

AIDA

AIDA Project Overview: what AIDA can do for you (and you for AIDA)

Project history

AIDA organization

AIDA activities



- Initiated in September 2009
- Proposal submitted in December 2009
- Project accepted by EC for negotiation in April 2010 :
- All documents including referee comments and budget reduction re-submitted by End July 2010 (Total budget 25 ME, EC contribution 8 ME)
- Negotiation finally closed on January 25th 2011
- AIDA 4-years project officially started on February 1st 2011 with pre-financing on May 2011
- Kick off meeting at CERN Mid-February 2011 attended by ~150 people. Endorsement of organization and clarify work sharing





AIDA Linear Collider in AIDA

AIDA: very broad based multi-community program

- LHC detector
- Neutrino detector
- Linear Collider detector

Infrastructure program (no “real” detector R&D) main goal is improvement of infrastructure

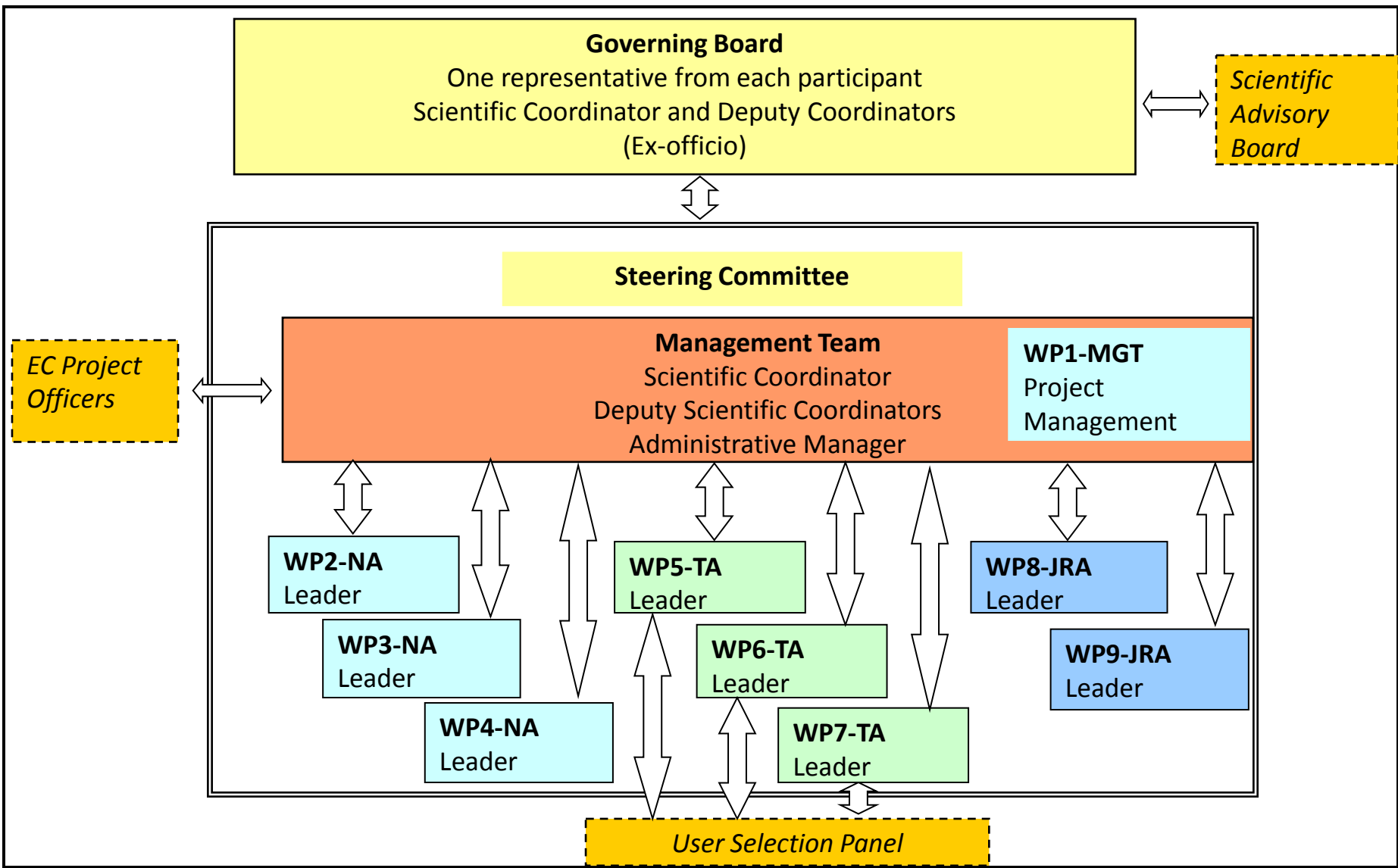
Linear Collider:

Strong participation building on the EUDET program
Nearly all European players in the LC field are present
Funding levels though are low: main purpose is
community building and support.





AIDA Organogram





AIDA Structure of work packages

WP1: Project management and communication

Laurent Serin, LAL-CNRS (scientific coordinator)

Ties Behnke, DESY & Paul Soler, Glasgow university, (scientific deputy coordinators)

Svet Stavrev, CERN (administrative coordinator)

Networking

WP2: Common software tools (Frank Gaede, DESY, Pere Mato, CERN)

WP3: Microelectronics and interconnection technology (Hans-Gunter Moser, MPG, Valerio Re, UNIBG)

WP4: Relation with industry (Jean Marie Le Goff, CERN)

Transnational access

WP5: Transnational access DESY (Ingrid Gregor, DESY)

WP6: Transnational access CERN (Horst Breuker, CERN)

WP7: Transnational access European irradiation facilities (Marko Mikuz, JSI)

Joint research

WP8: Improvement and equipment of irradiation and test beamlines (Michael Moll, CERN)

WP9: Advanced infrastructure for detector R&D (Marcel Vos, IFIC Valencia, Vincent Boudry, LLR-CNRS)

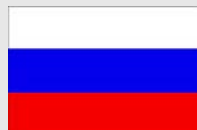
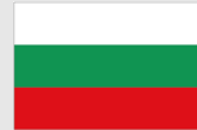




AIDA

Beneficiaries and Associates

23 countries and more than 80 institutes

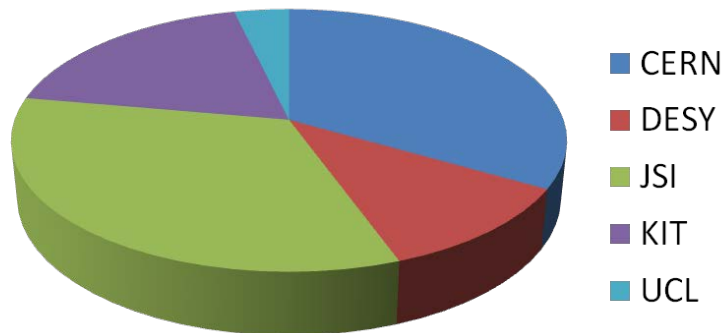


Recent request from Croatia institute to join AIDA

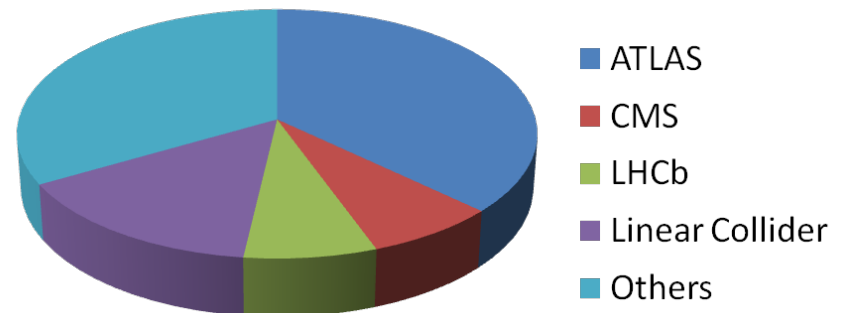


- Beam test facilities at CERN and DESY
- Irradiation facilities at UCL (Belgium), KIT (Germany), JSI (Slovenia) and CERN
- Call for funding (travels/subsistence) in CERN Courier March 2011
- Already 27 projects accepted (one not eligible) mainly at CERN and JSI. About 50 % from LHC experiments

Facilities



Projects



- Constraint to use most of CERN funding in 2011 and 2012 with accelerator shutdown scheduled in 2013/14

- Network activity limited by restricted budget
- Foreseen as starting point /framework of a possible new EC project about organized collaboration with industry following AIDA
- Within AIDA, scope reduced to organization of topical events (~one per year) on technologies of prime importance for HEP community : identify matching between our needs and industry interests and organize a follow-up
- Will be organized in a similar way as the successful SiPM industry-academia matching event organized by HEPtech at CERN in February 2011

- Theme retained for first event :

Position sensitive Si Detectors

To be refined in November for a meeting in March 2011 associated with AIDA annual meeting

- Others discussed themes : Optical link technologies, gas detector

- Strong and well organized contribution from Linear Collider community with a few LHC related tasks on tracking in high tracks environment
- Deliverables on general infrastructure already achieved
- Software design for geometry toolkit with interface to reconstruction, tracking toolkit and Particle Flow analysis toolkit expected in Feb 2012. Tools implementation and most of the validation within ILD.
- Expect also some applications in LC large scale prototype reconstruction and calibration of beam test data.

- Monthly meetings with strong interest from many institutes and various HEP community (LHC, Linear Collider,...)
- AIDA has selected a “via last ” approach to 3D integration to build a 2-layer device in heterogeneous technologies, where the two layers are fabricated independently (complementary to 3D world effort led by Fermilab)
- Workshop at Bergamo in last May with industry to review technologies.
- Many choices to be decided over this autumn to start production of various elements in 2012

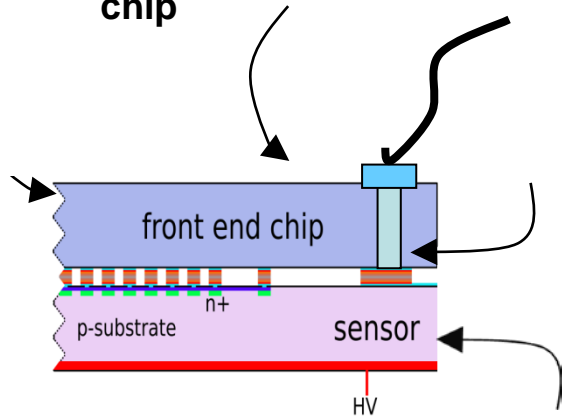
- Preparation of first MPW submission for IP blocks in CMOS (Nov 2012). Led by CERN. Technology to be decided (130, 90, 65 nm)

Choice of interconnection technology (mechanical and electrical bonding)

Choice of CMOS technology (0.13, 0.25, 0.35 μm) and foundry, design of a readout chip

Choice of technology for TSV (Through-Silicon-Via)

Choice of sensor (CMOS sensors, high resistivity planar or “3D” pixels)

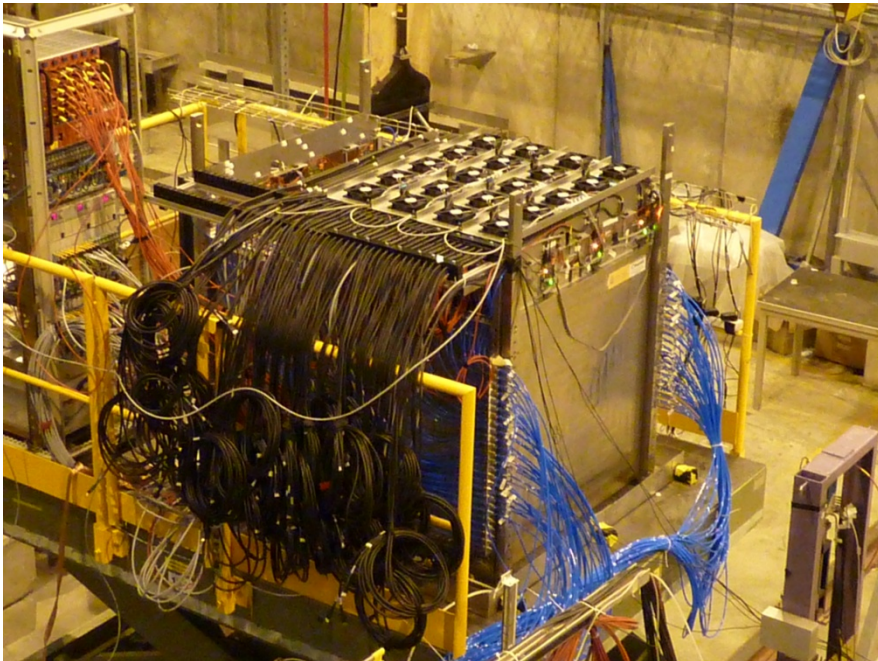




- **Frascati test beam line improvement:** mechanics, LYSO calorimeter + GEM chambers to monitor beam almost ready. Well in advanced / schedule
- **CERN & neutrinos :**
 - Design of a low energy beam line. Specifications expected in Jan 2012
 - MIND (Magnetized Iron Neutrino Detector) and TAsD (Totally Active Scintillator Detector) detectors : community active and discussion ongoing on finalizing the design. To be delivered at CERN in Jan 2014.
- **LHC oriented :**
 - Improvement of PS irradiation facility : recruitment of a engineer/physicist for 3 years on going. New cold boxes and new radiation monitoring devices to be tested in 2012
 - Improvement of GIF++ facility at CERN : activity just starting
 - Qualification of radiation hard components/materials : small but motivated community. In interaction with LHC machine and experiments. All results will be made public for the whole HEP community



- **Linear Collider community** : continuation of EUDET (FP6) program with strong focus on Large TPC test (Improve 1 T magnet DESY facility) , CMOS pixel detectors and calorimeters
Large scale prototype to be finalized and validated in beam tests during AIDA project.



Example of 1m³ CALICE semi digital Hadronic calorimeter
Presently in beam test at CERN

- Precise pixel detectors :
 - cross community activity : LHC (ATLAS/FEI4 & LHCb/Timepix), LC (CMOS MIMOSA)
 - Challenging task but crucial to demonstrate for a EU project that we can build an efficient and stronger community in detector R&D
 - Goal is to produce a pixel telescope which can be used to qualify high resolution device for LC, fast readout LHC devices and new alignment devices.
 - Continuation also under AIDA of support for the EUDET telescope heavily used at CERN and DESY test beams.

- After 1.5 years of preparation, AIDA officially started in February 2011 !
- Community well identified and motivated to make this project successful even if limited budget in some areas : can be used as a forum for new collaboration
- Regular meetings of each Work package.
- AIDA annual meeting at DESY : March 27-30 2012
- Some important milestones and deliverables expected in 2012