



MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO  
**INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS**

MINISTÉRIO DA  
CIÊNCIA, TECNOLOGIA  
E INOVAÇÃO



São José dos Campos, SP, Brazil  
10 August 2026

To:  
Dr. Hernando Tavera  
Institutional Chief  
Instituto Geofísico del Perú  
Calle Badajoz 169  
Urb. Mayorazgo IV Etapa, Ate  
Lima 15012, Peru

Dear Dr. Tavera,

On behalf of the Scientific Organizing Committee of the **4th International Workshop on Equatorial Plasma Bubbles (EPB-4)**, we are pleased to formally invite **Dr. Edgardo Enrique Pacheco Josan**, Principal Scientific Investigator at the Instituto Geofísico del Perú, to participate in the **EPB-4**, which will be held at the National Institute for Space Research (INPE), São José dos Campos, São Paulo, Brazil, from September 14 to 18, 2026.

**Dr. Edgardo Enrique Pacheco Josan's** abstract entitled “**Characterizing Equatorial Ionospheric Irregularities: Spread-F and Vertical Drifts in Peru**” has been **accepted** for **oral presentation** at the workshop.

The International Workshop on Equatorial Plasma Bubbles (EPB) series was established to bring together scientists and students from around the world to discuss the latest advances in **observations, modeling, and forecasting of ionospheric irregularities**, with a particular focus on **Equatorial Plasma Bubbles (EPBs)** and their impacts on **space weather and technological systems**. The first EPB Workshop was held at the Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Japan, in November 2016. The second edition took place at the Institute of Geology and Geophysics, Chinese Academy of Sciences (IGGCAS), Beijing, China, in September 2019, and the third EPB Workshop was organized at the Indian Institute of Geomagnetism (IIG), Mumbai, India, in September 2023.

The **EPB-4 Workshop** will be hosted by INPE under the central theme:

*“New Measurements, Advanced Simulations, and Forecasting of Equatorial Plasma Bubbles in the Era of Artificial Intelligence”*

**Key Topics and Objectives of EPB-4:**

- Promote in-depth discussions on the latest observational techniques for monitoring Equatorial Plasma Bubbles (EPBs), including upcoming satellite missions, advanced ground-based sensors, and multi-instrument networks
- Highlight recent progress in coupled models and numerical simulations to advance the understanding of the mechanisms governing EPB seeding, growth, and variability
- Enhance forecasting capabilities by integrating artificial intelligence and machine learning with observational and modeling data
- Examine the societal and technological impacts of EPBs on GNSS positioning, satellite communications, and space weather services
- Foster international collaboration and stimulate new research initiatives dedicated to EPB science and its applications

The participation of **Dr. Edgardo Enrique Pacheco Josan** will contribute to the scientific exchange and international collaboration promoted by EPB-4, particularly through the presentation of his research on equatorial ionospheric irregularities observed over Peru.

Please note that this invitation **does not constitute financial support or sponsorship**. Participants are responsible for covering their own **registration fees, travel, accommodation, and other related expenses**.

Further information about the workshop is available at:

<https://www.gov.br/inpe/en/events/the-4th-international-workshop-on-equatorial-plasma-bubbles/>

We look forward to his participation in the workshop.

Yours sincerely,

Cristiano Max Wrasse

**Chair, 4th International Workshop on Equatorial Plasma Bubbles (EPB-4)**

*Space Weather Division – DICEP*

*National Institute for Space Research (INPE/MCTI)*

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