

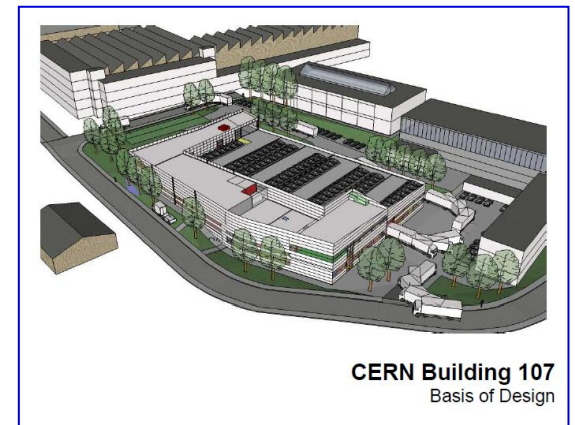
# MPGDs in AIDA-2

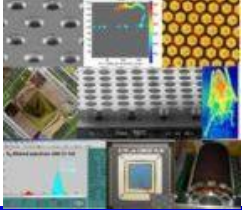
S. Dalla Torre

# RECALL

## AIDA (FP7) & RD51

- Including the infrastructural upgrade of the **MPGD WORKSHOP** at CERN in the AIDA programme has offered a fundamental boost towards the new workshop, completed by 2015
- The RD51 community is grateful to AIDA and to the colleague who made this link possible (Paul Colas)





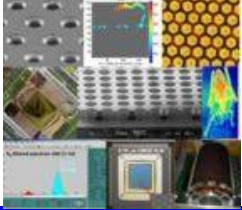
# AIDA-2

## The CONTEXT

- H2020
- Project to be submitted at the beginning of September

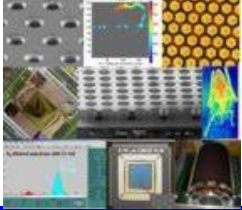
## The MISSION

- Support to the progress of HEP



# AIDA-2 & GAS DETECTORS

- Two technologies are included in the project, within a single WP, named WP12
  - **MPGDs**
  - **RPCs**
- Correspondingly, the WP leaders come from the two scientific communities:
  - Silvia Dalla Torre (MPGDs)
  - Imad Laktineh (RPCs)
- The design of the WP started at the end of February 2014 and it has been concluded at the end of May 2014
  - Remaining: Only refurbishing and administrative tasks



# AIDA-2 WP12, structure

- **Tasks grouped in 4 chapters:**
  - **Task 12.1: Coordination and Management**
    - A must for each WP
  - **Tasks 12.2: Detector progress**
    - Includes MPGD and RPC tasks
  - **Tasks 12.3: Tools to facilitate the detector progress**
    - Includes MPGD tasks
  - **Tasks 12.4: preparation for large series production**
    - Includes MPGD and RPC tasks

**In the following, emphasis to the MPGD tasks**

# AIDA-2 WP12, MPGDs in tasks 12.2

- **Task 12.2.3: high rate and fine space resolution RPCs operated with eco-gases**
  - RPC driven tasks, with some space also for
    - eco-gasses for GEMs
    - Gas filtering and recirculation systems, general interest
- **Task 12.2.4: development of compact, spark-protected, single amplification-stage, high resolution MPGDs**
  - Development of the Resistive-WELL GEM detector (R-WGEM)
- **Task 12.2.5: HIGH gain MPGDs based on advanced THGEMs and hybrid MPGDs**
  - Space to continue the technological development of THGEMs
  - Completion of the high-gain hybrid (THGEM + MICROMEAS) for HEP and applications beyond

General  
interest

Novel  
architecture

MPGD  
production

Novel  
architecture

# AIDA-2 WP12, MPGDs in tasks 12.3

- **Task 12.3.1: interfacing FE-chips specific to gas detectors to the scalable Read-out System**

- Goal: FE chip VMM128, GEMROC and TIMEPIX3 in SRS

MPGD  
electronics

- **Task 12.3.2: development of cheap, standard MPGD dedicated laboratory instruments**

- remotely controlled compact HV power supply
- picoampermeters
- signal processing modules

MPGD  
electronics

- **Task 12.3.3: PCB development using HDI-technology and 3D-mounting of chips for MPGD readout**

- Read-out by MPGDs (MICROMEAS) of the LC TPC

# AIDA-2 WP12, MPGDs in tasks 12.4

- **Task 12.4.2:** procedures and tools for large series resistive micromegas anodes
- **Task 12.4.3:** control of foil/micromesh mechanical tensioning by optical techniques
- **Task 12.4.4:** quality control tool for detailed gain maps (hole by hole)
  - Also in synergy with systematic optical scan
- **Task 12.4.5:** design of a quality control system to ensure the electrical integrity of electrode patterns by pulse reflection method
- **Task 12.4.6:** standard production protocols of optimised MPGD components to facilitate the technology dissemination

MPGD  
production

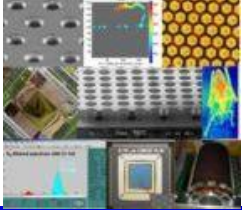
MPGD  
production

MPGD  
production

MPGD  
production

MPGD  
production



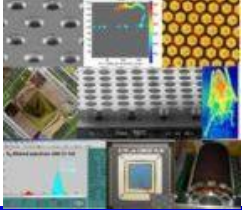


# AIDA-2 WP12, who ?

- **Beneficiaries (MPGD sector):**
  - CEA Saclay
  - CERN
  - INFN (Bari, Frascati, Trieste)
  - ULUND
  - Wigner RCP
  
- **Other partners (MPGD sector):**
  - Bonn
  - INFN (Bologna)
  - Krakow

# AIDA-2 - WP12, sectors of interest

WP12			
task	detector	main interest	other interests
12.2.1	RPC	LHC, upgrade2	
12.2.2	RPC	LHC, upgrade2	
12.2.3	RPC	others	general (eco-gas studies)
12.2.4	MPGD	novel architecture development	LHC, upgrade2
12.2.5	MPGD	photon detection	general (THGEM production), THGEMs in calorimetry and large noble liquid detectors
12.3.1	MPGD	general	LC
12.3.2	MPGD	general	LHC, upgrade 1
12.3.3	MPGD	LC	
12.4.1	RPC	LHC, upgrade2	LHC, upgrade 1
12.4.2	MPGD	large size applications	LC (TPC read-out)
12.4.3	MPGD	LHC, upgrade 1	general
12.4.4	MPGD	general	general
12.4.5	MPGD	general	LHC, upgrade 1
12.4.6	MPGD	general	LHC, upgrade 2
12.4.7	RPC	others	LHC, upgrade 1



# IN CONCLUSION

## **IF AIDA-2 approved and financed**

- **A non negligible support to MPGD progress**
  
- **The majority of the support is for general purposes, namely in the best RD51 spirit:**
  - **FE integration in SRS**
  - **Lab equipment (HV and others)**
  - **Gas studies and systems**
  - **A collection of production items:**
    - **Optimized THGEM production**
    - **large-size resistive anodes for MICROMEAS**
    - **Quality controls (foil/mesh stretching, detailed gain maps)**
    - **MPGD production protocols**