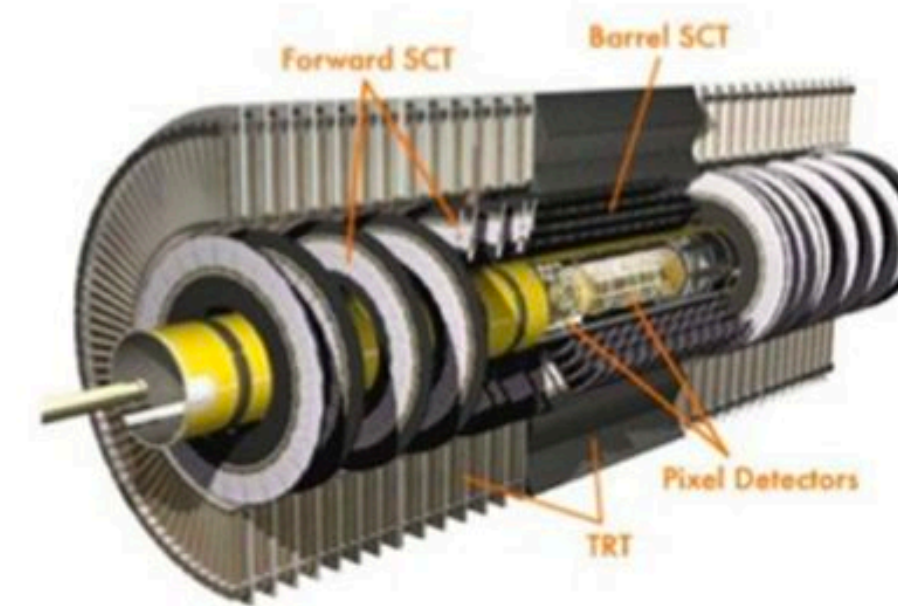
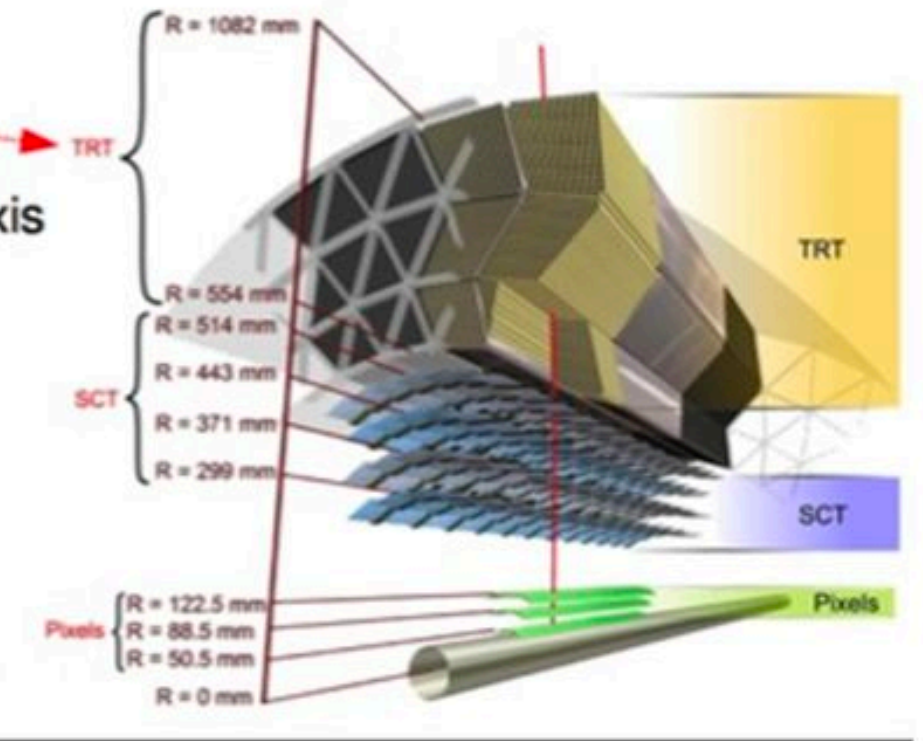


2014den beri

TRT Barrel:

- 3 layers * 32 ϕ modules
- 1.44m long straws, parallel to beam axis
- Wires electrically split in middle
 - ~1.5cm dead region
 - Read out on both sides
- 105,088 readout channels



2 TRT Endcaps, each with:

- 20 wheels with 8 straw layers each
- 39cm long radial straws
- 120,880 readout channels

ISOTDAQ 2010 - International School of Trigger and Data Acquisition

January 31, 2010 to February 7, 2010
Ankara, Turkey
Europe/Istanbul timezone

Overview

[Timetable](#)

[Contribution List](#)

[Author List](#)


[Registration](#)


Support



[✉ Gokhan.unel@cern.ch](mailto:Gokhan.unel@cern.ch)


[✉ Ozgur.cobanoglu@cern.ch](mailto:Ozgur.cobanoglu@cern.ch)

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 **Ankara, Turkey**
TAEK, Ankara / Turkey

  [isotdaq-tr12.avi](#)

 This is a seven days school on Trigger and Data Acquisition (TDAQ) systems. The school will be held in English with a maximum of 40 students and it will contain both lectures and laboratory exercises. There will be a final project to be delivered by email two weeks after the completion of the school. The target audience is the MS and PhD students aiming to continue their career in accelerator and particle physics specializing in the field of trigger and data acquisition. The basics of NIM, VMEbus, PC based readout systems and detectors will be covered together with reviews of modern TDAQ systems such as the CMS and ATLAS experiments at CERN.

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ISOTDAQ 2011 - International School of Trigger and Data Acquisition


Feb 9 – 16, 2011
INFN sezione di Roma c/o Universita' di Roma "Sapienza", Dipartimento di Fisica
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P.la A. Moro 2
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Italy

 [Enrico Pasqualucci](#)

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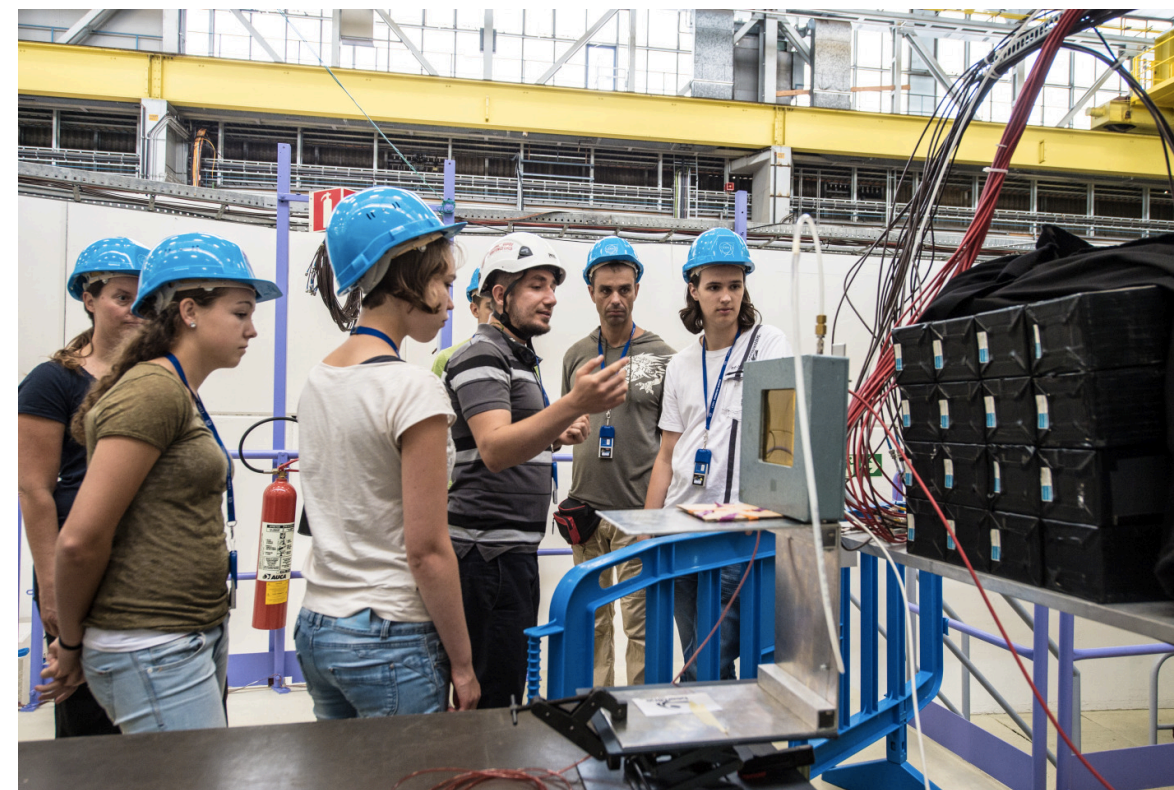
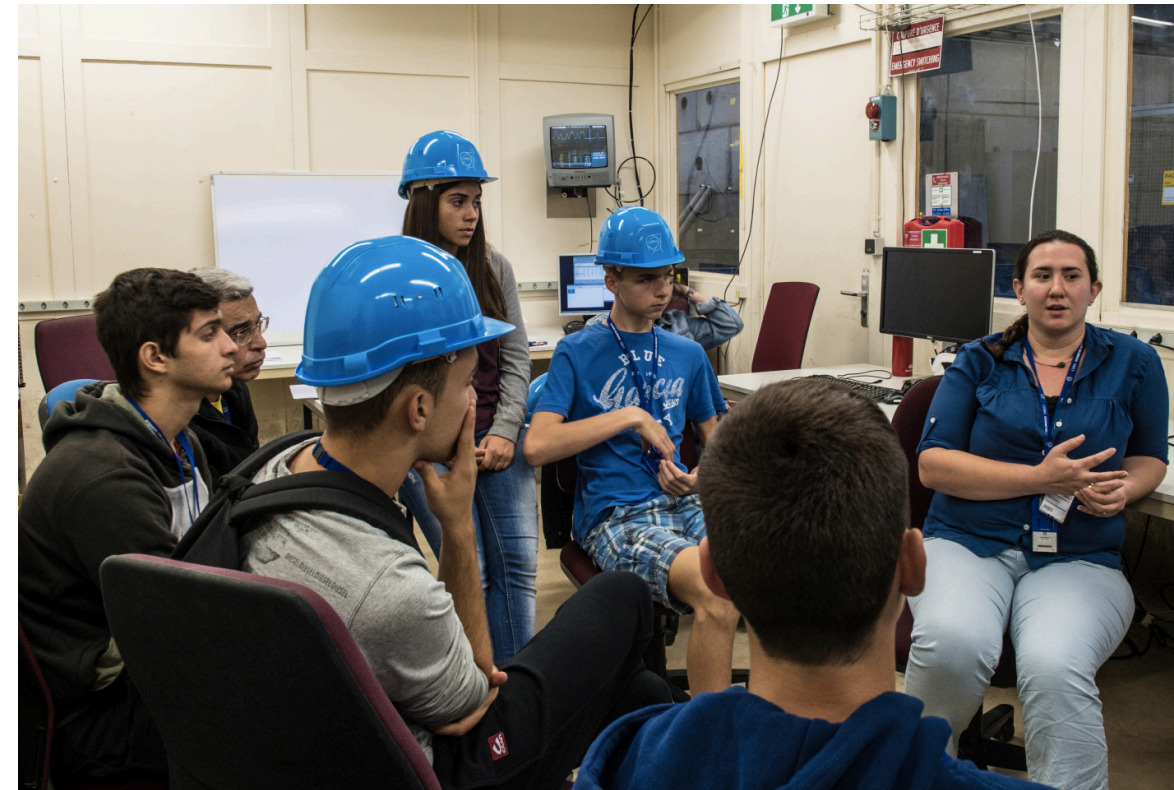
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A Beamline For Schools



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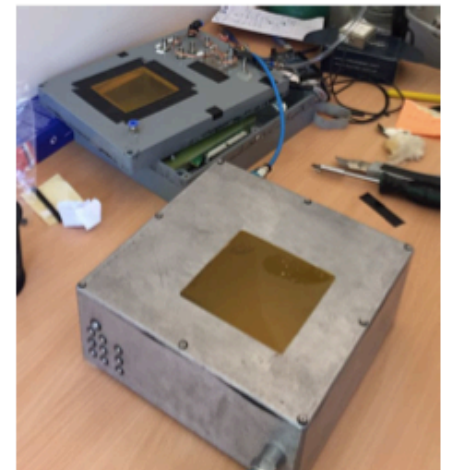
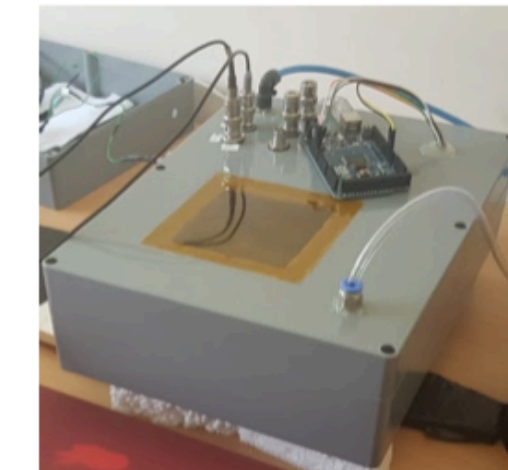
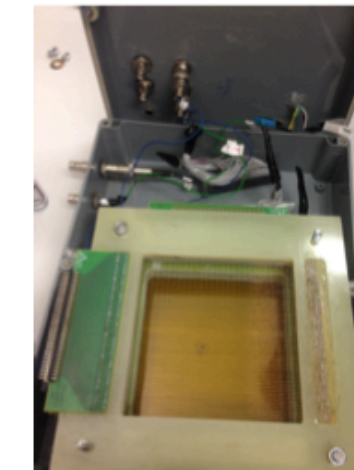
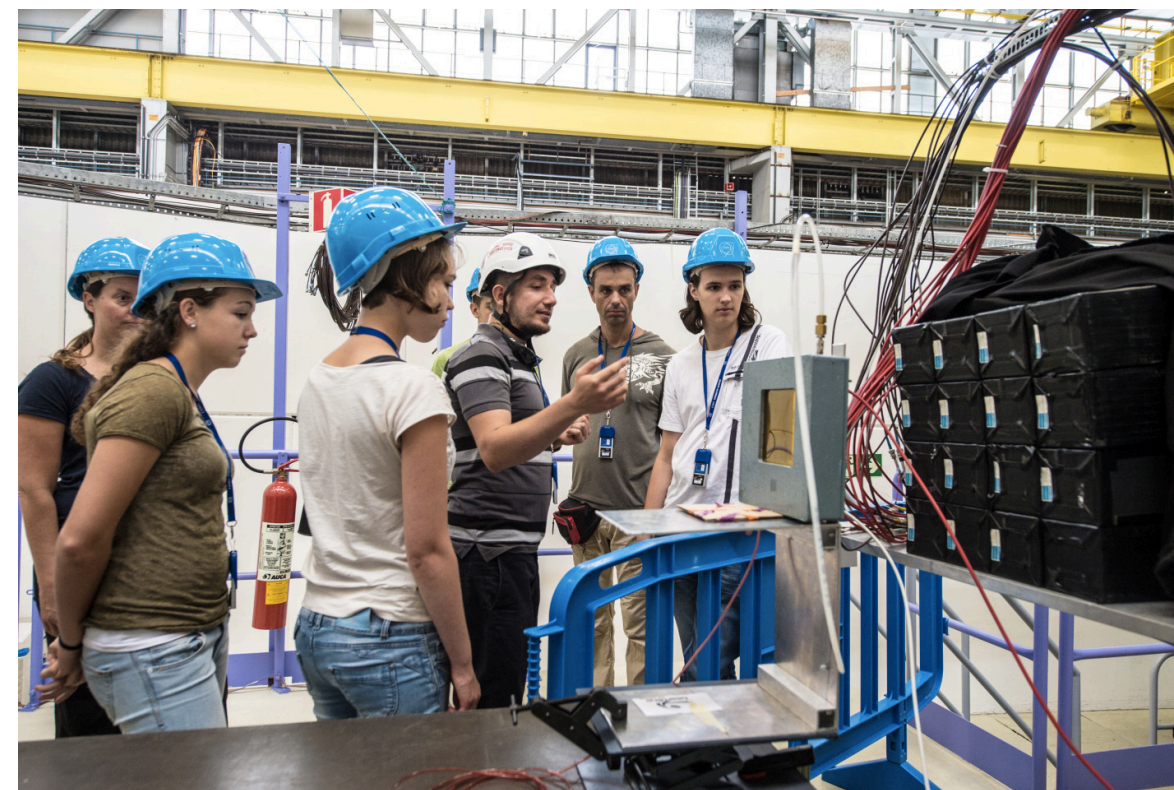
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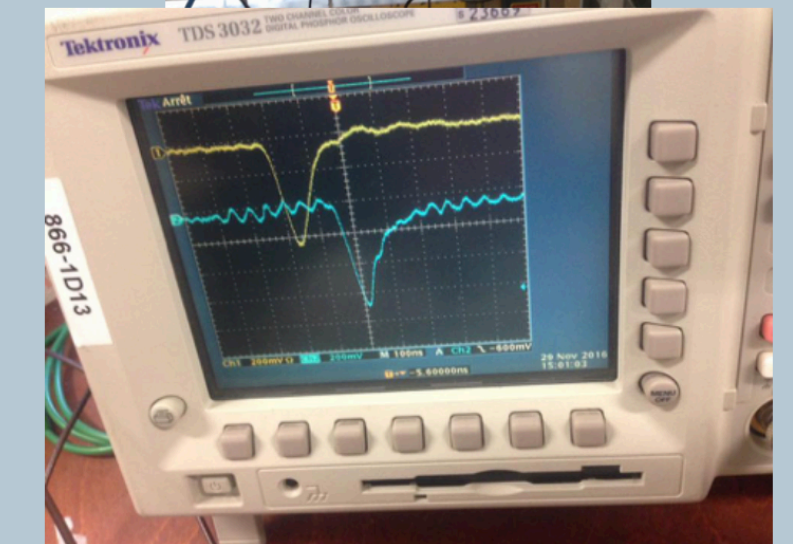
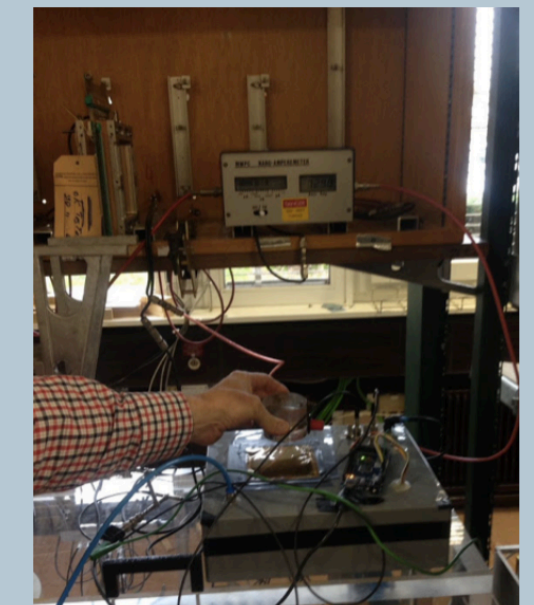
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Pia A. Moro 2
00184 Roma
Italy

👤 **Enrico Pasqualucci**

A Beamline For Schools



Tests at CERN with Sr90



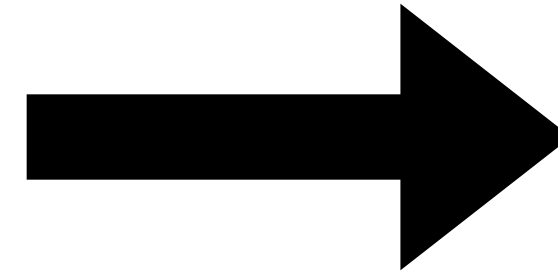
ISOTDAQ 2023

13th International School of Trigger & Data Acquisition



13-22 June 2023, Istanbul University, Istanbul, Turkey

Registration Deadline: 15 February 2023 **Target Audience:** Physicists, engineers and computer scientists with an interest in trigger and data acquisition systems
Email: isotdaq.schools@cern.ch
Website: <https://indico.cern.ch/event/1182415> **Places are limited:** Acceptance is by a selection committee



YENI
FIRSATLAR



- Announcements
- Snowmass Calendar
- Ethics Guidelines
- Snowmass Report

Organization

- Snowmass Steering Group
- Snowmass Advisory Group
- Frontier Conveners
- APS DPF Snowmass page
- Snowmass Early Career

Snowmass Frontiers

- Energy Frontier
- Neutrino Physics Frontier
- Rare Processes and Precision
- Cosmic Frontier
- Theory Frontier
- Accelerator Frontier
- Instrumentation Frontier**
- Computational Frontier
- Underground Facilities
- Community Engagement
- Snowmass Liaisons

Trace: • [conveners](#) • **start**

Welcome to Snowmass

The Snowmass Community Planning Exercise, which was delayed in January 2021 due to the COVID-19 pandemic, resumed full activity in September 2021. It will culminate in July with the Community Summer Study Workshop. For details and updates, please see the announcement at <https://snowmass21.org/announcements>. The ongoing activities and updates from the individual frontiers can be found on their frontier Wiki pages. We encourage you to participate in the activity by signing up to the research frontiers at their Wiki pages, accessible from the side menu if you haven't already done so.

The Particle Physics Community Planning Exercise (a.k.a. "Snowmass") is organized by the Division of Particles and Fields (DPF) of [the American Physical Society](#). Snowmass is a scientific study. It provides an opportunity for the entire particle physics community to [come together to identify and document a scientific vision](#) for the future of particle physics in the U.S. and its international partners. Snowmass will define the most important questions for the field of particle physics and identify promising opportunities to address them. (Learn more about the history and spirit of Snowmass here ["How to Snowmass" written by Chris Quigg](#)). The P5, Particle Physics Project Prioritization Panel, will take the scientific input from Snowmass and develop a strategic plan for U.S. particle physics that can be executed over a 10 year timescale, in the context of a 20-year global vision for the field.

We aim for everyone's voice to be heard. Your contributions and participation are critical for the success of Snowmass and they will naturally occur as part of one or more working groups directed by the conveners. There will be various Town Hall meetings for us to communicate with you and to receive your feedback. You are also welcome to provide input and suggestions on the Slack channel (<https://snowmass2021.slack.com/>). This Snowmass wiki provides news and announcements and has pages dedicated to each frontier. Agendas and presentations of all

Report of the Instrumentation Frontier Working Group for Snowmass 2021

1 **P. Barbeau, P. Merkel, J. Zhang**

2 D. Acosta, T. Affolder, A. Apresyan, M. Artuso, V. Bhopatkar, S. Butalla, G. Carini, T. Cecil,
3 A. Connolly, C.E. Dahl, A. Deiana, K. Dunne, C. O. Escobar, J. Estrada, F. Fahim, J. Fast,
4 M. Garcia-Sciveres, R. Guenette, M. Hedges, K. Irwin, A. Karle, W. Ketchum, S. Kravitz, H. Lippincott,
5 R. Maruyama, J. McIver, M. Newcomer, J. Parsons, M. Pyle, J.L. Raaf, C. Rogan, M. Sanchez, I. Shipsey,
6 B. Surrow, M. Titov, S. E. Vahsen, C. Vernieri, A. White, S. Worm, M. Yeh, R. Yohay, J. Zettlemoyer

7 Detector instrumentation is at the heart of scientific discoveries. Cutting edge technologies enable US particle
8 physics to play a leading role worldwide. This report summarizes the current status of instrumentation for
9 high energy physics, the challenges and needs of future experiments and indicates high priority research
10 areas. The Instrumentation Frontier studies detector technologies and R&D needed for future experiments
11 in collider physics, neutrino physics, rare and precision physics and at the cosmic frontier. It is divided
12 into more or less diagonal areas with some overlap among a few of them. We lay out five high-level key
13 messages that are geared towards ensuring the health and competitiveness of the US detector instrumentation
14 community, and thus the entire particle physics landscape.

Topical groups

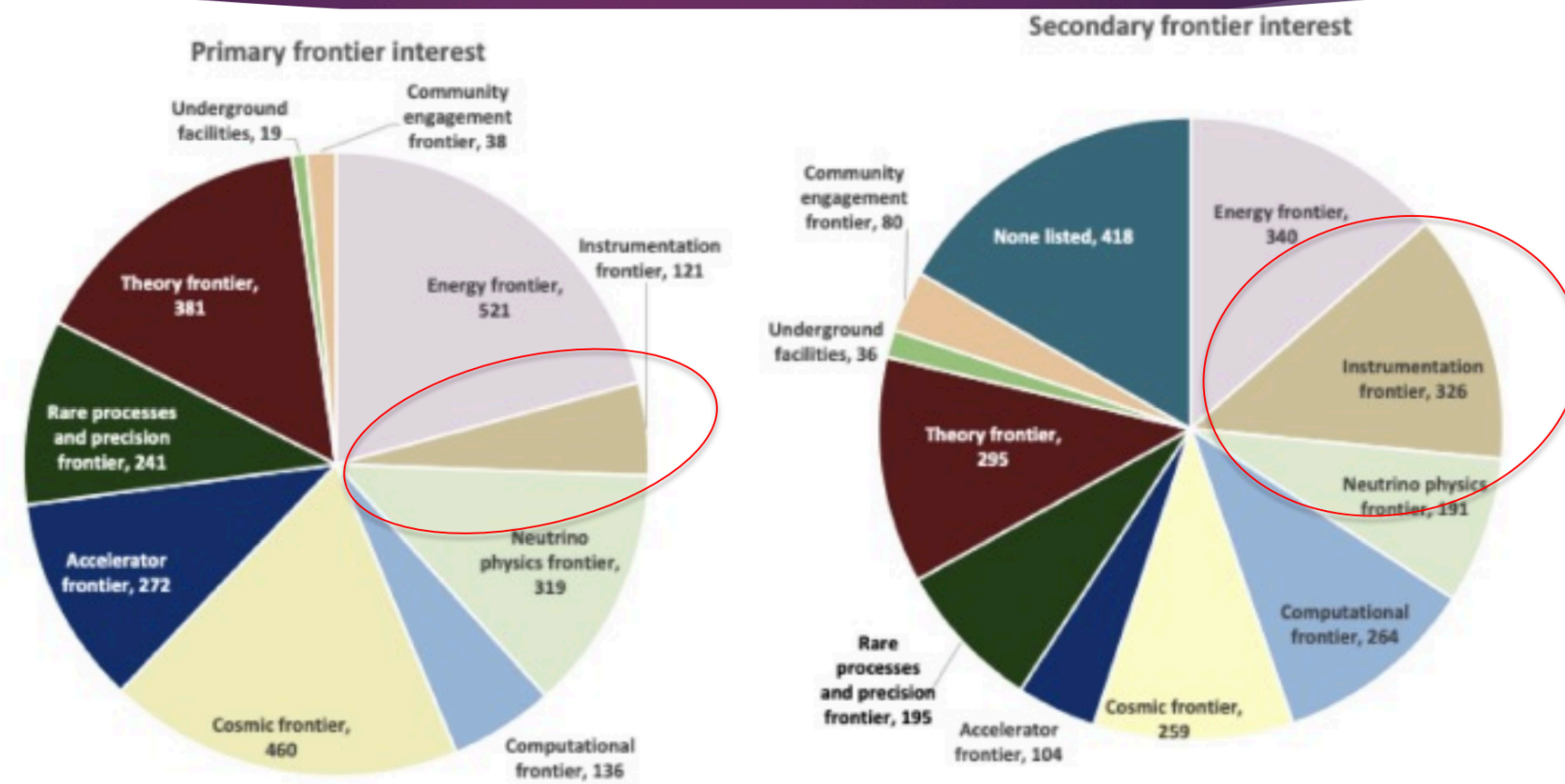
- IF1: Quantum Sensors
- IF2: Photon Detectors
- IF3: Solid State Detectors and Tracking
- IF4: Trigger and DAQ
- IF5: Micro Pattern Gas Detectors (MPGDs)
- IF6: Calorimetry
- IF7: Electronics/ASICs
- IF8: Noble Elements
- IF9: Cross Cutting and Systems Integration
- IF10: Radio Detection

Final Reports (Draft)

-  IF report and  Community feedback
-  IF01 topical group report and  Community feedback
- IF02 topical group report and Community feedback
-  IF03 topical group report and  Community feedback
-  IF04 topical group report and  Community feedback
-  IF05 topical group report and  Community feedback
-  IF06 topical group report and  Community feedback
-  IF07 topical group report and  Community feedback
-  IF08 topical group report and  Community feedback
- IF09 topical group report and Community feedback
- IF10 topical group report and Community feedback

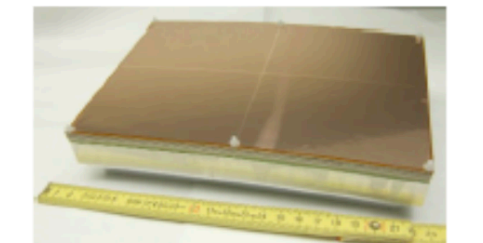
IF is geared to discuss detector technologies and R&D needs for future experiments in collider physics, neutrino physics, intensity physics and at the cosmic frontier, paying close attention to synergies between the different Topical Groups, and with other Frontiers and research areas outside HEP

From the 2021 Snowmass community workshop survey

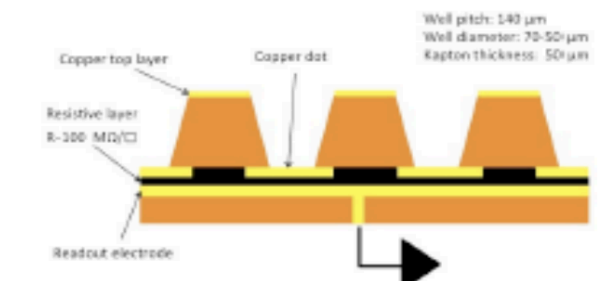


Tracking with Micro Pattern Gas Detectors

- ▶ MPGDs have major roles in TPCs and large area muon detection systems. Essential features – large area, low material budget
- ▶ TPCs – ILD/ILC, potential Belle II wire chamber replacement, for a detector at CEPC
 - ▶ MPGD readout: GEM, GridPix, ...
 - ▶ Synergy with Si ASIC development – wafer post-processing, gas amplification on top of pixelized r/o chip
- ▶ Muon detection systems
 - ▶ Precise muon tracking, trigger and tagger for collider detectors
 - ▶ Instrument large areas, high efficiency, in high-background, high-radiation environment
- ▶ Challenges:
 - ▶ Discharge protection (e.g. micro R-well), miniaturization of readout elements
 - ▶ FCC-hh very forward endcap regions
 - ▶ Multi-TeV Muon Collider: Fast Timing MPGD, use timing to mitigate beam-induced background
- ▶ **Note: there is ongoing discussion about the need for a MPGD facility in the US**



Triple-GEM r/o module for LCTPC

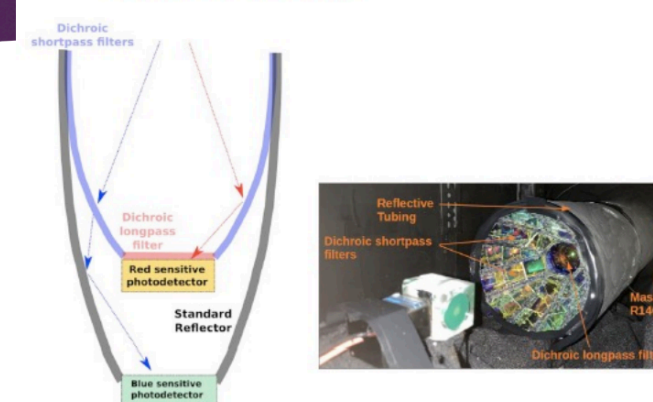


Micro R-well

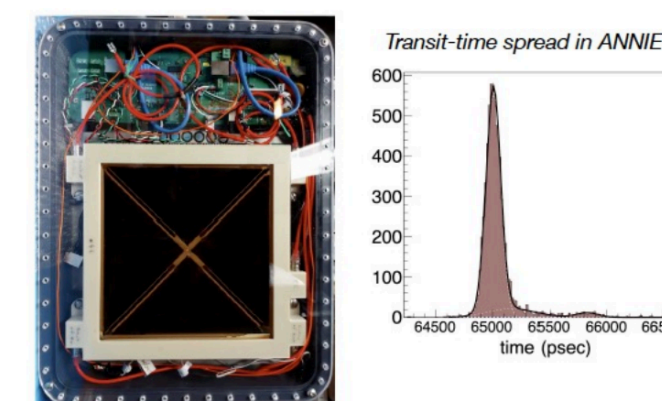
New ideas, materials and sensors

- ▶ New modalities in noble detectors (synergies with DM searches)
 - ▶ Ion detection and micron-scale track reconstruction for low-energy interactions and directional DM detection
 - ▶ Metastable fluids, e.g. scintillating bubble chambers with super-heated noble liquids
 - ▶ Enhance existing noble element detectors: e.g. KAMLAND-Zen, and dissolving H or LXe in LZ for light DM sensitivity and enhanced background tagging
- ▶ Hybrid detectors: extend capabilities of Cherenkov detectors with technologies that allow separation and detection of scintillation light
 - ▶ Separate temporally through fast/precise-timing detectors or slow-fluors
 - ▶ Separate spectrally through filters or narrow-band fluors
- ▶ All should be coupled with improved performance of existing technologies, e.g. in terms of quantum efficiency and timing, especially for VUV

Dichroic filter design



Fast timing with LAPPDs



<https://www.ftd.uni-bonn.de/en>



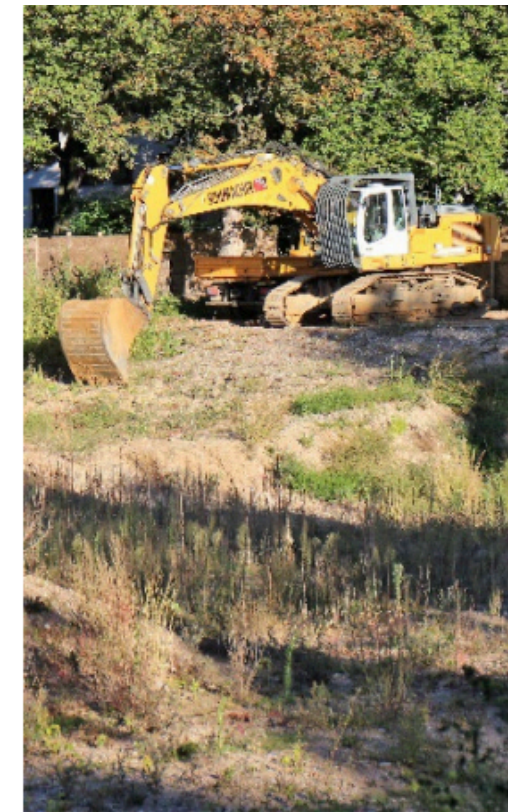
Research and Technology Center for Detector Physics

Research into the structure of matter on the smallest length scales requires the development of ever more powerful detectors and accelerators. The Research and Technology Center for Detector Physics (FTD) provides its users with highly technical infrastructure and measurement laboratories for the development of modern detectors for experimental particle physics and beyond on an area of about 3000 square meters. At the FTD, scientists from the Institute of Physics (PI) and the Helmholtz Institute for Radiation and Nuclear Physics (HISKP) of the University of Bonn work on the latest detector technologies for the detection of radiation and particles.



Vollantrag

15.11.2011



Beginn Tiefbau

15.03.2012



Grundsteinlegung

04.11.2014



Hüllenschluss

02.10.2015



Übernahme durch Uni

04.04.2016

05.07.2018

05.07.2021

08.11.2021

Antragsskizze
Art 91b GG

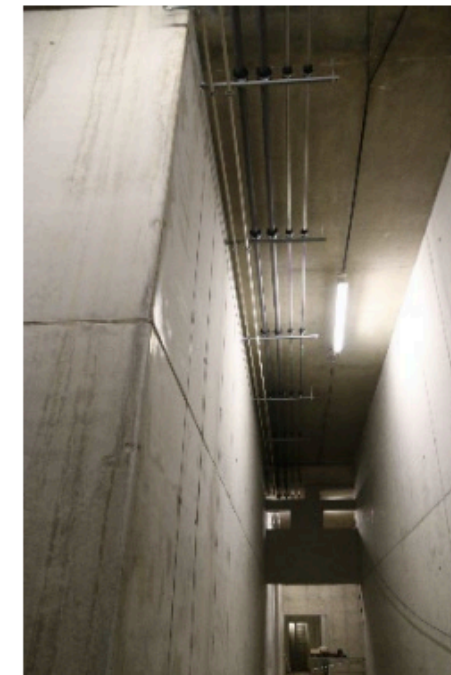
Abriss Alte Pharmazie



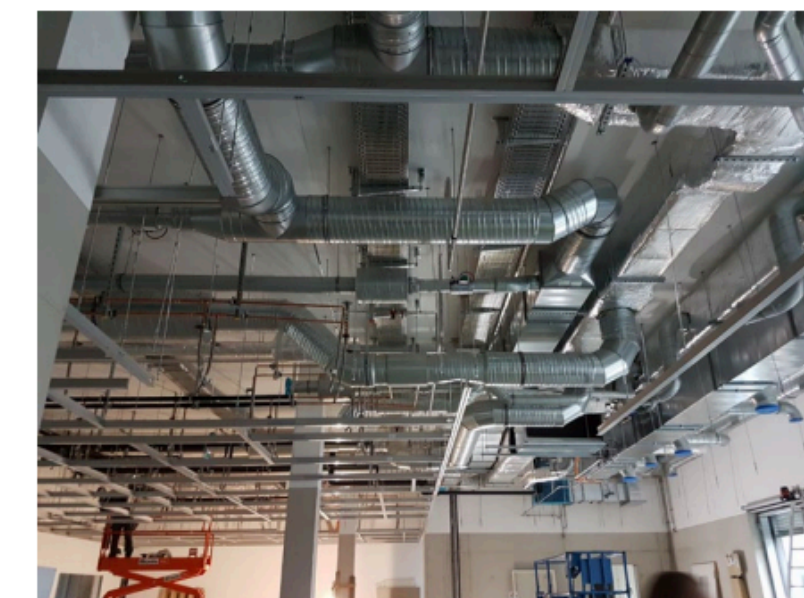
Beginn Rohbau



Beginn Innenausbau



Einbau Reinraum



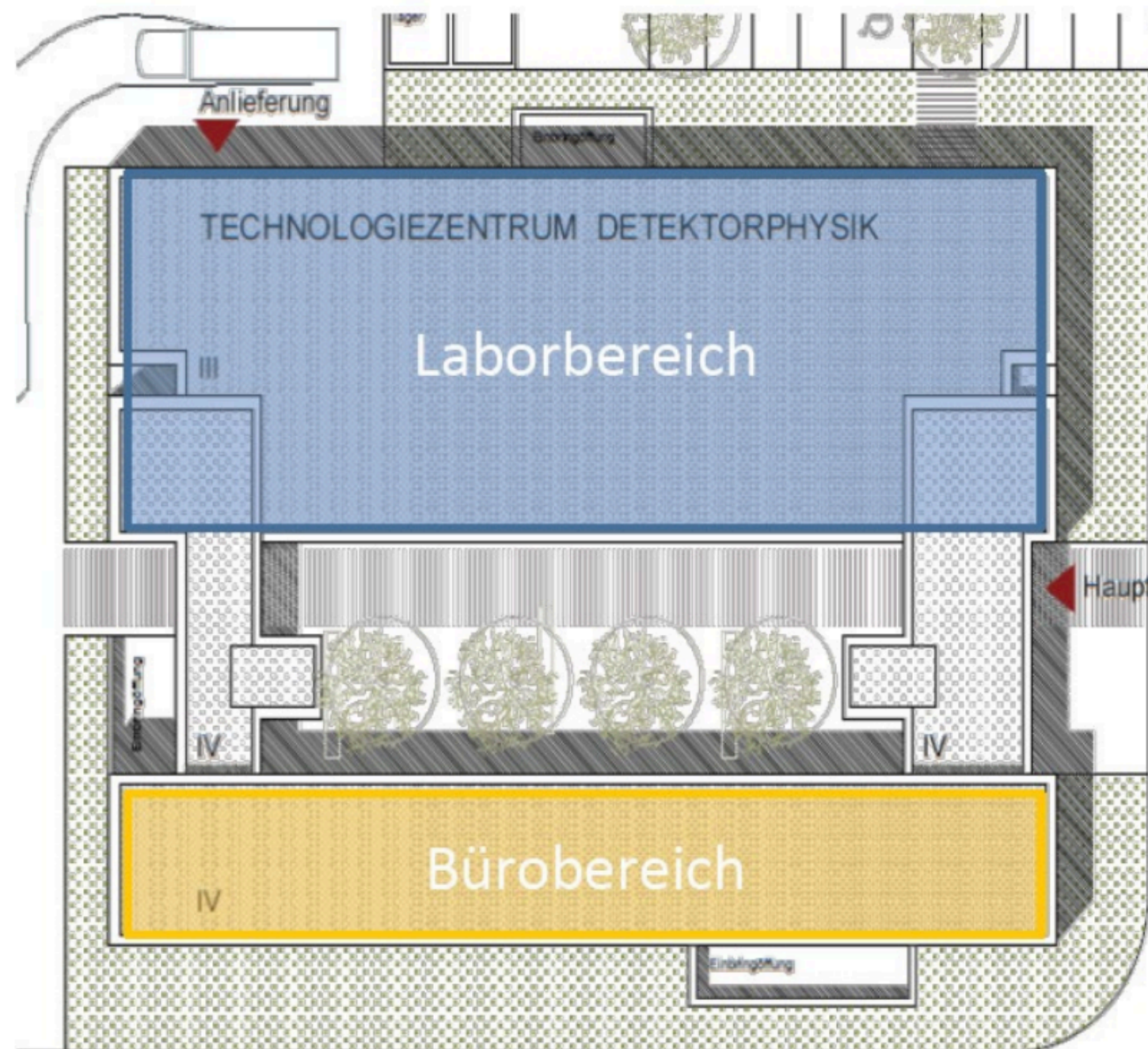
Einweihung





Office space:

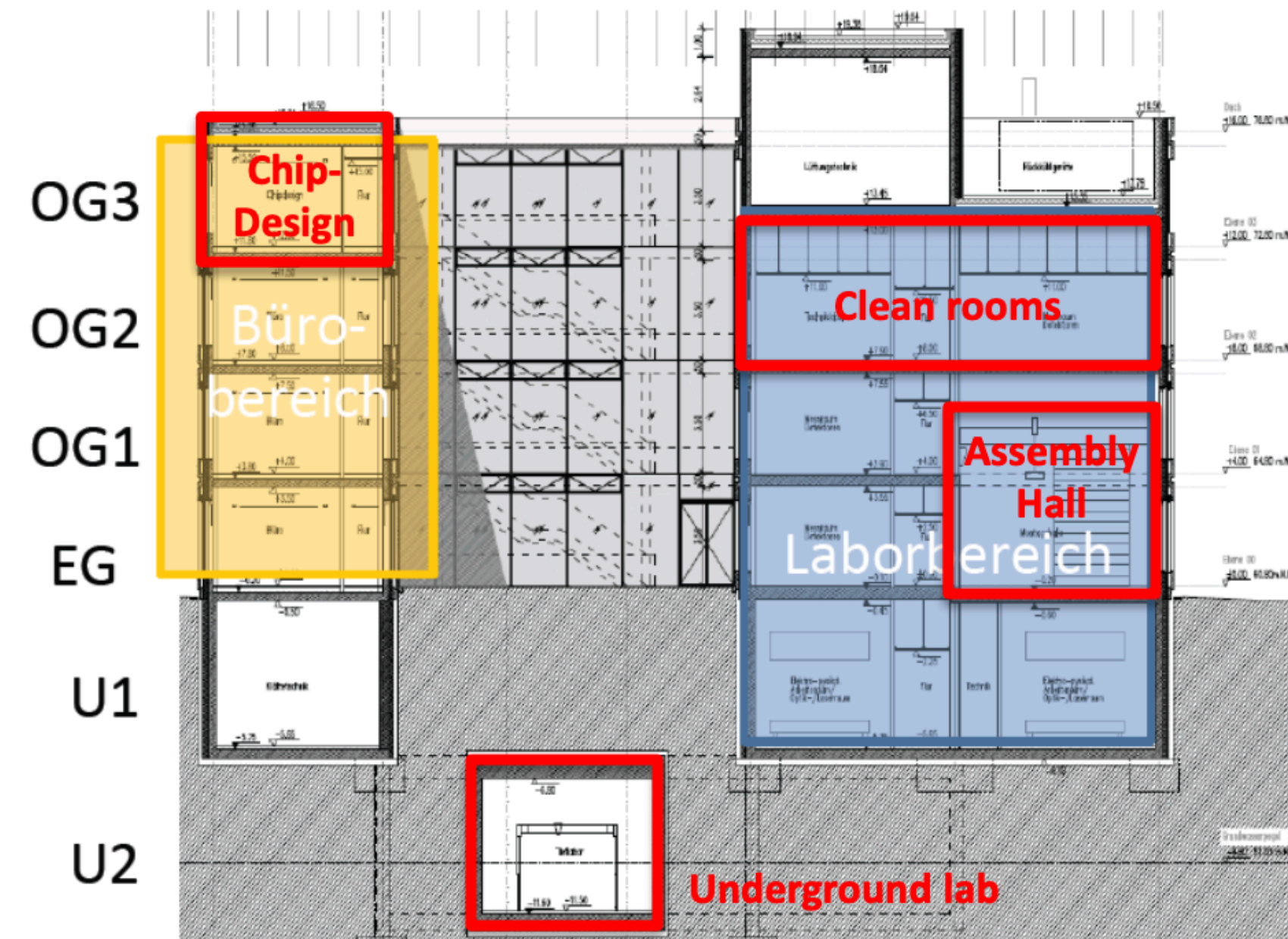
- 880 m²
- 4 Levels



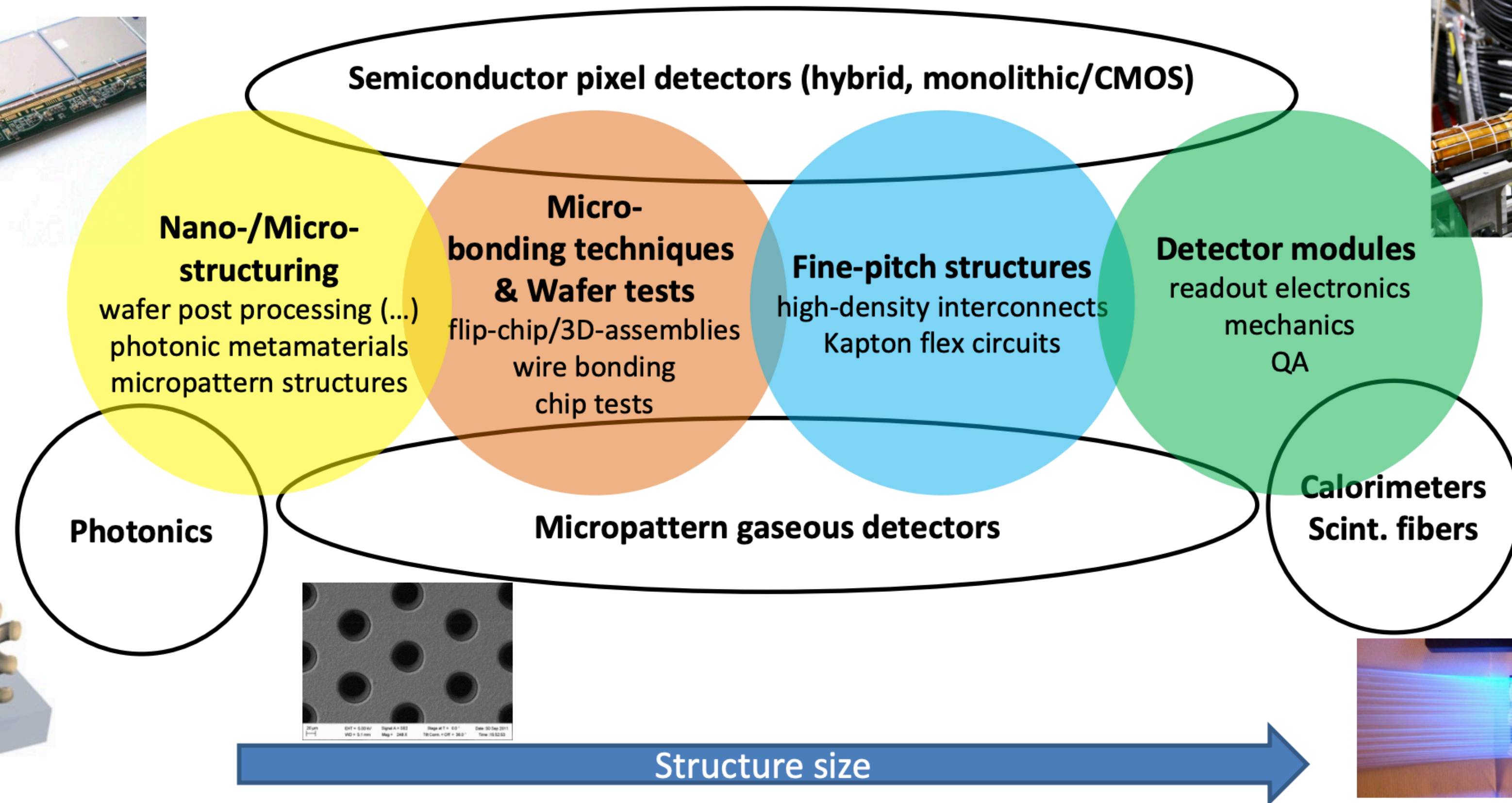
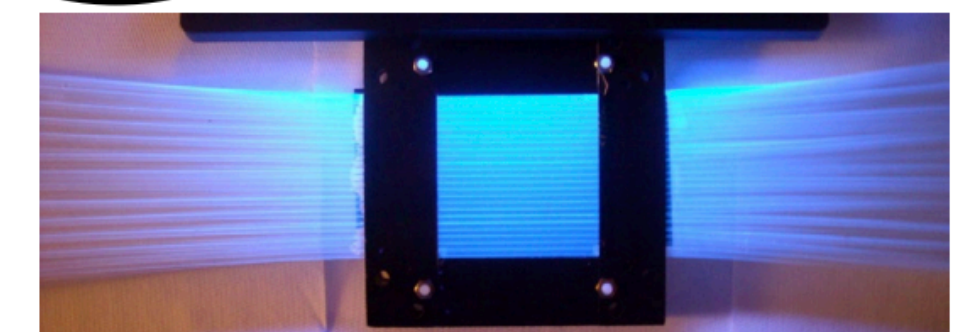
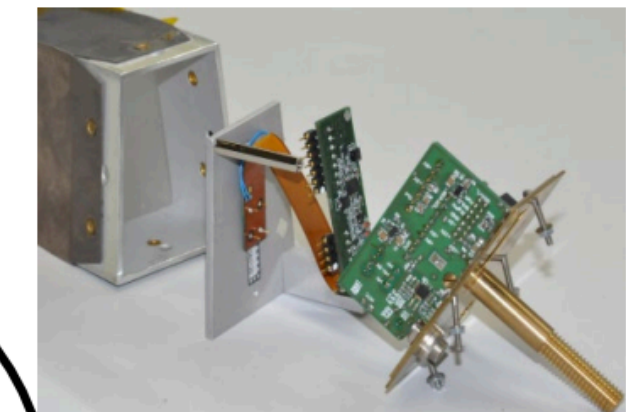
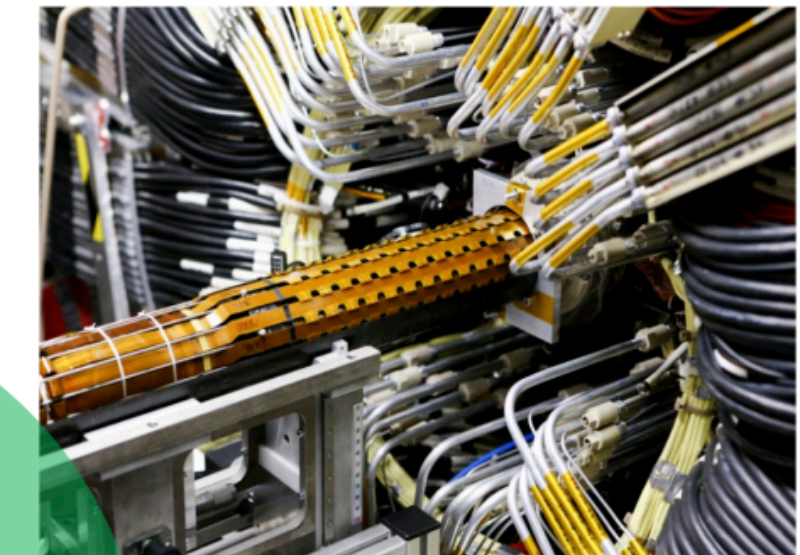
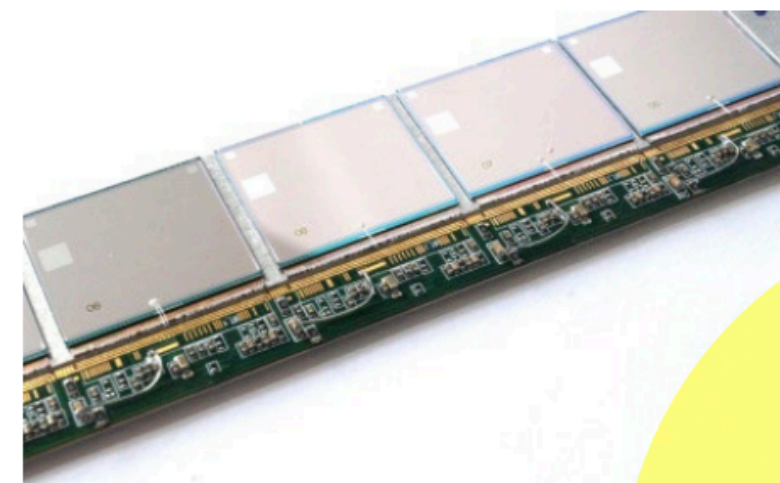
Wegelerstraße

Lab space

- 2010 m²
- 4 Levels + Underground Laboratory
- 360 m² clean rooms (ISO 5, 6, 7)



KEY TECHNOLOGIES AND APPLICATIONS



Goal: maximize synergies between development areas

CENTER FOR DETECTOR AND ACCELERATOR RESEARCH



New Core Facility in planning:

- FTD
- ELSA (Phys. Institut)
- Cyclotron (HISKP)

Development of detector and accelerator technologies for fundamental physics

- international collaborations
- local experiments
- open for external users through EU-funded transnational access (STRONG-2020)



FTD

- 2010 m² lab space
- 360 m² clean rooms (ISO 5, 6, 7)
- underground laboratory
- assembly hall

ELSA

- electron and
- photon (pol.) beams

Cyclotron

- light ion beams
- p and n irradiation