

# LOUISE NUIJENS

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**Full name:** Aloisia Antoinette Nuijens  
**Birth date/place:** 20.04.1983, Pretoria  
**Nationality:** Netherlands  
**Languages:** Dutch (mother tongue), English (fluent), German (advanced)



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My research interests focus on the myriad of smaller cumulus clouds that are ubiquitous over tropical oceans, where they are often called "trade-wind cumuli", as well as over land during fair-weather. The interaction of these cumuli with atmospheric circulations on much larger scales are thought to be critical for Earth's climate. I am also interested in the processes that shape cloudiness, precipitation and the energy and momentum budget of the atmospheric boundary layer. In my work I use observations, including field campaign data, satellite data and (re-)analysis products; theoretical models, including bulk models of the cloudy boundary layer or column models of the tropical atmosphere; and Large-Eddy Simulation.

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## — EDUCATION

- 01/01/2007 – 11/06/2010 **Ph.D** - Atmospheric Sciences  
Dept. of Atmospheric and Oceanic Sciences  
**University of California, Los Angeles (UCLA), USA**  
*Thesis title: "Precipitating Shallow Cumulus Convection".*  
*Committee: Bjorn Stevens (advisor), J. David Neelin, Carlos R. Mechoso, Joao Teixeira and Russel Caflisch*
- 01/01/2007 – 13/06/2008 **M.Sc** - Atmospheric Sciences  
Dept. of Atmospheric and Oceanic Sciences  
**University of California, Los Angeles (UCLA), USA**
- 01/01/2005 – 16/11/2006 **M.Sc** (cum laude) - Meteorology  
Dept. of Meteorology and Air Quality  
**Wageningen University and Research Center, the Netherlands**

## — POSITIONS

- 01/12/2015 – **Assistant professor (tenure-track)**  
Dept. of Geosciences and Remote Sensing  
Faculty of Civil Engineering and Geosciences  
**Delft University of Technology (TU Delft), Netherlands**
- 01/10/2015 – 31/10/2016 **Postdoctoral fellow**  
Prof. Dr. Kerry Emanuel's group  
Dept. of Earth, Atmosphere and Planetary Sciences  
**Massachusetts Institute of Technology (MIT), USA**  
*My funded project investigated large-scale impacts and constraints on shallow convection in large-scale atmospheric circulations (Hadley/Walker circulations).*

01/07/2010 – 30/08/2015 **Group leader**  
Observations and Process Studies Group, Atmosphere Dept.  
**Max-Planck Institute for Meteorology (MPI-M)** Germany  
*My group set up a permanent remote-sensing site in the trades, a regime that is critical in driving much of the uncertainty in future climate projections. My group used these observations to constrain the representation of clouds in models.*

01/01/2006 – 31/06/2006 **Research Intern**  
Supervision by Prof. Dr. A. Pier Siebesma  
**Royal Netherlands Meteorological Institute (KNMI)**,  
Netherlands  
*Preparation of the Rain In Cumulus over the Ocean (RICO) Large Eddy Simulation modeling case for the GEWEX Cloud System Studies group.*

## — RESEARCH GRANTS AND SCHOLARSHIPS

01/01/2017 – 31/12/2021 **ERC Starting Grant - CloudBrake - 1.876 M€**  
*"How nature's smallest clouds slow down circulations critical for climate"*

01/10/2015 – 31/09/2016 **Max Kade Postdoctoral Research Grant**  
**Max Kade Foundation, USA**  
*For the exchange of academic ideas between the US and German-speaking countries.*

01/10/2015 – 30/11/2016 **Reimar-Lüst Stipendium**  
**Max-Planck Society, Germany**  
*On the occasion of the 60th birthday of Prof. Dr. Reimar Lüst, former president of the Max-Planck Society, German enterprises subsidized a foundation for the promotion of young researchers, selected by Prof. Dr. Lüst every two years.*

01/01/2007 – 31/12/2007 **Scholarship, Institute of Geophysics and Planetary Physics,**  
**University of California, Los Angeles (UCLA), USA**

01/01/2005 – 31/07/2005 **Travel grants, for my MSc research in the US**  
Schuurman-Schimmel van Outeren Stichting, Hendrik-Müller  
Vaderlandsch Fonds, the Netherlands.

## — AWARDS

11/2008 **Bosart Award, Dept. of Atmospheric and Oceanic Sciences**  
**University of California, Los Angeles (UCLA), USA**  
*"For unselfish service to fellow students and positive contribution to department life while demonstrating firm commitment to academics"*

## — STUDENT SUPERVISION

01/05/2017 – **2 PhD's (main supervisor)** Kevin Kelfer, Beatrice Saggiorato.  
GRS Department, TU Delft

01/03/2014 – 30/06-2017 **1 PhD (main supervisor)** Raphaela Vogel  
Max-Planck Institute for Meteorology / Hamburg University, DE

2010 – 2015 **1 PhD (co-supervision); 5 Master students; 1 Bachelor student**  
Max-Planck Institute for Meteorology / Hamburg University, DE

## — TEACHING ACTIVITIES

- 3rd Quarter 2017      **Introduction to Meteorology** (CIE-4706), Environmental Engineering track, CITG Faculty, TU Delft
- 24/06/2013 – 05/07/2013      **Lecturer** - International Summer School on Clouds and Climate Les Houches, France.  
*Initiated and hosted by the European Union FP7 CLOUD Intercomparison, Process Study and Evaluation (EUCLIPSE) project.*
- 01/09/2009 – 31/12/2009      **Teaching assistant** for AOS 101 "Climate Change"  
Department of Atmospheric Sciences, UCLA, USA
- 2005 – 2006      **Originator** of a graduate student course on "Clouds and Climate"  
Wageningen University and Research Center, the Netherlands
- 2002 - 2005      **Freelance tutor** in physics/math for high-school students  
Private Tutoring Institute, Wageningen, the Netherlands

## — FIELD EXPERIENCE

- 01/07/2010 – 31/08/2015      **Barbados Cloud Observatory**, Barbados, West Indies  
*A permanent atmospheric measurement site on Barbados with state-of-the-art remote sensing instruments (radars / lidars). It has also served as a platform for a number of flight campaigns.*
- 01/01/2005 – 31/01/2005      **Rain In Cumulus over the Ocean (RICO) Field Campaign**  
Antigua & Barbuda, West Indies  
*Preparation of weather reports, flight strategies, performing data analysis*

## — PROFESSIONAL SERVICES, ACTIVITIES AND MEMBERSHIPS

- 03/2016      **Panel Reviewer** for the Department of Energy (DOE) Atmospheric System Research Program Funding Opportunity Announcements
- 06-07/07/2013      **Organizer Gordon Research Seminar** on Radiation & Climate  
Maine, USA  
*60 participants, a forum for graduate students and post-docs in conjunction with the Gordon Research Conference*
- 01/01/2007 – today      **Reviewer** for the: Journal of Atmospheric Sciences, 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
- 01/01/2007 – today      **Member** of: the American Meteorological Society (AMS) and American Geophysical Union (AGU)
- 01/07/2007 – 31/06/2008      **Co-president** of Chi Epsilon Pi, graduate student association  
Department of Atmospheric Sciences, UCLA, USA
- 01/10/2007 – 30/09/2008      **Student representative** at faculty meetings,  
Department of Atmospheric Sciences, UCLA, USA
- 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
- 2003 – 2004      **Secretary** - Board of the Pyrus study association, WUR

## — PUBLICATIONS AND TALKS

### a. JOURNAL ARTICLES. First-authored

[..] = citation number, excluding self-citations, dd. 15.05.2016.

**Nuijens, L.**, K. Emanuel, H. Masunaga, T. L'Ecuyer,,: Implications of rain in shallow cumulus and congestus clouds for large-scale circulations. Submitted to *Surveys in Geophysics*.

[0] **Nuijens, L.**, B. Medeiros, I. Sandu and M. Ahlgrimm, (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, DOI: [10.1002/2015MS000483](https://doi.org/10.1002/2015MS000483).

[3] **Nuijens, L.**, B. Medeiros, I. Sandu and M. Ahlgrimm, (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, pp 600-616 DOI:[10.1002/2014MS000390](https://doi.org/10.1002/2014MS000390).

— *these two publications describe a framework for interpreting the behavior of shallow convection and clouds in nature, whose insights are used to validate changes in cloudiness and cloud feedbacks in global climate models. The work was carried out in collaboration with three early-career research scientists at ECMWF and NCAR.*

[7] **Nuijens, L.**, I. Serikov, L. Hirsch, K. Lonitz and B. Stevens (2013): The distribution and variability of low-level cloud in the North-Atlantic trades, *Quarterly Journal of the Royal Meteorological Society*. **140**. pp 2364 -2374. DOI: [10.1002/qj.2307](https://doi.org/10.1002/qj.2307).

— *this publication compares the first long-term record of cloudiness in the trades from state-of-the-art ground-based remote sensing instruments deployed on the Island of Barbados.*

[14] **Nuijens L.** and B. Stevens (2012): The influence of wind speed on shallow marine cumulus convection. *Journal of Atmospheric Sciences*, **69**:1, pp 168–184.

[41] **Nuijens, L.**, B. Stevens and A.P. Siebesma (2009): The environment of precipitating shallow cumulus convection. *Journal of Atmospheric Sciences*, **66**, pp 1962-1979.

— *these two publications are the result of my PhD research, in which I used field data and Large Eddy Simulations to study the variability of precipitating shallow cumuli, and which highlight the correlation of surface wind speed with precipitation.*

### b. JOURNAL ARTICLES. Co-authored

Vogel, R. and **Nuijens, L.** (2017): Changes in precipitation, cloudiness and trade-wind layer structure from the winter to the summer trades. Submitted to *Journal of Advances in Modeling Earth Systems*

Bony, Stevens, Ament, Crewell, Delanoe, Farrell, Flamant, Gross, Hirsch, Mayer, **Nuijens**, Ruppert, Sandu, Siebesma, Speich, Szczap, Vogel, Wendisch and Wirth (2017): EUREC4A: a field campaign to elucidate the coupling between clouds, convection and circulation. Submitted to *Surveys in Geophysics*

[0] 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*, 133 (22). doi:[10.1073.pnas.1521494113](https://doi.org/10.1073/pnas.1521494113)

[0] Vogel, R., **Nuijens, L.** & Stevens, B. (in press). The role of precipitation and spatial organization in the response of trade-wind clouds to warming. *Journal of Advances in Modeling Earth Systems*. doi:[10.1002/2015MS000568](https://doi.org/10.1002/2015MS000568)

- [0] Stevens, B., Farrell, D., Hirsch, L., Jansen, F., **Nuijens, L.**, Serikov, I., Brüggemann, B., Forde, M., Linné, H., Lonitz, K., & Prospero, J. M. (in press). The Barbados Cloud Observatory — anchoring investigations of clouds and circulation on the edge of the ITCZ. *Bulletin of the American Meteorological Society*. [doi:10.1175/BAMS-D-14-00247.1](https://doi.org/10.1175/BAMS-D-14-00247.1)
- [0] Lonitz, K., Stevens, B., **Nuijens, L.**, & Hirsch, L. (2015). The signature of aerosols and meteorology in long-term cloud radar observations of trade-wind cumuli. *Journal of the Atmospheric Sciences*, 72, 4643-4659. [doi:10.1175/JAS-D-14-0348.1](https://doi.org/10.1175/JAS-D-14-0348.1)
- [2] Brueck, M., **Nuijens, L.**, & Stevens, B. (2015). On the seasonal and synoptic time scale variability of the North Atlantic trades and its low-level clouds. *Journal of the Atmospheric Sciences*, 72, 1428-1446. [doi:10.1175/JAS-D-14-0054.1](https://doi.org/10.1175/JAS-D-14-0054.1)
- [1] 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, 556-572. [doi:10.1175/JAMC-D-14-0146.1](https://doi.org/10.1175/JAMC-D-14-0146.1)
- [1] Lamer, K., Kollias, P., & **Nuijens, L.** (2015). Observations of the variability of shallow trade wind cumulus cloudiness and mass flux. *Journal of Geophysical Research-Atmospheres*, 120, 6161-6178. [doi:10.1002/2014JD022950](https://doi.org/10.1002/2014JD022950)
- [8] Siebert, H. et al. (2013). The fine-scale structure of the trade wind cumuli over Barbados – An introduction to the CARRIBA project. *Atmospheric Chemistry and Physics*, 13, 10061-10077. [doi:10.5194/acp-13-10061-2013](https://doi.org/10.5194/acp-13-10061-2013)
- [26] Rieck, M., **Nuijens, L.**, & Stevens, B. (2012). Marine boundary layer cloud feedbacks in a constant relative humidity atmosphere. *Journal of the Atmospheric Sciences*, 69, 2538-2550. [doi:10.1175/JAS-D-11-0203.1](https://doi.org/10.1175/JAS-D-11-0203.1)
- [24] Matheou, G., Chung, D., **Nuijens, L.**, Stevens, B., & Teixeira, J. (2011). On the fidelity of large-eddy simulation of shallow precipitating cumulus convection. *Monthly Weather Review*, 139, 2918-2939. [doi:10.1175/2011MWR3599.1](https://doi.org/10.1175/2011MWR3599.1)
- [72] vanZanten, M. et al (2011). Controls on precipitation and cloudiness in simulations of trade-wind cumulus as observed during RICO. *Journal of Advances in Modeling Earth Systems*, 3: M06001. [doi:10.1029/2011MS000056](https://doi.org/10.1029/2011MS000056)
- [11] Medeiros, B., **Nuijens, L.**, Antoniazzi, C., & Stevens, B. (2010). Low-latitude boundary layer clouds as seen by CALIPSO. *Journal of Geophysical Research - Atmospheres*, 115: D23207. [doi:10.1029/2010JD014437](https://doi.org/10.1029/2010JD014437)
- [24] 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, 1753-1762. [doi:10.1002/qj.684](https://doi.org/10.1002/qj.684)
- [153] Rauber, R. M. et al. (2007). Rain in shallow cumulus over the ocean: the RICO Campaign. *Bulletin of the American Meteorological Society*, 88, 1912-1928. [doi:10.1175/BAMS-88-12-1912](https://doi.org/10.1175/BAMS-88-12-1912)
- [5] Rauber, R. M et al. (2007). In the driver's seat: Rico and education. *Bulletin of the American Meteorological Society*, 88, 1929-1937

### c. BOOK CHAPTER

**Nuijens, L.** and C. Jacob: Introduction & Overview, Chapter 1 of *Clouds and Climate* (in press)

— *a graduate-level textbook initiated by the European Union FP7 CLOUD Intercomparison, Process Study and Evaluation (EUCLIPSE) project.*

### d. PhD THESIS

**Nuijens, L.** (2010): *Precipitating Shallow Cumulus Convection*. University of California, Los Angeles, USA

### e. INVITED SPEAKER

The following lists international conferences, workshops and universities to which I have been

invited to speak. In total I have given > 30 presentations at conferences/workshops since the start of my career (excluding a large number of informal seminars) and ~10 poster presentations at conferences/workshops.

- 06/28/2016      **Brookhaven National Laboratory**, Long Island, New York, US
- 05/05/2016      **Columbia University**, SEAS Colloquium in Climate Science, New York, US  
on: *When shallow convection deepens and precipitates: rethinking the role of subsiding regions in large-scale circulations*
- 04/13/2016      **Rosenthal School of Marine & Atmospheric Science**, Department of Atmospheric Sciences, Department Seminar, Miami, US  
on: *Observed and modeled sensitivity of trade-wind cloudiness to changes in the large-scale flow*
- 03/05/2016      **DLR/UNOOSA Conference on Climate Change**, Cologne, DE  
on: *Low clouds, more than the wild card in global mean temperature rise*
- 02/15/2016      **BMBF funded international conference** of the High Definition Clouds and Precipitation for Advancing Climate Prediction Project, Berlin, DE  
on: *Understanding clouds and precipitation through highly resolved process modelling and observations*
- 02/08/2016      **International Space Science Institute (ISSI) workshop**, Bern, CH  
on: *"Shallow clouds and water vapor, circulation and climate sensitivity"*
- 12/12/2015      **American Geophysical Union Fall Meeting**, San Fransisco, US  
on: *The Interaction of Trade-Wind Clouds with the Large-Scale Flow in Observations and Models*
- 03/09/2015      **ECMWF Annual Seminar on Physical Processes in present and future large-scale models** , Reading, UK  
on: *Coupling between clouds and their environment - using observations to constrain models*
- 24/01/2013      **University of Oxford**, Oxford, UK  
on: *The structure and variability of shallow trade-wind cumulus from long-term ground-based remote sensing*
- 08/11/2011      **Klaus Hasselmann Symposium**, Hamburg, Germany  
on: *Observations for model development*
- 18/08/2011      **Goldschmidt Conference**, Prague, CZ  
on: *The Barbados Cloud Observatory: controls on precipitating shallow cumulus convection*
- 20/04/2009      **European Geoscience Union (EGU) General Assembly** Vienna, AU  
on: *Relationships between wind speed, humidity and precipitating shallow cumulus convection*