

Alexander van Meegen

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Education

Harvard University

Swartz Postdoctoral Fellow
Supervisor Prof. H. Sompolinsky.

Cambridge

Since 09/2022

Jülich Research Center

PhD in Computational Neuroscience

Thesis "Simulation and Theory of Large-Scale Cortical Networks", supervisors Prof. M. Helias & Prof. S. J. van Albada.

Jülich

03/2018–08/2022

Humboldt University

Master of Science in Physics

Thesis "Colored Noise Problems in Neuroscience", supervisor Prof. B. Lindner.

Berlin

04/2015–09/2017

Paul Sabatier University

Erasmus exchange semester

Toulouse

09/2015–01/2016

Ruprecht Karl University

Bachelor of Science in Physics

Thesis "Structure Formation of Swimming Bacteria", supervisor Prof. U. Schwarz.

Heidelberg

09/2011–03/2015

Scholarships

German Academic Scholarship Foundation

Doctoral scholarship

2020–2022

Academic and financial support for doctoral studies by "Germany's largest and most prestigious scholarship foundation."

Federal Ministry for Economic Cooperation and Development

Weltwärts scholarship

2010

Full financial support for a one-year voluntary service in Kenya.

Publications

2022: K. Segadlo*, B. Epping*, [A. van Meegen](#)*, D. Dahmen, M. Krämer, and M. Helias: *Unified field theoretical approach to deep and recurrent neuronal networks*, J. Stat. Mech. 10, 103401.

2022: M. Layer, J. Senk, S. Essink, [A. van Meegen](#), H. Bos, and M. Helias: *NNMT: Mean-Field Based Analysis Tools for Neuronal Network Models*, Front. Neuroinform. 16, 835657.

2021: [A. van Meegen](#), T. Kühn, and M. Helias: *Large-Deviation Approach to Random Recurrent Neuronal Networks: Parameter Inference and Fluctuation-Induced Transitions*, Phys. Rev. Lett. 127, 158302.

2021: [A. van Meegen](#) and S. J. van Albada: *Microscopic theory of intrinsic timescales in spiking neural networks*, Phys. Rev. Research 3, 043077.

2018: [A. van Meegen](#) and B. Lindner: *Self-Consistent Correlations of Randomly Coupled Rotators in the Asynchronous State*, Phys. Rev. Lett. 121, 258302.

*: Shared first authorship.

Book Chapters

2019: S. J. van Albada, J. Pronold, [A. van Meegen](#), and M. Diesmann: *Usage and Scaling of an Open-Source Spiking Multi-Area Model of Monkey Cortex*, BrainComp 2019, Lecture Notes in Computer Science Vol. 12339, Springer.

Preprints

2022: J. Stubenrauch, C. Keup, A. Kurth, M. Helias, and [A. van Meegen](#): *Phase Space Analysis of Chaotic Neural Networks*, arXiv:2210.07877.

2022: A. Morales-Gregorio*, [A. van Meegen](#)*, and S. van Albada: *Ubiquitous lognormal distribution of neuron densities across mammalian cerebral cortex*, bioRxiv:2022.03.17.480842.

In Preparation

2022: J. Pronold*, [A. van Meegen](#)*, H. Vollenbröker, M. Senden, S. Bludau, T. Dickscheid, A. Goulas, C. C. Hilgetag, R. Bakker, and S. J. van Albada: *Multi-scale spiking network model of human cortex*.

Work Experience

Jülich Research Center

Research assistant

Jülich

09/2017–08/2022

Supported teaching as lecturer and teaching assistant; co-supervised students (lab rotation, Bachelor, Master); wrote parts of grant applications and reports (DFG grant SPP2041, compute time grant JINB33).

VDI/VDE Innovation + Technik GmbH

Working student

Berlin

04/2016–08/2017

Developed and implemented a text mining framework for analyzing research and development databases as well as newsfeeds. Results were used for political consulting of the German Federal Ministry of Education and Research.

EWC Weather Consult GmbH

Working student

Karlsruhe

10/2014–05/2015

Developed and evaluated a statistical method to improve energy forecasts in solar parks.

Lernzentrum CAPIto

Tutor

Heidelberg

09/2012–02/2015

Tutored high school students, including preparation for high school diploma (Abitur).

EWC Weather Consult GmbH

Intern

Karlsruhe

08/2013–10/2013

Developed and evaluated a wake model to improve energy-forecasts in wind farms.

Organization of Conferences & Workshops

Python Module of the Week

Organizer

Jülich

01/2019–05/2020

Organized a bi-weekly workshop on Python-related topics.

4th HBP Student Conference

Scientific committee

Pisa

01/2020

Organized scientific program and hands-on workshop day.

3rd HBP Student Conference

Scientific committee

Ghent

02/2019

Organized scientific program and hands-on workshop day.

INM-6 Retreat 2018 & 2019

Organizing committee

Organized scientific and social program for the annual retreat of the institute.

Heijen

05/2018 & 05/2019

Reviewing Activity

Ad hoc reviewer for Physical Review Letters, Biological Cybernetics, PLOS ONE, and Entropy.

Co-Supervision of Students

Past: Jakob Stubenrauch (MSc), Kai Segadlo (MSc), Hannah Vollenbröker (MSc & lab rotation), Bastian Epping (BSc), Michael Dick (MSc), Georg Chechelnizki (lab rotation).

Teaching

2020, 2021 & 2022: Lectures on network models, part of the 'Introduction to Computational Neuroscience' lecture series, *RWTH Aachen University*, Aachen.

Summer 2020: Teaching assistant for Theoretical Neuroscience, *RWTH Aachen University*, Aachen.

07/2019: Introduction to the simulation of structurally detailed large-scale neuronal networks (using NEST), *CNS 2019*, Barcelona.

04/2019: NEST simulator tutorial, *EITN Spring School*, Paris.

02/2019: NEST simulator tutorial, *3rd HBP Student Conference*, Ghent.

03/2018: NEST & TVB project 'From local circuits to whole-brain models', *EITN Spring School*, Paris.

Winter 2016/17: Teaching assistant for Statistical Physics, *HU Berlin*, Berlin.

Selected Talks & Posters

10/2021: A. van Meegen and M. Helias: *Statistical Physics Approach to Neuronal Dynamics*, invited talk, INTheory on-line Seminar Series.

02/2020: A. van Meegen, T. Kühn, and M. Helias: *Inferring random network parameters from continuous-time trajectories*, poster, COSYNE 2020, Denver.

02/2020: A. van Meegen, S. J. van Albada, and M. Helias: *On the path integral approach to random neural networks*, poster, Heraeus Seminar: Quantum Thermodynamics for Young Scientists, Bad Honnef.

07/2019: A. van Meegen and B. Lindner: *Self-consistent correlations of randomly coupled rotators in the asynchronous state*, plenary talk, *CNS 2019*, Barcelona.

04/2019: A. van Meegen, T. Kühn, and M. Helias: *A bridge from large deviation theory to statistical field theory*, invited talk, *EITN Mean-Field Workshop*, Paris.

07/2018: A. van Meegen and S. J. van Albada: *Intrinsic timescales in spiking neural networks – a theoretical approach*, talk, *INM/ICS Retreat 2018*, Jülich.

03/2018: A. van Meegen and B. Lindner: *Self-consistent correlations of randomly coupled rotators in the asynchronous state*, talk, *DPG Spring Meeting*, Berlin.

Memberships

Current: Organization for Computational Neurosciences, Bernstein Network Computational Neuroscience, German Physical Society, NEST Initiative.

Computer Skills

Python (data processing & analysis, scientific computing), C++ (scientific computing), NEST (neural network simulator), TensorFlow (machine learning library), RapidMiner (machine learning & data mining platform), Tableau (data visualisation), MySQL (databases).

Languages

German: Native speaker

English: Business proficient

Daily use, both written and spoken.

French: Fluent

Semester abroad (France).

Kiswahili: Intermediate

Worked in Kenya for one year.

Dutch: Basic

Dutch family (stepfather).

Voluntary Engagement

Jülich Research Center

Jülich

PhD representative INM-6

02/2019–04/2021

Represented PhD students' interests at institute meetings, kept in touch with research center committees, and mediated in case of conflicts.

ICJA Freiwilligenaustausch weltweit e.V.

Berlin

Chair of regional group Baden-Württemberg

09/2014–03/2015

Helped with the first steps in Germany, organized monthly social meetings, and mediated in case of conflicts.

ICJA Freiwilligenaustausch weltweit e.V.

Berlin

Mentor

08/2012–03/2015

Mentored international volunteers in Germany.

ICJA Freiwilligenaustausch weltweit e.V.

Berlin

Instructor

12/2014

Co-organized and co-conducted a final seminar for international volunteers in Germany.

Heidelberg Institute for International Conflict Research e.V.

Heidelberg

Voluntary staff

05/2013–12/2013

Researched the state of violent conflicts in Eritrea for the annual 'Konfliktbarometer'.

CoWaRT and Kiptere.CH

Kiptere

Voluntary service in Kenya

08/2010–08/2011

○ CoWaRT: HIV education in the Kiptere area.

○ Kiptere.CH: Improvement of the socio-economic situation of young adults and farmers in the Kiptere area.

SV GW Venum e.V.

Venum

Soccer coach and basketball referee

2008–2010