

SCIENTIFICA

Development, manufacturing and
commercialisation of precision
equipment for science

Equipment for science...

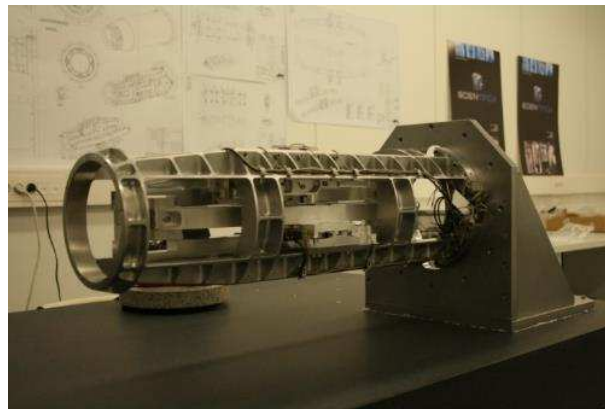
... based on three main **core technologies** in Scientifica:

Electronics & signal processing



- Control systems & electronics
- Signal processing
- Software development

Precision Mechanics



- High precision
- For hostile working environment (vacuum, radiation,...)

Composite materials



- Custom structural and functional materials

Services:

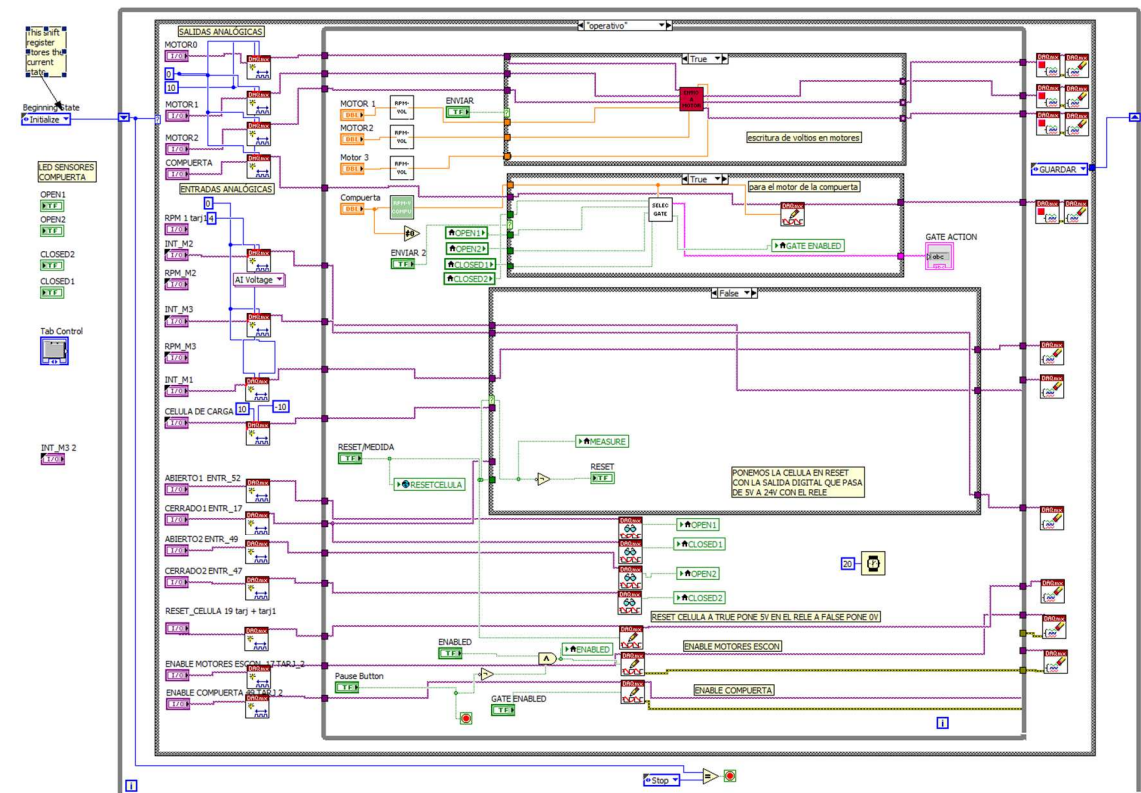
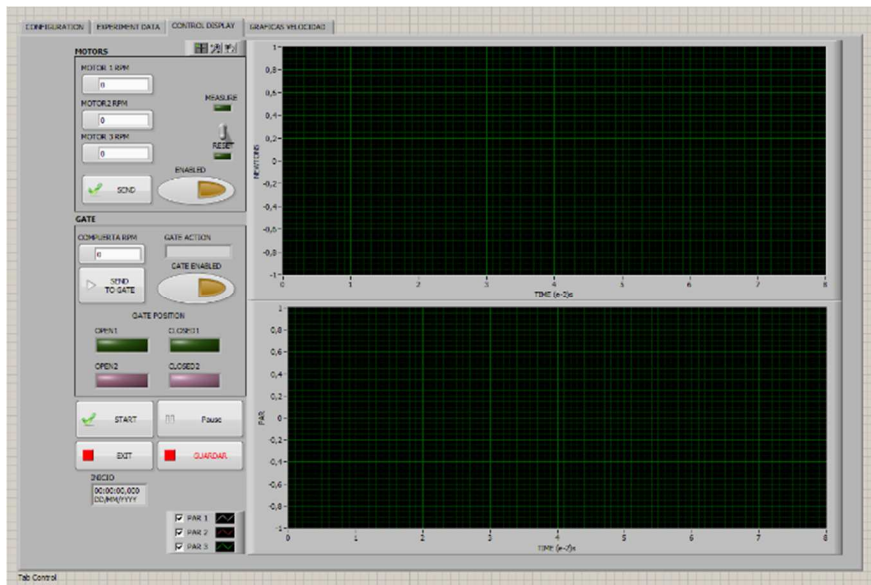
- **Outsourcing services for manufacturing and product development**
 - Detectors
 - Instrument developments or upgrades
 - Other equipment
- **Product/equipment support services:**
 - Maintenance
 - Upgrades
- **Technology Marketing /Licensing**
 - Interested in technology licensing from Scientific Facilities, to take them to the Scientific Community or Industry.

Control and Monitoring Solutions

Design, Development,
Programming and Maintenance of
Control Systems and Monitoring
Solutions

Products: Control & Monitoring Solutions

NI LabView:

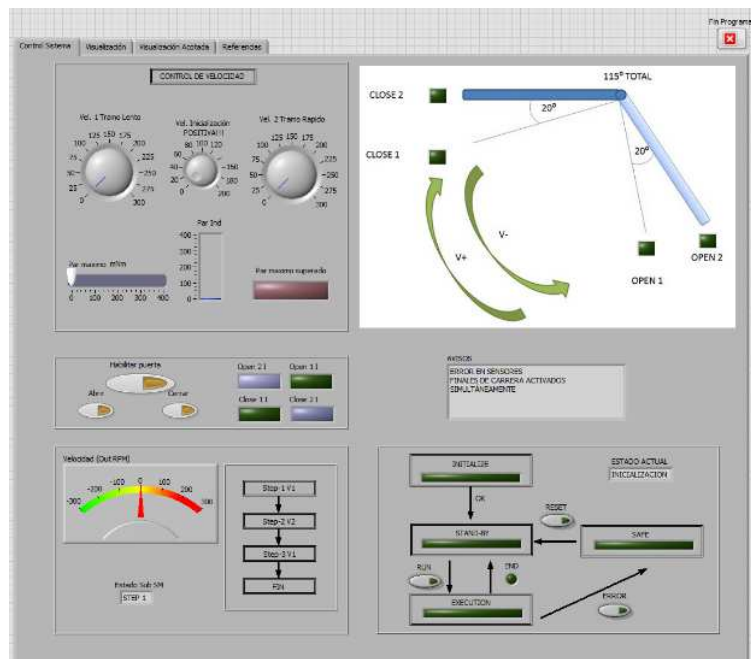


Features:

- Space dust collector test bench control system
- Two motion axis, linear stages.
- Force monitorization and control
- Data and states monitorization

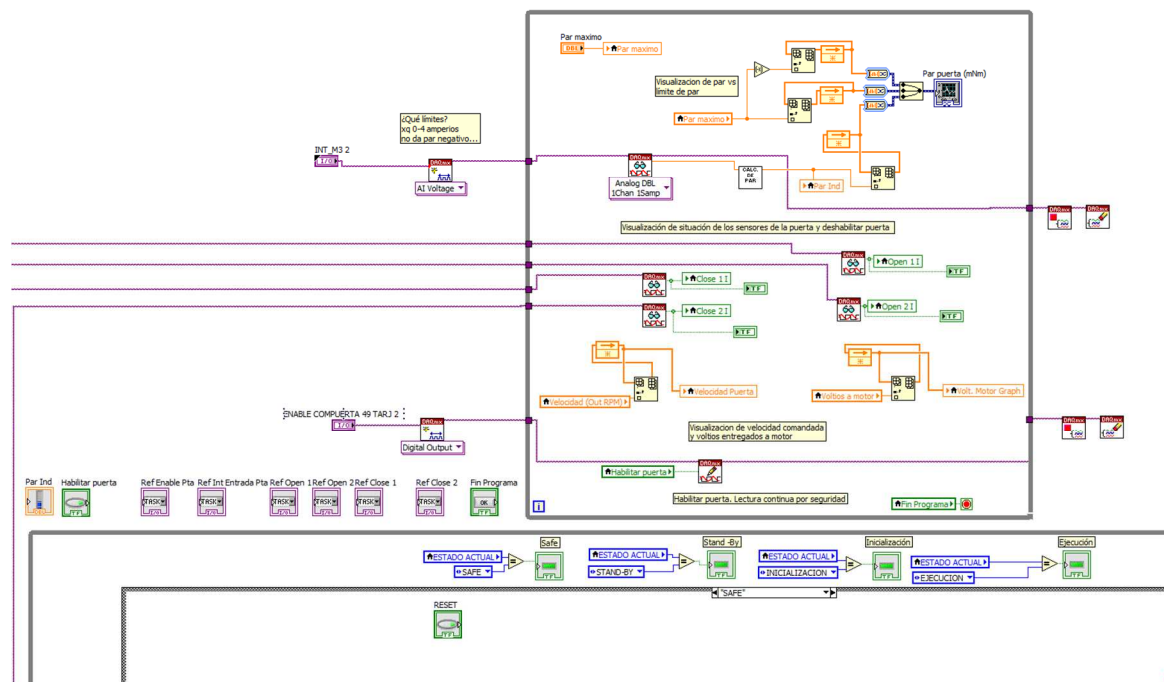
Products: Control & Monitoring Solutions

NI LabView:



Features:

- Space dust collector gate control system
- Speed and force control
- Variables, states and data visualization



Products: Control & Monitoring Solutions

Siemens S7:



Features:

- Reconfigurable nuclear shielding system
- Heavy duty mechanically actuated
- Three axes motion axis control
- PLC control system (multiple channels, sensor and actuators)
 - 30 digital inputs
 - 16 digital outputs

Delta Tau Motion Control:



Features:

- Positioning hexapod
- High precision six axis parallel kinematics motion control system
- Up to 1 micron accuracy

Elmo Motion Control:

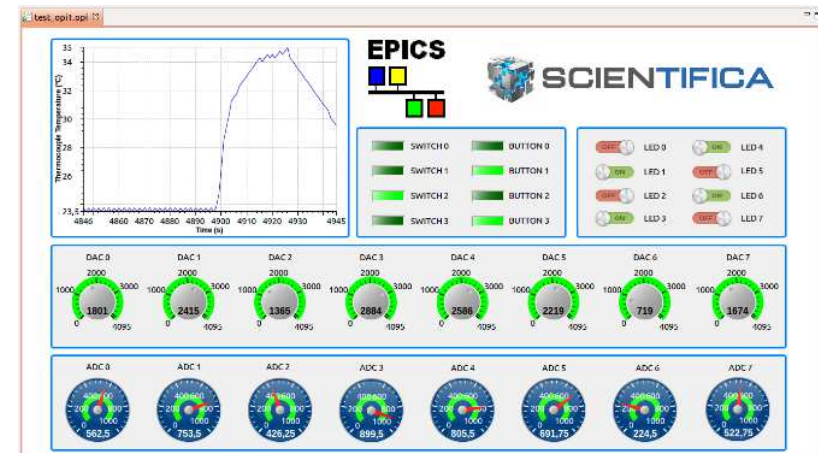
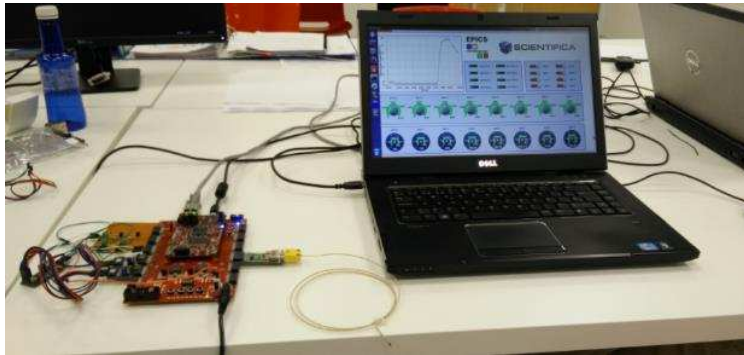


Features:

- High precision (1.5 micron accuracy in XY) two axis (600x710mm) motion control system
- Position and speed dual loop control system

Allen Bradley, Kollmorgen, ...

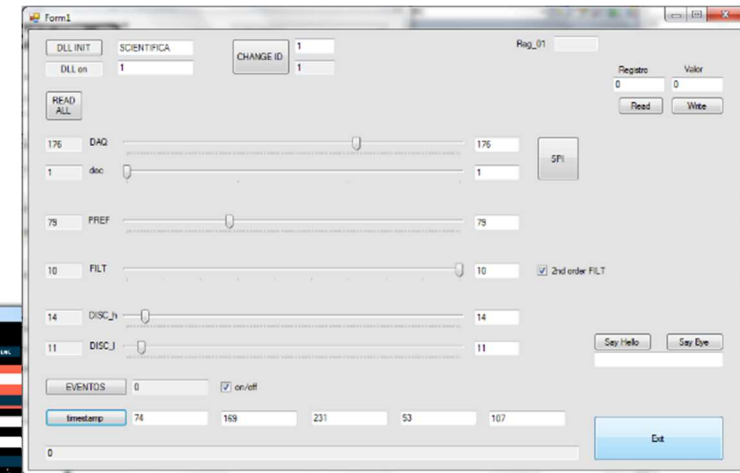
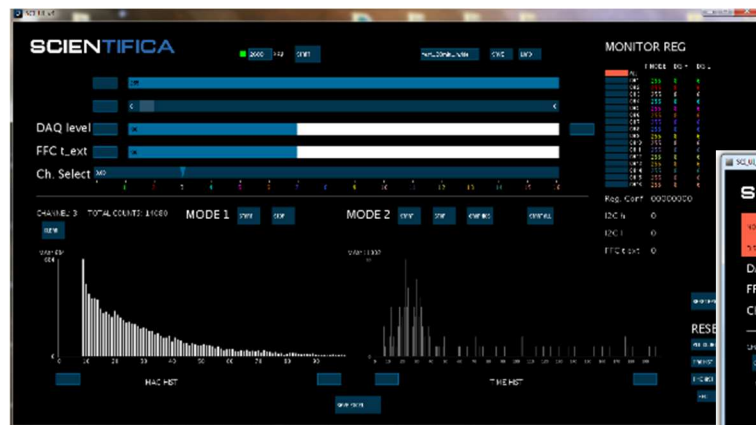
Products: Control & Monitoring Solutions



New Control Architecture (Zynq + EPICs) :

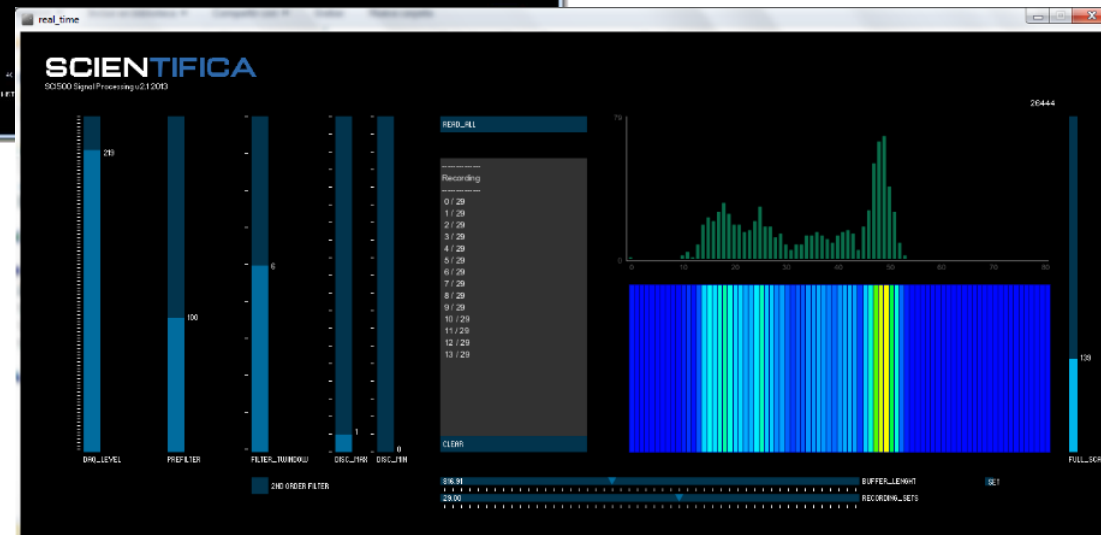
- FPGA / Microprocessor dual architecture
- Linux RT O.S.
- EPICs control & monitorization system integrated
- Inhouse development. Open Source and customizable platform

Products: Control & Monitoring Solutions



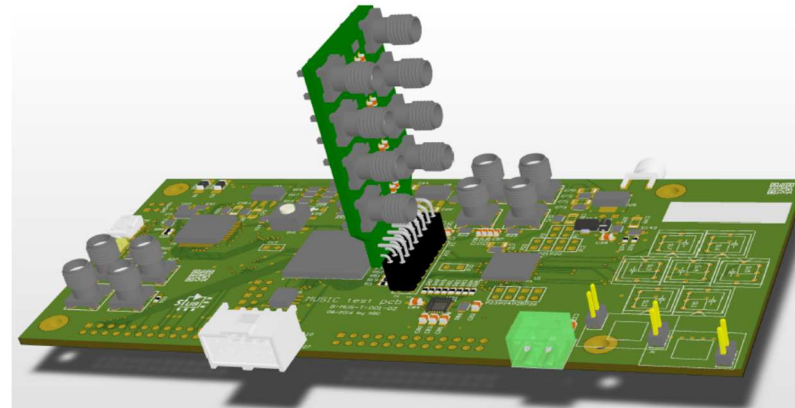
FPGA + Processing + Visual C :

- Neutron detector control system
- Detector configuration
- Real time event collection, processing and visualization.
- Configurable number of channels.



Products: SiPM readout chip and evaluation board

Evaluation Board:



8 channel SiPM anode readout ASIC based on a novel low input impedance current conveyor

Features:

- Three operation modes:
 - (1) SiPM pixel summing in differential mode;
 - (2) individual analog single ended (SE) channels and;
 - (3) digital outputs (one A/D is selectable per channel) 8 Channels
- A trigger pulse is provided by performing an OR between any binary signal and an output current for an external slow integrator

Products: Other solutions

FPGA based systems, analogic discret component systems, SMD components systems, integrated circuits, ASICS, ...:



FPGA based neutrón Detector Signal Processing And DAE:

- 16 channel module



Multichannel TIA for Fusion Diagnostic Application.

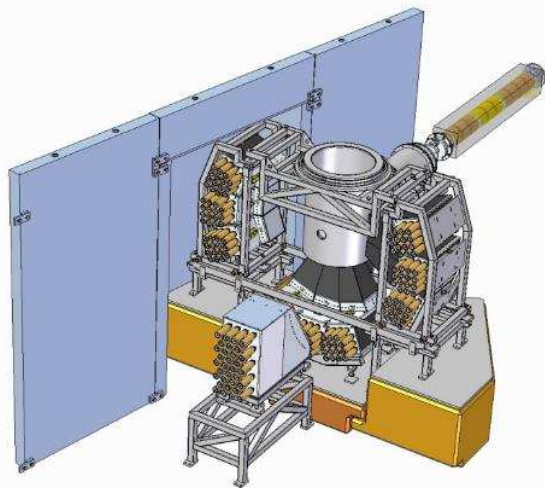
- 4 channel modules
- Up to 4 module in enrackable case.

Neutron detectors

Mechanical Design and Manufacturing,
Electronic Chain, Control System and
Software Development

We cover the whole value chain...
... in the development of **neutron detectors** for
multiple Scientific applications:

Design



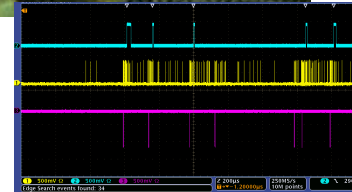
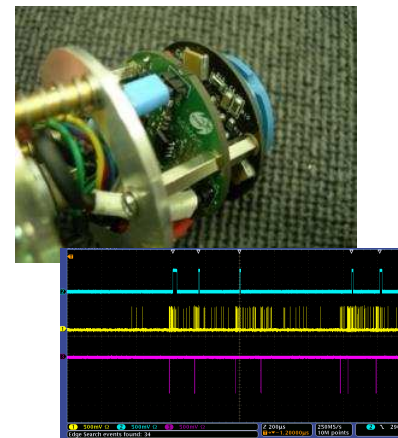
- Mechanical Design
- FEM & FEA
- McStas, MCNPX, GEANT4

Manufacturing



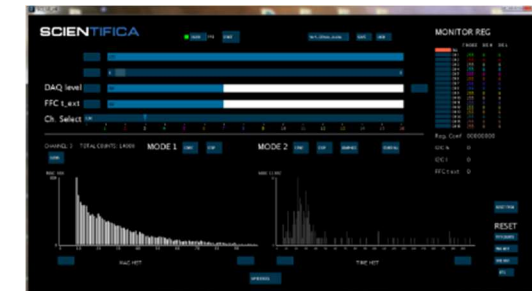
- Mechanical & optical assembly.
- Functional materials definition and production

Signal processing



- Signal conditioning
- N/γ Discrimination electronics
- HV power supply

Control System and Data management

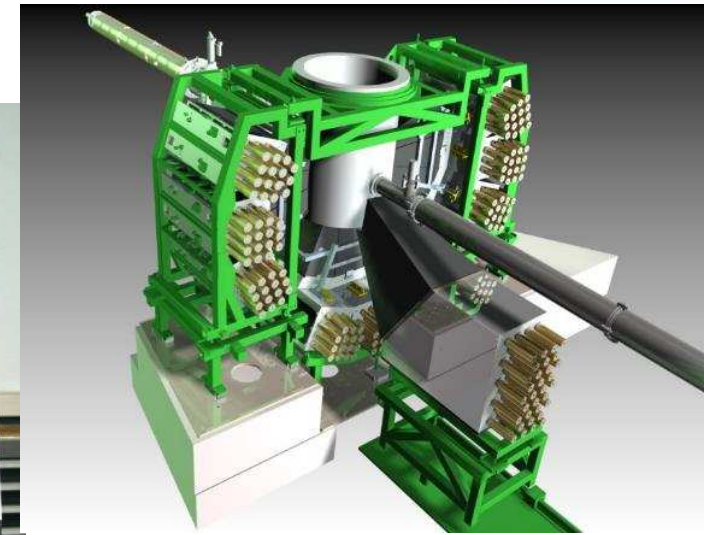


- Detector control system
- Calibration toolkit
- Data management

Neutron detectors: PEARL (ISIS. UK)

Main features:

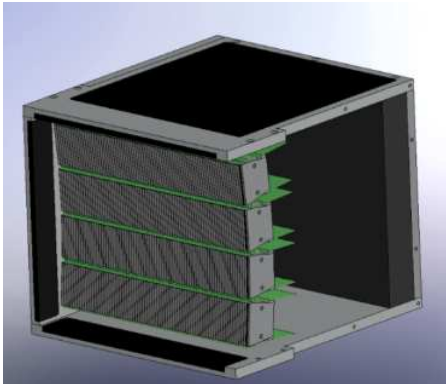
- Solid scintillator technology (ZnS) + ^6Li .
- Plastic Optical Fiber
- Pixel size: 3x(60x3) mm. Total: 1056.
- Area: Aprox. 1 m²
- Channels: 224



Neutron detectors: **prototypes**

Main features:

- Solid scintillator technology (ZnS) + ^6Li .
- POF/WLS Fiber
- Different Pixel concepts & sizes



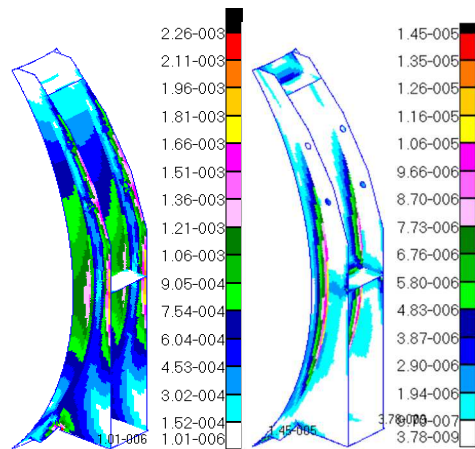
Composite Materials

Design, Development & Manufacturing
of functional and structural parts

For Science and Space

We cover the whole value chain...
... in the development of high added value applications in
composite materials for Science and Space:

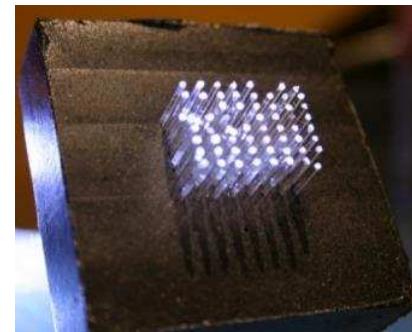
Design



Materials & Formulation



Manufacturing



Testing



- Mechanical Design
- FEM & FEA

- Material definition & election
- Resin formulation

- Custom structural and functional materials
- Process definition & implementation

- Quality control
- Integrity testing

Technologies / functionalities:

Vacuum

- Vacuum compatible
- Vacuum tight
- Controlled outgassing

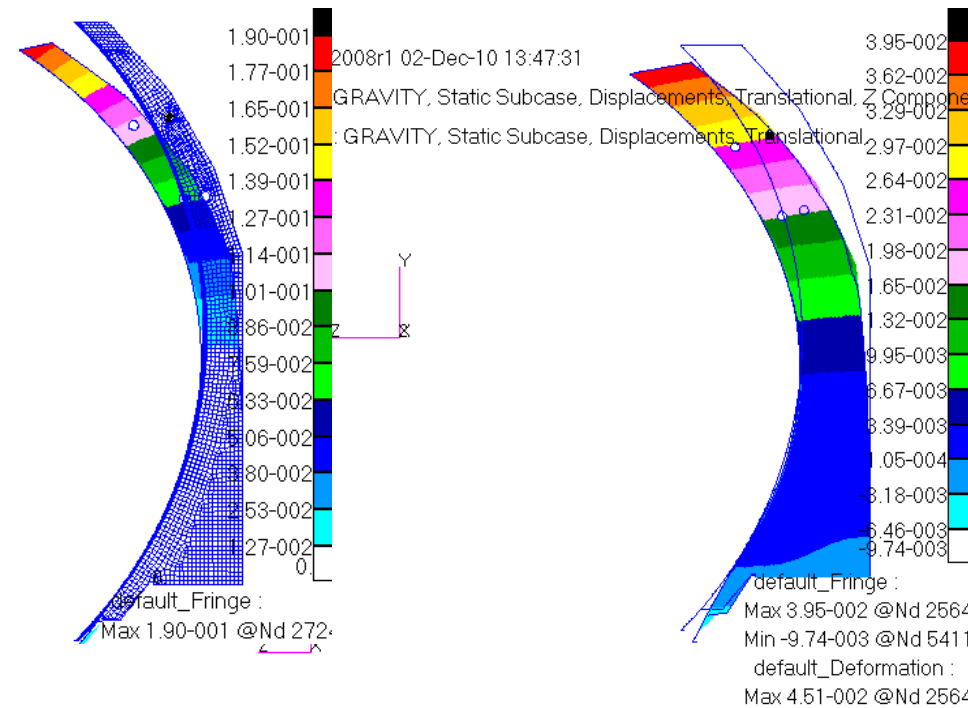
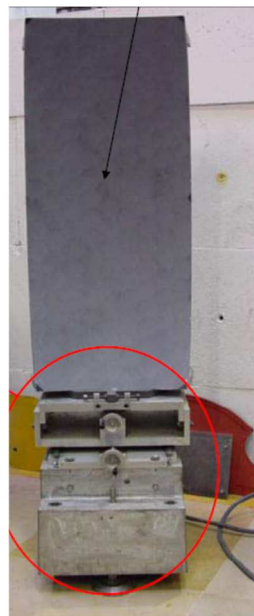
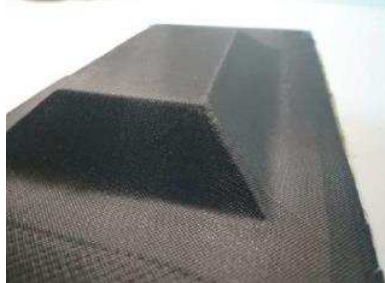
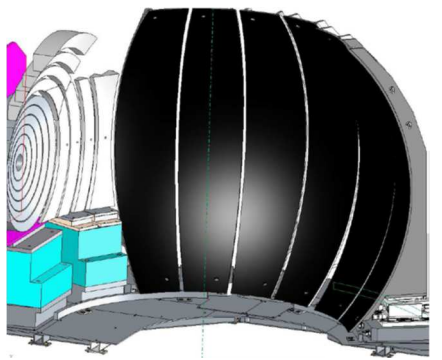
Radiation Hardness

- Rad hard materials
- Shielding materials
- Custom radiation protection solutions.

Sensorization

- Dimensional
- Optical
- Electrical
- Other physical effects

Applications: Functionalized Composite structures



Structural and geometrical tight specs:

- ± 0.1 mm deviation in sphere radius (2,000 mm).

Thermal & mechanical stability:

- within geometrical specs in 20°C T gradient

Surface quality: $R_a = 0.8$

Radiation absorption. Thermal neutron absorption.

General view



Facilities: Composites Room



Clean Room



Machining workshop



Assembly workshop

ANY QUESTION?

THANK YOU