

Ing. František Štampach, Ph.D.

CONTACT INFORMATION

Faculty of Nuclear Sciences and Physical Engineering
Czech Technical University in Prague
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RESEARCH INTERESTS

Spectral analysis of linear operators (Schrödinger, Dirac, Jacobi, CMV, Hankel, Toeplitz, etc.), mathematical methods in quantum physics, orthogonal polynomials, moment problem, asymptotic analysis, special functions.

EDUCATION

Czech Technical University in Prague, Czech Republic

Ph.D., Faculty of Nuclear Sciences and Physical Engineering, September 2014

- Thesis Topic: *Spectral Analysis of Jacobi Matrices and Related Problems*
- Supervisor: Prof. Ing. Pavel Štoviček, DrSc.

Master's Degree, Faculty of Nuclear Sciences and Physical Engineering, June 2010

- Graduated with honors
- Thesis Topic: *Spectral Problem of Jacobi Matrices of a Certain Type*

POSITIONS

- **01/01/2020 - present**: Assistant Professor at the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague
- **01/09/2012 - 31/12/2019**: Assistant Professor at the Faculty of Information Technology, Czech Technical University in Prague
- **01/11/2015 - 31/10/2017**: Postdoc at Department of Mathematics, Stockholm University
- **01/09/2015 - 31/10/2015**: Postdoc at Mathematisches Institut, Universität Bern

JOURNAL PUBLICATIONS

- The Hilbert L-matrix, *J. Funct. Anal.* **282** (2022) 1-46.
- A sharp form of the discrete Hardy inequality and the Keller-Pinchover-Pogorzelski inequality, joint with D. Krejčířík, *Amer. Math. Monthly.* **129** (2022) 281-283.
- On Lieb-Thirring inequalities for one-dimensional non-self-adjoint Jacobi and Schrödinger operators, joint with S. Bögli, *J. Spectr. Theory* **11** (2021) 1391-1413.
- New explicitly diagonalizable Hankel matrices related to the Stieltjes-Carlitz polynomials, joint with P. Štoviček, *Integr. Equ. Oper. Theory* **93** (2021) 1-39.
- Asymptotic behaviour and zeros of the Bernoulli polynomials of the second kind, *J. Approx. Theory* **262** (2021) 1-28.
- New family of symmetric orthogonal polynomials and a solvable model of a kinetic spin chain, joint with T. Kalvoda, *J. Math. Phys.* **61** (2020) 1-21.
- Location of eigenvalues of non-self-adjoint discrete Dirac operators, joint with B. Casano, O. O. Ibrogimov, and D. Krejčířík, *Ann. Henri Poincaré* **21** (2020) 2193-2217.
- The asymptotic zero distribution of Lommel polynomials as polynomials of their order with a variable complex argument, joint with P. Blaschke, *J. Math. Anal. Appl.* **490** (2020) 1-19.
- On Hankel matrices commuting with Jacobi matrices from the Askey scheme, joint with P. Štoviček, *Linear Alg. Appl.* **591** (2020) 235-267.
- Spectral enclosures for non-self-adjoint discrete Schrödinger operators, joint with O. O. Ibrogimov, *Integr. Equ. Oper. Theory* **91** (2019) 1-15.

- Spectral analysis of two doubly infinite Jacobi matrices with exponential entries, joint with M. E. H. Ismail, *J. Func. Anal.* **276** (2019) 1681-1716.
- Spectral representation of some weighted Hankel matrices and orthogonal polynomials from the Askey scheme, joint with P. Šťovíček, *J. Math. Anal. Appl.* **472** (2019) 483-509.
- Non-self-adjoint Toeplitz matrices whose principal submatrices have real spectrum, joint with B. Shapiro, *Constr. Approx.* **49** (2019) 191-226.
- The Hurwitz-type theorem for the regular Coulomb wave function via Hankel determinants, joint with Á. Baricz, *Linear Alg. Appl.* **548** (2018) 259-27.
- Spectral analysis of non-self-adjoint Jacobi operator associated with Jacobian elliptic functions, joint with P. Siegl, *Oper. Matrices* **11** (2017) 901-928.
- The characteristic function for complex doubly infinite Jacobi matrices, *Integr. Equ. Oper. Theory* **88** (2017) 501-534.
- Factorization of the characteristic function of a Jacobi matrix, joint with P. Šťovíček, *Oper. Matrices* **11** (2017) 147-169.
- On extremal properties of Jacobian elliptic functions with complex modulus, joint with P. Siegl, *Math. Anal. Appl.* **442** (2016) 627-641.
- Nevanlinna extremal measures for polynomials related to q^{-1} -Fibonacci polynomials, *Adv. Appl. Math.* **78** (2016) 56-75.
- The Nevanlinna parametrization for q -Lommel polynomials in the indeterminate case, joint with P. Šťovíček, *J. Approx. Theor.* **201** (2016) 48-72.
- Special functions and spectrum of Jacobi matrices, joint with P. Šťovíček, *Linear Alg. Appl.* **464** (2015) 38-61.
- The Hahn-Exton q -Bessel function as the characteristic function of a Jacobi matrix, joint with P. Šťovíček, *Spec. Matrices* **2** (2014) 131-147.
- Orthogonal polynomials associated with Coulomb wave functions, joint with P. Šťovíček, *J. Math. Anal. Appl.* **419** (2014) 231-254.
- The characteristic function for Jacobi matrices with applications, joint with P. Šťovíček, *Linear Alg. Appl.* **438** (2013) 4130-4155.
- On the eigenvalue problem for a particular class of finite Jacobi matrices, joint with P. Šťovíček, *Linear Alg. Appl.* **434** (2011) 1336-1353.

PRIZES AND
COMPETITIONS

- Josef Hlávka Award for excellent students and graduates of Czech public universities and young talented academics of the Academy of Sciences of the Czech Republic.
- Honorable mention to the doctoral thesis by the Václav Votruba prize committee.

GRANTS

- New challenges for spectral theory: geometry, artificial materials and complex fields, EXPRO grant No. 20-17749X of the [Czech Science Foundation](#) (team member).
- European Regional Development Fund-Project "Center for Advanced Applied Science", grant No. CZ.02.1.01/0.0/0.0/16_019/0000778 (team member).
- Spectral Analysis of Operators and its Applications in Quantum Mechanics, grant No. GA13-11058S of the [Czech Science Foundation](#) (team member).

JOURNALS
REFEREED FOR

Advances in Mathematical Physics; Analysis and Applications; Analysis and Mathematical Physics; Analysis Mathematica; Applied Mathematics and Computation; Computational and Applied Mathematics; Constructive Approximations; Integral Equations and Operator Theory; Inverse Problems in Science and Engineering; Journal of Difference Equations and Applications; Journal of Mathematical Analysis and Applications; Linear Algebra and its Applications; Methods of Functional Analysis and Topology; Mathematical Reviews, American Mathematical Society; Numerical Algorithms; Operators and Matrices; Operator Theory: Advances and Applications; Positivity; Results

in Mathematics; Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas; Symmetry, Integrability and Geometry: Methods and Applications (SIGMA); The Ramanujan Journal.

SELECTED
CONFERENCES
WITH ACTIVE
PARTICIPATION

- *Workshop on Operator Theory, Complex Analysis, and Applications*, Lisbon, Portugal, June 2021.
- *Mathematical aspects of the physics with non-self-adjoint operators*, Marseille, France, February 2021.
- *The 6th Najman Conference on Spectral Theory and Differential Equations*, Sveti Martin na Muri, Croatia, September 2019.
- *International Workshop on Operator Theory and its Applications*, Lisbon, Portugal, July 2019.
- *Colloquium for Queen's University Belfast*, Belfast, Northern Ireland, September 2018.
- *Hausdorff Geometry of Polynomials and Polynomial Sequences Conference*, Stockholm, Sweden, May 2018.
- *The Fifth Najman Conference on Spectral Theory and Differential Equations*, Opatija, Croatia, September 2017.
- *International Conference on Special Functions*, Hong Kong, China, June 2017.
- *Operator Theory, Analysis and Mathematical Physics*, Saint Petersburg, Russia, August 2016.
- *The 26th International Conference in Operator Theory*, Timisoara, Romania, June 2016.
- *Workshop on Operator Theory, Complex Analysis, and Applications*, Coimbra, Portugal, June 2016.
- *Conference on Mathematics and Applications*, Kuwait City, Kuwait, November 2014.
- *Operator Theory, Analysis and Mathematical Physics*, Stockholm, Sweden, July 2014.
- *An International Symposium on Orthogonality, Quadrature and Related Topics*, Puerto de la Cruz, Spain, January 2014.
- *International Workshop on Operator Theory and its Applications*, Bangalore, India, December 2013.
- *The 6th Pacific RIM Conference on Mathematics*, Sapporo, Japan, July 2013.
- *Operator Theory, Analysis and Mathematical Physics Conference*, Barcelona, Spain, June 2012.
- *International Workshop on Operator Theory and its Applications*, Sevilla, Spain, July 2011.

TEACHING
EXPERIENCE

Lectures:

- Analysis 4 (Measure & Integration Theory)
- Analysis 3 (Function Series, Topology, Functions of Several Variables)
- Linear Algebra
- Selected Mathematical Methods

Exercises:

- Advanced Real Analysis
- Equations in Mathematical Physics
- Quantum Physics
- Calculus 1-4
- Linear Algebra
- Introduction to Algebra and Number Theory
- Probability and Statistics