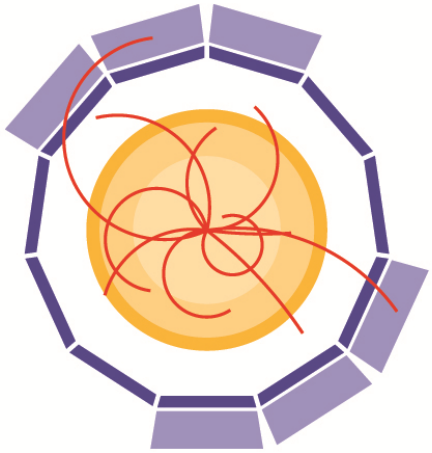


AIDA

Advanced European Infrastructures for Detectors at Accelerators

I. Vila IFCA (CSIC-UC)

6th Spanish Workshop on Future Accelerators
Granada May 2011

Outline

- AIDA 101
- News
- Partial summary of network related activities:
- Outlook

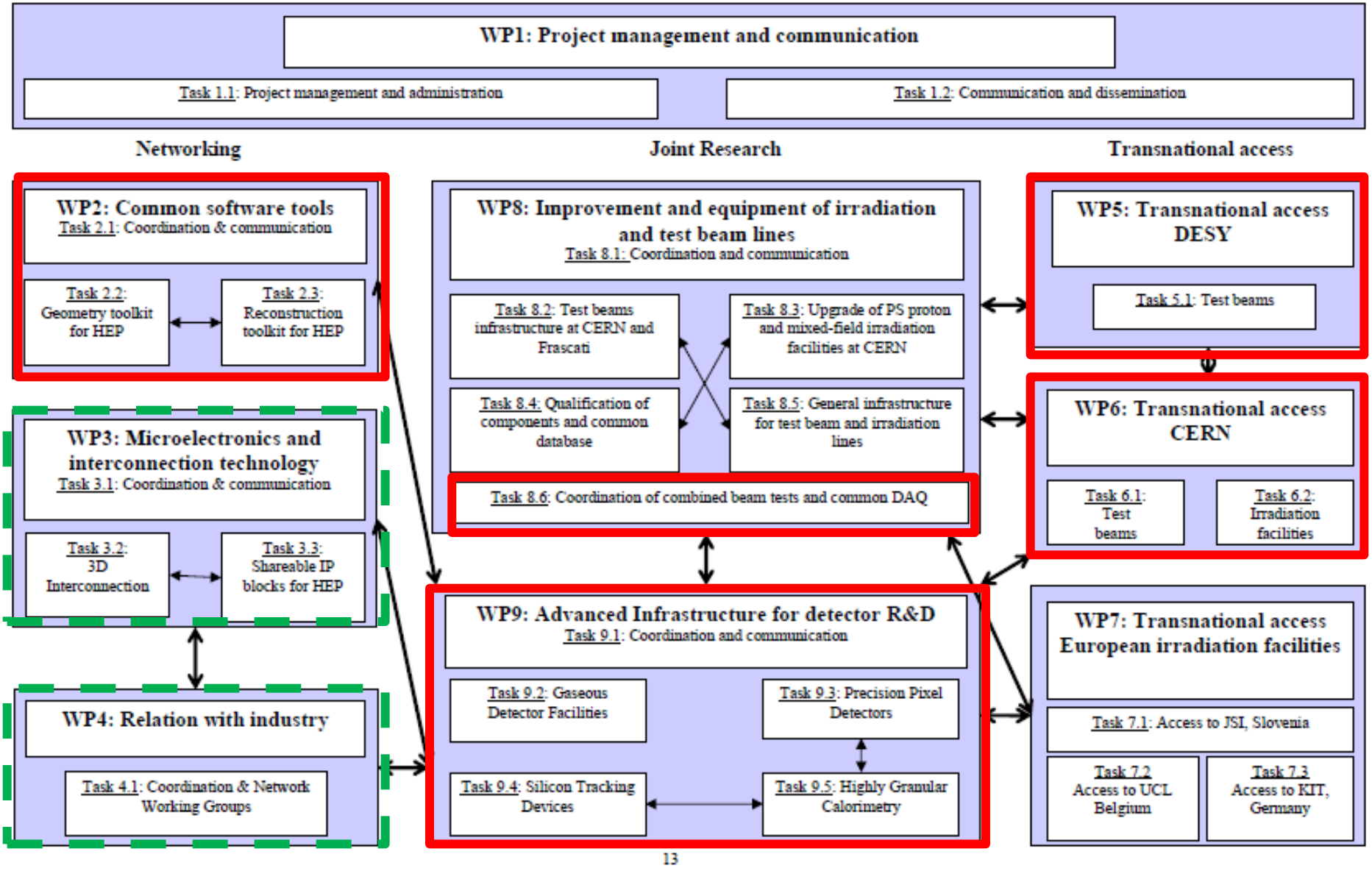
AIDA 101: Motivations and Goals(1)

- The **AIDA** project promoted by the RECFA Coordination Group for Detector R&D in FP7 to comply with European Strategy for EPP.
- Responds to the FP7-INFRASTRUCTURES-2010-1 call from the European Commission.
- AIDA addresses “existing” key infrastructures required for the development of detectors for future particle physics experiments.
- AIDA targets User communities SLHC, **ILC**, accelerator-driven neutrino facilities or **Super-B**.

AIDA 101: Motivation and Goals (2)

- AIDA appears as a continuation of the EUDET I3 FP6 project with a much wider scope beyond the ILC.
- Infrastructure call inside de Capacities program of the FP7.
- Combination of collaborative project (RTD) and coordination and support actions (CSA) for integrating activities: JRA, TA, NA.
- As IA project must:
  - provide wider and more efficiente access to the “existing” Research infrastructures (RI)
  - Better integration in the operation of the RI.

AIDA 101: Work Packages



AIDA 101: Final budget breakdown

Activity	EC funded budget
WP1 : Management	350 k€
WP2 : Common software tools	906 k€
WP3 : μelectronics & interconnection	918k€
WP4 : Relation with industry	120k€
WP5 : DESY testbeam	100k€
WP6 : CERN testbeam	150k€
WP7 : European irradiation facilities	550k€
WP8: Improvement of irradiation & beam lines	2324k€
WP9 : Advanced infrastructure for detector R&D	2582k€

AIDA 101: Partners and Beneficiaries

Beneficiaries

Associate partners

→ About 50 beneficiaries representing more than 70 Institutes

Project coordination

- WP1 : S. Stavrev (CERN) + L. Serin (LAL/Orsay)
- WP2 : F. Gaede (DESY) + P. Mato (CERN)
- WP3 : H.G Moser (MPI) + V. Re (INFN-Pavia)
- WP4 : S. Stapnes (CERN & Oslo)
- WP5 : I. Gregor (DESY)
- WP6 : H. Breuker (CERN)
- WP7 : M. Mikuz (JSI Ljubjana)
- WP8 : M. Moll (CERN)
- WP9 : **M. Vos (Valencia)** + V. Boudry (LLR)

Management team

Scientific coordinator	:	L. Serin (LAL/ORSAY)
Deputy coordinators :		T. Benke (DESY)
		P. Soler (Glasgow)
Administrative coordinator :		S. Stavrev (CERN)
Governing Board Chairman		**I.Vila (Santander)**

News

- None of the National Consortia were accepted (but CNRS joint institutes) so we have to split CSIC & UB full partners (CIEMAT, IFAE & USC associated partners to CERN).
- Very recently, Grant Agreement and Consortium agreement signed.
- First installment (pre-financement) from EC already at CERN. Expect it soon at your institute. Associated partners should get the total amount.
- The technical and scientific activity started officially with the kick-off meeting at CERN (February 16th)

Our contribution

- WP3: μelectronics and interconnection (CNM, UB)
- WP8.5 General Infrastructure for TB and Irradiation facilities (IFIC)
- WP9.3 Precise Pixel Detectors (IFAE, IFCA, IFIC, USC)
- WP9.4 Silicon Tracking (CNM, IFCA, IFIC, UB)
- WP9.5 High Granularity Calorimetry (CIEMAT)

- HERE brief status report on network related WP9 task (my bias).

WP9.4 Silicon Tracking: goals

- Providing multi-layer Si -strip coverage for the calorimeter stack of WP9.5, precise entry point as a reference for study of overlapping showers
- Task leader: Thomas Bergauer (HEPHY Vienna)
- Research team completed with Vienna and Prague, Spain is the main partner of this task.

	EC-FUNDED (K€)	TOTAL (k€)
IFIC	47	185
IFCA	47	184
UB	35	123
CNM	22	97

WP9.4 Deliverables and Milestones

After 1st year:

- MS39: Design of Silicon micro-strip ladders (Milestone; Report) [month 13: March 2012]

In 4th year:

- **D9.5) Silicon micro-strip ladders**: The Silicon micro-strip ladders are installed in front of the Calorimeter stack delivered by WP9.5. The pointing precision and timing performance are characterized. The devices remain available for the study of the calorimeter performance in case of overlapping showers. [month 39: May 2014]

WP 9.4 Task implementation

Baseline Deliverable

Two orthogonal layers of u-strips

Provide precise entry point to calorimeter

HPK SiLC sensors ?	AVP25 based hybrid	Conventional mechanics	Integration with CaloDAQ	Offline software	Deliverable 2nd QT 2014

Advanced Deliverable (ILD focused)

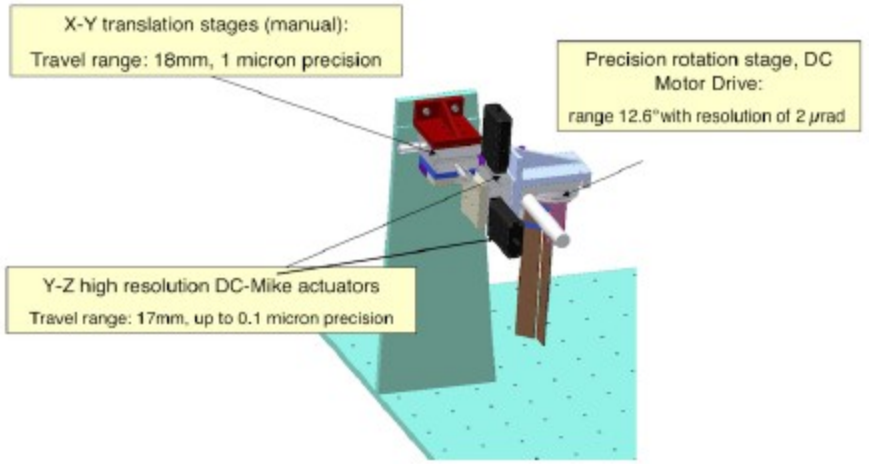
Ultra-light strip layer of thin sensors (230 um)

Demonstrator of ILD silicon tracker

Integrated PA or 2D-Poly silicon or short strip sensors.	APV25 based hybrid	Light mechanics with embedded Fiber Optic Sensors	Integration with caloDAQ	Offline Software	No deadline

WP9.3 Thermo-mechanical infraestructure & AID for pixels

- Implementation to be done, no well defined task yet. Unclear scope and goals.
- Should combine Thermal and mechanical characterization box + alignment Investigation Device.



R/O Chip for ILD

- Univ. Barcelona will continue SiLC effort to develop a readout chip suitable for ILD
  - different approach than Paris chip (top-down)
- Do design and simulation in AIDA, then find budget for (multi channel) strip
  - target technology IBM 90 nm
  - 1 channel design for prototype in 1.5 year
- Just a starting point for ILC chip design but not usable for AIDA

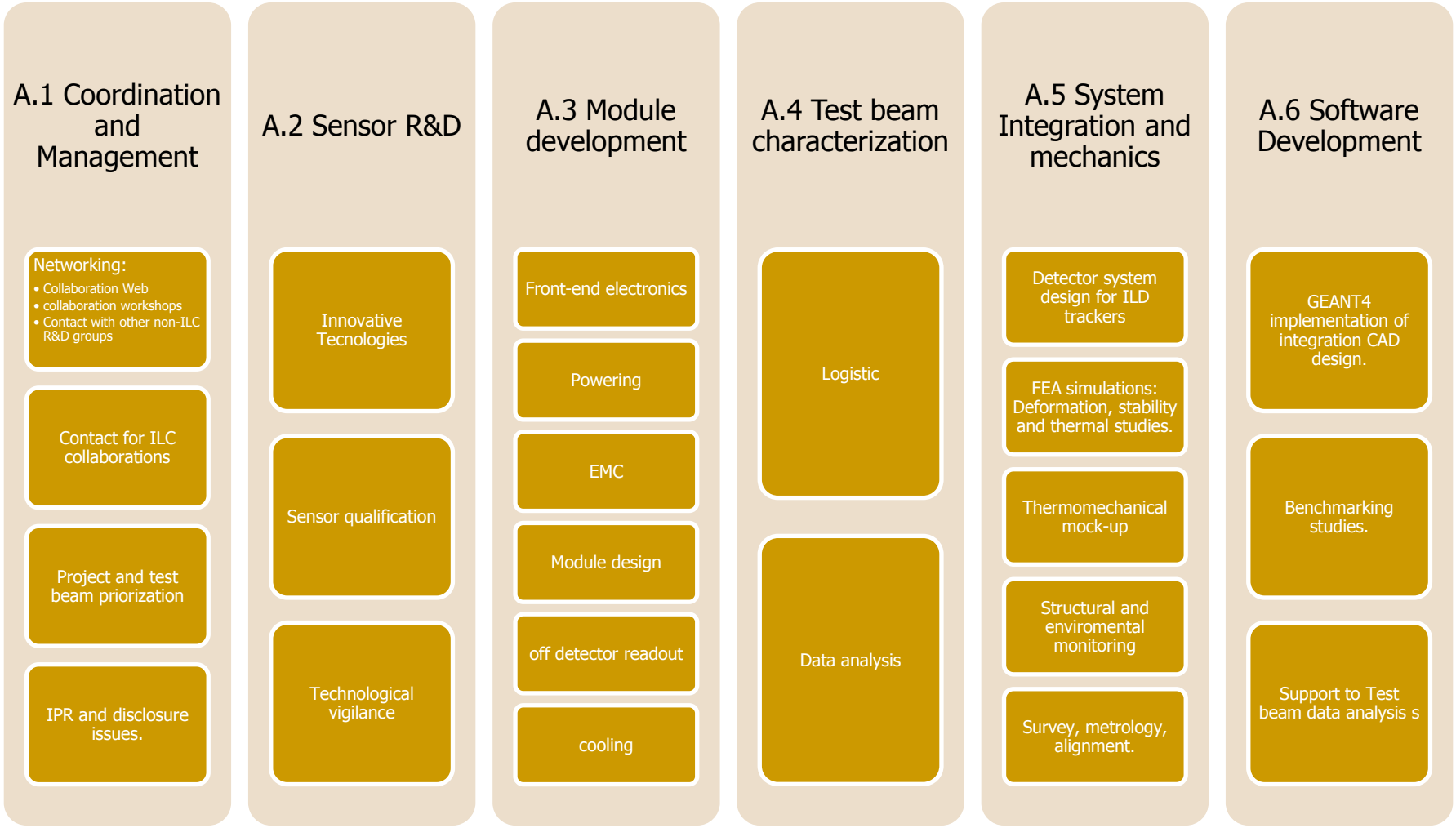
Outlook

- In brief, AIDA: 2250 PM (47 FTE) effort with a 27 M€ budget, (8M€ EC contribution) aiming to improve the R&D key infrastructures.
- Spanish contribution 178 PM (4 FTE), total budget 1.6 M€ (0.4M€ EC contribution).
- It is about infrastructure BUT in the implementation to achieve the deliverables relies the “actual” R&D interest. (strongly related with ILD, Belle-II)
- First installment to partners and associated expected to arrive very soon.
- The project has started, more proactive approach needed.

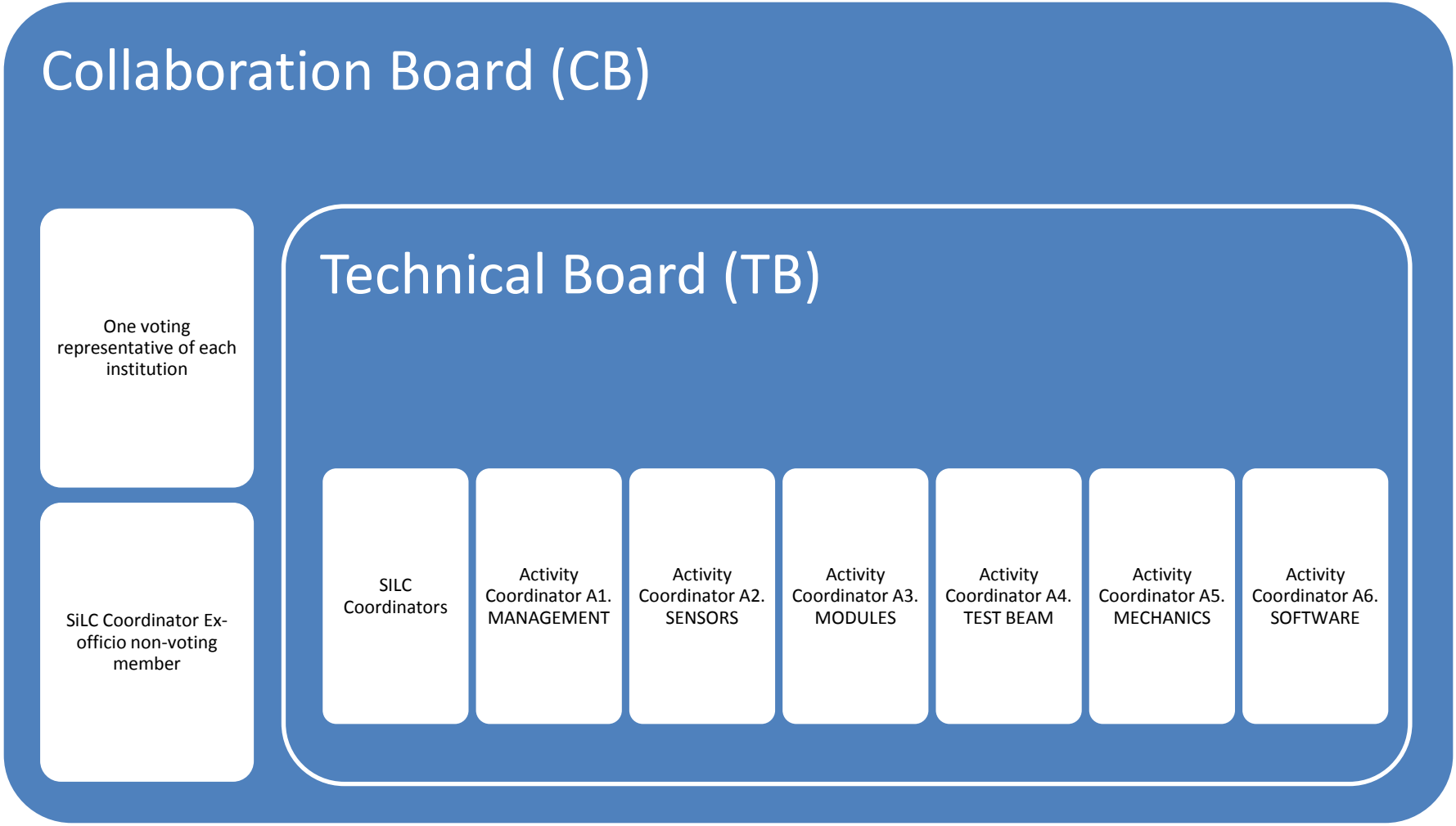
AIDA++ towards a SiLC

- All AIDA members are part of SiLC, proposal to link
- AIDA meetings to AIDA meetings (pre-meeting) and one IDL Workshop meeting.
- I have, informally, contacted all the active international European parts (Vienna, Prague, Karlsruhe) with good reception.
- After this meeting, call for a SiLC meeting to discuss this porposal

AIDA++ towards a SiLC (2)



AIDA++ towards a SiLC (3)



BACK-UP

Highlights (for the impatient)

- In our last workshop (December 2009) the proposal was just submitted to the EC.
- AIDA proposal obtained (March 2010) a excellent rank 14.5/15 by the EU referees (we did it!) BUT requested budget reduced from 10 M€ to 8M€.
- Annex 1 DoW submitted, May 2010 negotiation starts.
- July 2010 Partner amends UH out, KIT in, GPF sent.
- Today, still waiting (Since September) for a reply from our EU officer with all the modifications we have to do before the signature of the GA.

Highlights (2)

- AIDA will start February 1st
- Kick-off meeting February 16th to 18th
- Many pre-kick-off meetings are happening right now focused on several tasks and subtasks.

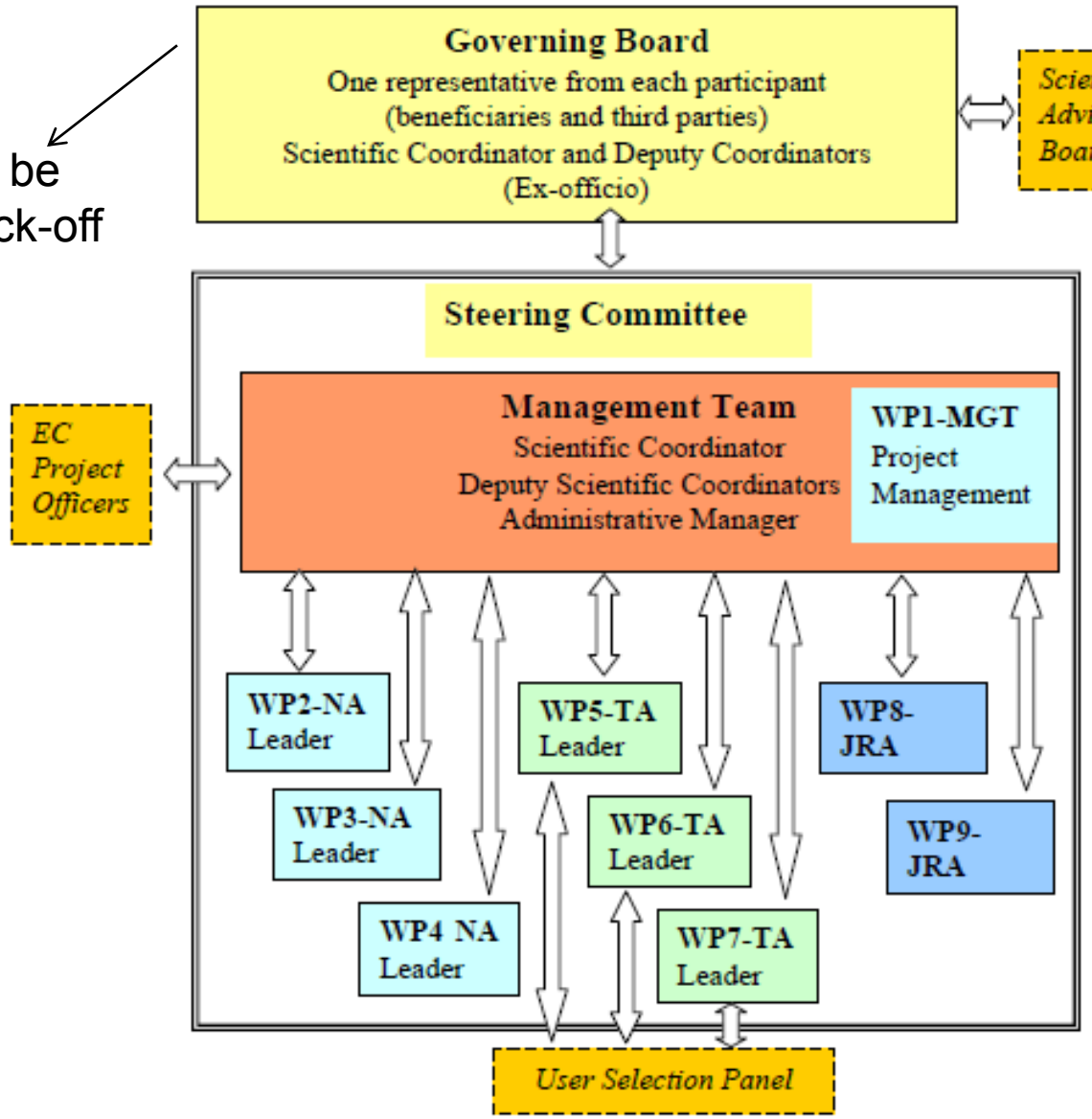
- Most of the consortia used in TIARA (FP7 project in negotiation in June) have been rejected. We are expecting to face the same problems

→ Some consortia will have to be split in individual partners

Organization

> 70 institutes

Chairman to be elected at kick-off meeting



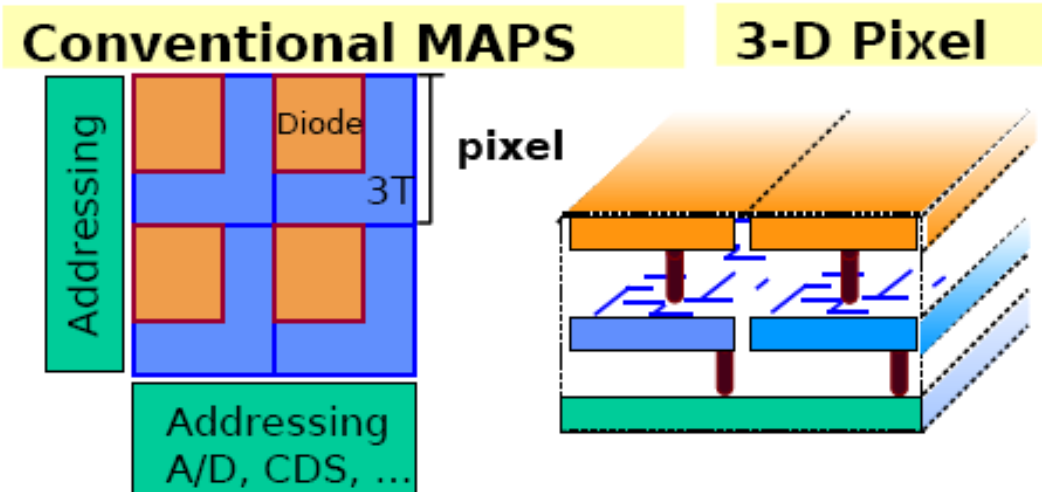
To be set up at kick-off meetin

Negotatiation main changes

- WP1 : Additional free manpower from IN2P3/CNRS
- WP2 : Small reduction of scope of a few tasks on reconstruction
- WP3 : Mainly unchanged but with small increase of contribution from partners.
- WP4 : Strong reduction but still keep the WP (42 months only). Might be the starting point of a new proposal to EU.
  - Reduce the technologies to prospect and reduce workshop to AIDA annual meeting.
- WP5 and WP6 unchanged
- WP7 : small uniform reduction
- WP8 : Main reduction from CERN priority and removal of some tasks
- WP9 : Reduction keeping the scope of the WP with larger
  - contributions of partners

WP3: μelectronics and interconnection

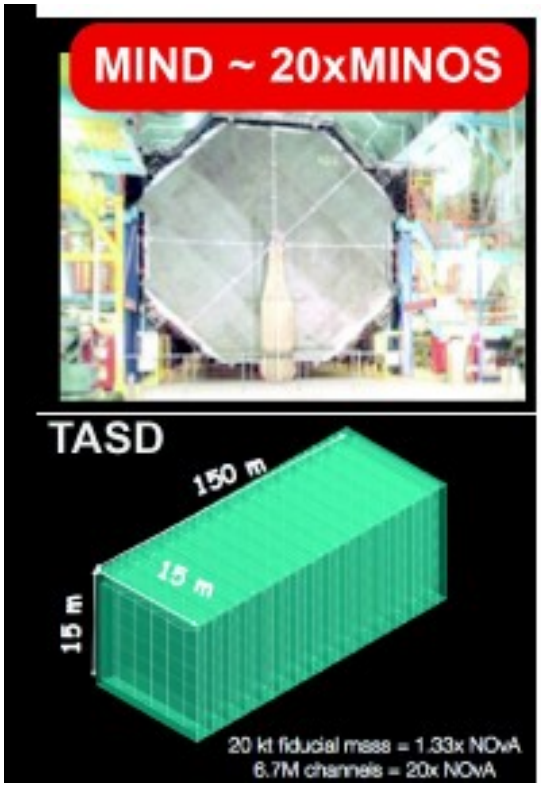
– Strong involvement of LHC community on 3D technology for pixel detectors but expect synergy/collaborative work with LC-pixel/CMOS activity : via-last option as complementary approach to the 3D/Fermilab approach (via-first)



	EC-FUNDED	TOTAL
CNM	50K€	194.6K€
UB	10K€	46.4K€

WP8.5 General Infrastructure for TB and Irradiation facilities

Beam test in CERN H8 line of "baby" prototype versions of massive detectors for ν_μ and $\overline{\nu}_e$ appearance in future oscillation experiments



	EC-FUNDED (K€)	TOTAL (k€)
IFIC	30	122

WP9.3 Precise Pixel Detectors

Task leader: I. Gregor (also DESY contact)

Second task leader + CERN contact to be defined

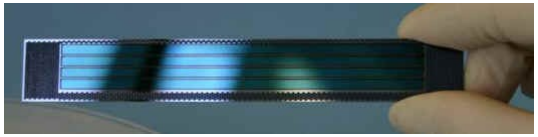
The main deliverable is an extremely precise beam telescope for characterization of prototypes (based primarily at CERN NA)

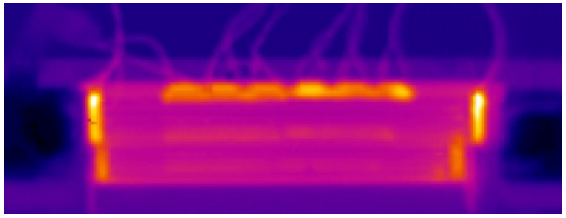
Catering to sLHC needs: CO2 cooling plant, fast read-out

Deliverable : Integrated telescope arm (T0+37),

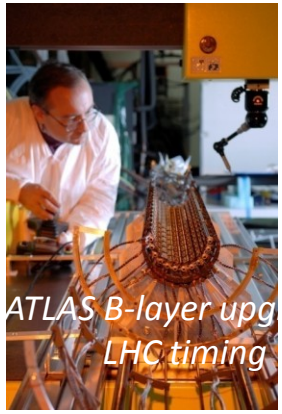
Complemented by infrastructure for high precision thermo-mechanical characterization (at DESY) (deliverable T0+33)

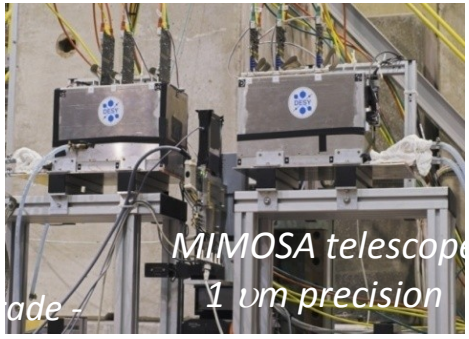
	EC-FUNDED (K€)	TOTAL (k€)
IFIC	30.5	143
IFCA	30.5	147
USC	30.5	120
IFAE	26	85

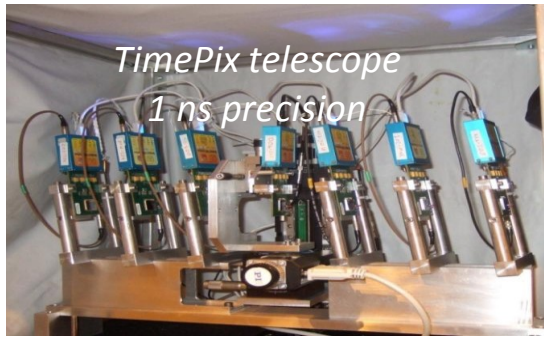




Use state of the art devices to satisfy both LC/LHC requirements





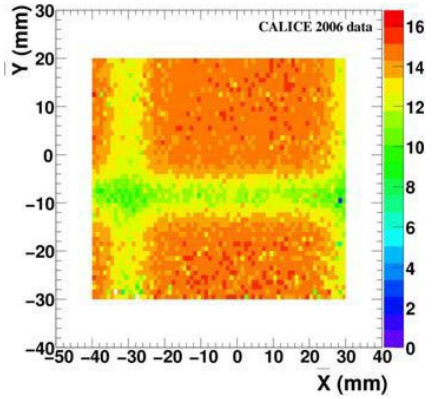


WP9.5 High Granularity Calorimetry

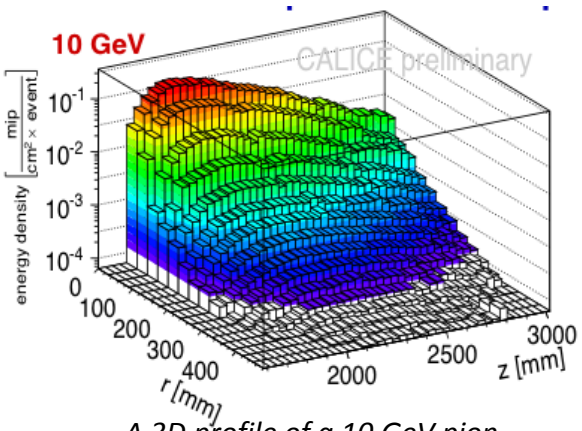
Task leader: Felix Sefkow (DESY)

Provide versatile calorimetric infrastructures to test detecting media **T0+40**

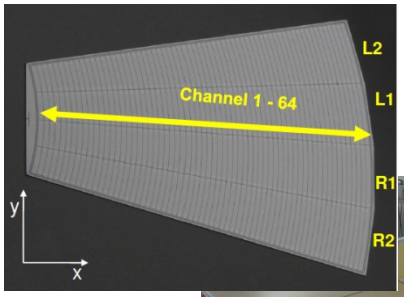
Reusing and extending the development made in EUDET to
build an integrated precision set-up with pixel hodoscope, pre-calo silicon strip layers and
• an extended EM calorimeter and a hadronic radiator (Fe, W) structure
• a luminosity calorimeter structure with tungsten radiator and read-out electronics
in which many types of sensors can be tested and their response compared to simulation.



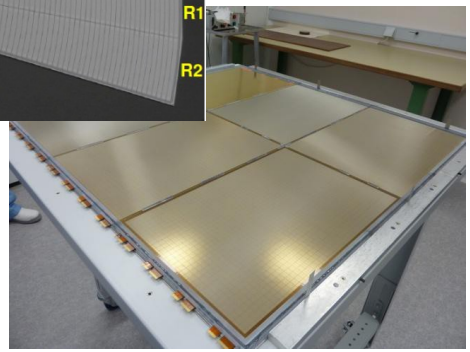
Inter-pad gap in ECAL



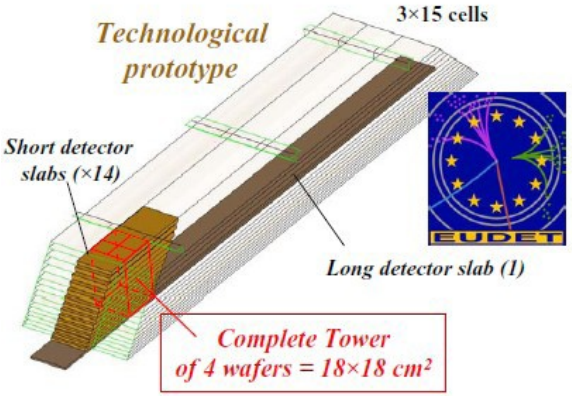
A 3D profile of a 10 GeV pion in a Fe-Scint calorimeter



Sensor for the LumiCal



one μ-Megas m²



The EUDET ECAL

	EC-FUNDED (K€)	TOTAL (k€)
CIEMAT	26	90