



**AIDA**<sup>2020</sup>

Advanced European Infrastructures  
for Detectors at Accelerators

# Discussion Toward a New Proposal

4<sup>th</sup> Annual Meeting

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DESY

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*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654168.*





- Scope, communities
  - main targets future colliders and accelerators-based neutrino experiments
  - other non-collider projects, e.g. SHIP, non-accelerator projects, e.g. axion and DM search, astro-particle physics?
- New Topics
- Replacing TA
- Integration vs Innovation
- Sustainability – now and then
- Industry involvement
- Roadmap
  - intermediate goals; items missing on CERN map
- Balance with CERN program
  - cooperation and complementarity
- PoC (for blue sky projects)



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# Back-up



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- Informal information from meeting at Brussels on March 5
- FP8 Call 5: Large initiatives and support measures to **foster the innovation potential of research infrastructures**:
  - New directions in EC funding instruments, addressing established communities
  - Following consultations with communities to prepare for FP9
  - To be published in summer
- INFRAINNOV-03-2020 - Co-Innovation platform for research infrastructure technologies (2020 – xx M€)
  - This is where ATTRACT phase 2 will be
- INFRAINNOV-04-2020 - **Innovation pilots** (2020 – yy M€, max zz M€ each)
  - Innovation in light source technologies
  - **Innovation in detector technologies**
  - Innovation in accelerator technologies
- **Deadline March 17, 2020**



- **Separation** between call II-03 and II-04, in particular AIDA++ and ATTRACT
- II-03 aims at **innovation for markets outside RI**
- II-04 **innovation for the delivery of services, or new services of RI**
  
- What is **Innovation**?
- For ATTRACT: launch of a new product to market
- For us: we are invited to interpret the topic for our community
  - Can be incremental
  - Low and high TRLs\*\*
  
- \* **RI** – Research Infrastructure
- \*\* **TRL** - Technological readiness level



- Objective:
- Support RI\* networks developing and implementing a **common strategy/roadmap including** technological development required for improving their services through **partnership with industry;**
- Support **incremental innovation** and cooperation with **industry and academia** in areas such as scientific instrumentation
- Target:
- **Advanced Integrated Activities\*\***, which have reached a high level of integration and can **focus on joint** research developments
  
- \* RI – Research Infrastructure
- \*\* e.g. AIDA-2020



- Development of **roadmap**/strategic agenda for the construction and upgrade of RI
- Development of **technologies & techniques underpinning** the use of the RI
- **Prototyping** corresponding methodologies & instrumentation
- Early stage involvement of **industry as beneficiary** and supplier
- **Sustainability** plan requested (co-funding of roadmap)
- **Complementarities** between the two innovation actions required
  
- **Tools:** JRA, NA type of activities -but **no TA**
- Proof of Concept (competitive allocation after start of project) possible, e.g. for low TRL, higher risk projects (“blue sky”)



- HL-LHC upgrades now moving to production
  - R&D largely done - will not guide AIDA++
- New in AIDA-2020 – could be expanded
  - Precision mechanics and CO<sub>2</sub> micro-cooling
  - Large cryogenic detectors
- Future hadron colliders
  - Fast timing for pile-up rejection increasingly important
    - Sensors, electronics and test infrastructures, beam instrumentation
  - Radiation tolerance requirements even more demanding
    - Sensors, electronics and “low-tech”: powering
    - Highly granular Lar calorimeters
    - Irradiation facilities
  - Machine learning for fast track and image reconstruction, trigger
- Future lepton colliders
  - Higher precision, less material
  - Requirements for linear and circular machines very similar
    - Except electronics, powering, cooling
    - Circular machines have much higher rates and require continuous powering
    - Need to push limits of particle ID
    - Gaseous tracking
  - Most aggressive requirements may be posed by the Z factory
    - 1e5 x LEP statistics
  - Non-collider experiments





# AIDA<sup>2020</sup>

## Main Challenges for a New Proposal

- **No Transnational Access:**
- This was one of our biggest successes; need to find new ways of directing EC funds to facilities; WP15-type of upgrade (“innovation”) activities, network
- Involvement of **industrial partners as beneficiaries:**
- Works in parallel Accelerator Initiative ARIES; need to understand how to protect their IP; start with known partners
- Emerging **roadmap** of future collider projects:
- Need to establish our own technological roadmap, in the proposal and during the project, long-term projects require intermediate goals
- **Sustainability** of matching funds:
- Will need to find ways to demonstrate the long-term commitment of partners



- **Proposal submission deadline March 17, 2020**
  - Call will be published in July
  - Alignment with European Strategy Process will be challenging
- CERN taking the lead and will ensure administrative support
  - Research Director nominated proposal coordinator
- First discussions starting here at Oxford, main slot Friday lunchtime
- **Call for Expressions of Interest in May, deadline end of June**
  - sub-community discussions should be prepared
- Foresee scrutiny of Eols by rapporteurs
- **Open community meeting early September:** tentatively Sept 6 (or 4)
- Formation of Proposal preparation team
- Submission in march, evaluation in June
  - Start of new project end of 2020 possible

## ATTRACT

- Emerging communities
- Competitive
- Independent projects
- Fully bottom-up approach
  
- Break-through development
- Co-innovation for non-HEP markets
- Third-party funding
- Diversifying

## AIDA-2020++

- Advanced community
- Collaborative, compete globally
- Interdependent work packages
- Aligned with European Strategy and corresponding roadmaps
- Evolutionary development
- Innovation mainly via pre-procurement R&D for HEP
- Leverage on national funding
- Integrating



- Emphasis is on keeping each other informed
  - **Avoid duplication and double-funding**
  - Information exchange, mutual invitations
  - Dividing line for double funding should be drawn
- Provide access to results for other projects
  - if needed; the giving side decides
- CA's within II-04 and between II-03 and II-04
- ATTRACT just finished selection of projects for seed funding
  - 150 projects à 100k, should be known now or soon
- 5-10 multi-M€\_projects for growth phase only after submission of our next proposal