

# Tom Beucler

✉ tom.beucler@unil.ch • 🌐 unil.ch/dawn • 📧 Tom Beucler • 🌐 tbeucler

CV last updated on April 1, 2024

## Research Interests

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Atmospheric Physics, Climate Informatics, Fluid Dynamics, Scientific Machine Learning, Tropical Meteorology.

## Education

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### MIT Program in Atmospheres, Oceans, and Climate

*Ph.D. in Atmospheric Science: Interaction between Water Vapor, Radiation and Convection*

Thesis committee: K. Emanuel (co-advisor), T. Cronin (co-advisor), P. O’Gorman, Z. Kuang, C. Bretherton.

2014 – 2019

Cambridge, USA

### École Polytechnique

*Master of Science in Mechanics*

Major in fluid dynamics and environmental science.

2013 – 2014

Palaiseau, France

### École Polytechnique & Lycée Sainte-Geneviève

*Bachelor of Engineering*

Coursework in mechanics, physics, mathematics, chemistry and biology.

2009 – 2013

Versailles & Palaiseau, France

## Academic Employment

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### University of Lausanne, Switzerland

*Assistant Professor of Environmental Data Science (Tenure Track)*

2021 – Present

Lausanne, Switzerland

### University of California, Irvine

*Assistant Project Scientist in Atmospheric Science: Machine Learning for Climate Science*

Principal investigators: M. Pritchard and P. Gentine.

2019 – 2021

Irvine, USA

### University of California, Irvine and Columbia University

*Postdoctoral Scholar in Atmospheric Science: Deep Learning for Convection and Clouds*

Co-advisors: P. Gentine and M. Pritchard.

2019

Irvine & NYC, USA

## Awards

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- (2021–Present) **Visiting scholar**, Earth System Science Department, UCI
- (2019–Present) **Visiting scholar**, Scripps Institution of Oceanography, UCSD
- (2023) **AGU 2022 Editor’s citation for excellence in refereeing**, Journal of Advances in Modeling Earth Systems
- (2022) **AGU 2021 Editor’s citation for excellence in refereeing**, Geophysical Research Letters
- (2021) **Invited Participant**, KITP Program on Machine Learning and the Physics of Climate at UCSB
- (2021) **AGU 2020 Editor’s citation for excellence in refereeing**, Journal of Advances in Modeling Earth Systems
- (2019) **Rossby award for best doctoral thesis**, Program in Atmospheres, Oceans and Climate, MIT
- (2019) **Invited scholar**, Max Planck Institute for Meteorology
- (2019) **Summer fellow**, 2nd ICTP Summer School on Climate Dynamics and Convective Organization
- (2018) **Finalist of the “Climate Changed” @ MIT competition**, *Higher Grounds* at MIT
- (2018) **AGU 2017 Editor’s citation for excellence in refereeing**, Geophysical Research Letters
- (2018) **Best poster prize (Water & Society)**, *Preparing MIT for 2050 Floodwaters* at the MIT Water Night
- (2018) **Graduate research fellow**, Program on Math. and Stat. Methods for Climate & the Earth System at SIAM Institute
- (2017) **Summer fellow**, Les Houches Summer School on Fundamental Aspects of Turbulent Flows in Climate Dynamics
- (2015) **Geophysical fluid dynamics fellow**, Woods Hole Oceanographic Institution
- (2014–2015) **Rasmussen fellow**, MIT Department of Earth, Atmospheric and Planetary Sciences
- (2014) **Outstanding Masters thesis**, École Polytechnique

## Funding

- (2024-Present) **Lead PI, SNSF Project Funding:** *RobustSR: Improving the Robustness of Super-Resolution Algorithms to Climate Change and Extreme Events*. Estimated value of resources awarded to  $\partial^3$ AWN: **CHF 584,989**
- (2024-Present) **Co-PI, Horizon Europe (CL5 Call):** *Artificial Intelligence and Machine Learning for Enhanced Representation of Processes and Extremes in Earth System Models*. Estimated value of resources awarded to  $\partial^3$ AWN: **CHF 528,309**
- (2021-Present) **Principal Investigator, Canton of Vaud funding for all IDYST professors:**  $\partial^3$ AWN Lab at IDYST. Estimated value of awarded resources: **CHF 120,000/year** (2 PhD students)
- (2020-2021) **Principal Investigator, Columbia University subaward:** *Physics-Guided Deep Learning for Climate Predictions*. Estimated value of awarded resources: **\$51,986**
- (2020-2021) **Co-Investigator, XSEDE computational resources allocation:** *Simulating global climate with turbulence-permitting cloud superparameterization to train machine learning emulators and advance understanding of aerosol-cloud feedbacks*. Lead PI: Mike Pritchard. Estimated value of awarded resources: **\$2,025,427**

## Peer-Reviewed Journal Publications and Book Chapters

1. (2024) *In press*, Rampal, N., S. Hobeichi, P. B. Gibson, J. Baño-Medina, G. Abramowitz, **T. Beucler**, J. González-Abad, W. Chapman, P. Harder & José Manuel Gutiérrez: Enhancing Regional Climate Downscaling Through Advances in Machine Learning. *Artificial Intelligence for the Earth Systems*.
2. (2024, Whitepaper) **Beucler, T.**, E. Koch, S. Kotlarski, D. Leutwyler, A. Michel & J. Koh: Next-Generation Earth System Models: Towards Reliable Hybrid Models for Weather and Climate Applications. *SATW Whitepaper on "AI for Climate Change Mitigation"*, 5.2.
3. (2024) Grundner, A., **T. Beucler**, P. Gentine & V. Eyring: Data-Driven Equation Discovery of a Cloud Cover Parameterization, *Journal of Advances in Modeling Earth Systems*, **16**, e2023MS003763.
4. (2024) Iglesias-Suarez, F., P. Gentine, B. Solino-Fernandez, **T. Beucler**, M. Pritchard, J. Runge & V. Eyring: Causally-informed deep learning to improve climate models and projections, *Journal of Geophysical Research: Atmospheres*, **129**, e2023JD039202.
5. (2024) Mooers, G., **T. Beucler**, M. Pritchard & S. Mandt: Understanding Precipitation Changes through Unsupervised Machine Learning, *Environmental Data Science*, **3**, e3.
6. (2024) **Beucler, T.**, P. Gentine, J. Yuval, A. Gupta, L. Peng, J. Lin, S. Yu, S. Rasp, F. Ahmed, P. O’Gorman, D. Neelin, N. Lutsko & M. Pritchard: Climate-Invariant Machine Learning, *Science Advances*, **10**, eadj7250.
7. (2023) **Beucler, T.**, I. Ebert-Uphoff, S. Rasp, M. Pritchard & P. Gentine: Machine Learning for Clouds and Climate, *Clouds and Their Climatic Impact: Radiation, Circulation, and Precipitation*, edited by: Sullivan, SC and Hoose, C., Wiley–American Geophysical Union: 327-346.
8. (2023) Mooers, G., M. Pritchard, **T. Beucler**, P. Srivastava, H. Mangipudi, L. Peng, P. Gentine & M. Pritchard: Comparing Storm Resolving Models and Climates via Unsupervised Machine Learning, *arXiv:2208.11843*.
9. (2023) Zanetta, F., D. Nerini, **T. Beucler** & M. Liniger: Physics-constrained deep learning postprocessing of temperature and humidity, *Artificial Intelligence for the Earth Systems*, **2**, e220089.
10. (2023) Ganesh S., S., **T. Beucler**, F. I. Tam, M. Gomez, J. Runge & A. Gerhardus: Selecting Robust Features for Machine Learning Applications using Multidata Causal Discovery, *Environmental Data Science*, **2**:e27.
11. (2022) Grundner, A., **T. Beucler**, P. Gentine, F. Iglesias-Suarez, M. Giorgetta & V. Eyring: Deep Learning Based Cloud Cover Parameterization for ICON, *Journal of Advances in Modeling Earth Systems*, e2021MS002959.
12. (2022) Wu, Z., **T. Beucler**, E. Székely, W. Ball & D. Domeisen: Modeling Stratospheric Polar Vortex Variation and Identifying Vortex Extremes Using Explainable Neural Networks. *Environmental Data Science 1*: e17.
13. (2022) Behrens, G., **T. Beucler**, P. Gentine, F. Iglesias-Suarez, M. Pritchard & V. Eyring: Non-Linear Dimensionality Reduction with a Variational Encoder Decoder to Understand Convective Processes in Climate Models. *Journal of Advances in Modeling Earth Systems*, e2022MS003130.
14. (2021) Gentine, P., V. Eyring & **T. Beucler**: Deep Learning for the Parametrisation of Subgrid Processes in Climate Models, *Deep learning for the Earth Sciences: With Applications and R, Second Edition*, **307-314**.
15. (2021) Mooers, G., M. Pritchard, **T. Beucler** et al.: Assessing the Potential of Deep Learning for Emulating Cloud Superparameterization in Climate Models with Real-Geography Boundary Conditions. *Journal of Advances in Modeling Earth Systems*, **13**, e2020MS002385.
16. (2021) **Beucler, T.**, M. Pritchard, S. Rasp, J. Ott, P. Baldi & P. Gentine: Enforcing Analytic Constraints in Neural-Networks Emulating Physical Systems, *Physical Review Letters*, **126.9**: 098302. **Editors’ Suggestion**.
17. (2020) Brenowitz, N., **T. Beucler**, M. Pritchard & C. Bretherton: Interpreting and Stabilizing Machine-Learning Parametrizations of Convection, *Journal of the Atmospheric Sciences*, **77.12**, 4357-4375.
18. (2020) **Beucler, T.**, D. Leutwyler & J. Windmiller: Quantifying Convective Aggregation Using the Tropical Moist Margin’s Length, *Journal of Advances in Modeling Earth Systems*, **12.10**, e2020MS002092.
19. (2020) Abbott, T., T. Cronin & **T. Beucler**: Convective Dynamics and the Response of Precipitation Extremes to Warming in Radiative–Convective Equilibrium, *Journal of the Atmospheric Sciences*, **77**, 1637-1660.
20. (2019) **Beucler, T.**, T. Abbott, T. Cronin & M. Pritchard: Comparing Convective Self-Aggregation in Idealized Models to Observed Moist Static Energy Variability Near the Equator, *Geophysical Research Letters*, **46**, 17-18.
21. (2019) **Beucler, T.**: Interaction between Water Vapor, Radiation and Convection in the Tropics, *Ph.D. Thesis in Atmospheric Science*.

22. (2018) **Beucler, T.** & T. Cronin: A Budget for the Size of Convective Self-Aggregation, *Quarterly Journal of the Royal Meteorological Society*, **145**, 947–966.
23. (2018) **Beucler, T.**, T. Cronin & K. Emanuel: A Linear Response Framework for Radiative-Convective Instability, *Journal of Advances in Modeling Earth Systems*, **10**, 1924–1951.
24. (2016) **Beucler, T.** & T. Cronin: Moisture-Radiative Cooling Instability, *Journal of Advances in Modeling Earth Systems*, **8**, 1620–1640.
25. (2016) **Beucler, T.**: A Correlated Stochastic Model for the Large-Scale Advection, Condensation and Diffusion of Water Vapour. *Quarterly Journal of the Royal Meteorological Society*, **142**, 1721–1731.
26. (2014) **Beucler, T.**: Self-Aggregation Phenomenon in Cyclogenesis, [http://tbeucler.scripts.mit.edu/tbeucler/wp-content/uploads/2018/03/Thesis in Fluid Mechanics](http://tbeucler.scripts.mit.edu/tbeucler/wp-content/uploads/2018/03/Thesis%20in%20Fluid%20Mechanics.pdf).

## Peer-Reviewed Conference and Workshop Publications

1. (2023, NeurIPS) Yu, S., W. Hannah, L. Peng, M. Bhouari, R. Gupta, J. Lin, B. Lütjens, J. Will, **T. Beucler** et al.: ClimSim: A large multi-scale dataset for hybrid physics-machine learning climate emulation. *Advances in Neural Information Processing Systems*. “**Oustanding Datasets and Benchmarks**” award.
2. (2023, NeurIPS Workshop) Lin, J., M. A. Bhouari, **T. Beucler**, S. Yu & M. Pritchard: Stress-testing the coupled behavior of hybrid physics-machine learning climate simulations on an unseen, warmer climate. *2023 Conference on Neural Information Processing Systems*.
3. (2021, NeurIPS Workshop) Mangipudi, H., G. Mooers, M. Pritchard, **T. Beucler** & S. Mandt: Analyzing High-Resolution Clouds and Convection using Multi-Channel VAEs. *2021 Conference on Neural Information Processing Systems*.
4. (2020, IGARSS) **Beucler, T.**, M. Pritchard, P. Gentine & S. Rasp: Towards Physically-Consistent, Data-Driven Models of Convection. *IEEE International Geoscience and Remote Sensing Symposium 2020*.
5. (2020, Climate Informatics) Mooers, G., J. Tuyls, S. Mandt, M. Pritchard & **T. Beucler**: Generative Modeling of Atmospheric Convection. *Proceedings of the 10th International Conference on Climate Informatics*, 98–105.
6. (2019, ICML Workshop) **Beucler, T.**, S. Rasp, M. Pritchard & P. Gentine: Achieving Conservation of Energy in Neural Network Emulators for Climate Modeling. *2019 International Conference on Machine Learning*.

## Submitted Manuscripts and Preprints

1. Behrens, G., **T. Beucler**, F. Iglesias-Suarez, S. Yu, P. Gentine, M. Pritchard, M. Schwabe & V. Eyring: Improving Atmospheric Processes in Earth System Models with Deep Learning Ensembles and Stochastic Parameterizations. *arXiv:2402.03079*.
2. Tam, F. I., **T. Beucler** & J. Ruppert: Identifying Three-Dimensional Radiative Patterns Associated with Early Tropical Cyclone Intensification. *arXiv:2401.09493*.
3. Cache, T., M. Gomez, **T. Beucler**, J. Blagojevic, J. Leitao & N. Peleg: Enhancing generalizability of data-driven urban flood models by incorporating contextual information. *Hydrology and Earth System Sciences Discussions*.
4. Gomez, M., & **T. Beucler**: Lessons Learned: Reproducibility, Replicability, and When to Stop. *arXiv:2401.03736*.
5. Lin, J., S. Yu, **T. Beucler**, P. Gentine, D. Walling & M. Pritchard: Systematic Sampling and Validation of Machine Learning-Parameterizations in Climate Models. *arXiv:2309.16177*.

## Conference Presentations and Invited Seminars

### 103rd AMS Annual Meeting

Core Science Keynote: *Systematically Generating Climate Model Hierarchies from Data using ML*

**Jun 2022–Present**  
Remote, Europe & USA

Presentation also given at:

- AMS 23rd AOFD, 12th Climate Informatics Conf., Royal Met. Soc. ML Workshop
- IMSI ML for Climate & Weather, CSSI-GW journal club, Caltech CliMA

### NCAR Climate & Global Dynamics; ESA-ECMWF Workshop 2021

Invited Seminar: *Atmospheric Physics-Guided Machine Learning*

**May 2021–Present**  
Remote, Europe & USA

Also given at:

- US CLIVAR PPAI Webinar; CNRM (Meteo France) Webinar
- EPFL ENAC; Uni Bern Colloquium in Climatology, Climate Impacts & Remote Sensing
- CSU/CIRA; ENS Lyon IXXI; AI Super-Resolution Simulations Workshop (CMU)
- LANL ML in Solid Earth Geoscience Lecture Series; MIT Sack Lunch
- Princeton PPPL ML Seminar Series; IGE Grenoble
- MeteoSwiss; UCLA Atmospheric & Oceanic Sciences Departmental Seminar Series
- Caltech CliMA; EPFL Applied Machine Learning days 2022; ETH Atmospheric Predictability

### Joint CLIMACT-ECCE Seminar

*Tropical Precipitation in a Changing Climate*

**Mar 2024**  
Lausanne, Switzerland

<b>Joint Climate Impacts-<math>\delta^3</math>AWN Group Meeting</b> <i>Demystifying Data-Driven Weather Forecasting</i>	<b>Oct 2023</b> Bern, Switzerland
<b>UNIL FGSE Academic Year Opening Ceremony</b> <i>L'intelligence artificielle au service des sciences du climat</i>	<b>Sep 2023</b> Lausanne, Switzerland
<b>EGU Gen. Assembly 2022; 102nd AMS Annual; Postdam Inst. for Climate Impact Research</b> <i>Invited Presentation: Physically and Causally-Informed Neural Networks</i> Also given at:	<b>Jan 2022–Apr 2023</b> Remote & Vienna, Austria
○ AI4OAC Workshop, NVIDIA, IPSL LSCE, UNIL ML Café, 11th Clim. Info. Conference, ESiWACE2 Workshop	
<b>ITU “AI for Good” Seminar Series</b> <i>Invited Presentation: AI for Tropical Meteorology, Challenges and Opportunities</i>	<b>Apr 2023</b> Remote
<b>ELLIS &amp; AGCI Workshops on Machine Learning and Climate Science</b> <i>Invited Presentation: Climate-Invariant Machine Learning</i>	<b>May 2022–Jun 2022</b> Valencia, Spain & Aspen, USA
<b>AI2ES NCAR Summer School on Trustworthy AI</b> <i>Invited Tutorial: Integrating Physics into Machine Learning</i>	<b>July 2021</b> Remote
<b>SIAM MPE20 &amp; 101st AMS Annual Meeting</b> <i>Invited Presentations: Physical Rescalings Help Neural Networks Generalize Across Climates</i> Also given as a poster at the AGU Fall Meeting 2020	<b>Aug 2020–Jan 2021</b> Remote
<b>IEEE International Geoscience and Remote Sensing Symposium 2020</b> <i>Invited Webinar/Paper: Towards Physically-Consistent, Data-Driven Models of Convection</i> Also given at:	<b>Apr 2020–Dec 2020</b> Remote
○ NOAA Satellite Applications and Research Seminar Series	
○ 1st Annual Workshop on Knowledge-Guided Machine Learning (UMN)	
○ UCSD SIO Machine Learners Group Meeting & UCI Earth System Science Departmental Seminar Series	
<b>AGU Fall Meeting 2019 &amp; 100th AMS Annual Meeting</b> <i>Invited Presentation: Building a Hierarchy of Hybrid, Neural Network Models of Convection</i>	<b>Dec 2019–Jan 2020</b> SF & Boston, USA
<b>AGU Fall Meeting 2019 &amp; 100th AMS Annual Meeting</b> <i>Poster &amp; Presentation: Comparing Self-Aggregation in Models to Observed MSE Variability</i>	<b>Dec 2019–Jan 2020</b> SF & Boston, USA
<b>UCLA Atmospheric &amp; Oceanic Sciences, UCI Earth System Science Departmental Seminar Series</b> <i>Invited Seminars: Interaction between Water Vapor, Radiation and Convection in the Tropics</i> Also given at:	<b>Aug 2018–Jul 2019</b> USA, France & Germany
○ MIT Sack Lunch Seminar; Yale Earth & Planetary Science	
○ ENS Paris Geosciences; LMU Munich Meteorology; MPI-Meteorology	
<b>International Conference on Machine Learning 2019. Climate Change: How Can AI Help?</b> <i>Workshop Paper: Achieving Conservation of Energy in Neural Network Emulators for Climate Modeling</i>	<b>Jun 2019</b> Long Beach, USA
<b>9th Northeast Tropical Workshop</b> <i>Presentation: Towards Interpretable Neural-Network Parametrizations of Convection</i>	<b>Jun 2019</b> Dedham, USA
<b>33rd Conference on Hurricanes and Tropical Meteorology</b> <i>Presentation: A Spectral Budget for the Size of Convective Self-Aggregation</i>	<b>Apr 2018</b> Ponte Vedra, USA
<b>Seminar in Geosciences, Université Pierre et Marie Curie</b> <i>Invited Seminar: A Spectral Budget for the Size of Convective Self-Aggregation</i>	<b>Dec 2017</b> Paris, France
<b>17th Conference on Mesoscale Processes</b> <i>Presentation: A Moist Static Energy Perspective on Atmospheric Rivers</i>	<b>Jul 2017</b> San Diego, USA
<b>21st Conference on Atmospheric and Oceanic Fluid Dynamics</b> <i>Presentation: The Vertical Structure of Radiative-Convective Instability</i>	<b>Jun 2017</b> Portland, USA
<b>Seminar in Geosciences, École Normale Supérieure</b> <i>Invited Seminar: Radiative-Convective Instability</i>	<b>Jan 2017</b> Paris, France
<b>2016 International Atmospheric Rivers Conference - CW3E, Scripps institution of oceanography</b> <i>Presentation: A Moist Static Energy Perspective on Atmospheric Rivers</i>	<b>Aug 2016</b> La Jolla, USA
<b>32nd Conference on Hurricanes and Tropical Meteorology</b> <i>Presentation: Instabilities of Radiative Convective Equilibrium with an Interactive Surface</i>	<b>Apr 2016</b> San Juan, USA

## Public Engagement and Outreach

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- (Mar 2024) Modéliser la physique atmosphérique, prévoir la formation de cyclones tropicaux, et prédire le climat futur. *Co-author as part of the contribution to: "Évaluer les risques naturels, simuler le devenir des glaciers ou encore appréhender la complexité des réseaux urbains : les géosciences évoluent avec les progrès de l'intelligence artificielle."*
- (Feb 2024) AI and Climate Science & Anticiper l'avenir climatique grâce à l'AI. *Co-author*
- (Jan 2024) A la croisée de la physique et de l'intelligence artificielle : les nouveaux horizons de la modélisation. *UNIL Honorary and Retired Professors Ceremony. Speaker.*
- (Sep 2023) L'intelligence artificielle au service des sciences du climat. *UNIL FGSE Academic Year Opening Ceremony*
- (Jun 2023) CLIMACT Atmospheric Science Day 2023. *Author*
- (Dec 2022) Intelligence artificielle : quels enjeux pour l'université ? *Contributor*
- (Mar 2021) Teaching a Neural Network the Hard Way. *APS Physics 14*
- (Jun 2020-Jun 2021) US CLIVAR Data Science Webinar Series. *Co-organizer and Moderator*
- (Nov 2020) Modelling Clouds and Climate. *Communications of the ACM*
- (Aug 2020) Outsourcing Sub-Grid Cloud Physics to Neural Networks. *E3SM Blog Post*
- (Jun 2018) When the Wind Blows: Predicting how Hurricanes Change with Climate. *CaféSci Boston*
- (Jan 2018) Higher Grounds. *MIT Climate Changed Ideas Competition*

## Mentorship and Supervision

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### Direct Research Supervision (PhD students & Postdocs)

- (Aug 2021 – Present) Milton Gomez (PhD student at UNIL)
- (Sep 2021 – Present) Frederick Iat-Hin Tam (PhD student at UNIL)
- (Aug 2021 – Dec 2023) Saranya Ganesh Sudheesh (Postdoctoral scholar at UNIL)

**Aug 2021 – Present**  
*Lausanne, Switzerland*

### Technical Advising (Weekly to Biweekly Mentoring of Early-Career Scientists)

- (Sep 2022 – Present) Jingyan Yu (Postdoctoral fellow at UNIL)
- (Sep 2021 – Present) Costa Christopoulos (PhD student at Caltech)
- (Jan 2020 – Mar 2024) Arthur Grundner (Previously PhD student then postdoc at the German Aerospace Center)
- (Jul 2019 – Feb 2024) Gunnar Behrens (Previously PhD student then postdoc at the German Aerospace Center)
- (Apr 2019 – Dec 2023) Griffin Mooers (Previously PhD student at UC Irvine, then postdoc at MIT)
- (Feb 2022 – Nov 2023) Francesco Zanetta (PhD student at ETH/MeteoSwiss, Visiting student at UNIL)
- (Dec 2019 – Jul 2021) Andrea Jenney (Postdoctoral fellow at UC Irvine)

**Jul 2019 – Present**  
*Europe & USA*

### PhD Thesis Committee Member

- (Feb 2024 – Present) Lucas Schmutz (UNIL)
- (Apr 2023 – Present) Kejdi Lleshi (UNIL)
- (Jan 2023 – Present) Tabea Cache (UNIL)
- (Sep 2022 – Present) Ségolène Crossouard (IPSL)
- (Jan 2022 – Present) Costa Christopoulos (Caltech)
- (Sep 2021 – Present) Janbert Aarnink (UNIL)
- (Jan 2020 – Apr 2023) Griffin Mooers (UC Irvine)
- (Oct 2022) Blanka Balogh (CNRM, Toulouse, only on final evaluation committee)

**Jan 2020 – Present**  
*Europe & USA*

### Direct Research Supervision (Bachelor & Master students)

- (Apr 2024 – Present) Mauricio Lima (Masters student at Sorbonne University & ECCE intern)
- (Apr 2024 – Present) Antoine Leclerc (Masters student at École Polytechnique & ECCE intern)
- (Mar 2024 – Present) Louise Largeau (Masters student at EPFL & ECCE intern)
- (Nov 2022 – Present) Fabien Augsburg (Masters student at UNIL)
- (Sep 2023 – Apr 2024) Louis Poulain-Auzeau (Masters student at EPFL)
- (Jun 2023 – Aug 2023) Aser Atawya (Bachelor fellow at UNIL)
- (May 2023 – Aug 2023) Marine Berthier (Masters student at ENSTA & ECCE intern)
- (Apr 2023 – Aug 2023) Jo Lécuyer (Masters student at École Polytechnique & UNIL intern)
- (May 2022 – Aug 2022) Léo Micollet (Masters student at ENSTA & UNIL intern)
- (Mar 2022 – Jul 2022) Deborah Bassotto (Post-Masters intern at UNIL)
- (Sep 2021 – Jun 2022) Meryam Cherqaoui (Bachelor student at UNIL)
- (Jul 2020 – Dec 2020) Ankitesh Gupta (Masters student at UC Irvine)

**Jul 2020 – Present**  
*Europe & USA*

## Teaching Experience

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<b>FGSE, University of Lausanne (2 occurrences)</b> <i>Main Instructor of "Introduction to Scientific Programming with Python" (2 ECTS, ≈50 students)</i> Design and delivery of yearly 4-week course open to all Masters and PhD students in Earth/env. sci. & geography.	<b>Sep 2022 – Present</b> <i>Lausanne, Switzerland</i>
<b>FGSE, University of Lausanne (2 occurrences)</b> <i>Main Instructor of "Géomatique et Systèmes d'Information Géographique" (3 ECTS, ≈100 students)</i> Design and delivery of yearly 12-week course open to all Bachelor students in Earth/env. sci. & geography.	<b>Sep 2022 – Present</b> <i>Lausanne, Switzerland</i>
<b>FGSE, University of Lausanne (3 occurrences)</b> <i>Main Instructor of "Machine Learning for Earth and Environmental Sciences" (5 ECTS, ≈25 students)</i> Design and delivery of yearly 12-week course open to all Masters and PhD students in Earth/env. sci. & geography.	<b>Jan 2022 – Present</b> <i>Lausanne, Switzerland</i>
<b>Foundation of Research and Technology-Hellas &amp; University of Oxford</b> <i>Main Instructor of the iMIRACLI 3rd Summer School on climate data science</i> Designed and delivered a one-day block course on physics-guided machine learning.	<b>Sep 2023</b> <i>Patras, Greece</i>
<b>European Centre for Medium-Range Weather Forecasts (MOOC)</b> <i>Consultant, Reviewer, and Content Provider for "Machine Learning for Weather and Climate"</i> Main instructor for the "Physics-Guided ML" & "Parametrisation emulation" e-learning modules.	<b>Mar 2022 – Mar 2023</b> <i>Remote, Luxembourg</i>
<b>MIT Teaching and Learning Laboratory</b> <i>Kaufman teaching certificate program</i> Program for MIT graduate students aimed at improving teaching skills.	<b>Feb 2017 – May 2017</b> <i>Cambridge, USA</i>
<b>PAOC, MIT</b> <i>Teaching Assistant in 12.801, The General Circulation of the Ocean</i> Prof. Raffaele Ferrari.	<b>Feb 2016 – May 2016</b> <i>Cambridge, USA</i>
<b>PAOC, MIT</b> <i>Teaching Assistant in 12.815, Atmospheric Radiation and Convection</i> Prof. Sara Seager and Prof. Kerry Emanuel.	<b>Sep 2015 – Dec 2015</b> <i>Cambridge, USA</i>
<b>Lycée Sainte-Geneviève</b> <i>Teaching Assistant in physics</i> Undergraduate level: waves, electromagnetism, optics, newtonian, solid and fluid mechanics.	<b>Sep 2012 – Mar 2014</b> <i>Versailles, France</i>

## Service

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<b>Reviewer for Journals and Workshops (41 submissions, 65 rounds)</b> <i>AGU Books, EDS, GMD, GRL, JAMES, JAS, JCLI, JGR, JHM, JMLR, MWR, NeurIPS, PLOS ONE, PNAS, PRL, QJRMS, RSE</i>	<b>Nov 2016 – Present</b>
<b>Reviewer for Proposals (11 submissions)</b> <i>American NSF, Belgian Science Policy Office, CLIMACT, Climate Change AI, German Aerospace Centre</i>	<b>Sep 2020 – Present</b>
<b>EOCE: Expertise Center for Climate Extremes</b> <i>Scientific Committee Member</i>	<b>Oct 2022 – Present</b> <i>Lausanne, Switzerland</i>
<b>Atmospheric Science Day in Lausanne</b> <i>Founder and co-organizer of the annual one-day workshop bringing together EPFL &amp; UNIL groups</i>	<b>May 2022 – Present</b> <i>Lausanne, Switzerland</i>
<b>Artificial Intelligence Advisory Panel for UNIL</b> <i>Committee Member</i>	<b>Mar 2024 – Present</b> <i>Lausanne, Switzerland</i>
<b>Swiss Geocomputing Centre</b> <i>Scientific Committee Member</i>	<b>Mar 2022 – Present</b> <i>Lausanne, Switzerland</i>
<b>UNIL FGSE's Faculty Council</b> <i>Committee Member</i>	<b>Sep 2023 – Present</b> <i>Lausanne, Switzerland</i>
<b>UNIL FGSE's Research Council</b> <i>Committee Member</i>	<b>Apr 2023 – Present</b> <i>Lausanne, Switzerland</i>
<b>Professor Hiring committee at IGD, UNIL</b> <i>Committee Member for the "Human Geography and/or Sustainable Urban/Regional Planning" position</i>	<b>Sep 2023 – Present</b> <i>Lausanne, Switzerland</i>
<b>UNIL Climate Physics Journal Club</b> <i>Co-founder and faculty support for student-driven seminar series</i>	<b>Dec 2021 – Jun 2023</b> <i>Lausanne, Switzerland</i>
<b>PAT Hiring committees at UNIL</b> <i>Committee Member for the position of "Computational Geoscientist" (IDYST/ISTE)</i>	<b>Jul 2022 – Mar 2023</b> <i>Lausanne, Switzerland</i>
<b>20th Edition of the Swiss Geoscience Meeting</b> <i>Co-chair of the session: Spatial Data Science</i>	<b>Feb 2022 – Sep 2022</b> <i>Lausanne, Switzerland</i>
<b>AMS 21st Conference on AI for Environmental Science</b> <i>Co-chair of the session: Applications of AI for Improved Estimation and Prediction of Weather and Climate</i>	<b>Apr 2021 – Jan 2022</b> <i>Houston, USA</i>

**CLIVAR Webinar: Emerging Data Science Tools for Climate Variability & Predictability***Invited Working Group Member: Co-organizer and moderator of the webinar***May 2020 – July 2021**  
USA**NeurIPS 2020 Workshop: AI for Earth Sciences***Co-organizer: Meta-reviewer and organizer of the atmospheric science session***Jun 2020 – Dec 2020**  
Vancouver, Canada**Editor-in-Chief Search Committee for JAMES (AGU)***Committee Member***Apr 2020 – Sep 2020**  
USA**MIT Office of Sustainability***Graduate research assistant in the Climate Resiliency Committee***Feb 2018 – Dec 2018**  
Cambridge, USA**Student and Post-doc Atmospheric Dynamics Lunch***Head of the organizing committee and founding member***Sep 2016 – May 2018**  
Cambridge, USA**EAPS Graduate Student Advisory Council***Secretary***Sep 2016 – May 2018**  
Cambridge, USA**Program in Atmospheres, Oceans and Climate Colloquium Series***Head of the organizing committee and founding member***Sep 2016 – Dec 2017**  
Cambridge, USA**Program in Atmospheres, Oceans, and Climate 2015 and 2016 Retreats***Co-organized 2015/2016 PAOC retreats for the professors, post-docs and students of the program***Jan 2015 – Oct 2016**  
Hancock and Brewster, USA**Graduate Climate Conference 2015***Member of the organizational committee of the 2015 Graduate Climate Conference***Jan 2015 – Nov 2015**  
Woods Hole, USA

## Non-Academic Professional Experience

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**Cronite Castings Limited***Maintenance engineer**Engineering and operator internship in the Crewkerne foundry.***Jul 2013 – Aug 2013**  
Crewkerne, UK**French Air Force***Lieutenant**Leadership training as part of the engineering school's curriculum.***Sep 2011 – Apr 2012**  
Cazaux, France

## Computer Skills

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**OS:** Linux, Unix, Windows**Programming:** Python, Matlab, Fortran 77/90, VBA, Java**GIS:** QGIS, ArcGIS Pro

## Language Skills

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**Native:** French, **Fluent:** English, **Intermediate:** German, **Beginner:** Japanese (N5), Spanish.

## Interests

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Weather Forecasting, Weightlifting, Swimming, Jogging, Hiking, Video Games, Rescued two feral kittens (photo).