

# CITEUC

**CENTRE FOR EARTH AND  
SPACE RESEARCH OF  
UNIVERSITY OF COIMBRA**

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Portugal Space Day 2015  
Brussels**



**The CITEUC:** is composed by 28 researchers with training in geophysics, astronomy, astrophysics, geology, physics, and mathematics, with the purpose of studying the Solar System at all scales.

Solar Sy

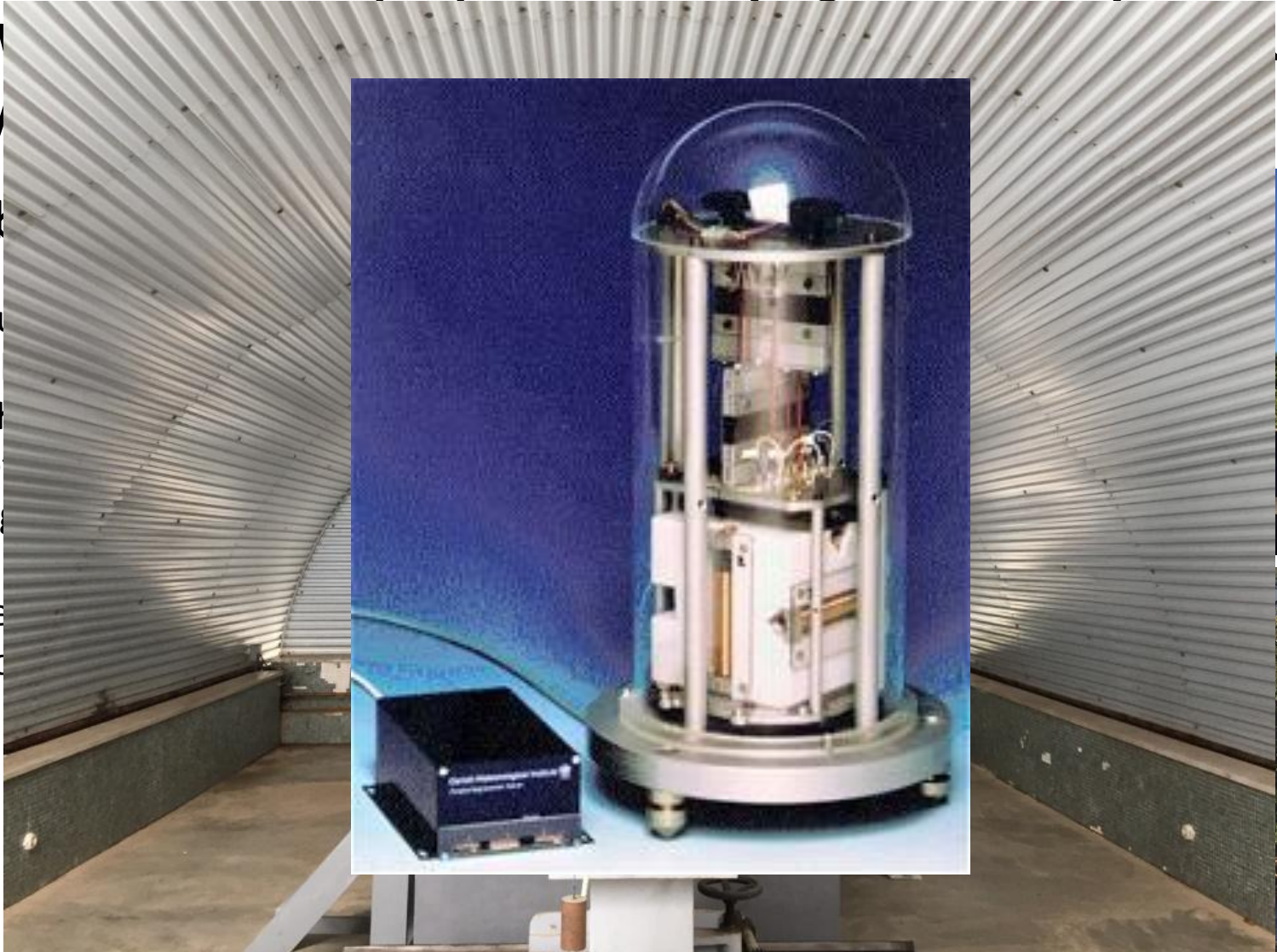
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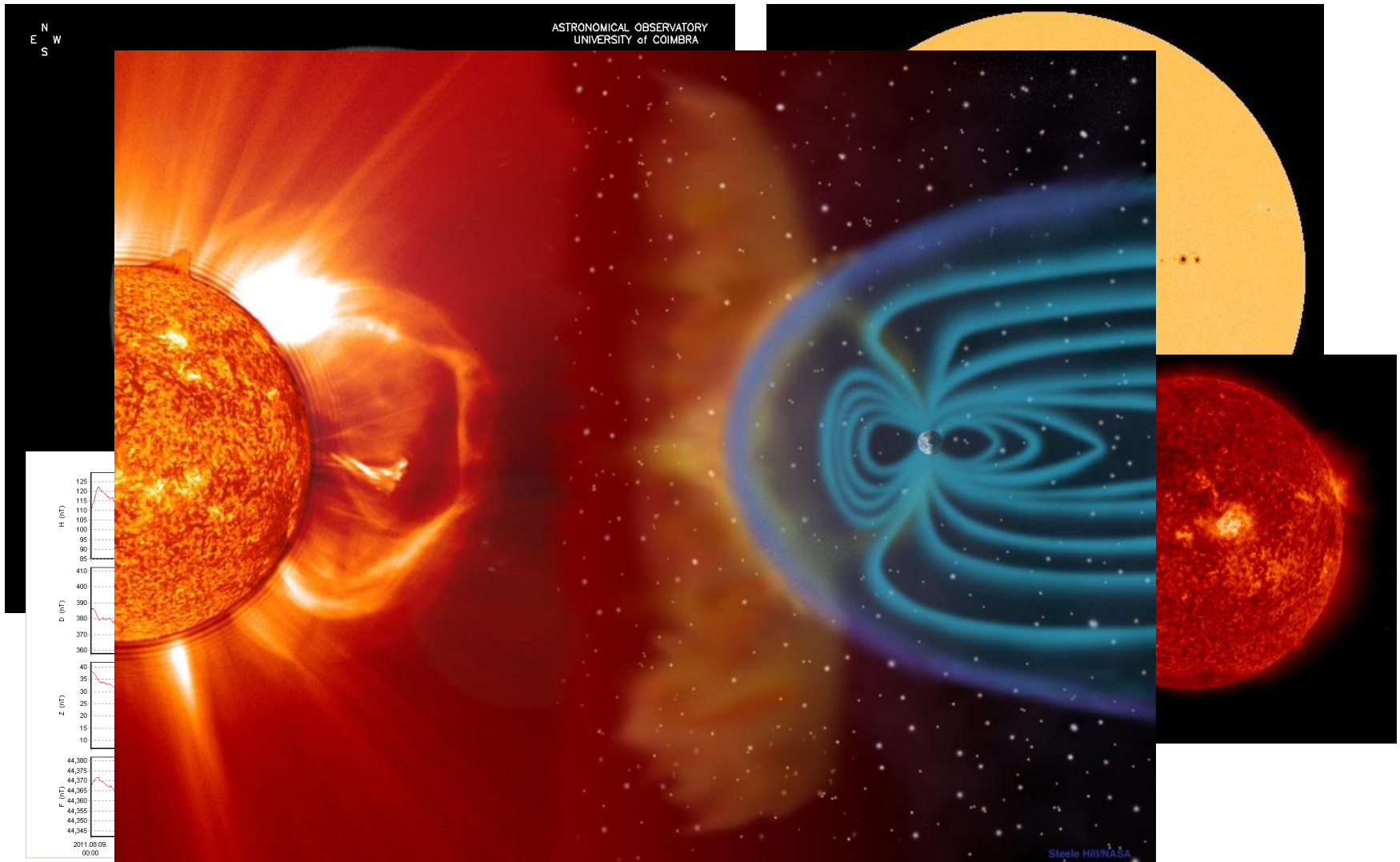
- climate
- seismic



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# Our Data

# Other Data



**Space weather** is a term which describes variations in the Sun, solar wind, magnetosphere, ionosphere, and thermosphere, which can influence the performance and reliability technological systems and can also endanger human health and safety.

Space-Planetary Interactions Monitoring and Forecasting  
Laboratory

**SPINLab**

One of main goals is to create:

**A PORTUGUESE REGIONAL SPACE WEATHER SERVICE**  
available through

IPMA



Portuguese Sea  
and Atmosphere  
Institute



To define the requirements of this service we are working both with scientific institutions and private companies

## Users/Customers & Other Stakeholders



## And in the future...



INPE / EMBRACE



CENTRE NATIONAL  
D'ÉTUDES SPATIALES



INTERMAGNET



ISES  
International Space  
Environment Service

( as collaborative member)



# SOLAR RISK SERVICE FOR CRITICAL GNSS APPLICATIONS

Space Weather

Aviation • Air Navigation • Oil & Gas



# Conclusions:

- Aviation / Air navigation will need a Space Weather service
  - The main obstacle for a commercial service is the go-to-market time, namely due to the uncertainties on civil responsibility legislation and the certification requirements for a solar risk targeting LPV procedures
  - Monitoring geomagnetic fields seems also important for Air Navigation
- Oil & Gas market is also a promising sector
  - Drilling and survey activities
  - It is very likely having a viable private backed business model primarily in Oil & Gas

Project end date (6 months): 19.12.2014

Funded: **PTTI – Portuguese Technology Transfer Initiative**





# SWAIR – SPACE WEATHER IMPACT ON GNSS SERVICE FOR AIR NAVIGATION

Application for a Small ARTES 20 project





# Scope and objective

- Scope: SWAIR aims to use available technology to provide early warning and forecast services, at regional level, specialized for Air Navigation
- Objective: Develop a prototype and refine the business plan of the product
  - Increase customer's confidence through validation, reach a demonstration asset for air navigation sales and assure the solution can be scalable
  - Correlate GNSS discontinuities with Space weather events and raise awareness on the occurrence of solar events susceptible of causing discontinuities



Ongoing Project  
Funded: Small ARTES





A centre for research about the Sun, the Earth and  
the other Solar System bodies.



and for R&D transfer with impact in social and  
economic activities (eg. Space Weather)

**THANK YOU!**