



e-CRLab

Cosmic
Rays
Electronics
Laboratory

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Colaborador



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Estudante de Doutoramento



- Instrumentation room
 - Integration/Setups room
 - Dark room
 - Offices
 - Prototypes production
- Some rooms are restricted access
(e.g. setups)

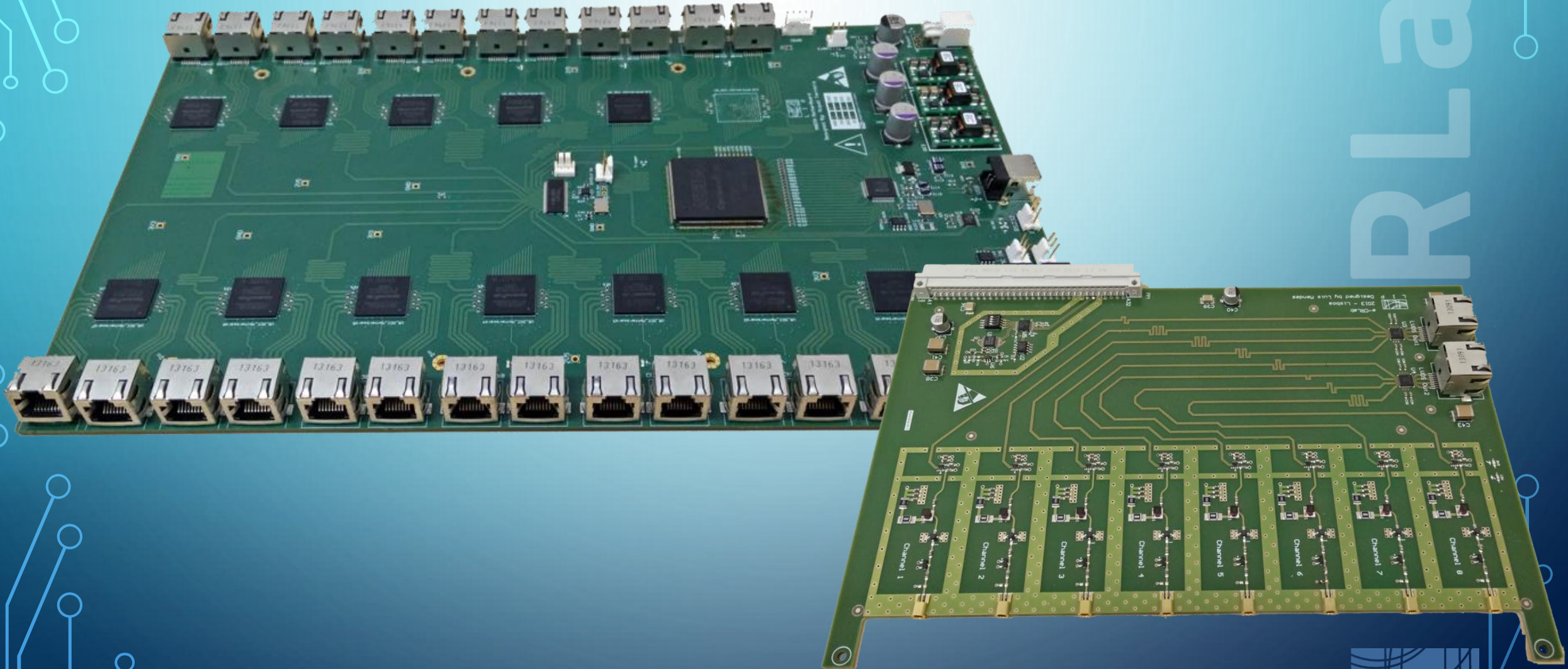




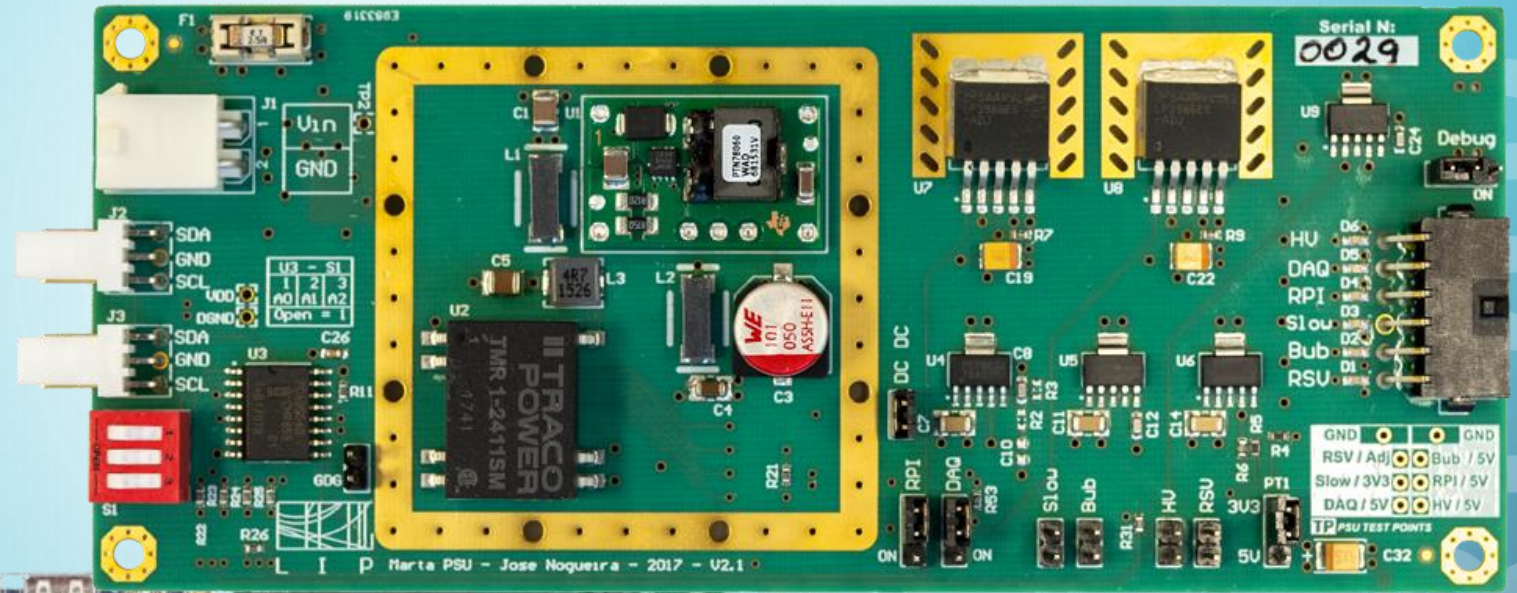
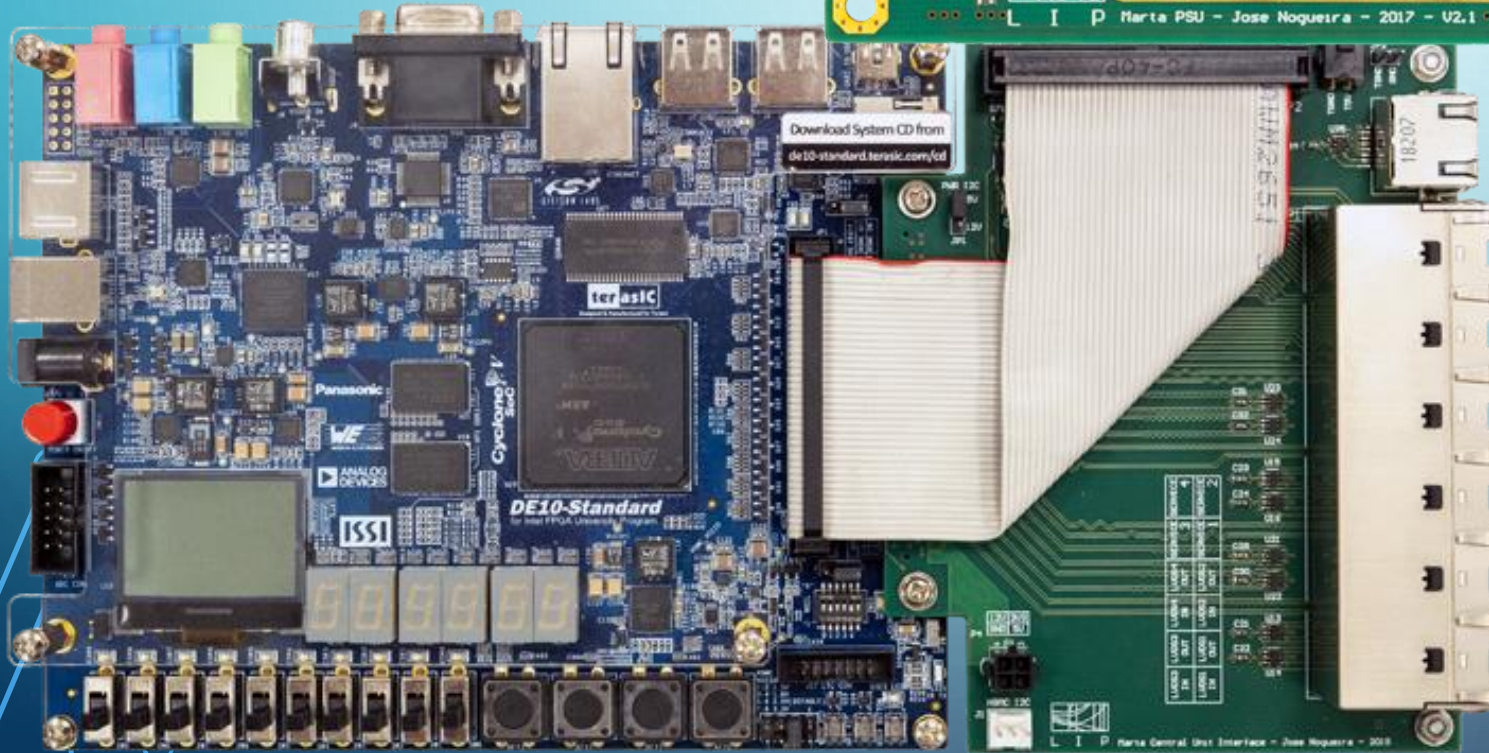
Main Focus

- Fast digital electronics implemented in FPGAs and embedded systems
- Precision measurements
- Degradation with Irradiation
- Capabilities:
 - design complex circuits
 - design complex printed circuit boards
 - produce simple PCB prototypes
 - Assembly and rework in PCB boards (small series)
 - Detector operation, optimization
 - Test electronics response test and measurement
 - Prototype detectors instrumentation

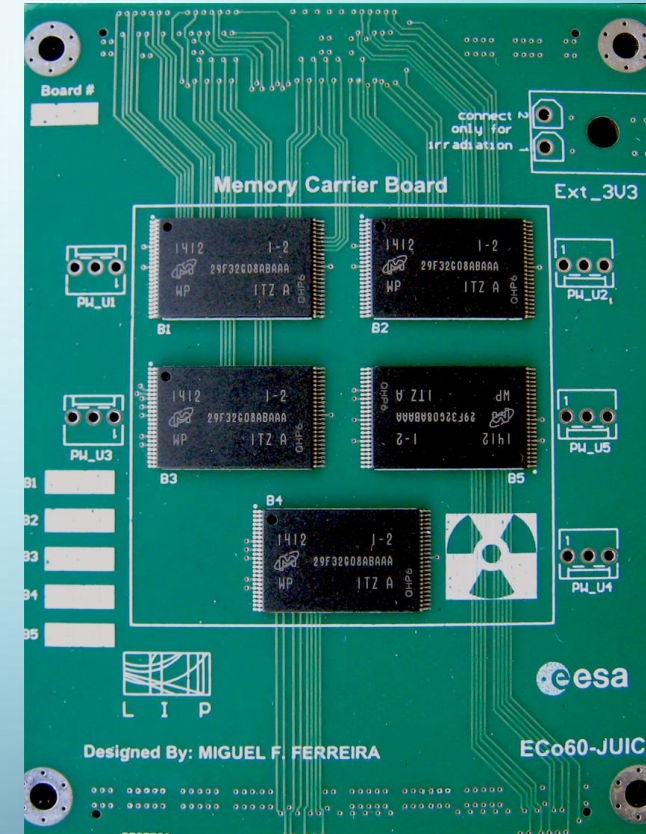
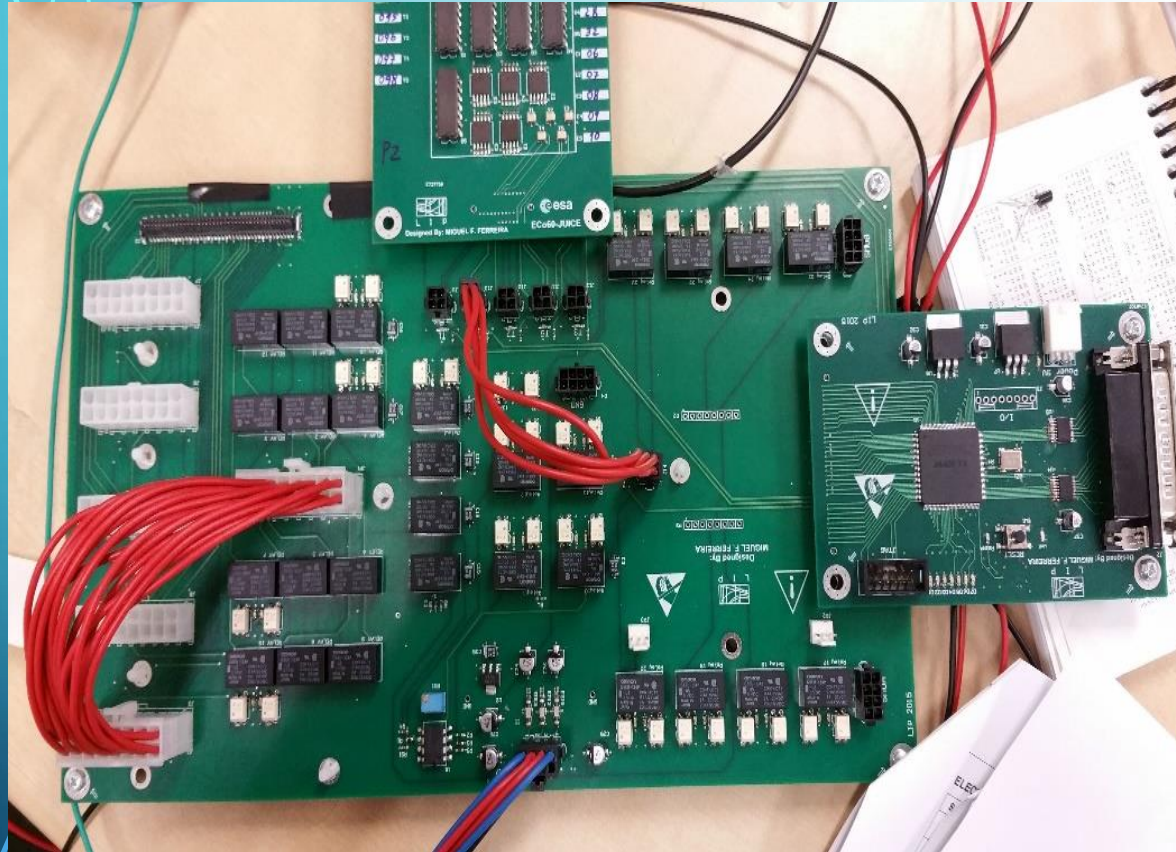
Portfolio

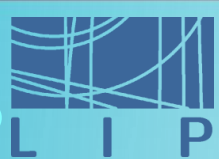


Portfolio



Portfolio





Lines of work

MARTA instrumentation

- operate RPCs in the Argentine Pampa.
- Prototype electronics were developed and characterized. System adopted for other RPC setups
- operation of setups @ Auger
- Development of MARTA front-end electronics based in the MAROC ASIC.
- Slow control

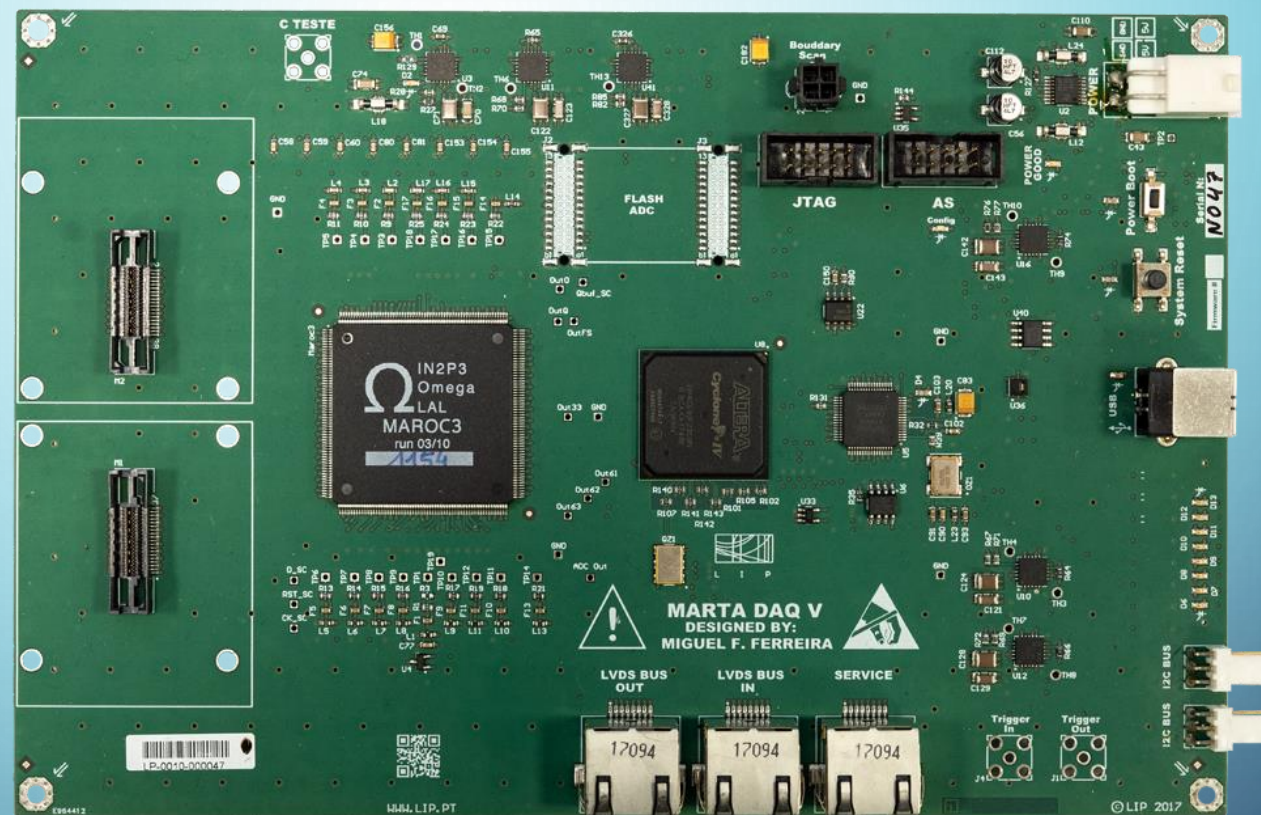
ESA / Space Radiation

- Instrumentation of detectors
- Degradation of EEE with radiation

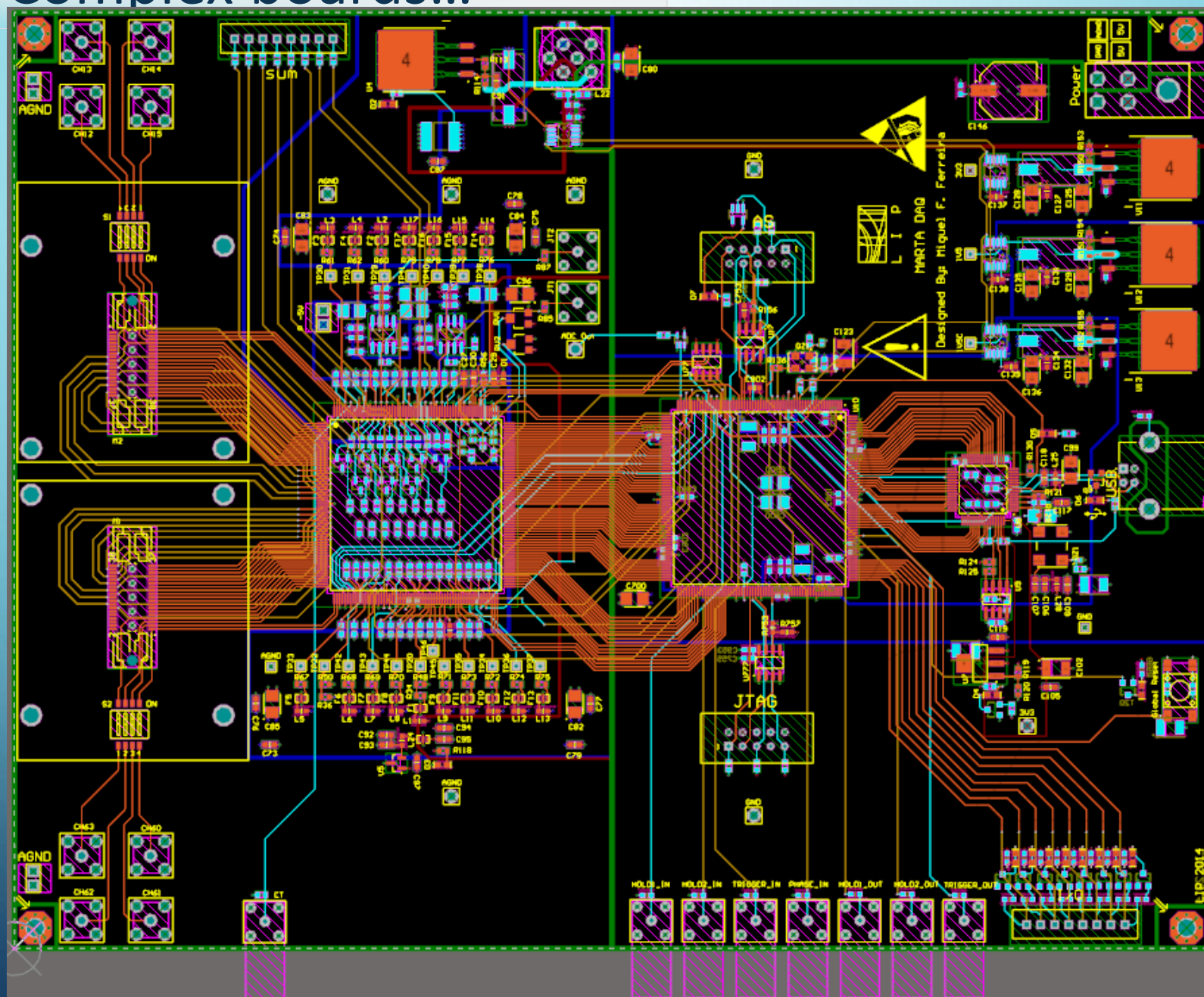
Support for other activities

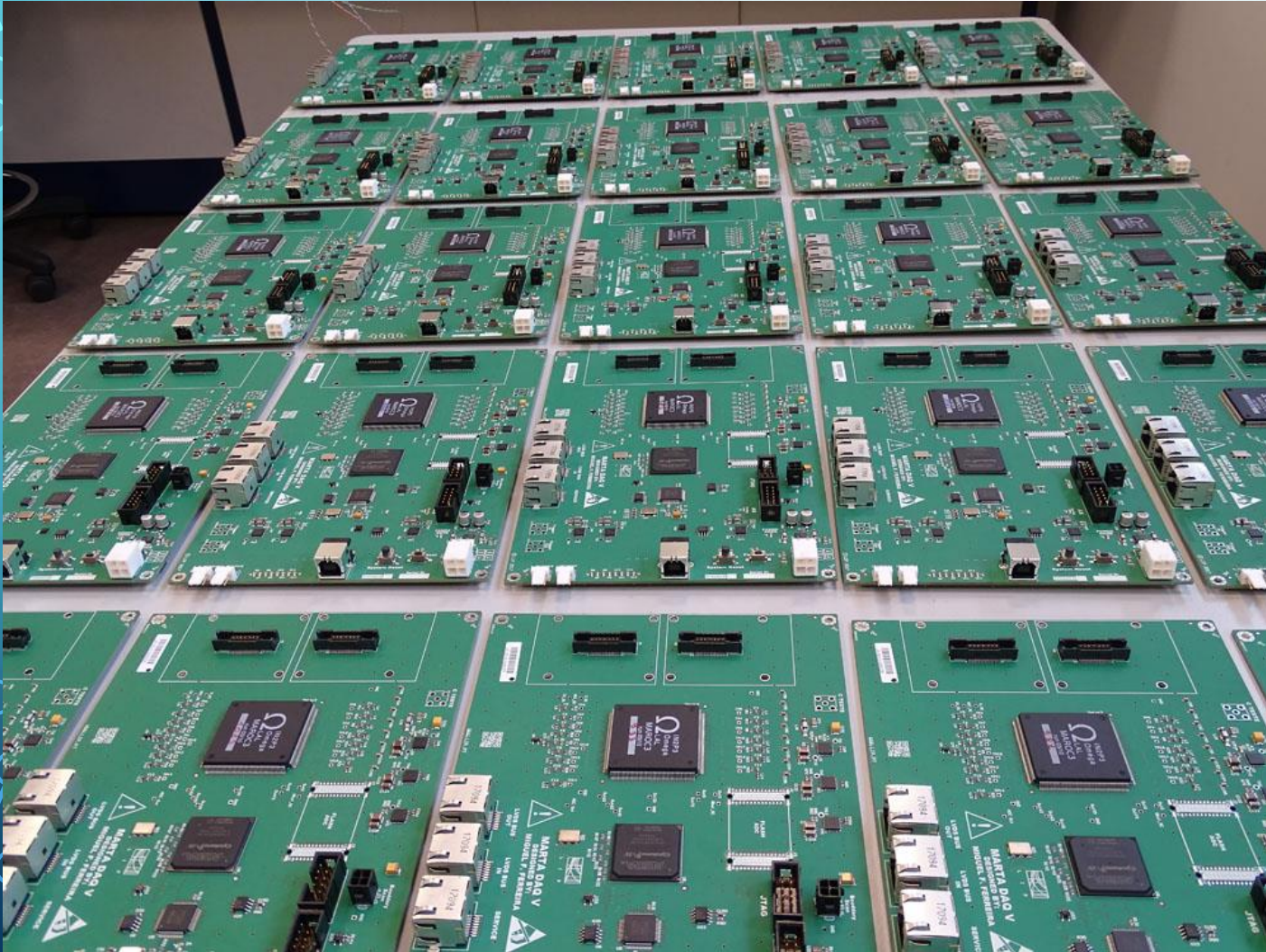
- Experimental setups and instrumentation for academia
- Instrumentation of dosimeters for medical applications
 - Participation in Micro Dosimetry instrumentation
- ATLAS HV Supplies upgrade.
- Trigger ATLAS upgrade

- Marroc Asic
- 64 Inputs channels
- 64 triggers output
- one FPGA
- one USB
- 4 high speed lvds output
- 4 high speed lvds inputs



Complex boards...





- Fifty-five boards were produced and assembled.
... and quality controlled
- Marta detectors were instrumented with the DAQs



MARTA DAQ VI

- Major change in MAROC package (old one was discontinued)
- Implies major redesign
- Opportunity for upgrading



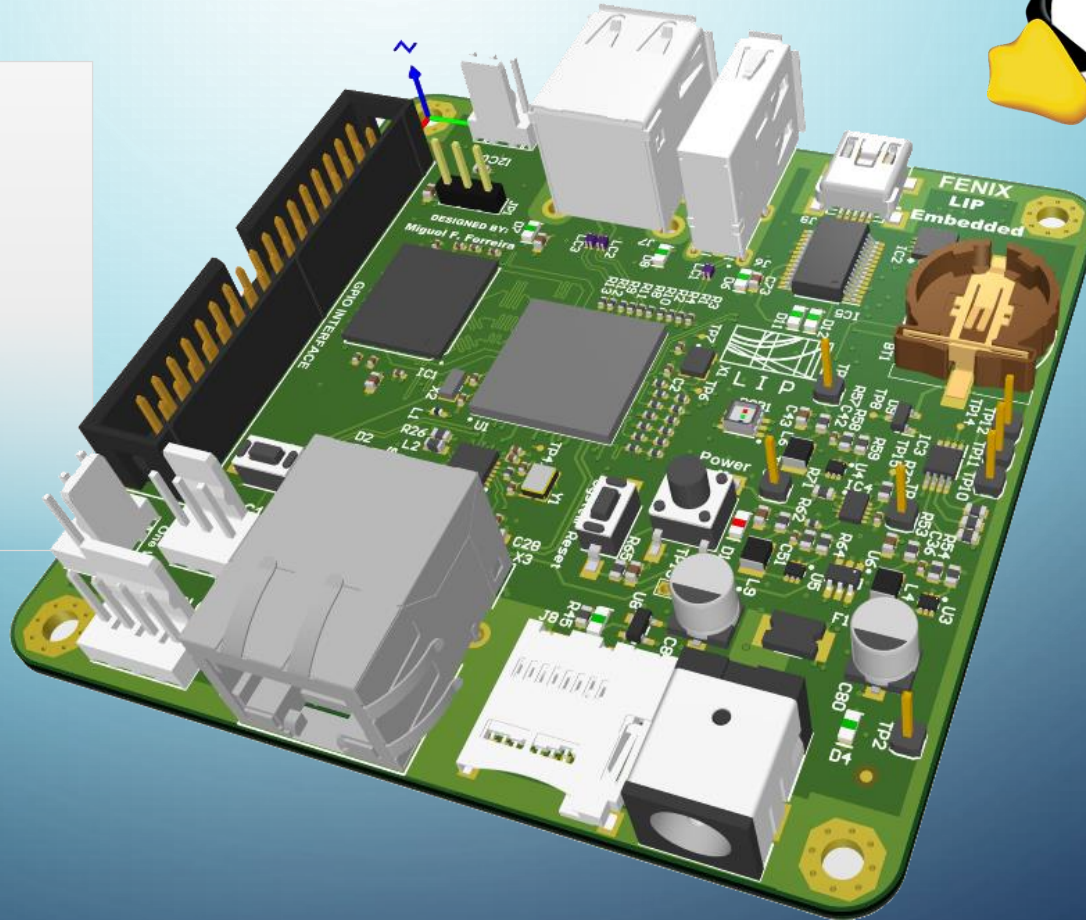
Intelligent autonomous DAQ

LIP Embedded Systems FENIX



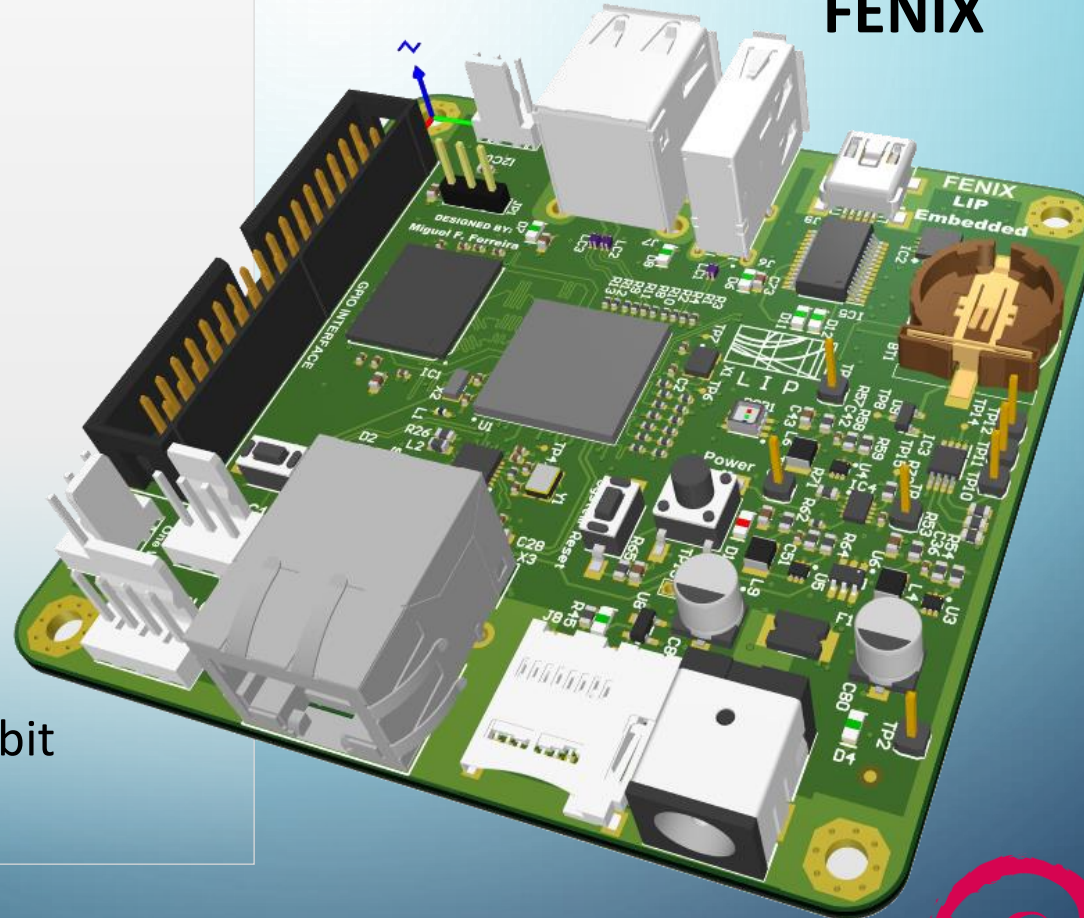
Software features

- Linux embedded
- Debian distribution
- Boot from external microSD card



Hardware features

- **MPU:** ARM Architecture
- **DDR2:** Memory IC 2Gb
- **I2C :** up to 2 I2C buses
- **SPI :** up to 2 SPI buses
- **One Wire :** up to 1 bus
- **UART:** up to 6 serial lines
- **GPIO :** up to 60/pwm
- **ADC :** up to 12 channels @ 10 bit



**LIP Embedded Systems
FENIX**

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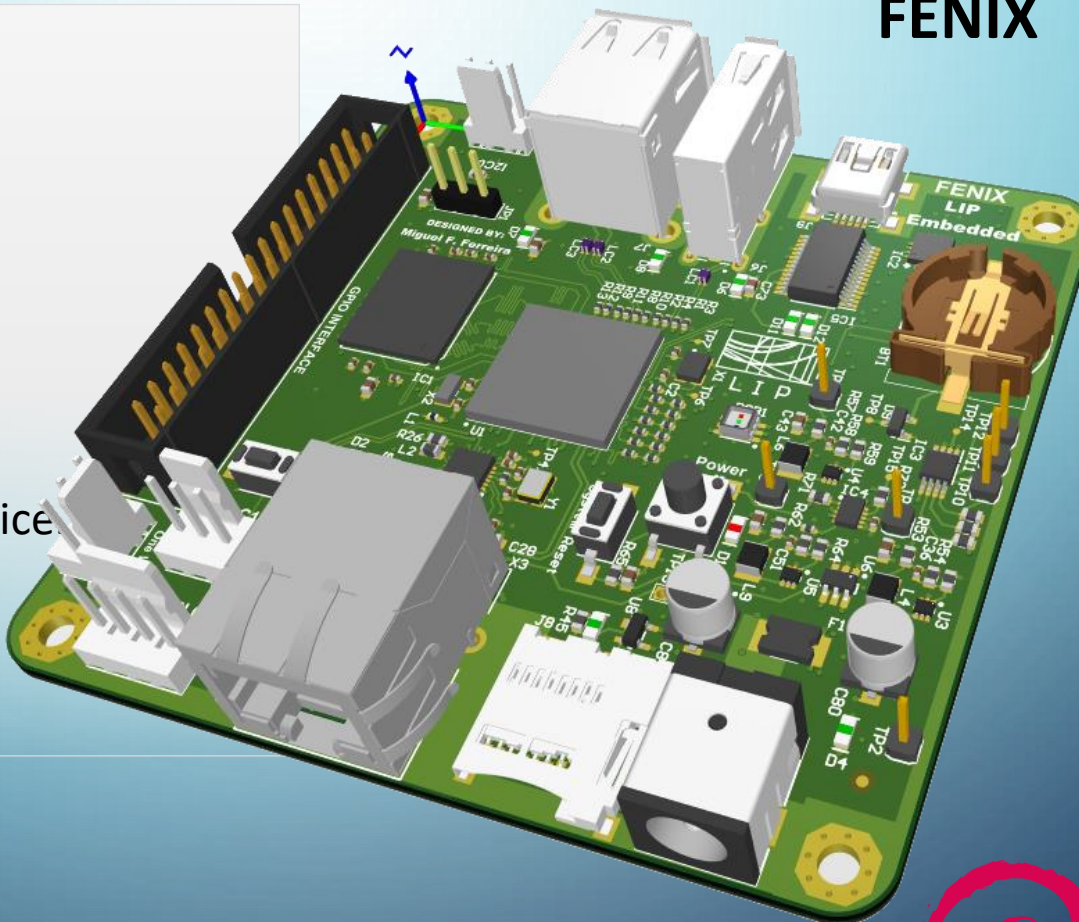
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Hardware features

- **Ethernet:** 10/100

USB: Ports up to 3 host ports:

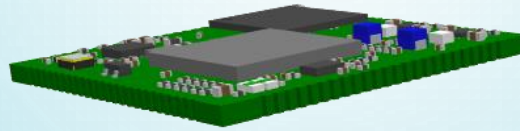
- one high speed host/device
- one high speed host.
- one full-speed.





Prototyping intelligence...

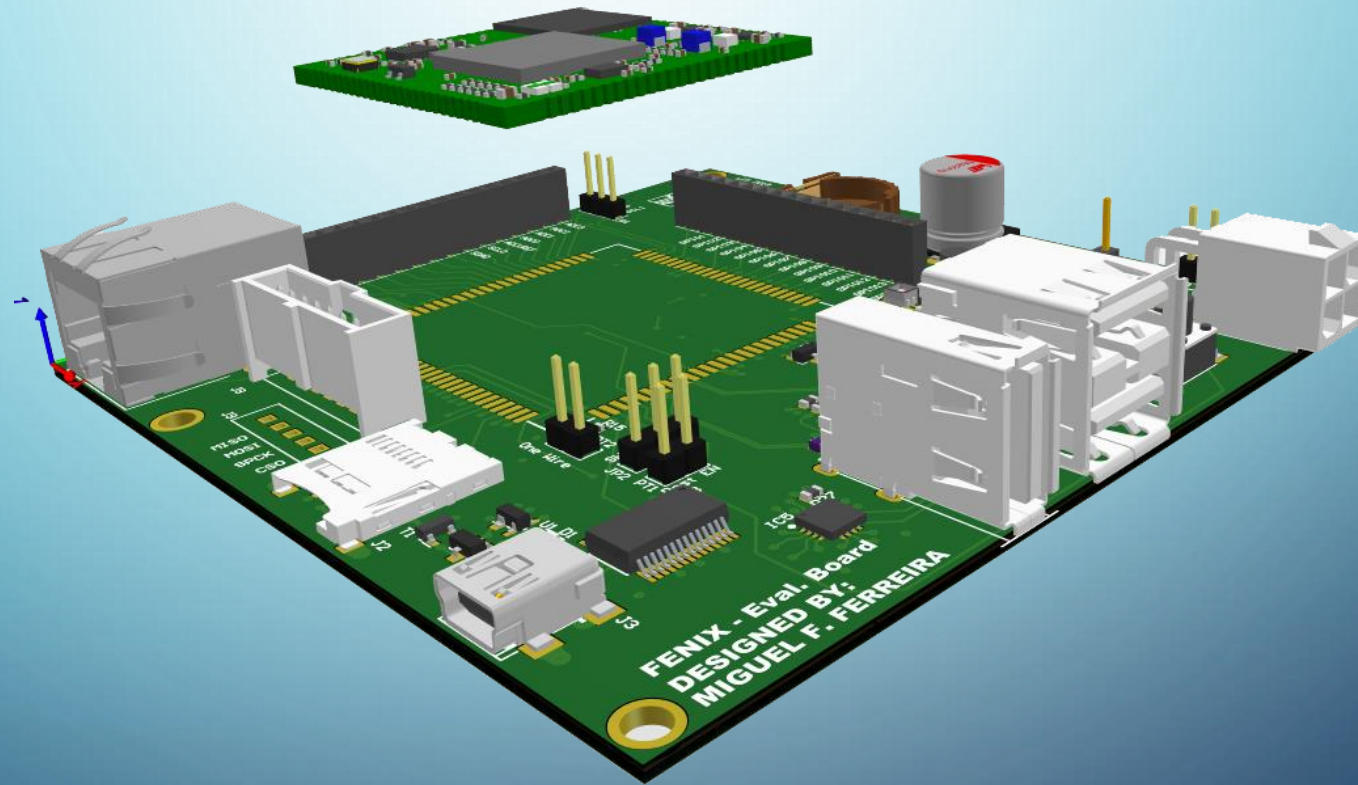
**LIP Embedded Systems
FENIX**



MARTA DAQ VI
MAIN BOARD

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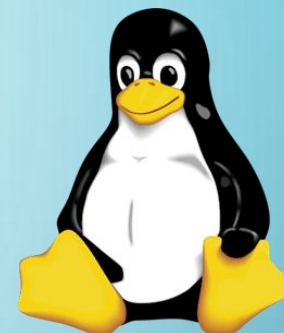
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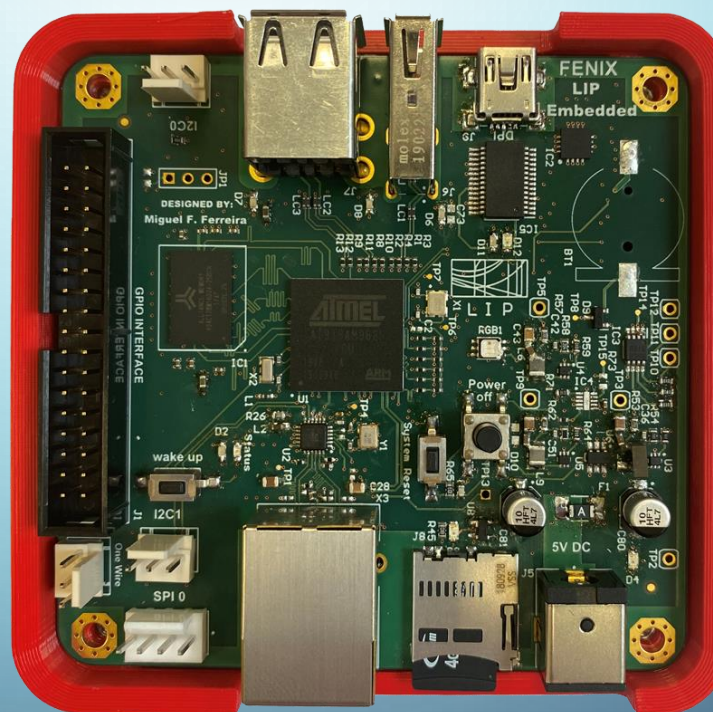
Spin-offs...

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Software features

- Linux embedded
- Debian distribution
- Boot from external microSD card



Thank you

