

Status of preparation of future proposal

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- We had several meetings with the coordinators of **I.FAST** and **LEAPS-INNOV** (together with **AIDAinnova** the 3 **INFRA-INNOV** pilot projects)
- We discussed what could be the best future EU calls for the three projects
 - We wrote a common report to the EU proposing 3 new calls, about 10 M€/each
 - We had a very good meeting in **Brussels in July 2023** with the new head of REA
- The draft of the 2025 Work Programme, **WP25** has been circulated
- In WP25 there are the **HORIZON-INFRA-2025-01-TECH-02** calls (**45 M€** budget total)
 - **AIDAinnova, I.FAST** and **LEAPS-INNOV** will participate to these calls
- For WP25 the submission deadline should be in **early autumn 25** with financing towards the **beginning of 2026**
- **Very Important:** it is **mandatory** to have **at least 2 ESFRI infrastructures** involved!

- We had in fact only 1 ESFRI infrastructure in AIDAinnova: **HL-LHC**
- Other **ESFRI infrastructures** that we could look at were:
 - **ET (Einstein Telescope)**
 - **EuPRAXIA**
 - **KM3NET 2.0**
 - **CTAO (Cherenkov Telescope Array Observatory)**
 - **ELT (Extremely Large Telescope)**
 - **ESRF EBS**
 - **ESS (European Spallation Source)**
 - **FAIR (Facility for Antiproton and Ion Research)**
 - **SKAO (Square Kilometre Array Observatory)**

- Deadline for submitting the proposal in early autumn 2025 (most likely 18th of September 2025)
- Start preparing a draft **WP structure**
- Select a **proposal preparation team (PPT)** in collaboration with the DRDC and DRD managers
- Preparation of the detailed funding of the **WPs** and tasks
 - Select **facilitators** to help in selecting the tasks
- Selection of **WP coordinators**
- Start writing the proposal
- Finalisation of the proposal
- **Submission**

- Members of the Team
 - [Paolo Giacomelli](#), AIDAinnova management (IT)
 - [Daniela Bortoletto](#), AIDAinnova management (UK)
 - [Giovanni Calderini](#), AIDAinnova management (FR)
 - [Thomas Bergauer](#), DRDC chair (AT)
 - [Katja Kruger](#), AIDAinnova and calorimetry (GE)
 - [Anna Colaleo](#), gas detectors (IT)
 - [Guy Wilkinson](#), PID (UK)
 - [Christophe de la Taille](#), electronics (FR)
 - [Frank Gaede](#), software (GE)
 - [Anna Zaborowska](#), software (CERN)
 - [Roberta Zanin](#), CTAO
 - [Domenico della Volpe](#), CTAO (CH)
 - [Anne Dabrowski](#), CERN
 - [Burkhard Schmidt](#), gas detectors and mechanics, CERN

- The funding from the EU should be **10 (12-15?) M€** for 4 years
- As in **AIDAinnova**, focus on strategic R&D in the **pre-TDR** phase
- **Keep all the "transversal" WPs**
 - WP3: Test beam and infrastructure
 - WP4: Upgrade of Irradiation and Characterisation facilities
 - WP10: Advance mechanics and cooling for tracking and vertex detectors
 - WP11: Microelectronics
 - WP12: Software
- **Keep most of the "detector" WPs**
 - WP5-6: DMAPS, Hybrid pixel sensors
 - WP7: Gas detectors
 - WP8: calorimeters
- **Keep WP13: "Blue sky" technologies (cascade funding)**

- **Increase** the funding of the Blue-Sky WP up to **~10%** of the total budget
- **Reduce** by a factor **~2** the number of tasks
 - As a consequence **increase** by a **similar amount** the **funding** per task
- Since now we have a detector roadmap, represented by the DRDs, we will not make a call for expressions of interest (EoI)
 - We will select tasks and activities from the existing ones in the DRDs
 - **Give priority** to activities and tasks where there is co-development with industrial partners
- The selected tasks will be **co-funded** by the **new project** and the **national sources** provided to the DRDS
 - We need to **avoid** the possible criticism of **double funding**
 - Extremely important that the co-funding mechanism is mentioned both in the new proposal but **ALSO** in the MoU and the annexes of the relevant DRDs

- Select activities of projects or experiments that have **not yet** reached the **TDR level**
 - Mostly focus on future projects with the exception of some possible future HL-LHC updates (LHCb upgrade?, ALICE upgrade?)
 - Keep a very close eye on the evolution of the ongoing European strategy update process
 - If there is a clear priority on a future accelerator at CERN focus on detector developments for that machine
 - Keep nevertheless some diversity
 - Integrate activities that are of particular interest to CTAO
 - Always keeping the WP distribution on technologies and not on specific projects
- The existing AIDAinnova management will manage the preparation of the new proposal
 - If the project will be successful, the same management will stay in charge

- **WP1: Project Management**
- **WP2: Communication, outreach and KT**
- **WP3: Test beam, Irradiation, characterization facilities and related infrastructure**
- **WP4: Solid state sensors for vertexing, tracking and timing**
- **WP5: Photodetection sensors and PID**
- **WP6: Gas detectors**
- **WP7: Calorimeters**
- **WP8: Mechanics and cooling**
- **WP9: Microelectronics**
- **WP10: Software**
- **WP11: Blue Sky**

Preliminary structure of the project

WP1: Project management			
Task	Description	Topics	Coordinators
1.1	Project management and coordination		P. Giacomelli, D. Bortoletto, G. Calderini, S. Stavrev, project coordinator (CERN)
1.2	Coordination with Detector R&D collaborations		
1.3	Relations with other INFRATECH projects		
WP2: Communication, outreach and KT			
Task	Description	Topics	Coordinators
2.1	Communication		T. Brent
2.2	Outreach		
2.3	KT	with health physics and other fields	EasyBioImaging
2.4	TB: Medical Applications (?)		A. Mengoni
WP3: Test beam, Irradiation, characterization facilities and related infrastructure			
Task	Description	Topics	Facilitators
3.1	Testbeams	telescopes, Caribou, TLU performance optimization and integration of SRS with other DAQ systems -Track Reconstruction for Test Beam Analysis: Development of tools aimed at improving reconstruction performance at test beams, and contributing to a shared, general-purpose test beam data reconstruction framework (e.g., Corryvreckan).	Marcel Stanitzki (DESY) (marcel.stanitzki@desy.de), Riccardo Farinelli (INFN-Bo) (Riccardo.Farinelli@bo.infn.it)
3.2	Irradiations	IRRAD, neutron reactor facility Test gas recirculation system at irradiation facilities - in AIDAInnova novel gas testing under detectors	Igor Mandic (JSI) (igor.mandic@ijs.si), Martina Ressegotti (INFN-GE) (martina.ressegotti@cern.ch), Federico Ravotti (CERN) (federico.ravotti@cern.ch)
3.3	characterization facilities	EMC, Micobeam RBI Croatia, TPA-TCT?	Fernando Arteché (Saragoza) (fartech@itainnova.es)

PPT connections:

P. Giacomelli, D. Bortoletto, G. Calderini, A. Dabrowski

PPT connections:

P. Giacomelli, D. Bortoletto, G. Calderini, A. Dabrowski

PPT connections:

B. Schmidt, A. Dabrowski, P. Giacomelli

Caveat

These topics are only possible suggestions

Preliminary structure of the project

WP4: Solid state sensors for vertexing, tracking and timing

Task	Description	Topics	Facilitators
4.1	MAPS	broad and transversal 65 nm R&D-small pitch, fast timing e.g. Octopus-like approach	Sebastian Grinstein (IFAE) (sgrinstein@ifae.es), Jerome Baudot (Strasbourg) (jerome.baudot@iphc.cnrs.fr)
4.2	Hybrid sensors, LGAD Sensors, 3D and interconnections		Claudia Gemme (Genova) (claudia.gemme@ge.infn.it), Dominik Dannheim (CERN) (Dominik.Dannheim@cern.ch), Anna Macchiolo (Zurich) (Anna.Macchiolo@cern.ch), Valentina Sola (Torino) (valentina.sola@cern.ch), Matteo Centis Vignali (FBK) (mcentisvignali@fbk.eu)
4.3	Wide bandgap	SiC, Diamond, GaN	Peter Svihra (Praha) (peter.svihra@cern.ch), Alex Oh (Manchester) (Alexander.Oh@cern.ch)
4.4	Simulations	Garfield++, Allpix, TCAD	Simon Spannagel (DESY) (simon.spannagel@cern.ch), Haakan Wennloef (Nikef) (h.wennlof@cern.ch)

PPT connections:

T. Bergauer, D. Bortoletto, G. Calderini

WP5: Photodetection sensors and PID

Task	Description	Topics	Facilitators
5.1	SiPM	Synergy HEP with CTAO. [suggestions: focus on timing, pixel size, radiation hardness]	Rok Pestotnik (Ljubljana) (rok.pestotnik@cern.ch), Jelena Ninkovic (HLL Munich) (nin@hll.mpg.de), Alberto Gola (FBK) (gola@fbk.eu), Mathieu Heller (UNIGE/CTAO) (Mathieu.Heller@unige.ch)
5.2	Vacuum PMTs, e.g. MCP-PMTs		Jon Lapington (Leicester) (jon.lapington@cern.ch), Claudio Gotti (Milano Bicocca) (claudio.gotti@mib.infn.it)
5.3	PID Devices	RICH	Fulvio Tessarotto (INFN Trieste) (fulvio.tessarotto@cern.ch), Roberta Cardinale (Genova) (roberta.cardinale@cern.ch), Antonis Papanestis (RAL) (antonis.papanestis@stfc.ac.uk)

PPT connections:

M. della Volpe, G. Wilkinson

Preliminary structure of the project

WP6: Gas detectors			
Task	Description	Topics	Facilitators
6.1	Development and Optimization of Manufacturing Facilities		Mauro Iodice (Mauro.Iodice@cern.ch) (INFN-Roma3), Piotr Gasik (GSI) (p.gasik@cern.ch), Marco Poli Lener (INFN-LNF) (marco.polilener@inf.infn.it)
6.2	Development of Sustainable and High-Performance Gas mixtures for Next-Generation Gaseous Detectors		Beatrice Mandelli (CERN) (beatrice.mandelli@cern.ch)
6.3	Simulation of Large Avalanches including Space-Charge effects		Piet Verwilligen (Bari) (piet.verwilligen@ba.infn.it), Djunes Janssens (CERN) (djunes.janssens@cern.ch)
WP7: Calorimeters			
Task	Description	Topics	Facilitators
7.1	Sandwich calorimeters with fully embedded electronics,		Gabriella Gaudio (INFN Pavia) (gabriella.gaudio@pv.infn.it), Imad Laktineh (Lyon) (laktineh@ipnl.in2p3.fr), Lucia Masetti (Uni Mainz) (Lucia.Masetti@cern.ch)
7.2	Liquefied-noble-gas calorimeters		Nicolas Morange (IJCLab) (nicolas.morange@cern.ch)
7.3	Optical calorimeters	scintillating-based sampling and homogeneous calorimeters	Philipp Roloff (CERN) (philipp.roloff@cern.ch), Michaela Mlynarikova (CERN) (michaela.mlynarikova@cern.ch)
WP8: Mechanics and Cooling			
Task	Description	Topics	Facilitators
8.1	Infrastructures for air cooling tests		Fabrizio Palla (INFN Pisa) (Fabrizio.Palla@cern.ch)
8.2	Design of lightweight and low-mass mechanical structures	(Composite material)	Gabriel Charles (gabriel.charles@ijclab.in2p3.fr), Peter Wintz (Peter.Wintz@cern.ch), Alessandro Miccoli (INFN Lecce) (alessandro.miccoli@le.infn.it)
8.3	Innovative cooling solutions	Kypton	Paolo Petagna (CERN) (Paolo.Petagna@cern.ch)
8.4	augmented reality	synergy with CTAO	Diego Alvarez Feito (CERN) (d.alvarez.feito@cern.ch)

PPT connections:
A. Colaleo, B. Schmidt, P. Giacomelli

PPT connections:
K. Kruger

PPT connections:
B. Schmidt, M. della Volpe

Preliminary structure of the project

WP9: Microelectronics			
Task	Description	Topics	Facilitators
9.1	Development of specialized front-end ASICs/FPGA for other WPs (picosecond timing, cluster counting, low noise, low power, streaming readout)	TDC and ADC blocks. Low power analog, on-chip data processing FPGA-based digitizer for cluster-counting in drift chambers	Flavio Loddo (INFN Bari) (Flavio.Loddo@cern.ch), Francesco Crescioli (CNRS) (francesco.crescioli@lphnhe.in2p3.fr), Alex Kluge (CERN) (Alexander.Kluge@cern.ch)
9.2	fast readout boards >6GHz for SiPM (CTAO) and LGAD/SiC (HEP)	analog memories	Eric Delagnes (CEA Saclay) (eric.delagnes@cern.ch), Stefan Ritt (PSI) (stefan.ritt@psi.ch)
9.3	embedded FPGA and open source chip design	custom FPGAs, on-chip data processing	Francesco Crescioli (CNRS) (francesco.crescioli@lphnhe.in2p3.fr), Sophie Baron (CERN) (sophie.baron@cern.ch)
WP10: Software			
Task	Description	Topics	Facilitators
10.1	Enhancing Key4hep framework	for performance, heterogeneous computing and seamless integration of AI/ML inference.	Thomas Madlener (DESY) (thomas.madlener@cern.ch), Andre Sailer (CERN) (andre.philippe.sailer@cern.ch)
10.2	Development of fast simulation, digitization, reconstruction and analysis algorithms also with ML/AI	in context of CTAO.	petagna
10.3	1. Tracking reconstruction algorithms for TPC gas/liquid detectors	in the context of search for rare events	Diego Gonzalez Diaz (Universidade de Santiago de Compostela) (diego.gonzalez.diaz@cern.ch)
WP11: Blue Sky			
Task	Description	Topics	Facilitators
11.1			
11.2			

PPT connections:
C. de la Taille, T. Bergauer

PPT connections:
F. Gaede, A. Zaborowska, R. Zanin

- **The new European project and the DRDs are two separate entities**
 - **Management and funding of the EU project will be separate from the DRDs**
 - **The new EU project will continue to have strong (>50%) co-funding by national sources**
 - **Will have great synergies between them**
 - **Some of the WP coordinators could also be WG coordinators of a DRD**
 - **Other experts from the DRDs will be consulted to select tasks of the EU project**
 - **Do not aim to have in the EU project all the activities present in the DRDs**
- **Suggest to limit to 3 tasks per WP**
 - **Do not wish to have tasks with less than 250 k€ EU funding**
 - **Aim at maximum 2 beneficiaries per task**

- **Propose possible tasks for the WP to which you are assigned**
- **Follow the guidelines described previously**
- **Some more guidelines:**
 - **Interact closely with the other facilitators and the PPT members assigned to your WP**
 - **Propose activities to which the EU project can provide a significant **impact****
 - **Avoid "catch-all" tasks where the impact would be diluted**
 - **If you propose more than 3 tasks please prioritise them**
 - **We will need to have some geographical balance among beneficiaries**
- **The last word on the selection of tasks will be from the **PPT** and then the **project management****

- The coordinators of AIDAinnova, I.FAST and LEAPS-INNOV have been insistently asked by the EU commission to take the lead in another call
- **INFRA-DEV-05 Area 3**
 - This call will have a budget of **1.5 M€** and a duration of **2 years**
 - Deadline will also probably be on September 18th, 2025
 - Scope is to bring together several important European Institutes and Laboratories and formulate the guidelines on how the future calls on Research Infrastructures should be organised in the EU Framework Program 10 (FP10)
 - This will be achieved organising workshops and meetings and then preparing a final report to the EU

- Very good collaboration with the other **INFRA-INNOV** projects, **LEAPS-INNOV** and **I.FAST**
- Organised together an Industry workshop on Cooling in **Paris** on **6-7/4/2024**
- Organised together the participation to BSBF in **Trieste** in **October 2024**
- Developed a **common strategy** for future **EU** calls
- All 3 will submit a proposal to the **HORIZON-INFRA-2025-01-TECH-02** call
 - Ask the **same amount** of **funding**
 - **Coordinate together** the preparation of a proposal also for the **INFRA-DEV-05** call

Backup