

LOUISE NUIJENS

**Associate professor,
Geoscience & Remote Sensing, TU Delft**

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My research focuses on unraveling the physical processes that underlie the interaction of clouds with atmospheric circulations and the implication of such processes for weather, climate and wind energy prediction. I combine field and satellite observations with high-resolution simulations and theoretical models.

— EDUCATION

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| 2007 – 2010 | Ph.D - Atmospheric Sciences
University of California, Los Angeles (UCLA), USA |
| 2007 – 2008 | M.Sc - Atmospheric Sciences
University of California, Los Angeles (UCLA), USA |
| 2005 – 2006 | M.Sc (cum laude) - Meteorology
Wageningen University and Research Center, the Netherlands |

— POSITIONS

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| 2022 – | Associate professor (since May 2022), GRS, TU Delft |
| 2016 – 2022 | Assistant professor (with tenure since Jan 2020)
Dept. of Geosciences and Remote Sensing (GRS)
Delft University of Technology (TU Delft), Netherlands |
| 2015 – 2016 | Postdoctoral fellow
Dept. of Earth, Atmosphere and Planetary Sciences
Massachusetts Institute of Technology (MIT), USA |
| 2010 – 2015 | Group leader
Observations and Process Studies Group, Atmosphere Dept.
Max-Planck Institute for Meteorology (MPI-M), Germany |

— RESEARCH GRANTS & AWARDS

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| 2022 – | NWO Aspasia grant - €50.000 |
| 2019 – 2024 | NWO VIDI Grant - CMTRACE (Tracing convective momentum transport in complex cloudy atmospheres) - €799.602 |
| 2019 - 2022 | European Center for Medium-Range Weather Forecasts Fellowship – computing time and travel support |
| 2017 - 2022 | ERC Starting Grant – CloudBrake: How nature's smallest clouds |

	slow down large-scale circulations critical for climate - €1.876.000
2015 - 2016	Max Kade Postdoctoral Research Grant - €50.270 Max Kade Foundation, USA
2015 - 2016	Reimar-Lüst Stipendium - €47.112 Max-Planck Society, Germany
2008	Bosart Award, Dept. of Atmospheric and Oceanic Sciences University of California, Los Angeles (UCLA), USA
2007	Scholarship, Institute of Geophysics and Planetary Physics, University of California, Los Angeles (UCLA), USA

— FIELD EXPERIENCE AND INTERNATIONAL ACTIVITIES

May / Sept 2021	CMTRACE / Ruisdael Observatory campaign at Cabauw: collocated Doppler wind lidar and cloud radar scanning to retrieve high-resolution wind profiles in cloud fields
Jan – Feb 2020	EUREC4A field study on Barbados, responsible for short- and long-range wind profiling measurements aboard the R/V Meteor in collaboration with IWES Fraunhofer and DTU Wind Energy, in support of the World Climate Research Programme's Grand Science Challenge on Clouds, Circulation and Climate Sensitivity, Barbados
May – June 2019	CloudBrake Flight Campaign (PI), dual-aircraft flights taking Doppler wind lidar and turbulence measurements, deployment out of German Aerospace Center, Oberpfaffenhofen, Germany
2019 – 2020	Joint Global Atmospheric System Studies Panel and Working Group on Numerical Experimentation project on surface drag and momentum transport (led by Irina Sandu (ECMWF))
2010 – 2015	Barbados Cloud Observatory (team lead), support in establishment of a permanent remote sensing platform on Barbados, West Indies
Jan 2005	Rain In Cumulus over the Ocean (RICO) Field Campaign (student team), Antigua & Barbuda, West Indies

— SUPERVISION AND LEADERSHIP

TU Delft	<p>Current group:</p> <ul style="list-style-type: none"> - PhD cand. Alessandro Savazzi (2020 -), CMTRACE - Postdoc Jose Dias Neto (2021 -), CMTRACE - PhD cand. Mariska Koning (2018 -), CloudBrake - 3 student assistants (Dugue, de Boer, Boonstra) <p>Past group members:</p> <ul style="list-style-type: none"> - PhD Kevin Helfer (2017- 2021), CloudBrake - PhD cand. Beatrice Saggiorato (2017 - 2021), CloudBrake - Postdoc Vishal Dixit (2019 - 2022), CloudBrake - PhD cand. Geiske de Groot (sick leave) CONSTRAIN, co-supervisor - 6 MSc students (Cranenburgh, van der Voort, Antonissen, Ramakrishnan, Koning, de Villiers, Kulkarni (external for L&R))
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MPI-M **Engineers/Technicians** (Jansen, Bruegmann, Linne)
2 **Scientific Staff** (Hirsch, Serikov)
2 **PhD's** (Raphaella Vogel, Katrin Lonitz)
5 MSc students, 4 BSc students, 4 Student assistants

— EDUCATIONAL ACTIVITIES

2019 – **BSA (Bindend Studie Advies)** committee member, TU Delft
2018 – **MSc Education Redesign** core team member, TU Delft
2018 – **Bachelor end project coordinator** GRS, TU Delft

2020 – 22 CTB3311 **Climate Impacts and Engineering** (coordinator), TU Delft
2017 – 22 CIE4706 **Introduction to Meteorology** (coordinator), TU Delft
2018 – 19 CIE5604 **Journal Club Climate Change & Geosciences**, TU Delft
2022 AES1242 **Grand Challenges – Climate week**, TU Delft

2013 Lecturer - International Summer School on Clouds and Climate, Les Houches, France (2013).

2009 Teaching assistant for AOS 101 "Climate Change", UCLA
2005 Design graduate student course on "Clouds and Climate", WUR

— PROFESSIONAL SERVICES

2020-2021 American Geophysical Union (AGU) Meeting Convener Cloud-Circulation session

2020-2021 Panel member mock sessions Veni candidates, TU Delft
2019 PhD thesis committee member, Xabier Pedruszo-Bagazgoitia, WUR
2017-2018 European Geophysical Union (EGU) Meeting Co-convener
2016-2019 Panel Reviewer for the Department of Energy (DOE) Atmospheric System Research Program, USA

2013 Organizer Gordon Research Seminar on Radiation & Climate, USA
2007 – Reviewer for the: Deutsche Forschungs Gemeinschaft (DFG), European Research Council (ERC), Nature, Journal of Atmospheric Sciences, Journal of Geophysical Research, Journal of Climate, Atmospheric Chemistry and Physics, Monthly Weather Review, Bulletin of the American Meteorological Society, Quarterly Journal of the Royal Meteorological Society, Journal of Advances in Modeling Earth Systems, Geoscientific Model Development.

2005 – 2006 Committee Member - 'Teacher of the Year' Award, Wageningen University and Research Center, Netherlands
2004 – 2005 Committee Member - 'Towards an improved B.Sc. curriculum', Wageningen University and Research Center, Netherlands

— OUTREACH & MEDIA

2020 'Clouds blowing (in) the wind', **ECMWF Science Blog**
2020 "**I am a scientist**" bringing science to classrooms worldwide', The Plenary, Boston, USA

- 2019 **Up in the Clouds, Stories of Science**, CITG, TU Delft
 2017 "The stilling: global wind speeds slowing since 1960", interview in the EU Research and Innovation Magazine Horizon
 2013 'The mystery of sheep clouds', **Video Interview** with Dr. Max from Die Zeit Wissen, Germany's largest newspaper, Hamburg, Germany

— INVITED TALKS

The following only lists international conferences, workshops and universities to which I have been personally invited to speak. In total I have given > 40 presentations at conferences and workshops since the start of my career (excluding a large number of informal seminars) and ~10 poster presentations at conferences/workshops.

- Invited **ECMWF Annual Seminar** on Challenging physics in seamless predictions, Reading, UK (Sept 12 – 16, 2022)
- 2022 **Tropical Cyclones, Convection, and Climate: A Symposium in Honor of Kerry Emanuel**, MIT Boston (June 21-22, 2022)
- 2021 **American Geophysical Union (AGU) Fall Meeting**, US, New Orleans
- 2021 Symposium Tropische Meteorologie, **Nederlandse Vereniging van Beroeps Meteorologen (NVBM)**, Arnhem, NL
- 2021 **Geophysical Fluid Dynamics Laboratory (GFDL) Formal Virtual Seminar Series**, US
- 2021 Copenhagen Spatial Organization of Convection Workshop (Virtual)
- 2020 CIMH, **Barbados Symposium: From BOMEX to EUREC4A**
- 2019 American Geophysical Union Fall Meeting (**AGU**), San Fransisco, US
- 2019 Karlsruhe Institute of Technology (**KIT**) Meteorologisches Kolloquium, Karlsruhe, Germany
- 2018 Cloud Feedback Model Intercomparison Project Meeting, Boulder,US
- 2018 **ECMWF Physics Seminar**, Reading, UK
- 2018 **Pan GASS (Gewex Cloud System Studies) Conference**, Lorne, Australia
- 2017 Workshop 'The Future of Cumulus Parameterization', TU Delft
- 2017 European Geoscience Union (**EGU**) General Assembly Vienna, AU
- 2017 **Max Planck Institute for Meteorology** Seminar, Hamburg, Germany
- 2016 **Brookhaven National Laboratory**, Long Island, New York, US
- 2016 **Columbia University**, SEAS Colloquium in Climate Science, New York
- 2016 **Rosenthal School of Marine & Atmospheric Science**, Department of Atmospheric Sciences, Department Seminar, Miami, US
- 2016 **DLR/UNOOSA Conference on Climate Change**, Cologne, DE
- 2016 BMBF funded international conference of the High Definition Clouds and Precipitation for Advancing Climate Prediction Project, Berlin, DE
- 2016 International Space Science Institute (**ISSI**) workshop, Bern, CH
- 2015 American Geophysical Union (**AGU**) Fall Meeting, San Fransisco, US
- 2015 **ECMWF Annual Seminar** on Physical Processes in present and future large-scale models , Reading, UK
- 2013 **University of Oxford**, Oxford, UK
- 2011 **Klaus Hasselmann Symposium**, Hamburg, Germany
- 2011 **Goldschmidt Conference**, Prague, CZ
- 2009 European Geoscience Union (**EGU**) General Assembly Vienna, AU

— BOOKS AND TECHNICAL REPORTS

Sandu, I., Bechtold P., **Nuijens, L.**, Beljaars, A. and Brown, A. (2020) What controls the systematic forecast biases in near-surface wind direction over the oceans? (ECMWF Technical Memo no 866)

Nuijens, L. and C. Jacob, (2020): Cloudy Perspectives, Chapter 1 of Clouds and Climate. Clouds and Climate: Climate Science's Greatest Challenge. Siebesma, A., Bony, S., Jakob, C., & Stevens, B. (Eds.). Cambridge: Cambridge University Press.

— PEER-REVIEWED JOURNAL PAPERS

My h-index is 20 and I have 8 first-authored out of of 33 peer-reviewed journal articles. My co-authorship is limited to projects I make a significant contribution to. My work on the interaction of clouds and their environment, which serves as a thread through my career, is highly cited.

Submitted/In Review:

- Dias Neto, J., **Nuijens, L.** , Unal. C. and Knoop, S. (submitted to *Earth System Science Data*): Combined Wind Lidar and Cloud Radar for Wind Profiling
- **Nuijens, L.**, Savazzi, A.C.M., de Boer, G., Brilouet, P-E., George, G., Lothon, M., Zhang, D. (*In review for the Quarterly Journal of the Royal Meteorological Society.*): The frictional layer in the observed momentum budget of the trades
- Savazzi, A.C.M., **Nuijens, L.**, Sandu, I., George, G., Bechtold, P. (*preprint/interactive discussion at ACP*): The representation of winds in the lower troposphere in ECMWF forecasts and reanalyses during the EUREC4A field campaign.

Published:

33. Koning, A.M., **Nuijens, L.**, Mallaun, C. (2022): Momentum fluxes from airborne wind measurements in three cumulus cases over land. *Atmos. Chem. Phys.*, 22, 7373–7388 <https://doi.org/10.5194/acp-22-7373-2022>
32. Helfer, K.C. and **Nuijens, L.** (2021): The morphology of simulated trade-wind convection and cold pools under wind shear. *Journal of Geophysical Research: Atmospheres*, 126, e2021JD035148.
31. Koning, A.M., **Nuijens, L.**, Bosveld, F.C., Siebesma, A.P., van Dorp, P.J., Jonker, H.J.J. (2021): Surface-Layer wind shear and momentum transport from clear-sky to cloudy weather regimes over land. *Journal of Geophysical Research: Atmospheres* , 126, e2021JD035087.
30. Stevens, B. and coauthors (2021): EUREC4A. *Earth System Science Data* , 13, 4067–4119, <https://doi.org/10.5194/essd-13-4067-2021>
29. Dixit, V.V., **Nuijens, L.**, Helfer, K.C. (2021): Counter-gradient momentum transport through subtropical shallow convection in ICON-LEM simulations. *Journal of Advances in Modeling Earth Systems* , 13, e2020MS002352.
28. Helfer, K.C., **Nuijens, L.**, Dixit, V.V. (2021): The role of shallow convection in the momentum budget of the trades from large-eddy-simulation hindcasts. *QJR Meteorol Soc*2021; 147: 2490– 2505. <https://doi.org/10.1002/qj.4035>

27. Helfer, K.C., **Nuijens, L.**, De Roode, S.R. and Siebesma, A.P. (2020): How wind shear affects trade-wind cumulus convection (2020). *Journal of Advances in Modeling Earth Systems*, 12, e2020MS002183. <https://doi.org/10.1029/2020MS002183>
26. Saggiorato, B., **Nuijens, L.**, Siebesma, A. P., de Roode, S., Sandu, I. and Papritz, L. (2020). The influence of convective momentum transport and vertical wind shear on the evolution of a cold air outbreak. *Journal of Advances in Modeling Earth Systems*, 12. <https://doi.org/10.1029/2019MS001991>
25. **Nuijens, L.** & Siebesma, A.P. Boundary Layer Clouds and Convection over Subtropical Oceans in our Current and in a Warmer Climate. *Curr Clim Change Rep* (2019) 5: 80. <https://doi.org/10.1007/s40641-019-00126-x>
24. Vogel, R., **Nuijens, L.**, Stevens, B (2020): Influence of deepening and mesoscale organization of shallow convection on stratiform cloudiness in the downstream trades. *Q J R Meteorol Soc.*; 146: 174– 185. <https://doi.org/10.1002/qj.3664>
23. **Nuijens, L.** and Emanuel, K. (2018): Congestus modes in circulating equilibria of the tropical atmosphere in a two-column model. *Quarterly Journal of the Royal Meteorological Society*. DOI: 10.1002/qj.3385
22. **Nuijens, L.**, Emanuel, K., Masunaga, H., L'Ecuyer, T.(2017): Implications of Warm Rain in Shallow Cumulus and Congestus Clouds for Large-Scale Circulations, *Surveys in Geophysics*, 38 (6), pp. 1257-1282. DOI: 10.1007/s10712-017-9429-z
21. Bony, S., Stevens, B., Ament, F., Bigorre, S., Chazette, P., Crewell, S., Delanoë, J., Emanuel, K., Farrell, D., Flamant, C., Gross, S., Hirsch, L., Karstensen, J., Mayer, B., **Nuijens, L.**, Ruppert, J.H., Sandu, I., Siebesma, P., Speich, S., Szczap, F., Totems, J., Vogel, R., Wendisch, M., Wirth, M. (2017): EUREC4A: A Field Campaign to Elucidate the Couplings Between Clouds, Convection and Circulation. *Surveys in Geophysics*, 38 (6), pp. 1529-1568. DOI: 10.1007/s10712-017-9428-0
20. Vogel, R., **Nuijens, L.**, Stevens, B. (2016): The role of precipitation and spatial organization in the response of trade-wind clouds to warming. *Journal of Advances in Modeling Earth Systems*, 8 (2), pp. 843-862. DOI: 10.1002/2015MS000568
19. Medeiros, B., **Nuijens, L.** (2016): Clouds at Barbados are representative of clouds across the trade wind regions in observations and climate models. *Proceedings of the National Academy of Sciences of the United States of America*, 113 (22), pp. E3062-E3070. DOI: 10.1073/pnas.1521494113
18. Stevens, B., Farrell, D., Hirsch, L., Jansen, F., **Nuijens, L.**, Serikov, I., Brüggemann, B., Forde, M., Linne, H., Lonitz, K., Prospero, J.M.(2016): The Barbados cloud observatory: Anchoring investigations of clouds and circulation on the edge of the ITCZ. *Bulletin of the American Meteorological Society*, 97 (5), pp. 735-754. DOI: 10.1175/BAMS-D-14-00247.1
17. **Nuijens, L.**, Medeiros, B., Sandu, I., Ahlgrimm, M. (2015): Observed and modeled patterns of covariability between low-level cloudiness and the structure of the trade-wind layer. *Journal of Advances in Modeling Earth Systems*, 7 (4), pp. 1741-1764. DOI: 10.1002/2015MS000483
16. Lonitz, K., Stevens, B., **Nuijens, L.**, Sant, V., Hirsch, L., Seifert, A.(2015): The signature of aerosols and meteorology in long-term cloud radar observations of trade wind cumuli. *Journal of the Atmospheric Sciences*, 72 (12), pp. 4643-4659. DOI: 10.1175/JAS-D-14-0348.1
15. **Nuijens, L.**, Medeiros, B., Sandu, I., Ahlgrimm, M. (2015): The behavior of trade-wind cloudiness in observations and models: The major cloud components and their variability. *Journal of Advances in Modeling Earth Systems*, 7 (2), pp. 600-616. DOI: 10.1002/2014MS000390
14. Lamer, K., Kollias, P., **Nuijens, L.** (2015): Observations of the variability of shallow trade wind cumulus cloudiness and mass flux. *Journal of Geophysical Research*, 120 (12), pp. 6161-6178. DOI: 10.1002/2014JD022950
13. Brueck, M., **Nuijens, L.**, Stevens, B. (2015): On the seasonal and synoptic time-scale variability of the North Atlantic trade wind region and its low-level clouds. *Journal of the Atmospheric Sciences*, 72 (4), pp. 1428-1446. DOI: 10.1175/JAS-D-14-0054.1

12. Burdanowitz, J., **Nuijens, L.**, Stevens, B., Klepp, C. (2015): Evaluating light rain from satellite- and ground-based remote sensing data over the subtropical North Atlantic. *Journal of Applied Meteorology and Climatology*, 54 (3), pp. 556-572. DOI: 10.1175/JAMC-D-14-0146.1
11. **Nuijens, L.**, Serikov, I., Hirsch, L., Lonitz, K., Stevens, B. (2014): The distribution and variability of low-level cloud in the North Atlantic trades. *Quarterly Journal of the Royal Meteorological Society*, 140 (684), pp. 2364-2374. DOI: 10.1002/qj.2307
10. Siebert, H., Beals, M., Bethke, J., Bierwirth, E., Conrath, T., Dieckmann, K., Ditas, F., Ehrlich, A., Farrell, D., Hartmann, S., Izaguirre, M.A., Katzwinkel, J., **Nuijens, L.**, Roberts, G., Schäfer, M., Shaw, R.A., Schmeissner, T., Serikov, I., Stevens, B., Stratmann, F., Wehner, B., Wendisch, M., Werner, F., Wex, H. (2013): The fine-scale structure of the trade wind cumuli over Barbados – An introduction to the CARRIBA project. *Atmospheric Chemistry and Physics*, 13 (19), pp. 10061-10077. DOI: 10.5194/acp-13-10061-2013
9. Rieck, M., **Nuijens, L.**, Stevens, B. (2012): Marine boundary layer cloud feedbacks in a constant relative humidity atmosphere. *Journal of the Atmospheric Sciences*, 69 (8), pp. 2538-2550. DOI: 10.1175/JAS-D-11-0203.1
8. **Nuijens, L.**, Stevens, B. (2012) : The influence of wind speed on shallow marine cumulus convection. *Journal of the Atmospheric Sciences*, 69 (1), pp. 168-184. DOI: 10.1175/JAS-D-11-02.1
7. Matheou, G., Chung, D., **Nuijens, L.**, Stevens, B., Teixeira, J. (2011): On the fidelity of large-eddy simulation of shallow precipitating cumulus convection. *Weather Review*, 139 (9), pp. 2918-2939. DOI: 10.1175/2011MWR3599.1
6. VanZanten, M.C., Stevens, B., **Nuijens, L.**, Siebesma, A.P., Ackerman, A.S., Burnet, F., Cheng, A., Couvreux, F., Jiang, H., Khairoutdinov, M., Kogan, Y., Lewellen, D.C., Mechem, D., Nakamura, K., Noda, A., Shipway, B.J., Slawinska, J., Wang, S., Wyszogrodzki, A. (2011): Controls on precipitation and cloudiness in simulations of trade-wind cumulus as observed during RICO. *Journal of Advances in Modeling Earth Systems*, 3 (2), DOI:10.1029/2011MS000056
5. Seifert, A., **Nuijens, L.**, Stevens, B. (2010): Turbulence effects on warm-rain autoconversion in precipitating shallow convection. *Quarterly Journal of the Royal Meteorological Society*, 136 (652), pp. 1753-1762. DOI: 10.1002/qj.684
4. Medeiros, B., **Nuijens, L.**, Antoniazzi, C., Stevens, B. (2010): Low-latitude boundary layer clouds as seen by CALIPSO. *Journal of Geophysical Research Atmospheres*, 115 (23), art. no. D23207. DOI: 10.1029/2010JD014437
3. **Nuijens, L.**, Stevens, B., Siebesma, A.P. (2009): The environment of precipitating shallow cumulus convection. *Journal of the Atmospheric Sciences*, 66 (7), pp. 1962-1979. DOI: 10.1175/2008JAS2841.1
2. Rauber, R.M., Stevens, B., Ochs III, H.T., Knight, C., Albrecht, B.A., Blythe, A.M., Fairall, C.W., Jensen, J.B., Lasher-Trapp, S.G., Mayol-Bracero, O.L., Vali, G., Anderson, J.R., Baker, B.A., Bandy, A.R., Brunet, E., Brenguier, J.L., Brewer, W.A., Brown, P.R.A., Chuang, P., Cotton, W.R., Di Girolamo, L., Geerts, B., Gerber, H., Göke, S., Gomes, L., Heikes, B.G., Hudson, J.G., Kollias, P., Lawson, R.P., Krueger, S.K., Lenschow, D.H., **Nuijens, L.**, O'Sullivan, D.W., Rilling, R.A., Rogers, D.C., Siebesma, A.P., Snodgrass, F., Stith, J.L., Thornton, D.C., Tucker, S., Twohy, C.H., Zuidema, P. (2007): Rain in shallow cumulus over the ocean: The RICO campaign. *Bulletin of the American Meteorological Society*, 88 (12), pp. 1912-1928. DOI: 10.1175/BAMS-88-12-1912
1. Rauber, R. M., Stevens, B., Davison, J., Goke, S., Mayol-Bracero, O. L., Rogers, D., Zuidema, P., Ochs, H. T., III, Knight, C., Jensen, J., Bereznicki, S., Bordoni, S., Caro-Gautier, H., Colón-Robles, M., Deliz, M., Donaher, S., Ghate, V., Grzeszczak, E., Henry, C., Hertel, A. M., Jo, I., Kruk, M., Lowenstein, J., Malley, J., Medeiros, B., Méndez-Lopez, Y., Mishra, S., Morales-García, F., **Nuijens, L. A.**, O'Donnell, D., Ortiz-Montalvo, D. L., Rasmussen, K., Riepe, E., Scalia, S., Serpetzoglou, E., Shen, H., Siedsma, M., Small, J., Snodgrass, E., Trivej, P., & Zawislak, J. (2007). In the Driver's

Seat: Rico and Education, *Bulletin of the American Meteorological Society*, 88(12),
1929-1938