



# Space Weather Activities in Argentina



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# SPACE WEATHER ACTIVITIES IN ARGENTINA

## Research Groups and Programs



<http://lagoproject.net/>



- SWx program
- ML program
- Cosmic Rays



<https://www.argentina.gob.ar/ciencia/conae>



- Argentina Space Program: SWx panel
- Working in collaboration with other groups
- Instrumentation in space (SABIAMAR-SAOCOM-etc)



<https://www.smn.gob.ar/>



- Instrumentation deployment (e.g. magnetometers, meteorological stations, lidar, etc)
- Instrument Networks
- Service oriented and 7/24 operations

- from low (~ 15 dip) to high lat (Antarctica)
- > number of instruments in the South Hemisphere
- Not Centralized



<https://www.ign.gob.ar>



- Argentinean network of GNSS receivers, covering all the Argentina surface



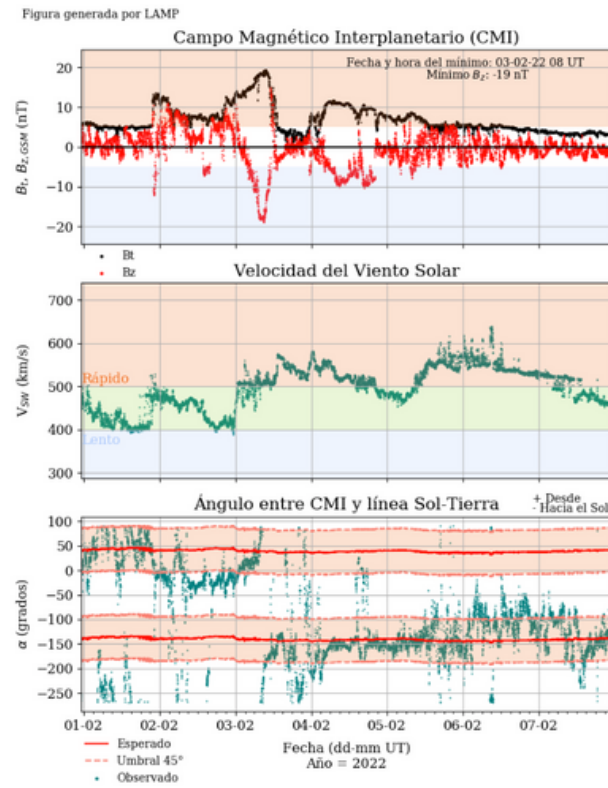
**+ Universities**

- Many research groups working in the full Sun-Earth system (UNLP, IAFE, UBA, UNT, UTN, UNC, etc)
- Human Resources (PhD programs, Courses, etc)
- Infrastructure



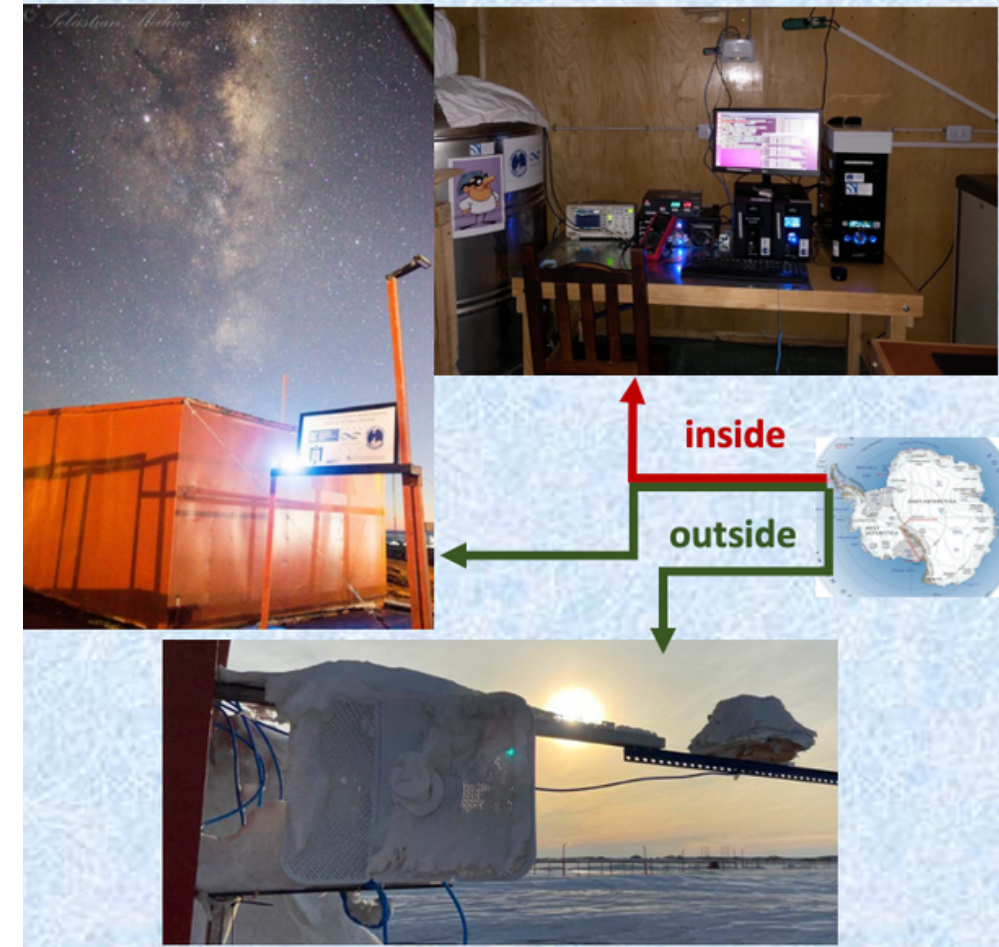
# Laboratorio Argentino de Meteorología del esPacio (LAMP)

Space Weather Laboratory for Argentina



- Daily monitoring and publication of a weekly Bulletin reporting SWx conditions
- web-site offering 14 operative real-time products (Sun-SolarWind-radiationBelts-Bge-Ionosphere-CRs)
- Antarctic SWx laboratory: Different instruments with (24/7) 5 minutes real-time
- Regional Warning Center of ISES
- Regional Training Center of WMO

## Antarctic SWx Lab in Argentina



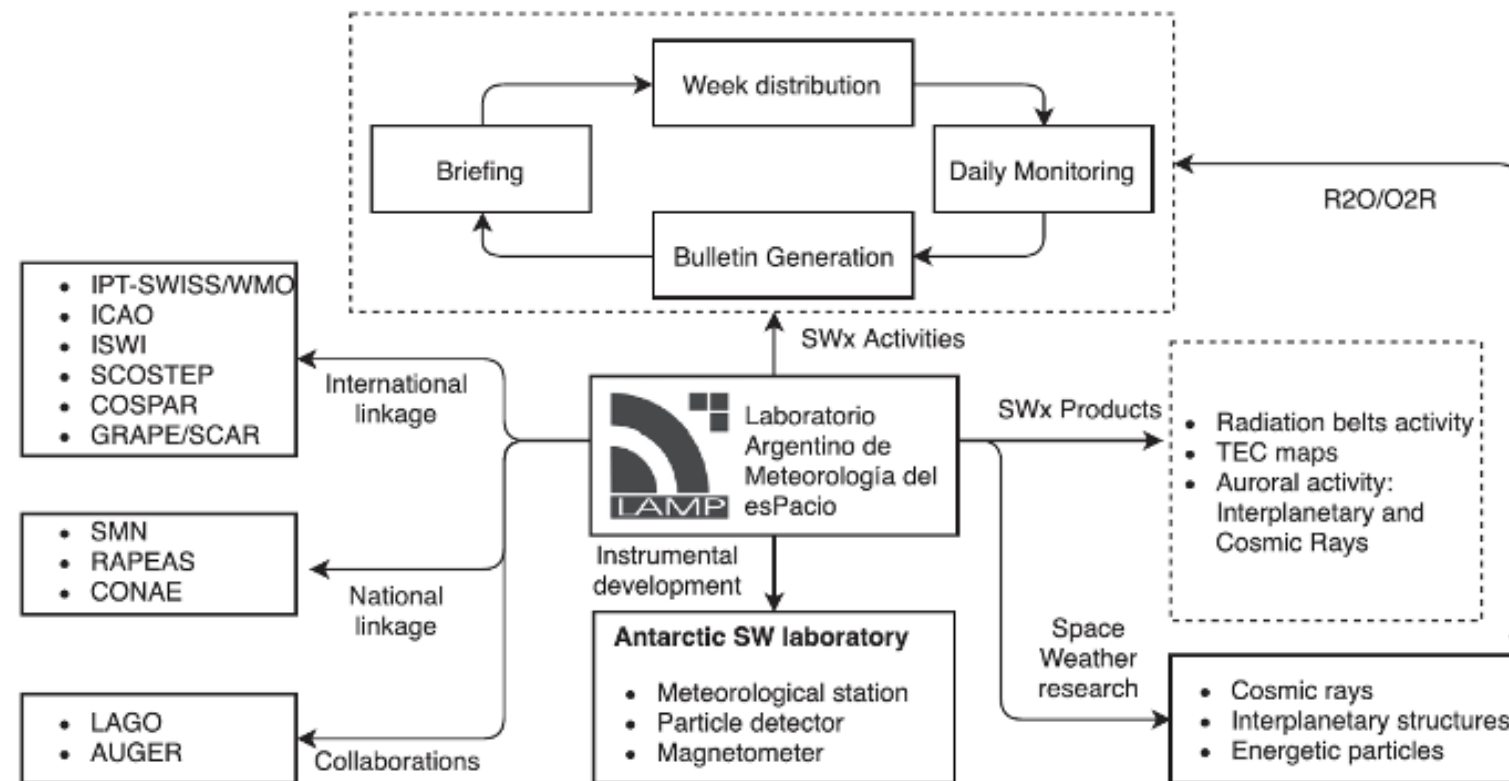
WEBSITE

spaceweather.at.fcen.uba.ar  
 www.iafe.uba.ar/u/lamp



## INSTITUTIONS

- UBA
- IAFE (CONICET)
- IAA (DNA) - Antarctic Institute



## References:

Dasso+2015, Proc. of Science, 105  
 Lanabere+2020, JASR, 65, 2223  
 Dasso+2020, ESWS-instrumentation, 4  
 Lanabere+2021, Bull. Arg. Astron, 62, 4  
 Gulisano+2021, Bull. Arg. Astron, 62, 280  
 Santos+2021, Bull. Arg. Astron, 62, 16

# Tucumán Space Weather Center (TSWC)



<https://spaceweather.facet.unt.edu.ar/>



[/spaceweatherargentina/](#)



- FACET- UNT
- UTN - Tucumán
- UTN - Bahia Blanca



## CAPACITY BUILDING

- SWx Postgraduate Curricula (UNT)
- International Workshop on ML for SWx: Fundamentals, Tools and Future Prospects

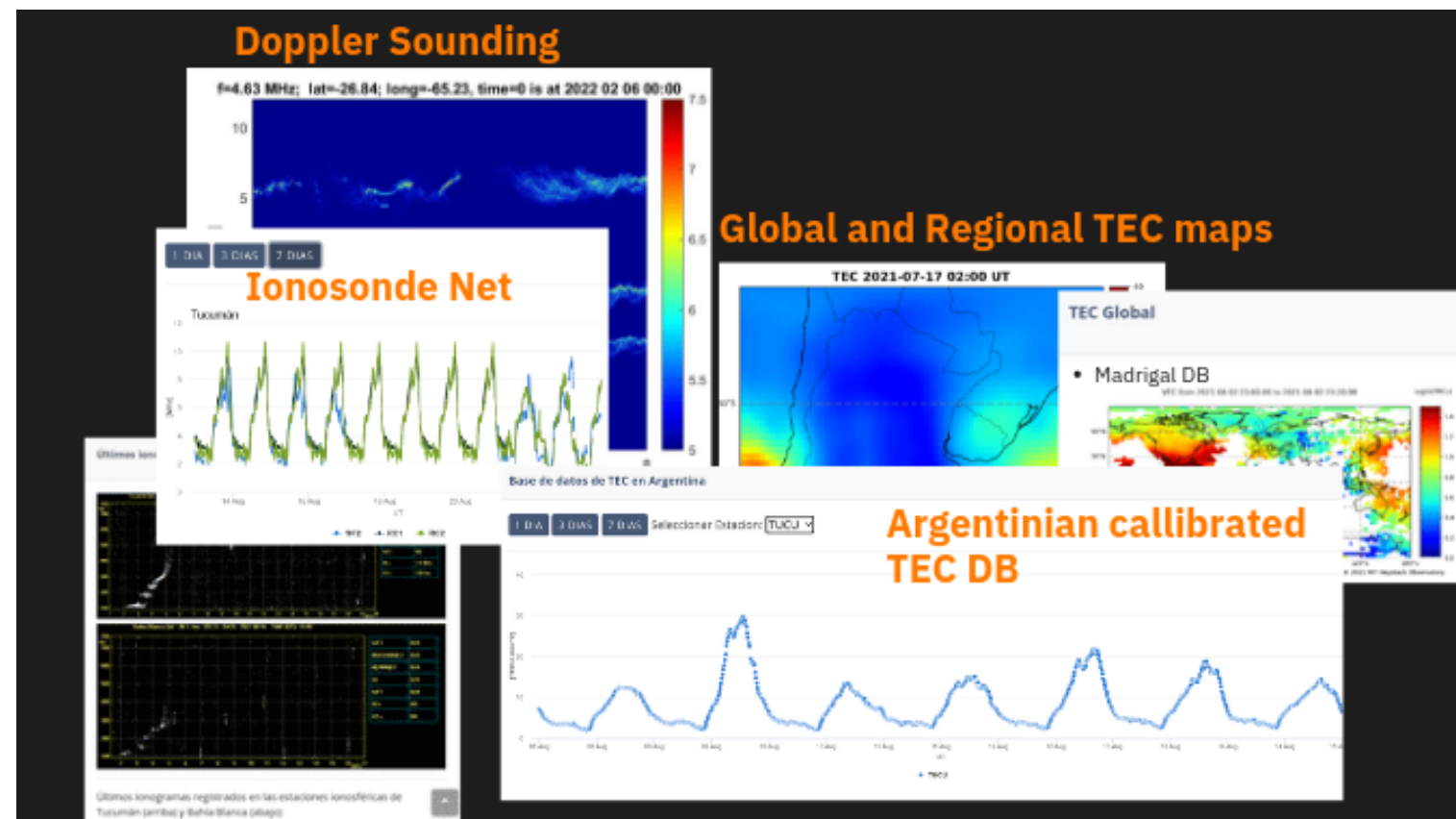
<http://indico.ictp.it/event/9840/>



- LAGO school



- SWx continuous monitoring.
- **Ionogram validated DB [Arg-Chile]**
- TEC calibration service [on request & on the web]
- **Automatic AGWs detection**
- ML-based ionospheric forecasting (global & regional).
- **Tailored Software Development & Data infrastructure for SWx. UNT-ICTP-INGV-Univ. Newcastle**
- Participation in SWx committee/panels: ISWI - PRESTO/SCOSTEP - CONAE - RAPEAS - ALAGE - LAGO, etc



## INSTRUMENTATION

- Real-time - 24/7
- Radar design and development (ionosonde, OTH)
- Ionospheric data for civil aviation: PECASUS Consortium (FMI, INGV) for ICAO
- **2 Iono sounders** - (low and mid lat). UNT-INGV-UTN.
- **2 GNSS receivers Tuc and Usuahia** (multi-freq & multi-constellation). UNT-INGV-SMN **[new]**
- **1 Magnetometer** (SA Net). UNT-INPE
- **1 Continuous Doppler System** (TIDs/AGWs). UNT-CAS. **[to be upgraded 2022]**
- **1 Riometer**