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Curriculum Vitae

Ing. Václav Zatloukal, Ph.D.

Research assistant at the
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Born: 31 March 1987 in Opočno, Czech Republic

Publications

- V. Potoček and V. Zatloukal,
  Quantum occupation time
  Phys. Scr. **98**, 014003 (2023)

- P. Martin-Dussaud, T. Carette, J. Glowacki, V. Zatloukal, and F. Zalamea,
  Fact-nets: Towards a Mathematical Framework for Relational Quantum Mechanics
  Found Phys **53**, 26 (2023), arXiv:2204.00335.

- V. Zatloukal,
  Real spinors and real Dirac equation
  Adv. Appl. Clifford Algebras **32**, 45 (2022), arXiv:1908.04590.

- V. Zatloukal,
  Local time of random walks on graphs,
  Phys. Rev. E **104**, 044302 (2021), arXiv:2012.15399.

- C. Rovelli and V. Zatloukal,
  Natural discrete differential calculus in physics,
  Found. Phys. **49** 693 (2019), arXiv:1902.03026.

- V. Zatloukal
  Classical field theories from Hamiltonian constraint: Local symmetries and static gauge fields, Adv. Appl. Clifford Algebras 28: 48 (2018), arXiv:1611.02906.

- V. Zatloukal
  Local time of Levy random walks: a path integral approach,
  Phys. Rev. E **95**, 052136 (2017), arXiv:1702.02488.

- P. Jizba, J. Korbel and V. Zatloukal,
  Tsallis thermostatics as a statistical physics of random chains,
  Phys. Rev. E **95**, 022103 (2017), arXiv:1610.07110.

- V. Zatloukal,
  Hamiltonian constraint formulation of classical field theories, Adv. Appl. Clifford Algebras **27**, 829-851 (2017), arXiv:1602.00468.

- P. Jizba and V. Zatloukal,
  Local-time representation of path integrals,
  Phys. Rev. E **92**, 062137 (2015), arXiv:1506.00888.

- V. Zatloukal,
  Classical field theories from Hamiltonian constraint: Canonical equations of motion and local Hamilton-Jacobi theory, Int. J. Geom. Methods Mod. Phys. **13**, 1650072 (2016*),* arXiv:1504.08344.

- V. Zatloukal, L. Lehman, S. Singh, J. K. Pachos, and G. K. Brennen,
  Transport properties of anyons in random topological environments,
  Phys. Rev. B **90**, 134201 (2014), arXiv:1207.5000.

- P. Jizba and V. Zatloukal, *Path-integral approach to the Wigner-Kirkwood expansion*,
  Phys. Rev. E **89**, 012135 (2014), arXiv:1309.0206.

- H. Kleinert and V. Zatloukal,
  Green function of the double-fractional Fokker-Planck equation: Path integral and stochastic differential equations,
  Phys. Rev. E **88**, 052106 (2013), arXiv:1503.01667.

- L. J. Lehman, V. Zatloukal, J. K. Pachos, G. K. Brennen,
  Braiding Interactions in Anyonic Quantum Walks,
  Quantum Computers and Computing (2012) **12** (1), pp. 51-62, arXiv:1210.3446.

- L. Lehman, V. Zatloukal, G. K. Brennen, J. K. Pachos, and Z. Wang,
  Quantum walks with non-Abelian anyons,
  Phys. Rev. Lett. **106** 230404 (2011), arXiv:1009.0813.

Scientific stays

CPT Luminy, Marseille, France (2018/2019), 6 months
- Discrete differential calculus in physics
  (with Prof. Carlo Rovelli)

Freie Universitaet and MPI for the History of Science, Berlin, Germany (2012-2016), 4 years
- Fractional Fokker-Planck equation, Applications of path integrals
  (with Prof. Hagen Kleinert)

ENS Lyon, France (2012), 2 months

- Low-temperature approximations of the equilibrium density matrix using path- and functional integrals
  (with Dr. Angel Alastuey)

Quantum information group, University of Leeds, United Kingdom (2011), 1 month

- spectral graph theory: Energy gaps of Hamiltonians from graph Laplacians using the Cheeger bound
  (with Dr. Jiannis Pachos)

Quantum information group, University of Leeds, United Kingdom (2010), 5 months

- applications of anyons in quantum information processing, specifically: Statistical dynamics of a non-Abelian anyonic quantum walk
  (with Dr. Jiannis Pachos)

Higher education

in the field of Mathematical Physics
at the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, Czech Republic (2006 – 2016):

- Bachelor degree in 2009, thesis "Applications of Supersymmetric Quantum Mechanics", supervised by Ing. Petr Jizba, PhD.

- Master degree in 2011, thesis "Anyons and Their Significance in Quantum Mechanics and Statistical Physics", supervised by Ing. Petr Jizba, PhD.

- Doctoral degree in 2016, thesis "Applications of Path Integrals in Quantum Theory and Statistical Physics", supervised by Ing. Petr Jizba, PhD.

Schools attended

- Quantum Structure of Spacetime and Gravity (2016), August 21-28, Belgrade, Serbia

- International School of Subnuclear Physics (2016), June 14-23, Erice, Italy

- Tri-Institute Summer School on Elementary Particles (2015), July 6-17, Perimeter Institute, Waterloo, ON, Canada

- International School of Subnuclear Physics (2015), June 24-July 3, Erice, Italy

- ATHENS Programme: Quantum Information and Communication (2009), November 14-21, TELECOM ParisTech, Paris, France

- Summer Student Practice (2008), June 29-July 20, JINR Dubna, Russia

Teaching activities

between 2017 and 2022

- Tutorials MSc. courses: Quantum field theory 1 and 2

- Tutorials Bc. courses: Mechanics, Heat and molecular physics, Electricity and magnetism, Thermodynamics and statistical physics, Waves and optics, Analytical mechanics, Quantum mechanics 1 and 2

Supervised theses

- Šimon Vedl: Geometric Algebra in Differential Geometry and Physics (Bc. thesis)
- Šimon Vedl: The Role of Shape Operator in Gauge Theories (MSc. thesis)

Other activities

- Cotranslation to Czech of the book: I. Bohnet, 42 největších hádanek fyziky (Die 42 grössten Rätsel der Physik), Grada (2022)

- Coorganiser of the workshop "Sejny Summer Institute on the Foudations of Physics" (2021, 2022)

- Coorganiser of l'Agape – Summer School of Theoretical Physics (2019)

Additional information

- Member of the BRCP – The Basic Research Community for Physics