# JONAS BERX, PHD

@ jonas.berx@nbi.ku.dk       ♥ Niels Bohr International Academy         ↓ +32493 04 98 99       ₩ 02 - 08 - 1995       ● https://orcid	University of Copenhagen, Copenhagen, Denmark .org/0000-0003-1904-8103
EDUCATION	
Ph.D. in Theoretical Physics (Statistical and Mather <b>KU Leuven, Institute for Theoretical Physics</b> 2018 - 2021 <b>Award date: 17/08/2021</b>	natical Physics) • Belgium
Ph.D. thesis title: <i>Deposition</i> , <i>diffusion and convection</i> : BLU Supervisor: prof. dr. Joseph O. Indekeu	JES approximants and some exact results
M.Sc. Physics: Theoretical Physics <b>KU Leuven</b> 2016 - 2018	
<i>Major:</i> Theoretical Physics; <i>Minor:</i> Mathematics (Dynam	ical Systems & Chaos)
<ul> <li>B.Sc. Physics: option Theoretical Physics</li> <li>Hasselt University</li> <li>2013 - 2017</li> </ul>	

# EXPERIENCE

Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellow University of Copenhagen, Niels Bohr International Academy					
🛗 05/2023 – present	<b>9</b> Denmark				
Postdoctoral Researcher					
University of Leiden, Medical Systems Biophysics and E 11/2022 - 04/2023	Bioengineering ♥ The Netherlands				
Postdoctoral Researcher					
<b>KU Leuven, Institute for Theoretical Physics</b> 10/2022	Selgium				
Postdoctoral Researcher					
Max Planck Institute for Dynamics and Self-Organisation	Max Planck Institute for Dynamics and Self-Organisation, Department of Living Matter Physics				
10/2021 - 01/2022	♥ Germany				
Other Research experience					
Research Internship					
Hasselt University, Computational Mathematics Group	)				
🛗 2017 - 2018	Selgium				
Subject: normal forms for semi-stable limit cycles of cod Supervisor: prof. dr. Peter De Maesschalck	imension 1.				
Teaching experience					

KU Leuven

<ul> <li>Course coordinator theoretical physics bachelor theses</li> </ul>	2020 - 2021
Supervisor bachelor & master thesis	2019 - 2020
Supervisor research internships (x2)	Summer 2021
<ul> <li>Teaching assistant (undergraduate courses):</li> <li>Introductory physics for Physical Therapy</li> <li>Experimental Methods in Physics</li> </ul>	2018 - 2019 2018 - 2019
- Advanced Physics for Civil Engineering	2019 - 2021
- Physics for Business Engineering	2019 - 2021

### Academic and administrative experience

Departmental Counsil member in the Department of Physics and Astronomy

### **KU Leuven**

🛗 2019 - 2021

Function: representative for PhD and postdoc researchers.

Reviewer for academic journals:

### Physica A (Elsevier, 50+ reviews), Entropy (MDPI), Mathematics (MDPI)

🛗 2019 – present

### Co-founder and subsequently chairman of UHasselt Physics Association (UhPA)

#### Hasselt University

🛗 2014 - 2016

### Other academic training

Summer School Fundamental Problems in Statistical Physics XV Brunico, Italy 107/2021

### Ph.D. course Science Communication & Outreach

# KU Leuven

🛗 06/2020

School and Workshop on Patterns of Synchrony: Chimera States and Beyond

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# **RESEARCH INTERESTS**

- Theoretical Biophysics and Thermodynamics
- Nonequilibrium Statistical Mechanics (active matter, interface growth)
- Differential Equations & Dynamical systems
- Nonlinear Physics, Chaos & Fractals
- Complex networks and knot theory

# LANGUAGES AND ICT

- Dutch (mother tongue)
- English



• French





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LATEX (professional knowledge)	C, C++ (professional knowledge)	UNIX systems	
Rstudio (working knowledge)	Matlab (average knowledge)	athematica (profe	essional knowledge)
LabVIEW (working knowledge)	Python (working knowledge)	LAMMPS (workir	ng knowledge)

# **GRANTS/PRIZES/AWARDS**

# **Research Fellowships:**

• Marie Skłodowska-Curie Actions (MSCA) Postdoctoral Fellowship (€230 774). Title: 'Stochastic Thermodynamics of Biochemical Replication'; ID 101104602; Score: <b>96%</b>	2023-2025
Mobility Grants:	
<ul> <li>MIT-KU Leuven MISTI Global Seed Fund (\$8000)</li> <li>Massachusetts Institute of Technology, USA</li> </ul>	2020-2023
<ul> <li>Academische Stichting Leuven Travel grant (€1200)</li> <li>Q Okayama University Japan</li> </ul>	2021
<ul> <li>FWO Travel grant (€1650)</li> <li>Q Okayama University, Japan</li> </ul>	2021
<ul> <li>FWO Travel grant (€1056)</li> <li>         Massachusetts Institute of Technology, USA     </li> </ul>	2021
<ul> <li>VLIR-UOS Mobility grant (fully funded travel, €2100)</li> <li>Stellenbosch University, South-Africa</li> </ul>	2019
<ul> <li>YouReCa International Mobility grant (fully funded travel, €2120)</li> <li>P Massachusetts Institute of Technology, USA</li> </ul>	2019
Prizes and awards:	
• G-Research's November grant winner (£1300)	2021

# REFERENCES

# Prof. dr. Joseph O. Indekeu (PhD supervisor)

- Ø joseph.indekeu@kuleuven.be
- Institute for Theoretical Physics, Department of Physics and Astronomy, KU Leuven Celestijnenlaan 200 D - box 2415 3001 Leuven, Belgium

# Prof. dr. Mehran Kardar (PhD thesis committee member)

- Ø kardar@mit.edu
- Department of Physics, Massachusetts Institute of Technology 77 Massachusetts Ave.
   Cambridge MA 02139, USA

# Prof. dr. Ramin Golestanian (Postdoc supervisor)

@ ramin.golestanian@ds.mpg.de

### Department of Living Matter Physics, Max Planck Institute for Dynamics and Self-Organisation Am Fassberg 17 37077 Göttingen, Germany

# **PUBLICATION LIST**

# Journal articles

# **Peer-reviewed**

**J. Berx**, A. Bose, R. Golestanian and B. Mahault, "Reetrant condensation transition in a model of driven scalar active matter with diffusivity edge", EPL **142**, 67004 (2023)

**J. Berx**, "Hierarchical deposition and scale-free networks: a visibility algorithm approach", Phys. Rev. E **106**, 064305 (2022)

**J. Berx** and J. O. Indekeu, "The BLUES function method for second-order partial differential equations: Application to a nonlinear telegrapher equation", PADIFF **5**, 100392 (2022)

N. V. Thu and **J. Berx**, "The condensed fraction of a homogeneous dilute Bose gas within the improved Hartree-Fock approximation", J. Stat. Phys. **188**, 16 (2022)

**J. Berx** and J. O. Indekeu, "Epidemic processes with constant vaccination and immunity loss studied with the BLUES function method", Physica A **590**, 126724 (2022)

**J. Berx** and J. O. Indekeu, "The BLUES function method applied to partial differential equations and analytic approximants for interface growth under shear", Phys. Rev. Research **3**. 033113 (2021)

J. Berx, E. Bervoets, C. V. Giuraniuc and J. O. Indekeu, "Coastlines and percolation in a model for hierarchical random deposition", Physica A 574, 125998 (2021)

**J. Berx** and J. O. Indekeu, "BLUES iteration applied to nonlinear ordinary differential equations for wave propagation and heat transfer", J. Phys. A: Math. Theor. **54**, 025702 (2020)

S. Put, **J. Berx** and C. Vanderzande, "Non-Gaussian anomalous dynamics in systems of interacting run-and-tumble particles", J. Stat. Mech.: Theory Exp. **2019**(12), 123205 (2019)

**J. Berx** and J. O. Indekeu, "Analytic iteration procedure for solitons and traveling wavefronts with sources", J. Phys. A: Math. Theor. **52**, 38LT01 (2019)

# Other manuscripts (draft available upon request)

**J. Berx** and A. Mashaghi, "Aggregation and structural phase transitions of semiflexible polymer bundles: a circuit topology approach", in preparation (2023)

J. O. Indekeu, N.V. Thu and J. Berx, "Three-component Bose-Einstein condensates and wetting without walls", under review in Phys. Rev. Lett. (2023)

J. Berx and A. Mashaghi, "Decoding chirality in circuit topology of a self entangled chain through braiding", under review in Soft Matter (2023)

**J. Berx**, J. Koning, K. Koga and J. O. Indekeu, "Efficiency and power of a hybrid thermo-chemical engine", in preparation (2023)

J. Berx, "Convergence acceleration for the BLUES function method", under review in J. Comp. Appl. Math. (2022)

# Presentations and posters

### Posters

**J. Berx**, "Coastal points and percolation in hierarchical random deposition", Poster presented at International summer school "Fundamental Problems in Statistical Physics XV" (2021)

**J. Berx**, "BLUES function method for partial differential equations", Poster presented at MECO45: 45th Conference of the Middle-European Cooperation (2020)

**J. Berx**, "Beyond linear use of equation superposition", Poster presented at MECO44: 44th Conference of the Middle-European Cooperation (2019)

### Presentations

**J. Berx**, "BLUES function method in an iterative procedure", invited presentation at Massachusetts Institute of Technology (MIT) Condensed Matter Theory Seminar (2019)

**J. Berx**, "Beyond Linear Use of Equation Superposition: application to a compartmental infection model", presentation at Institute for Theoretical Physics Science Day (2020)