

# POPDAT

## Problem-oriented Processing and Database Creation for Ionosphere Exploration

### NEW INSIGHTS INTO THE IONOSPHERE

Data from the ionosphere provide critical insights at the benefit of major European satellite initiatives, including GMES. However, data from past satellite missions to this part of the upper atmosphere are fragmented. The POPDAT projects attempts to facilitate their integration.

Between the thermosphere and the exosphere in the upper atmosphere, in the ionosphere atoms are transformed into ions by radiation from the Sun. The ionosphere is important; it is the scene of atmospheric electricity and developments here influence radio propagation throughout Earth. Also, the ionosphere is a critical environment for attempts to understand and predict Space Weather, and in the context of Europe's Global Monitoring for Environment and Security (GMES) initiative, ionospheric monitoring of natural and man-made disasters also has a potential.

However, our ability to profit fully from insights gained from observational data and past ionospheric satellite missions is currently impeded by the absence of effective and user friendly tools that would allow scientists to perform data-mining within a pool of coordinated datasets.

The POPDAT projects takes on this challenge, as it is set to establish foundations for an enhanced research infrastructure at the benefit of the ionospheric physics community.

Using a problem-oriented approach to data processing from a users' perspective, POPDAT aims to create a database of ionosphere waves catalogues. Accessible through a web portal, this database would constitute an Ionosphere Wave Service, enabling scientists to have a better view of data from the ionosphere, when taking a closer look at the ionosphere to obtain a better understanding e.g. of anomalous data behaviours and ionosphere perturbations.

In doing so, the project is set to overcome a number of existing limitations in the interpretation and procession go ionospheric measurements within scattered data sources, advancing the state-of-the-art in existing rudimentary wave catalogues and fledging statistics.



**KLAUS BRIESS**  
IS PROJECT COORDINATOR

### QUESTIONS & ANSWERS

#### What do you want to achieve with this project?

POPDAT will develop the set of tools for problem-oriented processing and data mining of ionospheric observational data collected and stored by past ionospheric satellite missions in order to create the database of ionosphere waves catalogues.

#### Why is this project important for Europe?

European scientific community working in the field of ionospheric research (e.g. Space Weather, space communication, physics of atmosphere, etc.) will be able to reinforce its global leadership and capitalize on previous investments avoiding unnecessary costs for new missions.

#### How does your work benefit European citizens?

Better knowledge of physical processes in the upper atmosphere will enable a wide community of GMES service providers (e.g. SMES in communication and navigation services, EO services) to offer higher quality services to European citizens, public services and industries.



Background showing Northern lights in the sky © Jörg Hackemann - Fotolia.com

**POPDAT creates new data mining tools for better processing of data from Earth's ionosphere.**

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## LIST OF PARTNERS

- Technical University Berlin, Germany
- Space and Solar-Terrestrial Research Institute, Bulgaria
- NOVELTIS SAS, France
- Engineering, Consulting and Management Office, Germany
- Eötvös Loránd University, Hungary
- Space Research Institute of Polish Academy of Sciences, Poland
- Lviv Center of Space Research Institute, Ukraine
- Space Research Institute of National Academy of Sciences and National Space Agency of Ukraine, Ukraine

## COORDINATOR

Technical University Berlin, Germany

## CONTACT

**Klaus BRIESS**

Tel: +(49) (30) (314 21339)

E-mail: klaus.briess@ilr.tu-berlin.de

## PROJECT INFORMATION

Problem-oriented Processing and Database Creation  
for Ionosphere Exploration (POPDAT)

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