

Curriculum Vitae Tyni, Teemu

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University of Toronto, Canada
Department of mathematics

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Education

University of Oulu

PhD. in Applied mathematics, 2018.

MSc. in Applied mathematics, 2015.

B.S. in Mathematics, 2013.

Dissertation: “Direct and inverse scattering problems for perturbations of the biharmonic operator”

Opponent: Prof. David Colton (Univ. of Delaware, USA)

Language skills

Finnish (native), English (fluent), Swedish (basics)

Current employment

Dept. of Mathematics, University of Toronto, Canada

Post-doctoral fellow, 1st of August, 2021 – present.

Supervisor: Professor Spyros Alexakis

Previous work experience

Dept. of Mathematics and Statistics, University of Helsinki, Finland

Post-doctoral researcher, 2019-2021.

Supervisor: Professor Matti Lassas

Dept. of Math. Sciences, University of Oulu, Finland

Post-doctoral researcher, 2018-2019.

PhD. student, 2015-2018.

Supervisors: Professor Valery Serov Docent Markus Harju

Sodankylä geophysical observatory, Finland

Researcher, 2014

Reference: Lassi Roininen

Dept. of Physics, University of Oulu, Finland

Research assistant at electron spectroscopy group, 2013

Reference: Lauri Hautala

Research funding

I received 32500€ research fund from the Emil Aaltonen foundation (Emil Aaltosen säätiö) in 2021
<https://emilaaltonen.fi/wp-content/uploads/2021/05/saajaluettelo.pdf>

I was awarded a four (4) year funding towards the completion of my PhD research in 2015 by Exactus (University of Oulu, Doctoral programme in Exact Sciences). The amount of funding corresponded to full salary for four years. I had a significant part in the preparation of the application. Supervisors: Professor Valery Serov and docent Markus Harju.

Scientific talks

1. Invited talk at International Zoom Inverse Problems seminar in February 2022, (University of California, Irvine, USA)
<https://sites.uci.edu/inverse/teemu-tyni-university-of-toronto/>
2. Invited talk at Inverse Problems and Nonlinearity online conference in August 2021, (Jyväskylä, Finland)
<https://www.jyu.fi/science/en/math/research/inverse-problems/inverse-problems-and-nonlinearity-2020>
3. Conference talk at Inverse Days 2019 (Jyväskylä, Finland)
<https://www.jyu.fi/science/en/math/research/inverse-problems/id2019>
4. Conference talk at AIP2019 (Grenoble, France)
<https://www.aip2019-grenoble.fr>
5. Conference talk at Inverse Days 2018 (Helsinki, Finland)
http://math.aalto.fi/en/research/applied/inverseproblems/inverse_days-2018/
6. Conference talk at Mathematical Days 2018 (Joensuu, Finland)
<https://www.uef.fi/fi/web/matematiikanpaivat2018>
7. Conference talk at Inverse Days 2016 (Kuopio, Finland)
<http://venda.uef.fi/inverse/FrontPage/IPDays2016>
8. Conference talk at Inverse Days 2015 (Lappeenranta, Finland)
<http://www.mafy.lut.fi/inversedays2015/>
9. Frequent speaker in the inverse problems research seminar at University of Oulu 2015–19
<http://www.oulu.fi/inverse/seminar>

Master's thesis supervision

MSc. Manu Holmberg, (co-supervisor with prof. Matti Lassas) completed in 2020

Teaching

Dept. of Math., University of Toronto

Instructor (Lecturer), Calculus 2 (MAT136) 2022

Instructor (Lecturer), Calculus 1 (MAT135) 2021

Dept. of Math. and Statistics, University of Helsinki

Teaching assistant, Partial differential equations 2021 (Zoom)

Lecturer, Inverse Problems II: Tomography and regularization 2020

Lecturer, Mathematics everywhere (MOOC) 2020

Lecturer, Latex course (online course) 2020

Lecturer, Recap of high school math. (online course) 2020

Lecturer, Inverse Problems II: Tomography and regularization 2019

Unit of Math. Sciences, University of Oulu

Lecturer, Introduction to LaTeX 2018–19

Teaching assistant, Complex analysis II 2018

Lecturer, Laboratory exercises in physics 1, Intro. to LaTeX 2018–19

Teaching assistant, Operator theory and integral equations 2017

Teaching assistant, Series and the integral 2017

Teaching assistant, Derivative 2016

Teaching assistant, A second course in differential equations 2015

Teaching assistant, Introduction to real functions 2015–16

Teaching assistant, Introduction to mathematical deduction 2015–16

Awards

- I received the Finnish Inverse Prize (2000€) for my PhD work in 2018.
<https://www.fips.fi/fipsprize.php>
- I was nominated for the *Teacher of the year* award by the students at University of Helsinki.

Other academic merits

1. I am an active referee for the journals: Inverse Problems & Imaging, SIAM Journal on Applied Mathematics, and Inverse Problems in Science & Engineering.
2. Organizing conferences:
 - I organized a minisymposium at the “Inverse Problems: Modeling and Simulations” conference at Malta, 2022.
<https://www.ipms-conference.org/ipms2022/m27>
 - I was part in organizing committee of the online conference “Inverse Problems and Nonlinearity”, Helsinki 2020.
<https://www.jyu.fi/science/en/math/research/inverse-problems/inverse-problems-and-nonlinearity-2020>
 - I took significant part in the organizing committee of the conference “Inverse Days, 2017” in Oulu.

Tyni, Teemu

Click on the journal title to open the link in browser. Also please find the up-to-date list of publications on my personal web page: <https://www.mv.helsinki.fi/home/tyniteem/research/>

A. Peer-reviewed scientific articles

1. Liimatainen T, Lin Y-H, Salo M and Tyni T, *Inverse problems for elliptic equations with fractional power type nonlinearities*, J. Differ. Equ., **306**, 189-219, 2022. DOI: 10.1016/j.jde.2021.10.015
2. Harju M, Kultima J, Serov V and Tyni T, *Two-dimensional inverse scattering for quasi-linear biharmonic operator*, Inverse Prob. Imag. **15**(5) 1015-1033, 2021. DOI: 10.3934/ipi.2021026
3. Brander T, Ilmavirta J, Piiroinen P and Tyni T, *Optimal recovery of a radiating source with multiple frequencies along one line*, Inverse Prob. Imag. **14**(6): 967-983, 2020. DOI: 10.3934/ipi.2020044
4. Tyni T, *Numerical results for Saito's uniqueness theorem in inverse scattering theory*, Inverse Problems, **35**(6), 065002, 2020. DOI: 10.1088/1361-6420/ab7d2d
5. Serov V and Tyni T, *Inverse medium problem for a singular contrast*, J. Math. Phys. **60**, 111508, 2019. DOI: 10.1063/1.5097915
6. Tyni T and Serov V, *Inverse scattering problem for quasi-linear perturbation of the biharmonic operator on the line*, Inverse Prob. Imag., **13**(1): 159–175, 2018. DOI: 10.3934/ipi.2019009
7. Tyni T, *Recovery of singularities from a backscattering Born approximation for a biharmonic operator in 3D*, Inverse Problems, **34**, 045007, 2018. DOI: 10.1088/1361-6420/aaaf7f
8. Tyni T and Serov V, *Scattering problems for perturbations of the multidimensional biharmonic operator*, Inverse Prob. Imag., **12**(1): 205–227, 2018. DOI: 10.3934/ipi.2018008
9. Tyni T and Harju M, *Inverse backscattering problem for perturbations of biharmonic operator*, Inverse Problems, **33**, 105002, 2017. DOI: 10.1088/1361-6420/aa873e
10. Serov V and Tyni T, *Inverse Scattering Problems for Perturbed Bi-harmonic Operator*, AIP Conference Proceedings 1776, 2016. DOI: 10.1063/1.4965410
11. Tyni T, Harju M and Serov V, *Recovery of singularities in fourth order operator on the line from limited data*, Inverse Problems, **32**, 075001, 2016. DOI: 10.1088/0266-5611/32/7/075001

B. Non-refereed scientific articles

1. Lassas M, Liimatainen T, Potenciano-Machado L and Tyni T, *An inverse problem for a semi-linear wave equation: a numerical study*, Pre-print: arXiv:2203.09427, 2022.

2. Lassas M, Liimatainen T, Potenciano-Machado L and Tyni T, *Stability estimates for inverse problems for semi-linear wave equations on Lorentzian manifolds*, Pre-print: arXiv:2106.12257, 2021.
3. Lassas M, Liimatainen T, Potenciano-Machado L. and Tyni T, *Uniqueness and stability of an inverse problem for a semi-linear wave equation* Pre-print: arXiv:2006.13193, 2020.

G. Theses

1. Tyni T, *Direct and inverse scattering problems for perturbations of the biharmonic operator*, Doctoral dissertation, Acta Universitatis Ouluensis. A, Scientiae rerum naturalium, 725, Oulu, 2018.
2. Tyni T, *Direct and inverse scattering problems for operator of order 4 on the line*, Master's thesis, Oulu, 2015.