

Curriculum Vitae - Dr. Niklas Boers

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CURRENT POSITIONS	Potsdam Institute for Climate Impact Research since 09/2019 Leader Future Lab “Artificial Intelligence in the Anthropocene” Free University Berlin since 09/2019 Junior research group leader at the Department of Mathematics and Computer Science University of Exeter since 09/2019 Senior Lecturer at the Global Systems Institute and Department of Mathematics
FORMER ACADEMIC POSITIONS	Potsdam Institut für Klimafolgenforschung 09/2018–08/2019 Humboldt fellow at the Department “Complexity Science” Imperial College London 09/2017–08/2018 Associate researcher at the Grantham Institute Advisors: Joanna Haigh and Brian Hoskins Ecole Normale Supérieure de Paris 09/2015–08/2017 Humboldt fellow at the Geosciences Department and the Laboratoire de Météorologie Dynamique Advisors: Michael Ghil and Denis-Didier Rousseau Potsdam Institut für Klimafolgenforschung 10/2011–08/2015 Guest researcher at the Department “Transdisciplinary Concepts and Methods” Advisor: Jürgen Kurths Ludwig-Maximilians-Universität München 03/2011–09/2011 Associate researcher and lecture assistant at the Department of Mathematics Supervisors: Detlef Dürr and Peter Pickl
HIGHER EDUCATION	Humboldt-Universität zu Berlin PhD in Theoretical Physics 11/2011–04/2015 <ul style="list-style-type: none">• Title: <i>Complex Network Analysis of Extreme Rainfall in South America</i>• Supervisors: Prof. Dr. Dr. h.c. mult. Jürgen Kurths and Prof. Dr. José Marengo• Date of Defense: April 30th 2015 Ludwig-Maximilians-Universität München Diploma in Physics 09/2004–03/2011 <ul style="list-style-type: none">• Diploma Thesis: <i>Mean Field Limits for Classical Many Particle Systems</i>• Supervisors: Prof. Dr. Detlef Dürr and Prof. Dr. Peter Pickl Master in Theoretical and Mathematical Physics 09/2007-03/2011 Westfälische-Wilhelms-Universität Münster Studies of Philosophy 04/2004-09/2004

Freigeist fellowship by the Volkswagen Foundation

Title: *Predicting abrupt transitions and extremes in the Earth system*

09/2019–08/2025

Horizon 2020 Research and Innovation Action (European Commission)

Title: *Tipping Points in the Earth System* (Associate Coordinator and PI)

09/2019–08/2023

Postdoctoral research fellowship by the German Science Foundation (DFG)

Title: *Modelling the interaction between the Amazon rainforest and continental-scale moisture circulation: Possible Impacts of deforestation* (PI)

09/2017–09/2018

Research Grant by the Fondation Mathématique Jacques Hadamard

Title: *Very Large Time Series Analysis for Predictive Maintenance* (Co-PI)

02/2017–02/2018

Feodor-Lynen postdoctoral fellowship by the Alexander-von-Humboldt foundation

Title: *Stability analysis of paleoclimatic time series: critical transitions, nonlinearities, and uncertain time axes* (PI)

09/2015–08/2019

PUBLICATIONS

1. C. Ciemer, **N. Boers**, M. Hirota, J. Kurths, F. Mueller-Hansen, R. Oliveira, R. Winkelmann: *Tropical vegetation in regions with higher rainfall variability is more resilient to climate change*, *Nature Geoscience* **12**, 174–179 (2019).
2. **N. Boers**, B. Goswami[†], A. Rheinwält[†], B. Bookhagen, B. Hoskins, J. Kurths: *The global pattern of extreme rainfall teleconnections revealed by complex networks*, *Nature* **566**, 373–377 (2019).
3. M. Gelbrecht, **N. Boers**, J. Kurths: *Phase Coherence between Precipitation in South America and Rossby Waves*, *Science Advances* **4**, 12, EAAU3191 (2018).
4. **N. Boers**, M. Ghil, D. Rousseau: *Interactions between ocean circulation and sea ice explain Dansgaard-Oeschger events*, *Proceedings of the National Academy of Sciences* **9**, E11005–E11014 (2018).
5. **N. Boers**: *Early-warning signals for Dansgaard-Oeschger events in a high-resolution ice core record*, *Nature Communications* **9**, 2556 (2018).
6. B. Goswami, **N. Boers**[†], A. Rheinwält[†], N. Marwan, J. Heitzig, S.F.M. Breitenbach, J. Kurths: *Abrupt transitions in time series with uncertainties*, *Nature Communications* **9**, 48 (2018)
7. **N. Boers**, M. Chekroun, H. Liu, D. Kondrashov, D.-D. Rousseau, A. Svensson, M. Bigler, M. Ghil: *Inverse stochastic-dynamic models for high-resolution Greenland ice-core records*, *Earth System Dynamics* **8**, 1171–1190 (2017)
8. C. Ciemer, **N. Boers**, H.M.J. Barbosa, J. Kurths, A. Rammig: *Temporal Evolution of the spatial covariability of rainfall in South America*, *Climate Dynamics*, published online first, DOI: <https://doi.org/10.1007/s00382-017-3929-x> (2017).
9. **N. Boers**, B. Goswami, M. Ghil: *A complete representation of uncertainties in layer-counted paleoclimatic archives*, *Climate of the Past* **13**, 1169–1180 (2017)

10. D.-D. Rousseau, A. Svensson, M. Bigler, A. Sima, J.P. Steffensen, **N. Boers**: *Eurasian contribution to the last glacial dust cycle: how are loess sequences built?*, *Climate of the Past* **13**, 1181–1197 (2017)
11. D.-D. Rousseau, **N. Boers**, A. Sima, A. Svensson, M. Bigler, F. Lagroix, S. Taylor, S. Antoine: *(MIS3 & 2) millennial oscillations in Greenland dust and Eurasian aeolian records—A paleosol perspective*, *Quaternary Science Reviews* **169**, 99–113 (2017)
12. M. Gelbrecht, **N. Boers**, J. Kurths: *A complex network representation of wind flows*, *Chaos* **27**, 035805 (2017)
13. **N. Boers**, N. Marwan, H.M.J. Barbosa, J. Kurths: *A deforestation-induced tipping point for the South American monsoon system*, *Nature Scientific Reports* **7**, 41489 (2017)
14. D. Traxl[†], **N. Boers**[†], A. Rheinwalt, B. Goswami, J. Kurths: *The size distribution of spatiotemporal extreme rainfall clusters around the globe*, *Geophysical Research Letters* **43**, 9939–9947 (2016).
15. D. Traxl, **N. Boers**, J. Kurths: *Deep Graphs – a general framework to represent and analyze heterogeneous complex systems across scales*, *Chaos* **26**, 06530 (2016)
16. **N. Boers**, B. Bookhagen, N. Marwan, J. Kurths: *Spatiotemporal Characteristics and Synchronization of Extreme Rainfall in South America with Focus on the Andes Mountain Range*, *Climate Dynamics* **46**, 601–617 (2016).
17. A. Rheinwalt, **N. Boers**, N. Marwan, J. Kurths, P. Hoffmann, F. Gerstengarbe, P. Werner: *Non-Linear Time Series Analysis of Precipitation Events Using Regional Climate Networks for the Region of Germany*, *Climate Dynamics* **46**, 1065–1074 (2016).
18. **N. Boers**, H. Barbosa, B. Bookhagen, J. Marengo, N. Marwan, and J. Kurths: *Propagation of Strong Rainfall Events from Southeastern South America to the Central Andes*, *Journal of Climate* **28**, 7641–7658 (2015).
19. **N. Boers**, B. Bookhagen, J. Marengo, N. Marwan, J. v. Storch, J. Kurths: *Extreme rainfall of the South American monsoon system: A dataset comparison using complex networks*, *Journal of Climate* **28**, 1031–1056 (2015).
20. **N. Boers**, A. Rheinwalt, B. Bookhagen, N. Marwan, J. Kurths: *A complex network approach to investigate the spatiotemporal co-variability of extreme rainfall*, in: *Machine Learning and Data Mining Approaches to Climate Science: Proceedings of the Fourth International Workshop on Climate Informatics*, Springer (2015).
21. A. Rheinwalt, **N. Boers**, B. Goswami, J. Heitzig, N. Marwan, R. Krishnan, J. Kurths: *Teleconnections in Climate Networks: A Network-of-Networks Approach to Investigate the Influence of Sea Surface Temperature Variability on Monsoon Systems*, in: *Machine Learning and Data Mining Approaches to Climate Science: Proceedings of the Fourth International Workshop on Climate Informatics*, Springer (2015).
22. **N. Boers**, R. Donner, B. Bookhagen, J. Kurths: *Complex network analysis helps to identify impacts of the El Niño Southern Oscillation on moisture divergence in South America*, *Climate Dynamics* **45**, 619–632 (2015).

23. **N. Boers**, P. Pickl: *On Mean Field Limits for Dynamical Systems*, Journal of Statistical Physics **165**, 1–16 (2015).
24. **N. Boers**, B. Bookhagen, H.M.J. Barbosa, N. Marwan, J. Kurths, J. Marengo: *Prediction of Extreme Floods in the Eastern Central Andes based on a Complex Networks Approach*, Nature Communications 5:5199 (2014).
25. D. Traxl, **N. Boers**, J. Kurths: *General scaling of maximum degree of synchronization in noisy complex networks*, New Journal of Physics **16**, 115009 (2014).
26. **N. Boers**, A. Rheinwalt, B. Bookhagen, H.M.J. Barbosa, N. Marwan, J. Marengo, J. Kurths: *The South American Rainfall Dipole: A Complex Network Analysis of Extreme Events*, Geophysical Research Letters **41**, 73977405 (2014).
27. **N. Boers**, B. Bookhagen, N. Marwan, J. Kurths, J. Marengo: *Complex networks identify spatial patterns of extreme rainfall events of the South American Monsoon System*, Geophysical Research Letters **40**, 4386–4392 (2013).