



Tucumán Low Latitude Observatory

Universidad Nacional de Tucumán

Argentina

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PhD student

<http://catedras.facet.unt.edu.ar/labetel/en/observatory/>



**Ground and space-based instruments for future research in
Solar-Terrestrial physics**

International School of Space Science (ISSS) - 6-10 June 2016- L'Aquila, Italy

Tucumán Low Latitude Observatory

[26° 51' S, 65° 12' W]

Head: Dr Miguel A. Cabrera

Overview

- Research
- Instruments
- Human Resources Development



Research

“Applied research in the middle and upper atmosphere”.
Agency for Science and Technology. www.agencia.gov.ar



“Research on upper atmosphere and remote sensing
by radio waves”. *Universidad Nacional de Tucumán*.
www.unt.edu.ar

“Development of Digital Ionospheric Sounder”.
Ministry of Defence www.mindef.gov.ar



Ministerio de
Defensa
[Presidencia de la Nación](http://Presidencia.de.la.Nacion)

Instruments

- **Advanced Ionospheric Sounder (INGV) (Italy)**

Operation: 2007 –present

Data: f_0F_2 , f_xF_2 , f_0F_1 , f_tE_s , $h' E_s$, MUF, $M(3000)F_2$

Responsible: Dr. Cabrera and Dr. Ezquer

- **Double Freq. GPS Receiver (INGV) (Italy)**

Operation: 2010 – present

Scintillation, S4, Amplitude and phase; TEC

<http://www.eswua.ingv.it/ingv/home.php>

Resp: Dr. V. Romano (INGV) and Dr. Ezquer



- **Single Freq. GPS Receiver (UNT)**

Operation: 1998 - present

Scintillation, only amplitude (old system)

Resp: Dr. Ezquer



Instruments

- **Multistatic HF Doppler Radar (API) (Czech Rep.)**

Operation: 2012- present

Data: Spectrograms and GWs velocity and direction det.

Resp: Dr. J. Chum and Dr. Cabrera



- **Riometer single Channel (Dr. K. Makita) (Japan)**

Operation: Since Set. 2015

Data: Cosmic Noise Absortion.

Resp: Dr. K Makita and Dr. Cabrera



- **Magnetometer (INPE) (Brazil)**

Operation: 2016

Data: three magnetic vector components (H, D, Z).

Resp: Dr. C. de Nardin and Dr. Cabrera

<http://www2.inpe.br/climaespacial/portal/index-summary>



Human Resources Development

Currentley 8 PhDs Thesis on the way

" Antenna Beamforming" (Eng. Ise)

" Metamaterials for RF Applications" (Eng. Cangemi)

"Automatic Detection Model for Radar Applications" (Lic. Molina)

"D2D Model for Cooperative Wireless" (Eng. Miranda Bonomi)

"Green Communications" (Eng. Grupalli)

"Fading Model for High Density Environment" (Eng. Bedoian)

"OTH Radar model in HF Band" (Eng. Saavedra)

"Study of GWs Related HF Communicatios" (Eng. Fagre)



Thank you!

