



Postdoctoral scientist

Starting as soon as possible. Fixed-term position, initial appointment for two years.

The CESBIO (Centre d'Etudes Spatiales de la Biosphère) is a joint research unit of Université Toulouse 3 Paul Sabatier (UT3), the Centre National d'Etudes Spatiales (CNES), the Centre National de la Recherche Scientifique (CNRS), the Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement (INRAE), the Institut de Recherche pour le Développement (IRD) and the Institut National de Recherches pour l'agriculture, l'alimentation et l'environnement (INRAE). The laboratory aims at doing research in the domains of observation and modelling of the continental surfaces, addresses the interface between physical and biological sciences and participates in the specification of space missions and analysis of remotely sensed data to improve understanding of continental biosphere dynamics and functioning at various temporal and spatial scales. CESBIO hosts the PIs of two European Space Agency (ESA) satellite missions (SMOS and Biomass missions), of the French-Israeli Venus satellite and the French-Indian THRSNA satellite. The CESBIO is the lead « Expert Support Laboratory » for land applications with SMOS for ESA and « Expertise Center » for the SMOS French ground segment, the CATDS (Centre Aval de Traitement de Données SMOS).

We are opening a post-doctoral scientist position

The CESBIO is seeking a post-doctoral scientist to reinforce their passive microwaves group regarding the study of long time series of soil moisture.

The soil moisture content is an essential climate variable that has to be monitored over long periods of time (see for instance Hirschi et al. 2024 and Dunn et al, 2024), however due to the limited lifetime of satellite missions, several satellites are needed to reach this goal. In this context, the European Space Agency (ESA) has implemented the Climate Change Initiative (CCI) for soil moisture project. It is essential that the two L-band sensors specifically designed to estimate soil moisture (ESA Soil Moisture and Ocean Salinity-SMOS-- and NASA Soil Moisture Active Passive --SMAP) are used in the optimal way so that they can be used to re-scale data from other sensors.

The main goal of this position is to improve the SMOS soil moisture retrieval algorithm used by the ESA CCI project. The retrieval algorithm is based in the Land Parameter Retrieval Model (LPRM) but currently it does not make use of the multi incidence angle capabilities of SMOS. The work will be done in close collaboration with the Technical University of Vienna and the Dutch company Transmissivity. Extensive evaluation of the retrieved soil moisture will be done using in-situ measurements, data from different sensors (SMAP, SMOS, AMSR2, ... and algorithms (DCA, LMEB, ...) and Numerical Weather Prediction reanalysis data such as ERA-5 from the European Centre for Medium-range Weather Forecasts. Part of the time can be used for research projects implying the use of remote sensing soil moisture climate data records for regional to global climate assessment.

The successful candidate should also contribute to broad public communication of the results of the team and communication with stake holders and funding agencies.

The post-doctoral fellow will be based at the CESBIO facilities in Toulouse. Short trips abroad are expected.

Your responsibility

- Conducting and developing a research project
- Scientific literature surveying
- Scientific publications, project reports and oral communications
- Communication to the general public and stake holders

Your profile

- PhD degree in remote sensing or a related field. Knowledge in microwave remote sensing.
- Knowledge in array programming in Python or Matlab
- Excellent command of English language
- Flexible, team-oriented player in an interdisciplinary and collaborative research network

We offer

- Integration and participation in a highly-motivated, interdisciplinary network
- Flexible, employee-friendly working hours
- Support for professional development and career management
- Depending on the applicant's qualifications and the precise nature of the tasks UT3 salary scale (2750-3800 € gross monthly salary for 1 to 6 years of experience after the PhD)
- Social security benefits
- -UT3 is committed to diversity and equal opportunities. Applications from women with relevant qualifications are strongly encouraged. The application of suitable persons with proven severe disabilities and persons of equal status is welcome.

How to apply

Are you interested? Then please, send your letter of motivation, curriculum vitae and work references to Drs. Nemesio Rodriguez Fernandez (nemesio.rodriquez-fernandez@cns.fr) and Arnaud Mialon (arnaud.mialon@univ-tlse3.fr). Do not hesitate to contact us if you have any questions about the job profile. Application open until filed.

We are looking forward to your application!

References

M. Hirschi, P. Stradiotti, W. Preimesberger, R. van der Schalie, T. Frederikse, D. Duchemin, N. Rodriguez-Fernandez, A. Gruber, S. Hahn, W. A. Dorigo, R. A. M. de Jeu, S. I. Seneviratne, and R. Kidd 2024, Soil Moisture [in "State of the Climate in 2023"]. Bull. Amer. Meteor. Soc., 105 (8), S76–S79

Dunn, R. J. H., J. Blannin, N. Gobron, J. B. Miller, and K. M. Willett, Eds., 2024: Global Climate [in "State of the Climate in 2023"]. Bull. Amer. Meteor. Soc., 105 (8), S12–S155, <https://doi.org/10.1175/BAMS-D-24-0116.1>.