Call for Applications: Post-Doctoral Research Fellow in Sub-Seasonal Forecasting with Machine Learning

I. Position Details

- **Job Title:** Post-Doctoral Research Fellow
- **Reference:** PD-CUMULUS-2025
- **Number of Positions:** 1
- **Location:** Cheikh Anta Diop University (UCAD)/École Supérieure Polytechnique (ESP), Dakar, Senegal
- **Contract Duration:** 18 Months
- **Expected Start Date:** 1st October 2025
- **Workload:** Full-Time
- **Required Education:** PhD
- **Field of Expertise:** Atmospheric Sciences, Climate Physics, Meteorology, or a related field.

II. Context and Mission

The West African Monsoon, the principal driver of rainfall in the region, exhibits complex spatio-temporal variability. While significant progress has been made in synoptic and seasonal forecasting, the **sub-seasonal (2-4 week) timescale** remains a major challenge for numerical weather prediction models, particularly in Africa. This forecasting horizon is nevertheless critical for decision-making in key sectors such as agriculture, flood management, and public health.

Funded by the Bill & Melinda Gates Foundation, the **CUMULUS project** aims to tackle this challenge by applying machine learning (ML) methods to weather forecasting for agriculture in West Africa. The project is led by The Alan Turing Institute (UK) in close collaboration with the University of Leeds (UK), and its partners in Senegal (Cheikh Anta Diop University of Dakar - UCAD and the National Agency for Civil Aviation and Meteorology - ANACIM) and Ghana.

Primary Mission:

The Post-Doctoral Fellow will join this international, interdisciplinary team to **deploy, apply, and evaluate** a new generation of machine learning-based sub-seasonal forecasts. The mission is grounded in a **co-production** approach, bridging researchers and forecasters to develop more relevant and reliable operational tools.

Key Responsibilities:

- Evaluate the performance of sub-seasonal to seasonal (S2S) forecasting models developed by the consortium.
- Participate in the development and optimization of innovative ML methods for S2S forecasting and statistical downscaling, with a focus on West Africa.
- Act as a liaison between methodological developments and their operational applications within African meteorological services.
- Contribute to writing scientific publications and technical reports.

III. Candidate Profile

Essential Qualifications:

The candidate must:

- Hold a PhD in Atmospheric Sciences, Climate Physics, Meteorology, or a closely related field.
- Possess a strong understanding of atmospheric dynamics and the West African monsoon system, as well as numerical climate models, particularly atmospheric models.
- Have proven proficiency in programming languages for data analysis (**Python is strongly preferred**; R, MATLAB, or NCL are also acceptable).
- Have demonstrated experience in processing and analyzing climate data (e.g., reanalysis datasets, model outputs, observations).
- Have excellent writing and analytical skills.
- Show scientific curiosity and a strong motivation to work in a collaborative, interdisciplinary environment.

Desired Skills:

- Practical experience in machine learning or deep learning is a significant advantage.
- Knowledge of predictability challenges at the sub-seasonal to seasonal timescale.

- Prior experience in partnered or collaborative research.
- A good command of scientific English is essential.

IV. Application Process

Interested candidates are invited to submit the following documents as a **single PDF file** to gatescumulusprojectucad@esp.sn no later than **September 23rd**. Please use the email subject line: **Application Post-Doc CUMULUS - [Your Last Name]**

Application must include:

1. A detailed cover letter (max. 2 pages).
2. A comprehensive Curriculum Vitae (CV) listing publications and relevant skills for the position.
3. Contact details (email and telephone) for two professional references.
4. A copy of the PhD diploma or a certificate of successful defense.