

# WP5 @INFN

**AIDAInnova - stato attività e preparazione avvio progetto**

**February 8<sup>th</sup>, 2021**

**Remote Connection**



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Participants: IFAE, CERN, OEAW, CEA, CNRS, UBONN, **INFN**, CSIC, UOXF

## Task 5.2. Development of high granularity DMAPS

DMAPS with high granularity (excellent position resolution), low mass and low power dissipation will be designed targeting specific experiments, like the [vertex detectors of the Belle II upgrade, ALICE and Higgs factories](#). The challenges are to fit the needed electronics in a small pixel while also consuming little power. This can be achieved by exploiting the more relaxed timing requirements. A major effort is needed for the successful design of these devices following the guidance provided by simulating the prototype performance. [After design validation, the ASICs will be submitted for fabrication](#). At this stage, [close interaction with the foundry](#) is needed. After the devices are received, they will be first [tested in various laboratories and characterised](#). The final validation will be the [test with particle beams](#). Afterwards the devices will be irradiated to the desired fluence (depending on the target application) and their performance will be re-evaluated in laboratories and with particle beams.

- ▶ Two EOIs submitted during the preparation of the proposal: **ARCADIA++** and **ThinCMOS**
- ▶ Similar goal with **lots of synergies**: Development of next generation monolithic CMOS devices.
  - Develop a demonstrator system that can be used in future experiments and upgrades
  - Improvements in many directions: timing, thickness, speed, power, area, bendability,...
  - **Arcadia++** more focused on future colliders (ALICE, Higgs factories)
  - **ThinCMOS** more focused on Belle II upgrade
- ▶ Many sections involved:
  - **ARCADIA++**: BO (A. Gabrielli), MI (M. Caccia), PD (J. Wyss), PV (G. Traversi), PG (P. Placidi), TIFPA (L. Pancheri), TO (Da Rocha Rolo)
  - **ThinCMOS**: PI (F. Forti), PV (L. Ratti)
- ▶ Main resources needed:
  - Silicon – must be funded through other projects
  - People – essential for building expertise: main purpose of AIDAInnova budget (max 4 AdR)

- ▶ **Arcadia++** : ARCADIA has currently a CNS5 call ongoing
  - mostly INFN effort, builds on silicon proven CMOS technology (funded by SEED-CSN5)
  - close collaboration with LFoundry for the development of sensor technology
- ▶ **ThinCMOS**: The Belle II effort is still in its infancy
  - Funding sources not clear and will be defined later
  - Several nations involved, needs to be harmonized
- ▶ **Synergy**
  - In any case the plan is to exploit the synergies and join forces for the developments, with the goal of developing a larger community and more complete expertise
  - The plan is to use the manpower hired through AIDAInnova for both projects.
- ▶ “Affinity” with current INFN projects
  - **Arcadia++**: ARCADIA, ALICE, RD\_FCC
  - **ThinCMOS**: BELLEII

## ► **Gestione coordinata**

- Ogni proposta di AdR (co-finanziato) discussa dai coordinatori INFN del WP5 (F Forti, M Rolo). Questa gestione coordinata e trasparente potenzierà la ricerca di sinergie ad ogni fase del progetto. I fondi AIDAInnova verranno usati esclusivamente per AdR co-finanziati;

## ► **Sedi partecipanti e proposta di rendicontazione**

- BO (A. Gabrielli), MI (M. Caccia), PD (J. Wyss), PV (G. Traversi, L. Ratti), PG (P. Placidi), PI (F. Forti), TIFPA (L. Pancheri), TO (M. Rolo);
- Le sezioni TO e PI espongono in partenza i PM necessari alla rendicontazione del contributo *in-kind* INFN, mentre la rendicontazione a consuntivo sarà vincolata alle sedi (dalle 8 elencate) che useranno effettivamente i fondi per generare AdR;
- All'inizio di ogni anno del progetto (03/2021, 03/2022,...) le sedi che useranno il finanziamento per finanziare AdR l'anno successivo esporranno gli FTE necessari alla rendicontazione nel DB INFN Preventivi.