

Moritz Günther

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Current position

since
09/2024

Postdoc at Max Planck Institute for Meteorology / Weizmann Institute of Science

Effects of land-sea flux contrasts on pattern formation

While land equilibrates within days in response to forcing, the fluxes over the ocean remain substantial for centuries. How does the resulting land-sea circulation contribute to the formation of SST patterns, in particular over the Pacific Ocean?

Department: Climate Dynamics (MPI) / Earth and Planetary Sciences (Weizmann)

08/2020 -
08/2024

PhD Student at Max Planck Institute for Meteorology

Asymmetries between the climate responses to CO₂ and stratospheric aerosol forcing - “summa cum laude”, with distinction (link to PhD thesis)

Climate feedback to stratospheric sulfate aerosol forcing is stronger than to CO₂ forcing. I explained why, using the pattern effect framework. I demonstrated the importance of the Brewer-Dobson circulation for surface temperature patterns in response to stratospheric aerosol forcing.

Department: Climate Physics

member of the IMPRS-ESM grad school

08/2020: major research topic change from medical physics / physiology to climate science

02/2020 -
06/2020

Data analyst: (Pre-)processing of EEG recorded during motion

Center for Advanced Methods in Rehabilitation Sheba Hospital, Tel HaShomer, Israel

Development of novel EEG preprocessing methods based on independent / principal component analysis (ICA/PCA) and artifact subspace reconstruction (ASR), automatic removal of movement artifacts

10/2016 -
06/2019

Student Research Assistant: physiological and stochastic signals

Uni Halle, Germany; Bar-Ilan University, Ramat Gan, Israel

Statistically analyzed artificial and physiological signals (EEG, EMG, ECG, ...) and their interrelations in healthy subjects and subjects with Parkinson's disease

Education

10/2017 -
01/2020

M.Sc. Medical Physics (final grade: 1.3*)

Martin-Luther University, Halle, Germany and
Bar-Ilan University, Ramat Gan, Israel

Master's Thesis: Transitions in physiological coupling across physiological states and pathological conditions (grade: 1.0*)

10/2014 -
09/2017

B. Sc. Medical Physics (final grade: 1.5*)

Martin-Luther University, Halle, Germany

Bachelor's Thesis: Statistical analysis of EMG amplitudes and frequencies of patients with Parkinson's disease (grade: 1.0*)

06/2013

High School Graduation / Abitur (final grade: 1.0*)

*on the German grading scale, that ranges from 1.0 (best) to 4.0 (passed) / 5.0 (not passed).

<u>Languages</u>	German	native
	English	fluent / professional
	Hebrew (modern)	fluent
	French	advanced
	Latin	Latinum certificate
	Spanish	basics

Invited Talks,
Awards, and
Grants

Joint Max-Planck / Weizmann Postdoctoral Fellowship

2024 – 2028
~ 300k €

Invited Talk IUGG conference 2023

"Climate feedback to stratospheric aerosol forcing: The key role of the pattern effect"

Outstanding Student Presentation Award 2021

AGU Fall Meeting

Minerva Short Term Research Grant 08/2018 – 09/2018

for a stay as a visiting scientist in Sheba Hospital, Tel HaShomer, Israel
~ 2k €

Scholarship of the German Academic Scholarship Foundation

2015 – 2020
~ 20k €

Gustav Mie Award 2017

for outstanding performance in the Bachelor's studies
~ 2k €

Conference
contributions

**Co-Convener of EGU 2025 session “Climate Sensitivity,
Radiative Feedbacks, and the Pattern Effect”**

TROPICS Workshop (talk) 2024

EGU (talk) 2024

CFMIP / GASS Meeting (poster) 2023

EGU (poster) 2023

AGU Fall Meeting (talk) 2022

SPARC General Assembly (poster) 2022

Pattern Effect Workshop (poster) 2022

AGU Fall Meeting (talk) 2021

CFMIP Meeting (poster) 2021

GeoMIP Meeting (talk) 2021

vEGU Meeting (talk) 2021

Outreach and
Community
Service

I'm a scientist outreach program targeted at 5th to 12th grade students; 2022 –
<https://2klimawandel.imascientist.de/questions-to/moritzguenther/>
(in German)

Invented, established, and co-organize the “Interface Seminar”
for facilitating cross-departmental exchange at Max-Planck-Institute for Meteorology

Reviewing

Journal of Climate (2 publications)
International Journal of Climatology (1)
Atmospheric Chemistry and Physics (1)
Earth System Dynamics (1)

Supervision

Lior Avrutzky 01/2020 – 07/2020
B.Sc. Biomedical Engineering, day-to-day supervision

Ravikiran Hegde 07/2023 - 05/2024
M.Sc. Physics, day-to-day supervision, co-conceptualized the project

Shreyas Iyer 06/2024 - presumably 03/2025
M. Sc. Physics, day-to-day supervision, co-conceptualized the project

Peer-Reviewed
Publications
([Google Scholar](#))

Günther, M., H. Schmidt, C. Timmreck, and M. Toohey:
Why does stratospheric aerosol forcing strongly cool the warm
pool? *Atmos. Chem. Phys.*, 2024. doi.org/10.5194/acp-24-7203-2024

Marquez, J.S., Bartsch, R.P., **Günther, M.**, Shafiul Hasan, S.M., Koren, O.,
Plotnik, M., Bai, Ou 2023: Supplementary Motor Area Activity Differs in
Parkinson's Disease with and without Freezing of Gait. *Parkinsons Dis*,
2023. doi.org/10.1155/2023/5033835

Günther, M., Schmidt, H., Timmreck, C., Toohey, M. 2022: Climate
Feedback to Stratospheric Aerosol Forcing: The Key Role of the Pattern
Effect. *J. Climate*, 35, 4303–4317.
doi.org/10.1175/JCLI-D-22-0306.1

Günther, M., Kantelhardt, J.W., Bartsch, R.P. 2022: The Reconstruction
of Causal Networks in Physiology. *Front. Netw. Physiol.*, 2022-2.
doi.org/10.3389/fnetp.2022.893743

Asher, E.E., Plotnik, M., **Günther, M.**, Moshel, S., Levy, O., Havlin, S.,
Kantelhardt, J.W., Bartsch, R.P. 2021: Connectivity of EEG synchronization
networks increases for Parkinson's disease patients with freezing of gait.
Commun Biol 4, 1017.
doi.org/10.1038/s42003-021-02544-w

Günther, M., Bartsch, R.P., Miron-Shahar, Y., Hassin-Baer, S., Kurths, J.,
Plotnik, M., Kantelhardt, J.W. 2019: Coupling Between Leg Muscle
Activation and EEG During Normal Walking, Intentional Stops, and
Freezing of Gait in Parkinson's Disease. *Front. Physiol.* 10:870.
doi.org/10.3389/fphys.2019.00870

Hegde, R., **Günther, M.**, Kroll, C. A., Schmidt, H.: Surface Temperature
Dependence of Stratospheric Sulfate Aerosol Forcing and Feedback.
EGUsphere [preprint], 2024.
doi.org/10.5194/egusphere-2024-2221

Publications in
preparation or
peer review

Günther, M.: Separating Forced Response from Internal Variability with Independent Component Analysis.

Burt, D. J., Putrasahan, D., **Günther, M.**, Ilyina, T.: Characterising interannual climate variability and Marine Heatwaves in the latest Permian. *In prep. for Climate of the Past*

Andreasen, L. S., Shaw, T. A., **Günther, M.**, Timmreck, C.: Volcanic Eruptions and Tropical Teleconnections

Segura, H., Bayley, C., Esch, M., Fiévet, R., Glöckner, H., **Günther, M.**, Kluft, L., Naumann, A. K., Ortega, S., Praturi, D. S., Rixen, M., Schmidt, H., Winkler, M., Hohenegger, C., Stevens, B.: Global storm-resolving models and the double ITCZ bias : air-surface interaction role for convection in light wind regimes; *submitted to J Adv Model Earth Syst*