

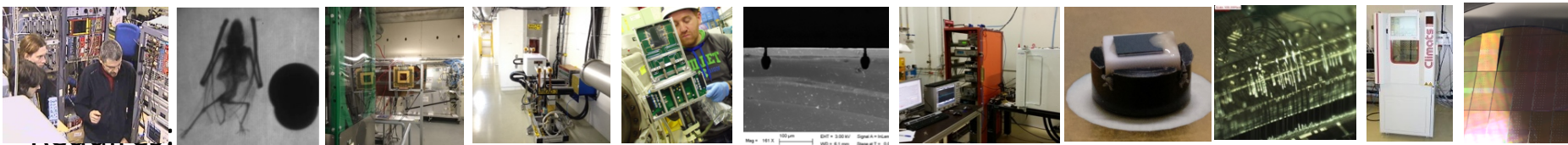
EP-DT-DD

Mandate Activities

Mandate

To lead research and development projects in various detector technologies for future experiments. Foster common development between experiments.

- Rich experience in the field of **silicon and gas detectors** and their integration – **from first steps to final systems!**
- **Leading roles in R&D projects** (e.g. RD50 and RD51 spokespersons, STREAM workpackage leader) and **providing managerial and organizational support**
- **Providing infrastructure and support** for the entire gas and silicon detector community.



→ **State of the art infrastructure and equipment to support the various activities of the different communities**

→ **Multi-disciplinary team with renowned expertise in the different fields**

EP-DT-DD Projects and Team

Gas Detector Development

Leader: Leszek Ropelewski (STAF)
Eraldo Oliveri (STAF)
Filippo Resnati (FELL, ESS funds)
Patrik Thuiner (FELL, BightnESS funds)
Michael Lupberger (FELL, BightnESS funds)
Florian Brunbauer (Austrian DOCT)

Development of Rad. Hard Si Detectors

Leader: Michael Moll (STAF)
Pedro Dias de Almeida (TRNE)
Sofia Otero Ugobono (DOCT)
Joaquin Gonzalez Jimenez (TRNE, DT&CMS)
Esteban Curras Rivera (DOCT, DT&CMS)
Julio Calvo Pinto (FELL)
Isidro Mateu Suau (TRNE, 50% with IRRAD)

Irradiation Facilities

Leader: Federico Ravotti (STAF)
Giuseppe Pezzullo (STAF)
Maurice Glaser (STAF, HON Member)
Martin Jaekel (STAF, ATLAS&CMS, 50%)
Georgi Gorine (DOCT, FCC)
Blerina Gkotse (DOCT, CERN&EU AIDA 2020)

DSF and QART Lab

Leader: Alan Honma (STAF)
Julien Bonnaud (FELL, DT&CMS)
Ian McGill (STAF, 50%)
Florentina Manolescu (STAF)
Richard Fortin (STAF, 0%)

Pixel Detector Development

Leader: Petra Riedler (STAF)
Roberto Cardella (EU, STREAM)

Microfabrication

Leader: Alessandro Mapelli (STAF)
Dora Fejes-Kjatar (TRNE until Oct. 2016)
Clementine Lipp (TRNE)
Jacopo Bronuzzi (DOCT)

Many visitors in all projects!

Retirement of M. Glaser and R. Fortin end 2016, beginning 2017 and of key people in the (very) near future.

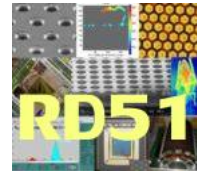


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Current Projects

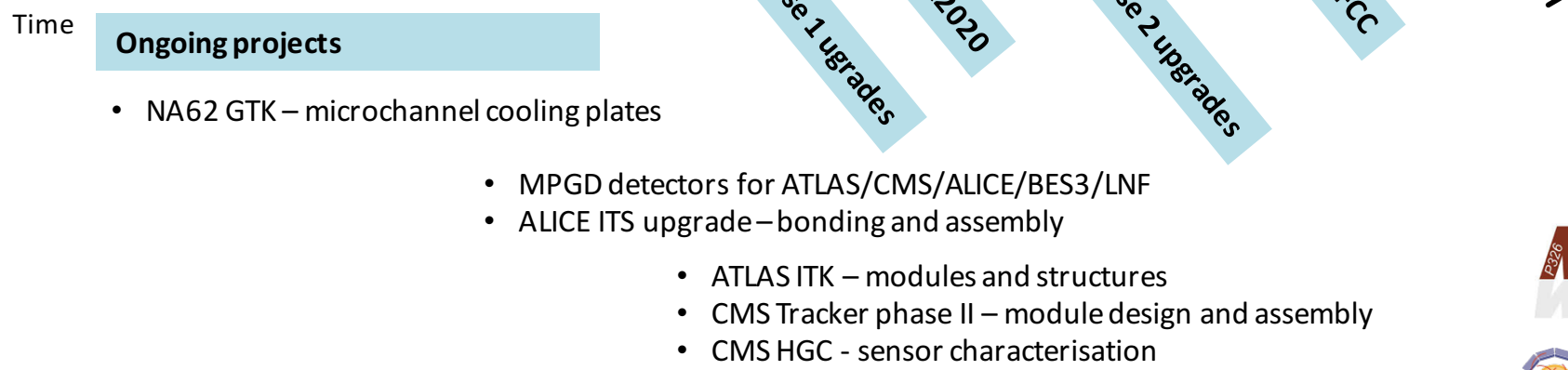


ALICE
RD50



Involved in LHC experiments, non-LHC experiments, future activities (AIDA2020, FCC, etc.) and generic R&D - in 2016 continued R&D projects and preparing for production for LS2 projects

Examples:



R&D

- RD50 (radiation hard semiconductor devices for VHL colliders)
- RD51 (development of micro-pattern gas detector technologies)
- AIDA2020 (irradiations, sensor studies)
- STREAM FP7 EU project (development of innovative radiation-hard, smart pixel sensors)
- FCC (new radiation sensors, radiation hardness assurance)

+ support and service for CERN, users, visitors (e.g. Bond lab, QART, Gas lab, Irradiation facilities)



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Competencies & Infrastructure

Unique infrastructure providing **R&D platform and service to the gas and silicon detector communities.**

Test facilities (coordination responsibility) with **ready-to-use equipment** (maintenance and refurbishment)

- Gas detector lab and test area (b. 154, SPD H4)
- Solid state detector lab (b. 28 and 186)

Cleanroom areas (e.g. DSF) for **detector assembly and integration, interconnection and QA tests**

- Departmental Silicon Facility (b. 186)
- Wire bonding and interconnect facility (b. 186)
- Quality and Reliability Assurance lab (b. 186)

EP irradiation facilities

- Proton/mixed field irradiation - IRRAD (PS)
- Gamma Irradiation facility – GIF ++ (SPS)

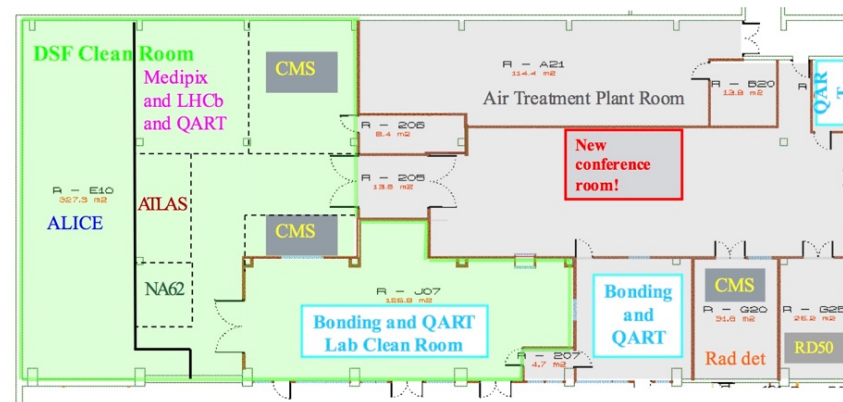
Contact for activities at EPFL cleanroom (Lausanne)



Infrastructure and Service Improvements in 2016 – Example 1

DSF – Departmental Silicon Facility:

- **Procedures** - improved access procedures for the common clean room (access in EDH, electronic lock, cleanroom test in SIR)
- **Structural changes** – separation for ALICE ITS production area in the clean room, enlarged entrance SAS to the clean room, meeting room outside the cleanroom (big thanks to Isabelle Mardirossian and her team!)
- **Equipment improvements** – new G5 bonding machine to replace unsupported 6400 Delvotek bonder (delivered, installation in November)



Infrastructure and Service Improvements in 2016 – Example 1



ALICE Airlock in the cleanroom



Meeting room



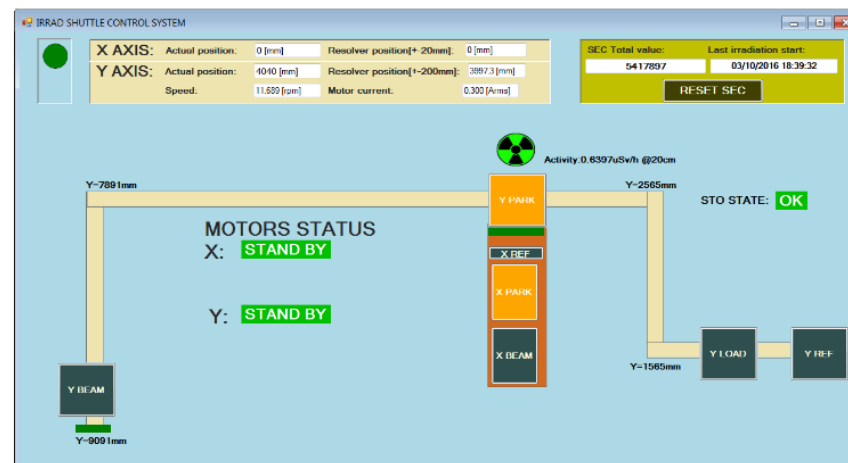
ALICE zone in cleanroom with separation

Infrastructure and Service

Improvements in 2016 – Example 2

Irradiation Facilities:

- **Temperature control in GIF++** by HVAC air-conditioning system working well (further improvements for RH needed)
- **Upgrade of the spectrometry lab** to meet more demanding needs for more complex irradiations and higher sample numbers
- **New software control of the Irrad1 shuttle** put in operation (desk and touch panel) - includes interlock system on sample activation



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Presentations, Conferences, ...

Many interesting new results in the different R&D projects!
Well documented by many contributions to international conferences, journals and organisation of special meetings.

Some examples:

- RD50 and RD51 workshops and meetings!
- ICHEP presentations and session convener (August 2016)
- KT Innovation day at CERN (Oct. 2016)
- IPRD 16 (october 2016)
- Academia-industry matching event on Nanotechnology and HEP (October 2016)
- Workshop on discharges in MPGDs (March 2016)
- STREAM introduction workshop (September 2016)
- IEEE/NSS Conference (this week)
- AIDA2020 meeting
- RADECS Conference 2016

And many more!



38th INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS

AUGUST 3 - 10, 2016
CHICAGO



EP KT Innovation day



3D characterization of solid state devices using a Two Photon Absorption Transient Current Technique

Marcos Fernández Garcia
IFCA-CSIC Universidad de Cantabria (Spain)
(permanently stationed at CERN-SSD)

On behalf of the TPA-TCT team:



Marcos Fernández
Iván Vila

Michael Moll

Raúl Montero

Rogelio Palomo

EP-KT Innovation Day
CERN, October 14th 2016

Optical readout:
an intuitive readout
for MPGD detectors

Filippo Resnati (EP-DT-DD)
on behalf of the GDD team

EP-KT Innovation Day - CERN - 14th October 2016



EP-DT-DD Objectives

- **We have an excellent team with experts in different areas of gas and silicon detectors!**
- **Infrastructure and facilities** for testing, assembly, integration, irradiation,....
- The team is strongly involved in **existing project/upcoming upgrades for LHC and non-LHC experiments** and takes leading roles in generic **R&D**.

Continue to:

- Exploit **common needs** and competencies in the section and in experiments.
- Continue to keep the **balance between service and support** for experiments and **well-defined R&D** that can be implemented in experiments.
 - E.g. important developments of RD50 and RD51 while supporting LHC experiments' upgrade work for LS2
 - availability of labs and measurement systems, organization of test beams,...
 - dedicated studies for relevant issues such as micro discharges in MPGDs,...
- **Prepare for the upcoming challenges** of upgrades and new projects: modernisation and adaptation of facilities and services:
 - Continue consolidation of DSF infrastructure (water pipes, etc.)
 - Ramp up of ALICE ITS production with DSF/QART support
 - Support and extend (long time) irradiations of samples for upgrade studies and cope with increasing demands
 - Activities on large area pixel detector development with STREAM
- **Maintain the competencies and strengthen the team**
 - retirements and part time availability further reduce the manpower for essential and unique services for the community