters.* IMA Workshop *Novel Optical Materials*, University of Minnesota, March 2017

COLLOQUIUM  
TALKS (5)

*An inverse boundary value problem for Maxwell's equations.* Boston Graduate Math Colloquium, Harvard University, Cambridge MA, April 2018

*An inverse boundary value problem for Maxwell's equations.* AMS Graduate Student Conference at Brown, Brown University, Providence RI, February 2018

*An inverse problem for Maxwell's equations.* Northeastern University Graduate Student Seminar, Boston MA, March 2017

*Seeing the unseen: Inverse problems and their applications.* Northeastern University Graduate Student Seminar, Boston MA, October 2016

*Inverse scattering transform for the focusing nonlinear Schrödinger equation with non-zero boundary conditions at infinity.* Northeastern University Graduate Student Seminar, Boston MA, November 2014

TECHNICAL  
SKILLS

**Programming Languages:**

Python, MATLAB, Mathematica

**Tools:**

pandas, NumPy, Matplotlib, seaborn, NetworkX, scikit-learn, Jupyter, Dash

**Applications:**

$\text{\TeX}$  ( $\text{\LaTeX}$ ,  $\text{\BIBTeX}$ ), Microsoft Office, OpenOffice

**Languages:**

English, Fluent

German, Native Speaker

Italian, Fluent

Spanish, Basic Knowledge

Dutch, Basic Knowledge

Austrian Sign Language, Basic Knowledge

ACTIVITIES AND  
SERVICE

**Pie R Squared** Spring 2016 to present

Volunteer tutor for middle school and high school children in Roxbury, MA  
<http://www.piersquared.org>

**Mathematics Graduate Student Association** Fall 2015 to Summer 2018

Secretary, Northeastern University

**Math Club Organizing Committee** Fall 2017 to Summer 2018

Graduate Student Representative, Northeastern University

REFERENCES

**Ting Zhou**

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Department of Mathematics  
Northeastern University  
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**Egon Schulte**

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**Gino Biondini**

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