

Pavel Hájek

Hackerova 791/1
181 00, Prague 8, Czech Republic
Phone: +49 176 995 71920
Email: hajek_pavel@yahoo.de
Born on September 29, 1987 in Prague
Nationality: Czech
Personal website: <https://p135246.github.io>



ACADEMIC POSITIONS

- Jan–Feb 2021 *Guest researcher* in the symplectic geometry group of Prof. Dr. Chris Wendl at the Humboldt University of Berlin.
- Sep–Dec 2020 *Mittag-Leffler scholar* in the program "Knots, strings, symplectic geometry and dualities".
- Oct 2019–2021 *Postdoc* with specialization in string topology and symplectic geometry with Prof. Dr. Janko Latschev at the University of Hamburg.
(position interrupted until March 2021)

RESEARCH INTERESTS

Actively: Chain models of string topology coming from symplectic geometry (moduli spaces of holomorphic curves), understanding relations to Chern-Simons theory, TCFT's and string field theory, applications of the language of operads, applications of the BV-formalism.

Generally: Symplectic geometry, string topology, dynamical systems—spinning tops and celestial mechanics, symmetries, integrability and semi-classical physics, mathematics of QFT and string theory.

EDUCATION

- 2015–2019 *PhD in Mathematics supervised by Prof. Dr. Kai Cieliebak at the University of Augsburg.*
Thesis on IBL-infinity algebras, string topology and perturbative Chern-Simons theory. Training in symplectic topology and dynamical systems. Final grade Magna cum laude.
- 2011–2014 *MSc in Theoretical and Mathematical Physics, LMU Munich.*
Thesis on Eilenberg-Steenrod axioms for a homology theory based on manifolds with corners supervised by Prof. Dr. Kai Cieliebak. Graduated with high distinctions.
- 2007–2011 *BSc in Physics, Charles University in Prag.*
Thesis on dynamical symmetries in classical and quantum mechanics supervised by prof. RNDr. Pavel Cejnar, Dr., DSc. Graduated with distinctions.
- 2007–2010 *BSc in Mathematics, Charles University in Prag.*
Thesis on Liouville integrability of a generalization of the Lagrange top to higher dimensions supervised by doc. RNDr. Svatopluk Krýsl, Ph.D. Graduated with high distinction.

SCHOLARSHIPS

- Sep–Dec 2020 Junior Fellowship from the Mittag-Leffler institute.
 2012–2013 Scholarship for master studies by the DAAD (full coverage).
 2007–2011 Merit based scholarship from the Charles University.

PREPRINTS

- [1] Pavel Hájek. *Hodge decompositions and Poincaré duality models*. 2020. arXiv: 2004 . 07362 [math . AT]. Submitted to Journal of Homotopy and Related Structures.
 [2] Pavel Hájek. *IBL-Infinity Model of String Topology from Perturbative Chern-Simons Theory*. 2020. arXiv: 2003 . 07933 [math-ph]. Ph.D. thesis.
 [3] Pavel Hájek. *Twisted IBL-infinity-algebra and string topology: First look and examples*. 2019. arXiv: 1811 . 05281 [math-ph].

PAPERS IN PREPARATION

- Chain-level equivariant string topology for simply connected manifolds (with K. Cieliebak and E. Volkov).
- Chain-level string topology for \mathbb{S}^1 (with K. Cieliebak).
- Chern-Simons Maurer-Cartan element in various contexts (with L. Peksová).
- Vanishing results for Hodge propagators.

TEACHING

- SS20 Exercise class in Floer Theory.
 WS19 • Four exercise classes in Mathematics for physicists I (German).
 • Exercise class in Symplectic Geometry.
 WS16–SS17 Teaching assistant in Analysis I & II (German).
 SS16 Coorganizer of a seminar on Floer homology.
 WS14–SS15 • Teaching assistant in Linear Algebra I & II (German).
 • Homework corrector in courses for math teachers (German).
 SS12–WS13 Homework corrector for Algebraic Topology I & II.

OTHER ACADEMIC EXPERIENCE

- 2018 Help with organization of the Workshop on Symplectic Field Theory IX, University of Augsburg, August 25–31 (responsible for the webpage and videos).

TALKS GIVEN

- 2021 Chain models of string topology coming from symplectic geometry I & II, Symplectic seminar of the Humboldt University of Berlin, January 11 and 25.
 2020 • Symplectic chain models of string topology, Mathematical Institute of Charles University in Prague, December 17.
 • Chern-Simons theory on \mathbb{S}^1 I & II, Informal seminar at the Mittag-Leffler institute, Stockholm, September 16 and 21.

- IBL_∞ chain model of equivariant string topology from perturbative Chern-Simons theory, Seminar on Lie groups and moduli spaces, University of Geneva, June 16.
- 2019 • Computations of the IBL_∞ structure, Workshop on String field theory, BV quantization, and moduli spaces, Simons Center for Geometry and Physics, Stony Brook, May 20–24.
- Explicit computation of Feynman integrals, Seminar for symplectic geometry, University of Augsburg, May 13, 2019.
- IBL_∞ formality and Poincaré duality models, Seminar for symplectic and contact geometry at the University of Hamburg, April 25.
- Chern-Simons theory and string topology, Seminar of the Research Institute for Mathematical Science, Kyoto, March 14.
- Feynman integrals with the Green kernel, Seminar of the Mathematical Institute at the University of Potsdam, February 28.
- IBL_∞ structure and string topology conjecture, 39th Winter School Geometry and Physics, Srní, January 12–19.
- 2016 Presentation of a part of the proof of the Cheeger-Müller theorem, Block seminar on Torsion in Geometry and Topology, Schloss Gollwitz, Brandenburg, July 3–8.
- 2015 Homology theory based on manifolds with corners, Meeting of symplectic geometers, Weimar, Germany, 16–18 January.

Some other talks in local seminars:

Costello's work on TCFT's, Chas-Sullivan string topology, Cyclic homology, Seiberg-Witten theory, Symplectic capacities and the ball packing problem, E. Witten's non-perturbative treatment of Chern-Simons theory, Linking numbers and Green kernels, Dynamics near the Lagrange points in the restricted three body problem, Molecules of the Euler top.

CONFERENCES ATTENDED

- 2020 40th Winter School Geometry and Physics, Srní, January 11–18.
- 2019 • Geometric Dynamic Days 2019, RWTH Aachen, November 15–16.
- Workshop on String field theory, BV quantization, and moduli spaces, Simons Center for Geometry and Physics, Stony Brook, May 20–24.
- 39th Winter School Geometry and Physics, Srní, January 12–19.
- 2018 Workshop on Symplectic Field Theory IX, University of Augsburg, August 25–31.
- 2017 Meeting of symplectic geometers, Free University of Berlin, Germany, February 17–19.
- 2016 • Block seminar on Torsion in Geometry and Topology, Schloss Gollwitz, Brandenburg, Germany, July 3–8.
- X Workshop on Symplectic Geometry, Contact Geometry, and Interactions, University of Augsburg, Germany, February 25–27.
- 2015 • Summer School on String Topology and Rational Homotopy Theory, University of Hamburg, Germany, September 2–4.
- Moduli Spaces in Symplectic Topology and in Gauge Theory, CIRM, Marseille, France, June 1–5.
- 35th Winter School Geometry and Physics, Srní, Czech Republic, 17–24 January.
- Meeting of symplectic geometers, Weimar, Germany, 16–18 January.

- 2014 Loop spaces in geometry and topology, University of Nantes, France, 1–5 September.
- 2013 Minicourse on free loop spaces in topology and physics, University of Münster, Germany, 24 April.
- 2012 Poisson Geometry in Mathematics and Physics, University of Utrecht, Netherlands, 23 July–3 August.

LANGUAGES

Czech mother tongue,
English full professional proficiency,
German full professional proficiency.

Ability to teach mathematics and physics in all three languages.

TECHNICAL SKILLS

- *Hobby programmer*: Wolfram *Mathematica*[®] (projects on computing Feynman integrals for spheres and searching for trajectories with prescribed itineraries in R3BP), Object Pascal (projects on triangulation of polygonal domains with holes, minimization of logical functions and others), Bash Script (automatization of daily tasks), Haskell (theoretical interest), Python and other (system tweaks and modifications).
- *Hobby electronics*: knowledge of basic A/D circuits and principles, PCB design and simulations in OrCAD, programming of microchips Atmel in Assembler and C.
- *Advanced Linux user*: knowledge of system, hardware and protocols, CLI, fast typing in Vim, versioning with GIT, remote administration via SSH, cryptography using PGP.

REFERENCES

- *Prof. Dr. Janko Latschev*: University of Hamburg, Bundesstraße 55 (Geomatikum), 20146 Hamburg, Germany. Phone: +49 40 42838 - 5147. Email: janko.latschev@uni-hamburg.de
- *Prof. Dr. Kai Cieliebak*: University of Augsburg, Universitätsstraße 14, 86159 Augsburg, Germany. Phone: +49 821 598 - 2138. Email: kai.cieliebak@math.uni-augsburg.de
- *Prof. Dr. Urs Frauenfelder*: University of Augsburg, Universitätsstraße 14, 86159 Augsburg, Germany. Phone: +49 821 598 - 2158. Email: urs.frauenfelder@math.uni-augsburg.de

HOBBIES

Windsurfing (trying power jibe), tennis (enthusiastic player), dancing (salsa parties and balls), music (playing at basic level on many instruments; folk, seamen's songs, blues).