

Observations from the Science Advisory Panel

Marcel Demarteau

on behalf of the SAP

DESY, Hamburg, June 16, 2016





Ariella Cattai
CERN

Lead for

- WP2
- WP9
- WP13



Marcel Demarteau
Argonne

Lead for

- WP2
- WP6
- WP7



Peter Mättig
Wuppertal

Lead for

- WP4
- WP2
- WP11
- WP12
- WP15



Greame Stewart
Glasgow

Lead for

- WP3
- WP2
- WP5



Jim Strait
Fermilab

Lead for

- WP1
- WP2
- WP8



Isabelle Wingerter
Anncy

Lead for

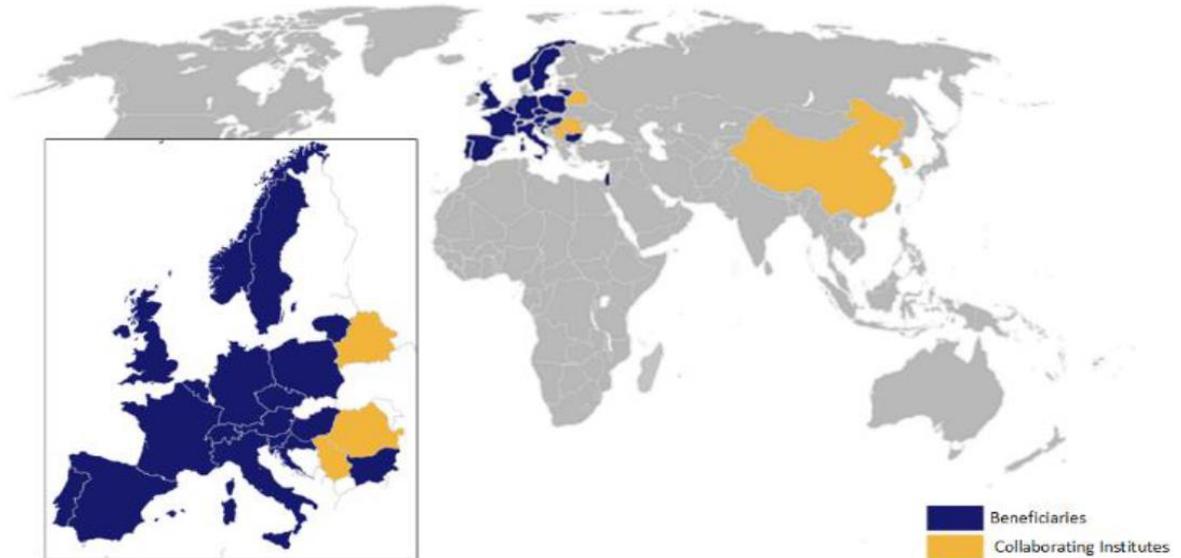
- WP2
- WP10
- WP14

- We understand our task to be first and foremost helpful and constructive.
- More formally, to advise the Governing Board on a regular basis on technical and strategic matters related to the scientific program of the projects
- The SAP is expected to:
 - Monitor the progress of the project
 - Advise and comment on milestones/deliverables and help management to find solutions in case of problems/delays on deliverables.
 - Present a Report at the Annual plenary meetings
 - Provide a short written document
 - In case of conflicts, participate in a review of the issue and advice, if asked to do so

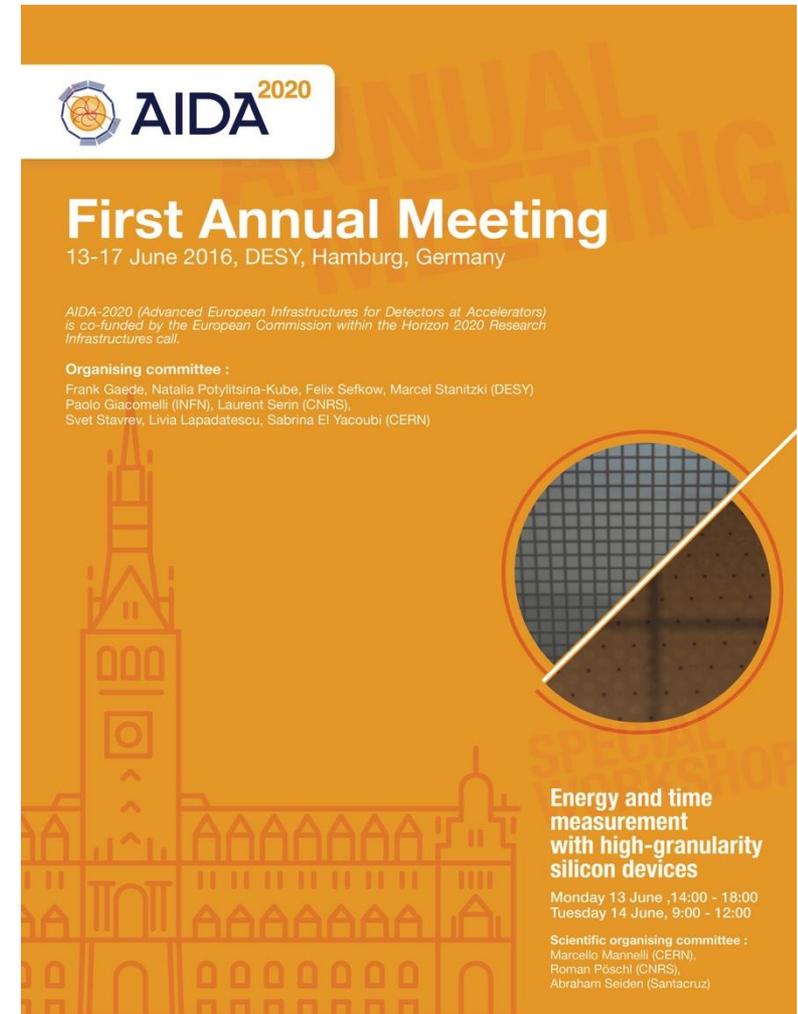
- Integrated infrastructure initiative in EU FP8 “Horizon 2020”
- Loose definition of “infrastructure” = common interest
- Project with four year duration

- EU contribution 10 M€
- Total budget 29.7 M€

- 19 participating countries
- 38 beneficiaries



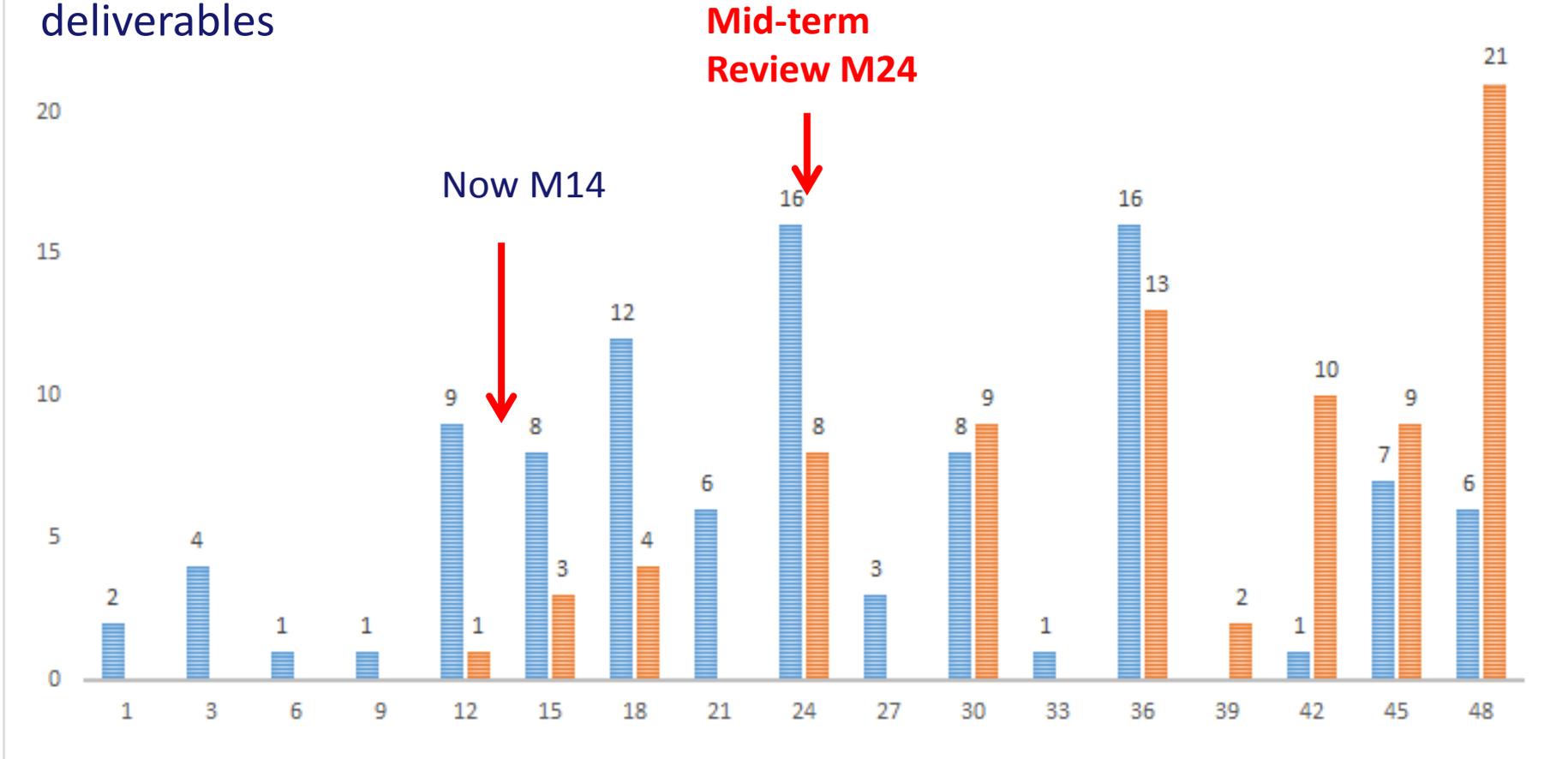
- First workshop very impressive
- 135 participants
- 24 parallel sessions with a total of 102 excellent presentations in parallel sessions
- Enthusiastic and dedicated teams in each working group
- Very impressive body of work being done for the community at large
- Thank you!

The poster is primarily orange with white and blue text. At the top left is the AIDA 2020 logo. The main title "First Annual Meeting" is in a large, bold, white sans-serif font, with the dates "13-17 June 2016, DESY, Hamburg, Germany" below it. A smaller line of text states: "AIDA-2020 (Advanced European Infrastructures for Detectors at Accelerators) is co-funded by the European Commission within the Horizon 2020 Research Infrastructures call." Below this is the "Organising committee" list: Frank Gaede, Natalia Potylitsina-Kube, Felix Sefkow, Marcel Stanitzki (DESY); Paolo Giacomelli (INFN), Laurent Serin (CNRS); Svet Stavrev, Livia Lapadatescu, Sabrina El Yacoubi (CERN). On the right side, there is a circular graphic with a grid pattern and a diagonal line. At the bottom right, the text reads: "Energy and time measurement with high-granularity silicon devices", followed by the schedule: "Monday 13 June, 14:00 - 18:00" and "Tuesday 14 June, 9:00 - 12:00". Below the schedule is the "Scientific organising committee" list: Marcello Mannelli (CERN), Roman Poschl (CNRS), Abraham Seiden (Santacruz). The background of the poster features a faint orange outline of a building.

<http://cern.ch/aida2020>



- AIDA 2020 has adopted a structured approach with milestones and deliverables



- 21 deliverables and 42 milestones to be produced / accomplished - and documented – in the next 10 months

- AIDA 2020 has adopted a structured approach with milestones and deliverables
- This structured approach may be anathema to a program with a focus on research and development
- The overall value of reporting is very high with a lot of benefits
- It is understood that for R&D, it is well possible that not all milestones will be met; documenting the process still has many merits
- The working groups are highly encouraged to meet their reporting deadlines, especially over the next ten months when a significant amount of milestones and deliverables are to be met

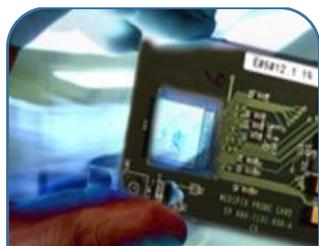
- Great collaborative spirit during all working group sessions
- Very active discussions how to address different experimental needs
- Fostering more discussions among the different work packages could be very beneficial; it is often the sharing of ideas and concepts that leads to innovative developments
- It is generally recommended, for all working groups, to not only maintain good communication with various experiments, even if they are not actively involved in an AIDA-2020 project, but even strengthen the relation with these communities
 - Value of the work greatly enhanced if it advances technologies of current experiments and adopted by proposed experiments

WP 1: Management

- AIDA-2020 is well organized, with knowledgeable co-coordinators for each work package and a small, capable overall management team
- The management structure is lean, allowing most of the funding to be applied directly to technical work
- The management team could play a more active role in promoting cooperation and coordination among related work packages
 - For example the several WP related to silicon detectors

WP 2: Innovation and Outreach;

- Proof of Concept fund (€200k) for spin-offs with as objective to increase the impact of tools, techniques and technology beyond particle physics.
- Strongly supported by panel and all WP's encouraged to take advantage of this opportunity. Since the funds are small work must be carefully focused.
 - Aims is projects with a high technology readiness level
- Organisation of joint topical academia-Industry events might be helpful
- Panel encourages a more proactive attitude by the management with the help of CERN.



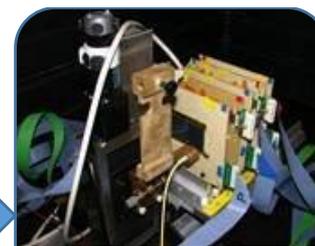
**Identification
of key
technologies**



**Search for
suitable
industrial
partners**



**Selection of
projects for
PoC funding**



**Testing and
validation of
concepts and
technologies**

WP 3: Software

- Good scope of projects, covering important areas for HEP software
- Good relationships to experiments
- Very active discussions about how to generally satisfy different experimental needs
- Maintain good communication channels with different experiments, even if they are not actively using an AIDA-2020 software project
- Ensure discussions with software projects intersecting with AIDA-2020 are ongoing

WP 4: Micro-electronics

- Good scope of tasks
- Prototype test chips in 65 nm technology have been designed and work is going on towards large demonstrator chip.
- Chip to be used to work on new interconnect technologies.
- Some progress has been made on developing ASICs for the calorimeter read – out
- Since no milestones and deliverables were due in Y1. the progress of this WP is difficult to evaluate in detail.
- Complementarity with RD53 not clear for 65nm work.

WP 5: Common DAQ for LC test beam

- Goal of common DAQ infrastructure is very worthwhile; well coordinated
- However, almost everyone already has their solution already
- New EUDAQ specification and DQM framework on track
- Benefits should be clear – if it's easy for groups to use
- It is noted that documentation and support will be very important

WP 6: HV CMOS sensors

- Excellent scope exploring innovative tracking-detector technology based on active CMOS sensors and well organized task structure
- Good progress in TCAD simulations of sensors structures with positive feedback
- Large scale (2cm x 2cm) HVCMOS sensors already available
- Samples of capacitive coupled devices available
- WP holds good promise for creating new paradigm for trackers

WP 7: Hybrid Pixel detectors

- Good scope of projects
- TCAD Simulations well advanced; developing radiation damage models
- Three technologies (planar, 3D, LGAD) making good progress
- A lot of efforts ongoing; relationship and relative advantages and complementarity of R&D not always clear

WP 8: Cryogenic detectors for neutrino exp's

- Good progress developing technologies and prototypes for a 10 kt LAr neutrino detector
- The technology developed has applications for other experiments, such as direct dark matter searches
- Work package could benefit from greater coordination with similar efforts world-wide to ensure that the infrastructure developed is maximally complementary, for example regarding high voltage
- The plans for cooperative R&D on large-area SiPM with DarkSide is a welcome development

WP 9: Mechanics and μ -channel cooling

- Good activity in the design, production and testing of micro-channel cooling
- Many different prototypes fabricated, being tested and results compared to simulations.
- Work on low-mass mechanical structures started
- There seems room for improvement in the interaction and coordination among the subgroups and their tasks

WP 10, WP 11, WP 12: Beam test facilities, Irradiation facilities, Detector characterization facilities

- Important progress in making complementary European test facilities available at transnational level
- Impressive amount of usage and scientific output by EU and outside EU institutes in a small time span

WP 13: Gas Detectors

- Excellent work packages definition, all concentrated on forefront R&D activities with good coherence across WP
 - Large effort to improve the RPC performances (*still the larger and faster detectors on the market*)
 - Large effort to Find Eco-friendly gases (more an issue is for the old LHC systems)
 - Large effort to realize novel and more robust MPGD architectures
 - Very successful developments of common electronic equipment and infrastructures
- Strongly encouraged to continue the studies of eco-friendly gases
- Strongly encouraged to strengthen the studies on large size single-photo detectors

WP 14: Calorimetry

- Good activity in design and production of micro-channel cooling.
- Many different prototypes fabricated, being tested and results compared to simulations
- Work on light mechanical structures has started
- Interaction among subgroups could be improved and work better coordinated

WP 15: Test beam & Irradiation upgrades

- Work is progressing towards improving test facilities and devices, which is important in view of the high use of these facilities.
- A new beamline and several additional special additions to existing facilities to broaden and facilitate the use of test beams and irradiation facilities being planned
- The contributions of the WP includes simulation to optimized designs as well as building and improving structures.
- All activities are within time, well motivated, and no major problems are identified.

- AIDA-2020 is off to a great start
- Great mix of working groups and topics that are well integrated with the priorities of the field of particle physics
 - Cooperation between communities within the same working groups
 - LHC upgrades, future colliders such as ILC, CLIC, CepC, FCC
 - Network with neutrino community
- New work package with focus on technology transfer to industry
- A lot of exciting work ahead
- We'd like to thank the organizers for the great program and hospitality and all participants for the presentations and discussions.
- Looking forward to the next report and the next meeting !