

Tenure Track Junior Professorship

Profile n°1: Integrated approaches to spatial observation in the NEXUS water-biomass-energy for regional institutional decision support (ORioN)

Key words: Spatial observation, geomatics, land use planning, Guiana Shield

**Planned tenured position as IRD Research Director after a 5-year contract
Chair attached to Espace-Dev, French Guiana, IRD, French Guiana university, France**

◊ Context and stakes for the Global South

The IRD institution is committed to strengthening partnerships with universities and to participating in the emergence of major research universities. With the chairs for junior professors, the research programming law opens up a system allowing the reinforcement of the institute's site policy.

In French Guiana, the SEAS Spatial Imaging Platform is a high-level infrastructure constituting a center of expertise in Earth observation and geomatics for the Guiana-Antilles-Amazon region. Various programs are supported by SEAS such as PROGYSAT (Regional Cooperation Project for the Observation of the GuYanas by SATellite) financed by the European funding agency. PROGYSAT offers research and innovation projects around space imagery, for the benefit of the development of French Guiana and its neighbors on the Guiana Shield. This project strongly contributes to regional cooperation on various themes such as the biodiversity of forest massifs, mangroves, cross-border health/environment, water resources, urban development, energy transition, land use maps, panning. It also carries out training and distance learning actions in geomatics, intended for partners in the Guiana Shield. It participates in raising the awareness of the general public and schoolchildren about Earth observation and its importance for knowledge of the territories. As a project of the Espace-Dev laboratory in close partnership with the University of French Guiana and the spatial agency CNES, PROGYSAT mobilizes other laboratories such as AMAP, GET, and LEGOS.

SEAS and the projects that are there, fully participate in the site policy led by the University of French Guiana, by promoting high-resolution satellite information for the benefit of the territory and its neighbors (Suriname, French Guiana, Northeast of Brazil), and by promoting the emergence of a university education in French Guiana that would create high-level local expertise.

This fully meets the IRD's overseas strategy.

◊ Scientific objectives

The research issues as well as the sustainability of our Overseas activities are crucial for our lab Espace-Dev. Particularly in French Guiana where the unit has substantial academic strength. The University of French Guiana is a core member of the unit, contributing several academic staffs.

To take advantage of the dynamics of research, innovation and capacity building around the SEAS stations, Espace-Dev aims to strengthen its activity by positioning an IRD researcher on site.

This chair would make it possible to achieve this objective by developing research activities on the environment and resources in a framework of energy and socio-ecological transition, and by strengthening research-teaching links with the University of French Guiana. These challenges are also part of an international entity, operating in West Africa, of which Espace-Dev is a partner. A multi-site approach would reinforce the relevance of this recruitment in French Guiana. The project focuses

on the study of water – biomass – solar resources, their interrelationships and their interactions with the climate, with the aim of planning an energy transition that preserves sustainable land use. The challenges concern the search for a viable balance between the different uses of these resources in the short and medium term (20 years). This involves the mapping of these resources, a spatio-temporal monitoring of their dynamics, and the construction of scenarios of their uses (via the modeling of complex systems). The project is part of the implementation of a life cycle from data to knowledge and decision support. The monitoring of these resources will be supported by the SEAS platform, and will be integrated into existing approaches both at the university and in the local authority of French Guiana. The monitoring data will make it possible to build decision support scenarios, based on the modeling of complex systems and intended for the institutions concerned.

The researcher will have expertise in spatial modeling, in processing chains and their integration into learning simulation models, and will have a strong interest in the challenges of energy transition. The innovative aspect of this project lies in the integration of heterogeneous data and a systemic approach towards decision support dedicated to regional institutions. Many different approaches exist for solar, biomass and hydrology mapping, however there is no approach integrating the sometimes-conflicting issues of energy planning of the territory in connection with the global changes taking place and the management and planning of the territory. In addition to an activity ensuring the publication of articles in peer-reviewed journals and communication in scientific events, the person must be able to set up and coordinate large-scale international and regional projects, to develop networks research and collaborate with other researchers in the unit. Recruitment will be on the laboratory's Guianese site, and will also involve missions on partner and regional sites, as well as in mainland France.

The chair, resulting from a partnership between the University of French Guiana and the IRD, consists of a 5-year fixed-term contract (with a 2-month trial period) followed, after positive evaluation, by tenure IRD researchers. This tenure will be finalized once the candidate obtains an Habilitation to supervise research (HDR), a French degree, before the end of the 5 years contract.

Teaching objectives

The recruited person will strengthen the University of French Guiana's master program on energy transition with research expertise in GIS and remote sensing, allowing the mapping and management of natural resources. She will organize her teaching load by making sure to give a significant place to students from the Guiana Shield, and will promote these courses through the IRD network, her contacts in the South and training actions in the South for the preparation to Master and Doctoral degrees. It will ensure the supervision of Master's students in the laboratory, and the co-supervision then supervision of PhD students after obtaining the HDR diploma.

Funding available

The junior professor will be awarded (1) by an ANR grant of 200 k€ (including a minimum of 120 k€ in payroll - doctoral students, post doc, technicians), (2) by an IRD grant for a doctoral contract, or a post-doctorate for a period of two years, and 30 k€ for a long-term mission (about 6 months), and (3) by EGCE as other IRD researchers of the group, and will have access to shared equipment of the UMR in molecular biology, behavioral observation tools and electrophysiology.

◆ Conditions for applicants

Candidates must fulfill one of the following criteria :

- hold a doctorate as provided in article L.612-7 of the French Education Code;
- hold a PhD or doctoral level of education;
- hold a doctorate in engineering;
- hold a study and research diploma in computer science, GIS;
- hold a study and research diploma in remote sensing;
- hold an overseas university degree considered equivalent to the above-mentioned diplomas; in this case, applicants should submit an equivalence request.
- show proof of qualifications or scientific works considered equivalent to the above-mentioned diplomas; in this case, applicants should submit an equivalence request.

For the equivalence request - (refer to the file integrated into the platform "démarches-simplifiées).

◆ Applications, selection and interviews

Applications must be submitted online at: <https://demarches.adullact.org/commencer/ird-chaire-de-professeur-ou-professeure-junior-e-2> by **May 11, 2023 at 11:59 p.m. (metropolitan France time)**. Applications will be assessed by a committee comprising IRD members and external experts. Candidates pre-selected by the committee will be invited for interview. Interviews will last for one hour, and will be conducted remotely by video-conference.

The recruitment date for the chair is set for December 1, 2023.

◆ Assessment criteria

- Excellence of the candidate, motivation, scientific and pedagogical supervision capacity
- Quality, originality, interdisciplinarity of the research and teaching projects and their Global South component
- Relevance of the proposed methods with regard to the identified problems
- Relevance and structuring effect of the project within the laboratory and at the level of partnerships
- Coherence with the Site policy
- Adequacy of the means to the proposed project and capacity to mobilise complementary means.