Renan Lucas Fagundes

PhD Candidate in Physics
Faculty of Physics, TU Dresden
Email: r.fagundes@ioer.de
Website: rlfagundes.owlstown.net

Research Interests

Complex systems, network science, spatial data analysis, urban systems, percolation theory, computational modeling.

Education

M.Sc. in Physics, Federal University of Lavras - UFLA, Brazil, 2024
B.Sc. in Physics, Federal University of Lavras - UFLA, Brazil, 2021

Selected Publications

- Fagundes, Renan L., Yunfei Li, Fabiano L. Ribeiro, and Diego Rybski. 2025. "A Review of Percolation-like Transitions in Cities and Landscapes." Findings, December. https://doi.org/10.32866/001c.150358
- Ribeiro, F. L., Fagundes, R. L., & Rybski, D. (2025). One-dimensional urban scaling. Environment and Planning B: Urban Analytics and City Science, 0(0). https://doi.org/10.1177/23998083251348682
- A. Deppman, R. L. Fagundes, E. Megias, R. Pasechnik, F. L. Ribeiro, C. Tsallis. Nonlinear dynamics approach to urban scaling. Chaos, Solitons & Fractals, vol. 191, 2024, p. 10. https://doi.org/10.1016/j.chaos.2024.115877

Selected Talks

- DPG Spring Meeting of the Condensed Matter Section (SKM), Dresden (2026) – "Percolation on the *urban influence* field: analyzing Europe's urban fabric"
- DPG Spring Meeting of the Condensed Matter Section (SKM), Regensburg (2025) – "Dynamics of Cities"
- ILUS - International Land Use Symposium 2025, Dresden (2025) – "Power-law level-set percolation of urban land-cover in Europe – exploratory results"

Academic Experience

Research Assistant, CriticaL/IOER, Dresden, Germany, 2024–Present

Institutional Scientific Initiation Scholarship Program[1]

- The quantum structure of space-time and the fundamental interactions of matter", PIBIC/CNPq, UFLA, Brazil, 2021–2022
- "Fiber bundle formalism in gauge theories", PIBIC/CNPq, UFLA, Brazil, 2020–2021
- "Space-time algebra: a geometric description of Maxwell's equations", PIBIC/CNPq, UFLA, Brazil, 2019–2020
- "The Dirac equation in curved space-time", PIBIC/CNPq, UFLA, Brazil, 2018–2019

Skills

Programming: Python, R, Mathematica
Data Analysis: GIS, raster analysis, clustering algorithms, statistical modeling
Tools: LaTeX, LyX, LibreOffice, Markdown, Git, Linux, Jupyter, QGIS

Awards

Academic Merit, UFLA, Brazil, 2022

[1] During undergraduate studies.