

UNIVERSIDAD NACIONAL DE LA PLATA  
FACULTAD DE INGENIERIA  
DEPARTAMENTO DE ELECTROTECNIA

María Inés VALLA

LEICI

Instituto de Investigaciones en  
Electrónica, Control y  
Procesamiento de Señales



# ARGENTINA in South America



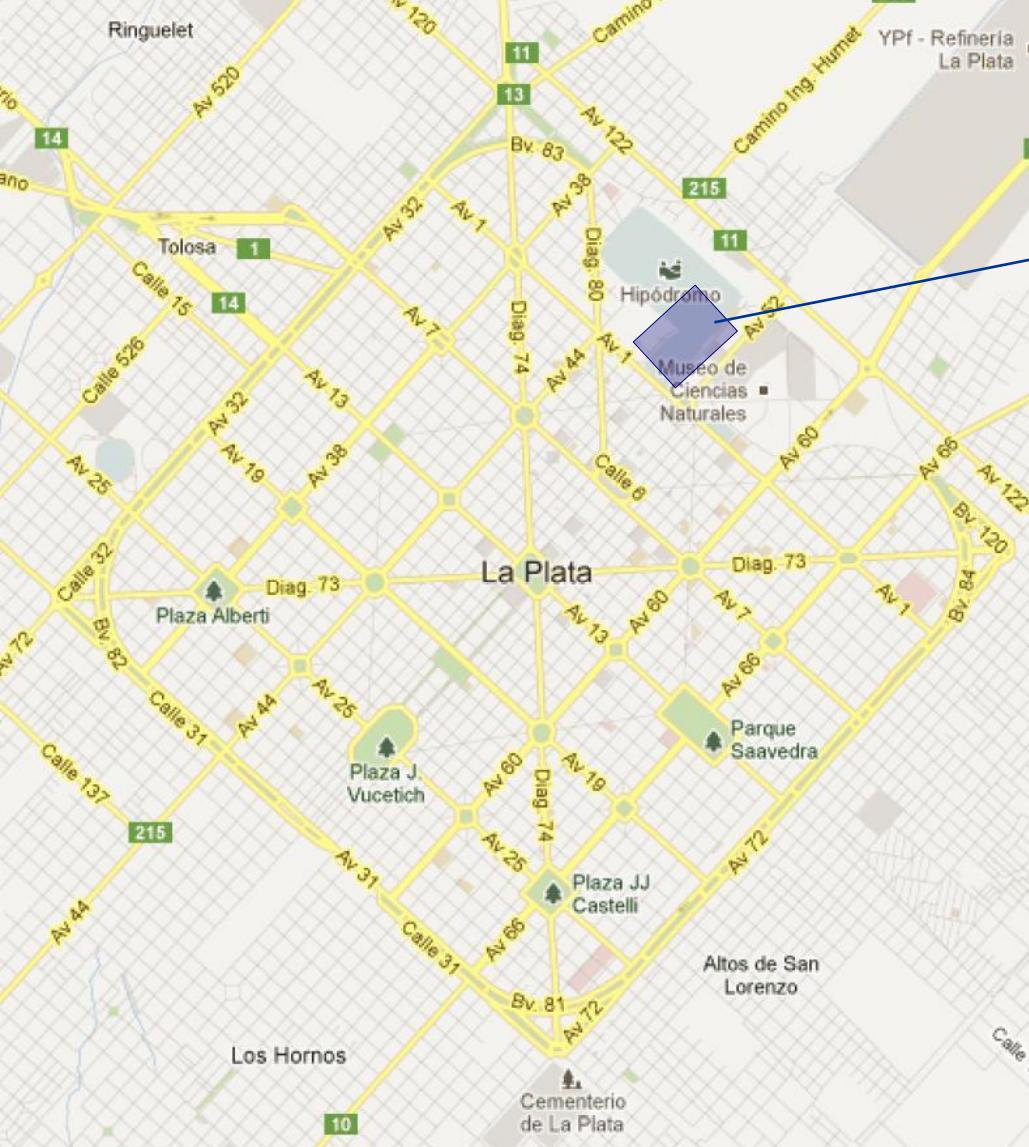
# Province of Buenos Aires

La Plata



# La Plata

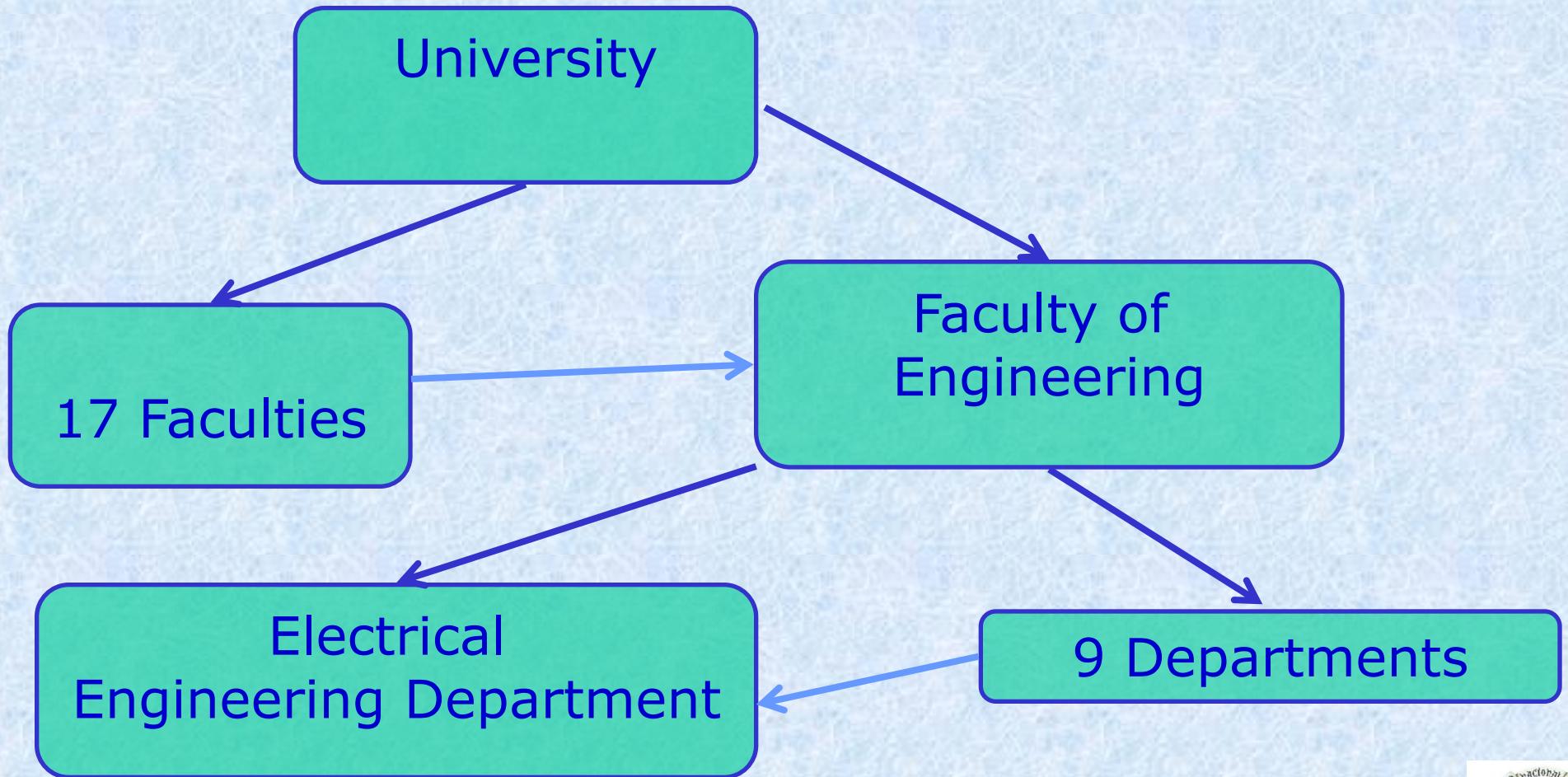
## Faculty of Engineering



- ▶ La Plata is a 133-year-old, 500,000 populated city located 60kms from Buenos Aires.
- ▶ The National University of La Plata is one of the most traditional and largest universities in Argentina.
- ▶ 20,000 students enrolled every year.



# National University of La Plata



# Electrical Engineering Department

## Professional Degrees (5years)

- Electric Engineer
- Electronics Engineer
- Computers Engineer

## Graduate Studies:

- Doctor in Engineering
- Master in Engineering

## Working Groups

CeTAD

LEICI

GEMyDE

Com Digitales.

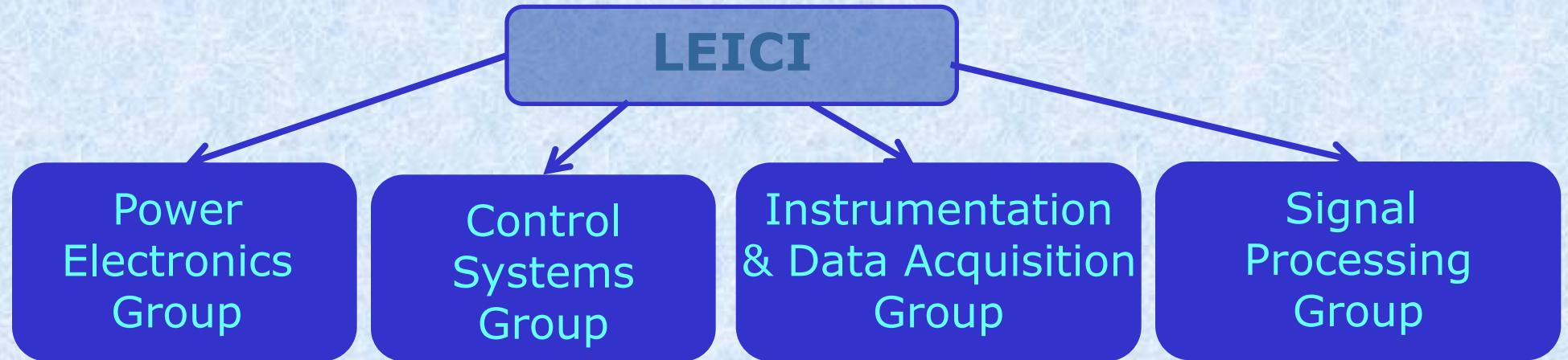
IITREE-LAT

LEME

LEDE



# LEICI – Research Institute on Electronics, Automatic Control and Signal Processing



## Staff:

20 Professors (Assistant, Associate and Full)

26 PhD and Master Students

4 Pos doc Fellows



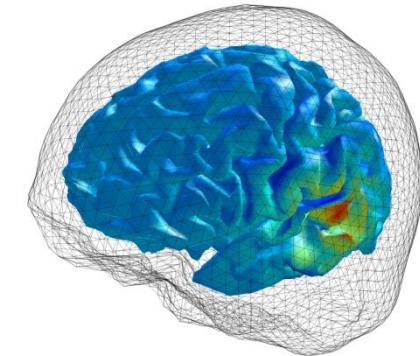
# LEICI – Research Institute on Electronics, Automatic Control and Signal Processing



# Signal Processing

- **Detection & processing of brain activity**

- Estimation of brain activity sources (characteristics and position) and oriented to epilepsy
- Effect of impairments on brain location and characterization
- Data fusion with other methodologies



Brain Activity from magnetic resonance imagines

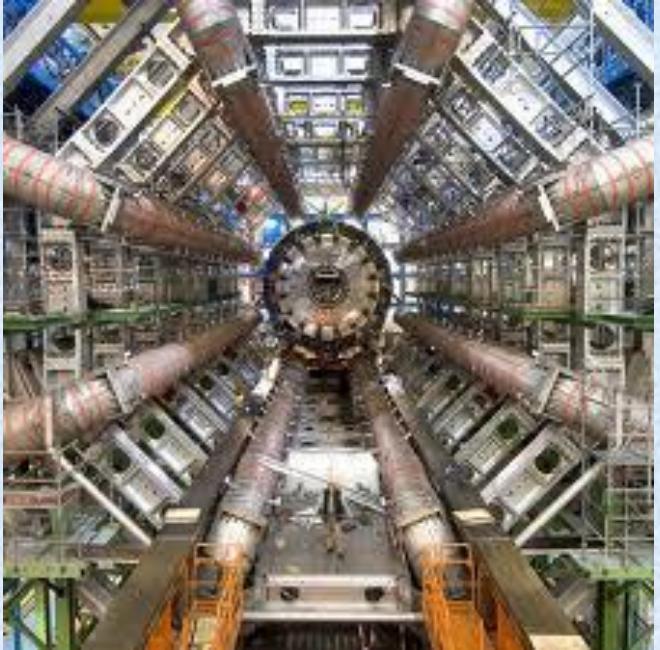


Assembling SAC-D/Aquarius satellite at INVAP, Bariloche Argentina

- **Global Navigation Satellite Systems for aerospace applications**
  - GPS receivers in sounding and launching rockets, and in satellites (SAC-D 6/2011)
  - GNSS based orientation, Reflectometry
- **Antenna and Sensor arrays in Radars**



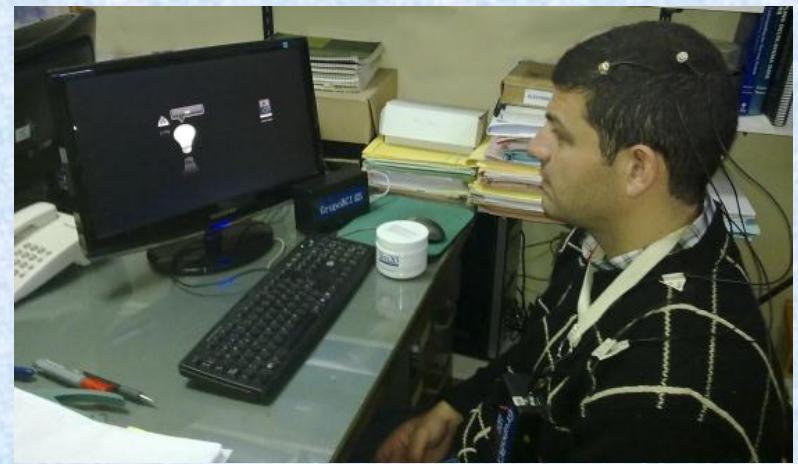
# Instrumentation & Data Acquisition



- **Detection and instrumentation in high energy physics**

- Measurement strategies for particles detectors  
TGC (Thin gap chamber) used in the Atlas experiment at CERN

Atlas detector (CERN)



BCI Experimental set-up at LEICI

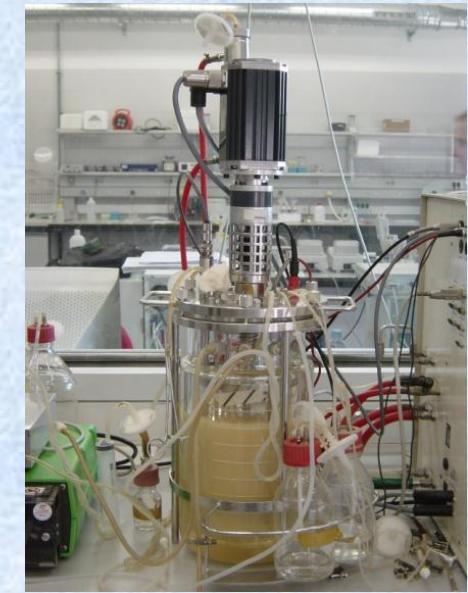


# Control Systems

- **Control theory**

- Switched control
- Control of systems with constraints
- Gain scheduling (LPV) control

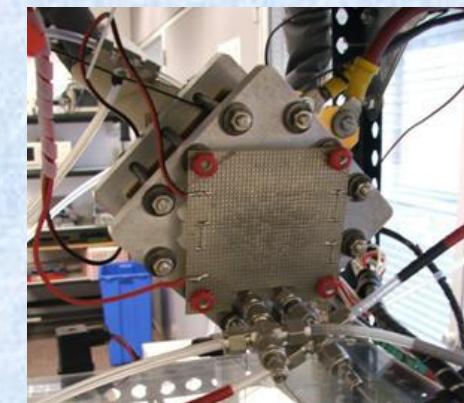
Bioreactor at Biopolis  
(collaboration)



- **Alternative energy generation systems**

- Control of wind turbines
- Control of photovoltaic systems
- Control of fuel cells systems
- Control of hybrid generation systems
- Control of hybrid vehicles

Fuel cell at UPC  
(collaboration)



- **Control of biological systems**

- Artificial pancreas
- Control of bioprocesses



# Power Electronics

## • Converter topologies

- Generalized analysis of Multilevel VSI
- Hybrid multilevel VSI
- Multilevel CSI

## • Control of Power Converters

- Finite state predictive control
- Nonlinear control based on exact linearization

## • Renewable Energies and Power Quality

- Power converters in Wind energy systems
- CSMI for hydrogen generation
- Active and Hybrid power filters



Multilevel Current Source inverter  
experimental set-up at ITBA

# THANK YOU!

