

# JAN KORBEL

Researcher in statistical physics, complex systems, and econophysics

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## WORKING EXPERIENCE

Postdoctoral researcher

**Complexity Science Hub Vienna**

📅 Sep 2017 – Ongoing

📍 Vienna, Austria

Postdoctoral researcher

**Medical University of Vienna**

📅 Sep 2017 – Sep 2024

📍 Vienna, Austria

Postdoctoral researcher

**Zhejiang University**

📅 Sep 2016 – May 2017

📍 Hangzhou, China

Doctoral intern

**Max-Planck Institute for the history of science**

📅 Sep 2013 – Jun 2014

📍 Berlin, Germany

Research intern

**Watson Research Centre, IBM**

📅 Dec 2012 – Aug 2016

📍 Prague, Czechia

## EDUCATION

Ph.D. degree, Mathematical Engineering

**Czech Technical University in Prague**

📅 Jul 2012 – May 2016

📍 Prague, Czechia

Bachelor's & master's degree, Mathematical Physics

**Czech Technical University in Prague**

📅 Sep 2007 – Jun 2012

📍 Prague, Czechia

## TEACHING

Technical University of Vienna

**Introduction to financial networks**

📅 2023 –

📍 Vienna, Austria

Medical University of Vienna

**Basic Lecture**

📅 2020 – 2022

📍 Vienna, Austria

Czech Technical University in Prague

**Quantum physics, Thermodynamics, Classical mechanics**

📅 2012 – 2016

📍 Prague, Czechia

## ACADEMIC STATS

📄 **Publications**

45 publications in PNAS, Nat. Com., PRL, New J. Phys., Sci. Rep., PRE, FCAA, and others.

🗉 **Citations**

~620 citations in Web of Science.

✍ **Peer review**

~200 reviews of academic papers.

🗣 **Conference talks**

~50 conference and workshop talks.

👥 **Event organization**

co-organized ~15 workshops, including a virtual annual workshop on stochastic thermodynamics (WOST) with ~900 registered participants.

🏆 **Awards**

2019 MDPI Mathematics Best paper award (received for review paper [6]).  
2023 Dora Brücke-Teleky award - Best paper written by a postdoc at MedUni Wien (received for paper [3]).

## RESEARCH INTERESTS

Statistical Physics

Generalized entropies

Stochastic thermodynamics

Structure-forming systems

Complex systems

Complex networks

Opinion dynamics

Information theory

Econophysics

Option pricing

Fractional diffusion

Transfer entropy

Multifractal time series

## LANGUAGES

Czech

English

German



# 10 MOST IMPORTANT PUBLICATIONS

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## Journal Articles

- [1] J. Korbelt, S. Havlin, and S. Thurner, "Microscopic origin of abrupt mixed-order phase transitions," *Nature Communications*, vol. 16, p. 2628, 2025.
- [2] D. H. Wolpert, J. Korbelt, *et al.*, "Is stochastic thermodynamics the key to understanding the energy costs of computation?" *Proceedings of the National Academy of Sciences*, vol. 121, no. 45, e2321112121, 2024.
- [3] J. Korbelt, S. D. Lindner, T. M. Pham, R. Hanel, and S. Thurner, "Homophily-based social group formation in a spin glass self-assembly framework," *Physical Review Letters* (editors' suggestion), vol. 130, p. 057 401, 5 2023.
- [4] T. M. Pham, J. Korbelt, R. Hanel, and S. Thurner, "Empirical social triad statistics can be explained with dyadic homophilic interactions," *Proceedings of the National Academy of Sciences*, vol. 119, no. 6, e2121103119, 2022.
- [5] J. Korbelt, S. D. Lindner, R. Hanel, and S. Thurner, "Thermodynamics of structure-forming systems," *Nature Communications*, vol. 12, p. 1127, 2021.
- [6] J.-P. Aguilar, J. Korbelt, and Y. Luchko, "Applications of the fractional diffusion equation to option pricing and risk calculations," *Mathematics*, vol. 7, no. 9, p. 796, 2019.
- [7] P. Jizba and J. Korbelt, "Maximum entropy principle in statistical inference: Case for non-shannonian entropies," *Physical Review Letters*, vol. 122, p. 120 601, 12 2019.
- [8] J. Korbelt, R. Hanel, and S. Thurner, "Classification of complex systems by their sample-space scaling exponents," *New Journal of Physics*, vol. 20, no. 9, p. 093 007, 2018.
- [9] H. Kleinert and J. Korbelt, "Option pricing beyond black-scholes based on double-fractional diffusion," *Physica A*, vol. 449, pp. 200–214, 2016.
- [10] J. Korbelt and Y. Luchko, "Modeling of financial processes with a space-time fractional diffusion equation of varying order," *Fractional Calculus and Applied Analysis*, vol. 19, no. 6, pp. 1414–1433, 2016.