ABOUT **PITHIA-NRF**

PITHIA-NRF is a unique Research Infrastructure that brings together the best European facilities, databases, and models for the study of the Earth's IONOSPHERE, THERMOSPHERE, and PLASMASPHERE.

PITHIA-NRF aims to pave the way to considerable research advances and promote the development of novel business practices and new technologies in the upper atmosphere and near-Earth domains.

GET INVOLVED

Next spring, don't miss out on our first Innovation Day! This event is a remarkable opportunity for the private sector and PITHIA-NRF's stakeholders to come together and discuss the basis for mutual support.

Check the PITHIA-NRF's website section "NEWS" to get all the relevant updates.

PLASMASPHERE IONOSPHERE THERMOSPHERE INTEGRATED RESEARCH ENVIRONMENT AND ACCESS SERVICES

TNA **NODES**



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PITHIA-NRF-YouTube

www.linkedin.com/in/pithia-nrf-research-infrastructure

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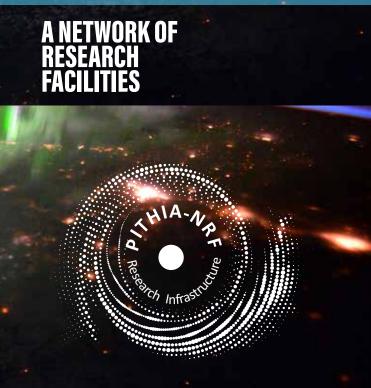




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https://www.esa.int/ESA_Multimedia/ Images/2017/10/Aurora_over_northern_ Canada



concept design Laboratorio Grafica e Immagini | INGV, Italy

PITHIA-NRF SERVICES MITIGATING THE SOCIO-ECONOMIC IMPACTS OF THE UPPER ATMOSPHERE EFFECTS

Many space weather phenomena perturb the upper atmosphere and influence the performance and reliability of several essential and costly space-borne and groundbased technologies on Earth, such as:

- EARTH OBSERVATION (EO) SYSTEMS (E.G., LOW-FREQUENCY SAR), WHICH ARE AFFECTED BY:
- Faraday rotation.
- Ionospheric Scintillation.
- UHF COMMUNICATIONS USED IN SATCOM THAT ARE ATTENUATED BY:
- Ionospheric plasma bubbles.
- POSITIONING, NAVIGATION, AND TIMING (PNT) WITH GNSS SATELLITES AND GROUND-BASED AUGMENTATION SYSTEMS (GBAS) THAT IS MADE INACCURATE BY:
- Large total electron content (TEC) gradients.
- Ionospheric plasma bubbles (leading to scintillations and ionospheric delay).
- Travelling Ionospheric Disturbances.
- ASTRONOMICAL OBSERVATION (AO) SYSTEMS (E.G., LOFAR), WHICH ARE RENDERED UNAVAILABLE BY:
- Geomagnetic storms & auroral jets intensifications
- Ionospheric plasma bubbles.
- TERRESTRIAL RADIO SYSTEMS USING HF AND VHF COMMUNICATIONS, WHICH ARE DISRUPTED BY:
- Polar Cap Absorption.
- Sporadic E-layer.
- Travelling Ionospheric Disturbances.
- Ionization depletions.
- SATELLITES IN LOW EARTH ORBIT (LEO), WHOSE ORBITS CAN BE AFFECTED BY THERMOSPHERIC DRAG.

PITHIA-NRF services will significantly contribute to predicting these effects and, thus, support the design of technologies mitigating their impacts.

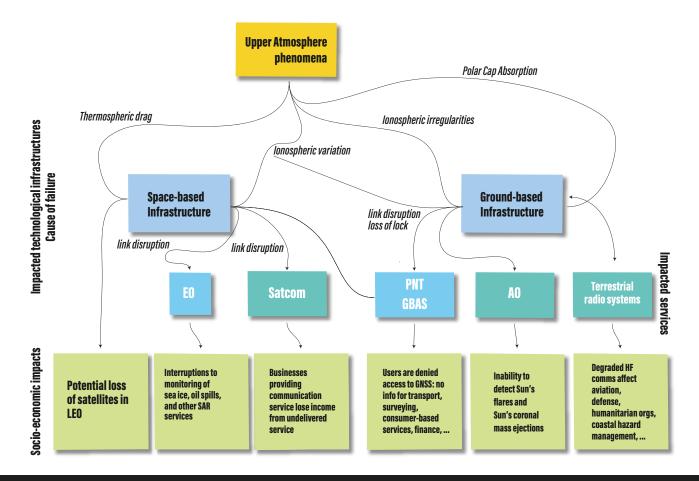


FIGURE 1. Mind map of the socio-economic impacts of the upper atmosphere effects

TRANS-NATIONAL ACCESS PROGRAM

Through the Trans-National Access (TNA) program,

PITHIA-NRF opens the doors of the Consortium's facilities to scientific users from academia, SMEs, large companies, and public and institutional organizations.

There are twelve nodes within PITHIA-NRF, all dedicated to investigating the Plasmasphere, lonosphere, and Thermosphere.

The access to the nodes can consist of a **subsidized** oneweek visit or one-month remote access. In both cases, the user will benefit from **support from top experts** within the field and learn how to operate the chosen observing facility end-to-end.

In particular, the TNA program provides private companies with the unique chance of testing new instrumentation before market launch.

The program is conducted in the framework of **competitive open calls** for projects.

For more information, visit our dedicated webpage or reach out to the TNA Support Centre.