

Cover Letter

Dear Dr. Louise Nuijens,

I am applying for the opened Postdoc position from your research group. I am a physicist with a master in meteorology, and I am currently doing my PhD in meteorology at the University of Cologne. I will be available at the beginning of 2021. I am excited about this position, which gives me the possibility to balance software development and technical skill to process/analyze radar/lidar data for advancing the current knowledge about convective momentum transport.

At my current position (PhD), I am combining observations from tree Doppler cloud radars (X-, Ka and W-band) for understanding the early and late stage of snow aggregation and its impact on the rainfall. For this, I developed the data chain processing, using Python, from the raw radar moments (lev-0) to a highly controlled dataset (lev-2). At the same time, I am also using the Doppler spectra for identifying the different hydrometeor classes (e.g. snow, ice crystal and supercooled water). Recently, I am using PAMTRA and PyTmatrix, radar forward operators, for connecting the results from the observation with our current knowledge about aggregation.

During my time as a research assistant at the National Institute for Space Research (INPE) in Brazil, I developed a set of computational tools (aotPy), using Python, to evaluate the Aerosol Optical Depth retrieved by the new generation of NOAA polar satellites. The data set was extremely large and complex, and it was encapsulated like HDF5. In the development of those tools, I became experienced with several python libraries (e. g. h5py, Numpy, SciPy, pandas, IPython, Matplotlib, and Basemap). In December of 2015, I began to work with small Linux Rocks Cluster to develop a parallel version of aotPy; simultaneously, I gained experience with installation and administration of Rocks Operational System.

During master's, I worked at the Meteorological Instrumentation Laboratory from INPE; where, I planned the experimental setup, developed a mathematical tool and created a Python routine to calculate calibration coefficients of Longwave Radiation Sensors. At the same time, I joined in field group from that laboratory and participated in scientific cruises to measure atmospheric and oceanic variables, spending several days at sea, which I enjoyed very much. Moreover, I gained experience with oceanic sensors such as Expendable Current Profiler, UnderwayCTD, and Radiosonde. During the cruises, I easily interacted with the other scientists and the crew.

Apart from it all, I am a self-taught person with enormous curiosity, and high interest to learn new things. I appreciate each opportunity to work in the field and laboratory, to plan the experiment, and to perform the measurements. Yet, I really enjoy to build things by hand and to fix broken things. Thus, this position will give me pleasurable possibility to combine my experiences working in the field, processing datasets, and radar remote sensing for learning about the turbulent momentum fluxes and for solving new problems. In the event of a tie with another candidate; I see the emergence of a new problem like a challenge, and I only leave the problem when it is solved. I never give up to find a solution.

Thank you for your time and consideration. Please let me know if I can provide additional information to aid you in the evaluation of my application.

Sincerely,

José Dias Neto

José Dias Neto - CV

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Education

- 2017-Present PhD in Meteorology - University of Cologne
PhD's Thesis: Investigating Microphysical Processes in Ice and Snow Clouds Using Novel Combination of Polarimetric and Multi-Frequency Cloud Radars
Advisor: Dr. Stefan Kneifel
- 2012-2014 MSc in Meteorology - National Institute For Space Research
Master's Thesis: Pyrgeometer Characterization and Quality Control of Measured Data
Advisor: Dr. José Celso Thomaz
- 2007-2011 BSc in Physics - Federal University of Rio Grande do Norte
Undergraduate Project: Irregularity at Ionospheric Plasma - Effect on Satellite Telecommunication
Advisor: Prof. Dr. Enivaldo Bonelli

Professional Experience

- 2014 National Institute For Space Research, Brazil
2017 *Research Assistant*
- Development of **computational tools** to read and evaluate large data arrays, of Aerosol Optical Depth, retrieved by new Generation of NOAA Polar Satellite System (SUOMI - NPP) over Brazilian territory
Advisor: Dr. Simone Sievert da Costa Coelho

Field Experience

- 1 Nov 2018 - Tripex-Pol
21 Feb 2019 *Assistant*
- Assistence during the **Triple-frequency and Polarimetric Radar Experiment** at Jülich - Germany
- 20 Nov 2013 - Archipelago of São Pedro and São Paulo Program
25 Nov 2013 *Scientist*
- Scientific cruise** participation on board of the Araguari Ocean Patrol Vessel for maintenance and data retrieval from **meteorological stations** in São Pedro and São Paulo rocks.
- 04 Jun 2013 - Prediction and Research Moored Array in the Atlantic (PIRATA)
24 Jun 2013 *Scientist*
- Scientific cruise** participation on board of the Ocean Stalwart ship for maintenance of oceanic buoys and measuring oceanic/atmospheric variables using **XCP, underwayCTD, and radiosonde**.
- 15 Feb 2013 - Prediction and Research Moored Array in the Atlantic (PIRATA)
25 Mar 2013 *Scientist*
- Scientific cruise** participation on board of the Ocean Stalwart ship for maintenance of oceanic buoys and measuring oceanic/atmospheric variables using **XCP, underwayCTD, and radiosonde**.

Publications

Mróz, K., Battaglia, A., Kneifel, S., D'Adderio, L. P., **Dias Neto, J.**, (2020). Triple-frequency Doppler retrieval of characteristic raindrop size, *Earth and Space Science*, <https://doi.org/10.1029/2019EA000789>.

Dias Neto, J., Kneifel, S., Ori, D., Trömel, S., Handwerker, J., Bohn, B., Hermes, N., Mühlbauer, K., Lenefer, M., and Simmer, C., (2019). The **TRIPLE-frequency and Polarimetric radar** Experiment for improving process observations of winter precipitation, *Earth System Science Data*, 2019, 11, pp.845-863. <https://doi.org/10.5194/essd-11-845-2019>.

Kneifel, S., **Dias Neto, J.**, Ori, D., Moiseev, D., Tyynelä, J., Adams, I. S., Kuo, Kwo-Sen, Bennartz, R., Berne, A., Clothiaux, E. E., Eriksson, P., Geer, A. J., Honeyager, R., Leinonen, J., Westbrook, C. D., (2018). Summer Snowfall Workshop: Scattering Properties of Realistic Frozen Hydrometeors from Simulations and Observations, as well as Defining a New Standard for Scattering Databases, *Bulletin of the American Meteorological Society*, 2018, 99, pp.55-55. <https://doi.org/10.1175/BAMS-D-17-0208.1>.

Dias Neto, J., Thomaz Júnior, J. C., and Urbano Neto, D. F. (2016). Mathematical Adjustment Method for Validation of **Longwave Radiation Sensor** Measurements, *Revista Brasileira de Meteorologia*, 2016, vol.31, n.1, pp.37-44. <http://dx.doi.org/10.1590/0102-778620140022>.

Conferences

2019 - 39th International Conference on Radar Meteorology (Japan)

Talk: Investigating snow aggregation close to the melting layer using novel ground-based triple-frequency observations (**prize: 2nd best talk**)

2019 - 2nd International Summer Snowfall Workshop (Finland)

Poster: Intense aggregation close to the melting layer observed with triple-frequency radars

2018 - 15th Conference on Cloud Physics/15th Conference on Atmospheric Radiation (Canada)

Talk: Intense Aggregation Above The Melting Layer Observed With Novel Triple-frequency Radars

2017 - 1st International Summer Snowfall Workshop (Germany)

Poster: First results of the TRIPLE-frequency and Polarimetric radar Experiment for improving process observation of winter precipitation (TRIPEX campaign)

2015 - VI International Symposium of Climatology (Brasil)

Poster: Evaluation of Aerosol Optical Depth retrieved by new generation of NOAA polar satellites on Brazilian territory

2014 - Brazilian Symposium of Geophysics and Aeronomy (Brasil)

Poster: GPS satellite scintillation, in 8 of June from 2011, in Natal (Brazil), generated by magnetic storms

2013 - V International Symposium of Climatology (Brasil)

Talk: An methodology for correcting the observed longwave radiation

2010 - XXVIII North and Northeast Physicist Meeting (Brasil)

Poster: Spatial coordinate acquisition using an optical mouse

Skills

■ Doppler Radars

Good experience working with the moments and spectra from **Meteor 50DX (X-band)** from Selex ES, **MIRA 35 (Ka-Band)** from Meteorologische Messtechnik, **FMCW 94 (W-band)** from Radiometer Physics.

- **Radar Forward Operators**

Introductory experience working with **PAMTRA** and **PyTMatrix**.

- **Sensors**

Strong knowledge of calibration and measurement technique of **longwave radiation sensors**; experience with measurement procedure using **Expendable Current Profiler(XCP)**, **UnderwayCTD**, **Radiosonde**.

- **Data Acquisition**

Good knowledge programming **datalogger CR3000** from Campbell Scientific.

- **Coding**

Good knowledge of scientific programming; all projects were developed in **Python** and **Shell-Script**. The Python library used on those projects are: **NumPy**, **SciPy**, **h5py**, **pandas**, **IPython**, **Matplotlib**, **Basemap**, **pytest**, **pep8**, **flake8**, **virtualenv**, **xarray**, **Jupyter Notebook**. Yet, I have a introductory knowledge using **Bokeh**.

- **Systems**

Good experience with administration of **Unix-based** and **Mac OS X** operating systems, experience with administration and installation of **Rocks cluster**.

- **Generic Tools**

Good experience with **LaTeX** writing; good experience with version control system (Mercurial and Git) and repository (**Bitbucket** and **GitHub**).

- **Prototyping Platform**

Introductory knowledge in **Arduino** and **Raspberry Pi** open-source prototyping platform.

Languages

- Portuguese (native language)
- English