A postdoctoral position is available in the AMAP lab located in Montpellier, France (https://amap.cirad.fr/en/). The position is part of the LECO project (Investigating the physiological underpinnings of leaf turnover and its consequences on the seasonality of ecosystem fluxes in tropical rainforests: from Leaf-level measurements to ECOsystem-wide simulations), funded by MUSE (https://muse.edu.umontpellier.fr/en/muse-i-site/), and the PHENOBs project (Towards a phenology observatory in French Guiana to study climate vegetation feedbacks and the diversity of plant strategies), funded by the Labex CEBA (http://www.labex-ceba.fr/en/).

What we would like to achieve and why this is important:

Covering just 7% of the Earth’s land surface, tropical forests play a disproportionate role in the biosphere: they store about 25% of the terrestrial carbon and contribute to over a third of the global terrestrial productivity. They also recycle about a third of the precipitations through evapotranspiration and thus contribute to generate and maintain a humid climate regionally with positive effects also extending well beyond the tropics. However, the seasonal variability in fluxes between tropical rainforests and atmosphere is still poorly understood. In particular, dynamic global vegetation models (DGVMs) typically simulate a decrease in productivity with a decline in precipitation and soil water availability (Restrepo-Coupe et al. 2017), while observations in light-limited rainforests, including those in French Guiana, point to a dry-season increase in gross primary productivity (Aguilos et al. 2019). Better understanding the processes underlying flux seasonality in tropical forests is thus critical to improve our predictive ability on global biogeochemical cycles.

Some previous studies highlighted the importance of the variation of leaf properties with leaf age to explain fluxes seasonality (Wu et al. 2016, 2017; Albert et al. 2018), but data is critically lacking to develop evidence-based knowledge on the underlying mechanisms and allow their integration into predictive models.

Within the frame of the LECO and PHENOBs projects, the successful candidate is expected to develop alternative modules of leaf demography within a trait-based and individual-based model of forest dynamics (TROLL, Maréchaux & Chave 2017). Such modules will explore alternative ways to simulate leaf demography investigated in previous studies in different models (De Weireld et al. 2012; Maréchaux & Chave 2017; Wu et al. 2017; Chen et al. 2020) and propose new ones based on novel leaf physiological trait data across leaf ages collected within the frame of the LECO and PHENOBs projects. Data available for calibration and validation steps include LAI (leaf area index) retrieved from high temporal and spatial resolution UAV LiDAR, tree-level phenology monitoring based on Phenocam and drone stereophotogrammetric data, eddy-flux data (https://paracou.cirad.fr/website/experimental-design/guyaflux-tower), leaf litterfall data, leaf traits data, and inventory data.

The ability to propose and develop his/her own questioning and analysis method is encouraged. The successful candidate could also contribute to the general implementation of the LECO and PHENOBs projects by participating to field campaigns in French Guiana to make leaf trait measurements and to the analyses of remote-sensing and eddy-flux data.

Who you are:

- You have a PhD in ecology, modelling or a related field.
- You have an expertise in programming (in R, but, ideally, also in an object-oriented language such as C++).
You are eager to contribute to a better understanding of tropical forest ecosystem functioning within a multidisciplinary and international team that combines different approaches (remote sensing, modeling, ecophysiology, citizen science, plant architecture).

You have excellent written and verbal communication skills

What we offer you:

A position in a bustling Mediterranean city, south of France, for a period of 18 months starting between September 2021 and January 2022, with a *net* salary of ca 2200 € per month.

Fundings for conference, potential field missions or publication costs.


Review of applications will begin on the 1st of July 2021 and continue until the position is filled. To apply, e-mail (1) a letter of application, (2) a CV and (3) the names and email addresses of two references, in one single pdf file, to Isabelle Maréchaux: isabelle.marechaux@inrae.fr

References:


