CERN

European Organization for Nuclear Research
Organisation Européenne pour la Recherche Nucléaire

CERN in FP7 and perspectives for Horizon 2020

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CERN EU projects office

Mandate

The main mission of the EU Projects Office is to oversee the participation of CERN in the EU Programmes for scientific and technological cooperation, and to provide support in the preparation and implementation of EU projects, carried out at CERN.

CERN EU projects office

Activities

- **Overview** of EU Programmes relevant to CERN, focus on FP7
- **Advise** CERN staff of appropriate funding for new projects
- Provide **guidelines** for proposal preparation and **review** proposals
- Integrate EU projects and contracts into standard administrative **procedures**
- Help **manage** CERN-coordinated EU projects, in limits of resources
- **Liaise** with EIROforum organisations, European Commission, Parliament and Council, and other European institutions on behalf of CERN

CERN in FP6 (2002-2006)

⇒ CERN participated in some **35 EU projects** (coordinated 11) and received around **40 M€** (over the period 2004 – 2010)

Programme	*No. of projects*	*EC funding*
Research Infrastructures	**5**	**~9** M€
E-Infrastructures	**14**	**~20** M€
Marie-Curie	**10**	**~10** M€
Other	**6**	**~1** M€

CERN in FP7 so far (2007-2012)

⇒ CERN has participated in **80 EU projects*** to date with associated EC funding of ~ **100 M€**

Programme	*No. of projects*	*EC funding*
Research Infrastructures	**14**	**~17** M€
E-Infrastructures	**20**	**~20** M€
Marie-Curie	**25**	**~50** M€
Other	**21**	**~13** M€

* Of which 32 projects coordinated by CERN

E-infrastructure projects

CERN is actively involved in European IT projects

- Deploying Grid infrastructure
- Developing middleware
- Disseminating results
- Expanding reach of Grid technologies
- Supporting user communities
- Open access digital libraries and repositories

Marie Curie projects

CERN mission includes training young scientists and engineers

Initial Training Networks in

- Data acquisition electronics
- Clouds & cosmic ray interactions
- Beam diagnostics
- Radiation detectors
- Hadron therapy for cancer treatment
- LHC data and theory
- …

Cofunding

- CERN Fellowship programme

International Research Staff Exchange Scheme

Industry-Academia Partnerships

Other projects (examples)

Cooperation (10)
- Astroparticle physics (ERA-NET)
- Ecology with IT (Environment)
- Hadron therapy (Health)

Ideas ERC grants (8)
- Cosmology at the LHC (Starting)
- Mass hierarchy (Advanced)
- Supersymmetry, Quantum Gravity & Gauge Fields (Advanced)

Capacities: Science in Society (2)
- Study of Open Access Publishing
- Science education

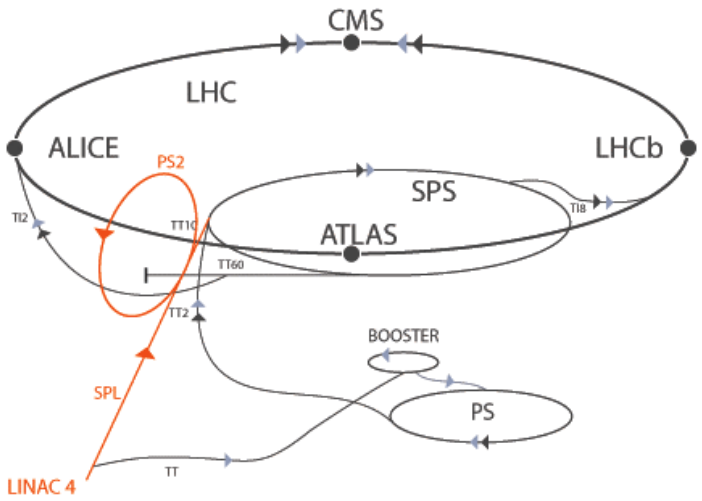
Research Infrastructure projects

CERN has key role in current & future research infrastructures in Europe

- **Integrating Activities (6)**
- **Design Studies (3)**
- **Preparatory Phases projects (3)**
- **Implementation Phase project (1)**
- **Support action (1)**

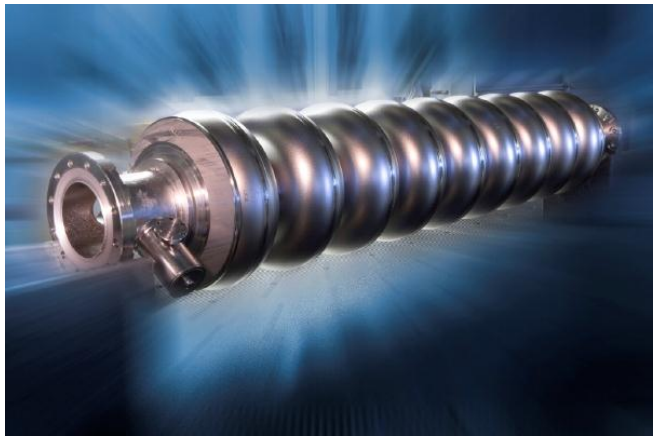
SLHC-PP

- **SLHC-PP:** Preparatory Phase of the Large Hadron Collider Upgrade
- Abstract: *The main aim of SLHC-PP is to prepare the Super-Large Hadron Collider (SLHC) project for a decision on the approval of its implementation by 2011. Beside the justification of SLHC by the physics results and operational experience from the first years of LHC running, the necessary ingredients for the approval will include: the maturity of new technologies required for SLHC, solutions for critical safety issues, and the formation of collaborations for the implementation, including the definition of work sharing and financial commitments.*
- 17 beneficiaries coordinated by **CERN**
- Project duration: 01.04.2008 – 30.03.2011
- Type of project: PP (Preparatory Phase)
- Total budget of 15.5 M€.
- EC contribution of 5.2 M€.



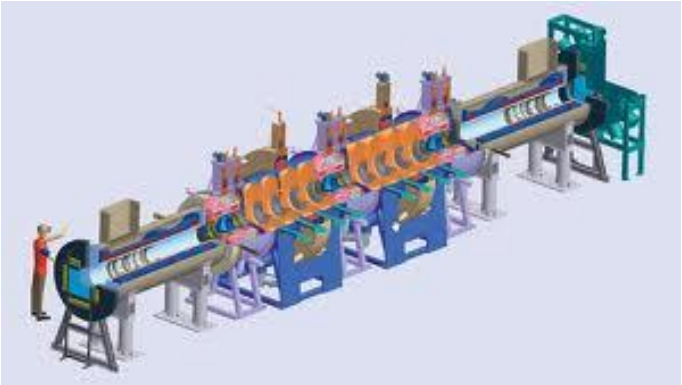
ILC-HiGrade

- **ILC-HiGrade:** International Linear Collider and High Gradient Superconducting RF-Cavities
- Abstract: *One of the main objectives of the ILC-HiGrade project is to create at least 24 accelerating cavities, superconducting components made of pure niobium for the planned International Linear Collider (ILC), that reach the high technical standards needed for the planned particle physics project. Other objectives include the development of a possible organisation and governance for the ILC and measures to prepare for the actual construction of the machine, including a detailed study on possible sites in Europe.*
- 6 beneficiaries coordinated by **DESY**
- Project duration: 01.02.2008 – 31.01.2012
- Type of project: PP (Preparatory Phase)
- Total budget of 10 M€.
- EC contribution of 5 M€.



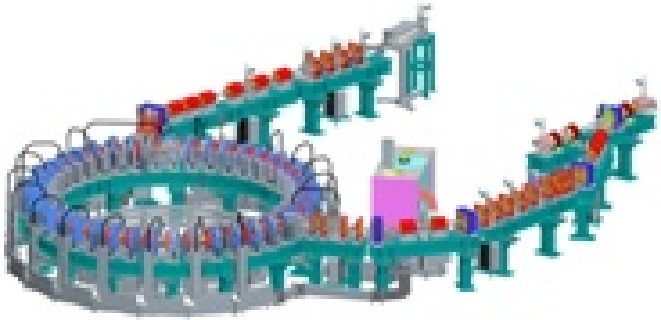
EUROnu

- **EUROnu:** High Intensity Neutrino Oscillation Facility in Europe
- Abstract: *This design study is prompted by the recent discovery that the neutrino changes type (or flavour) as it travels through space, a phenomenon referred to as neutrino oscillations. To investigate these oscillations will require new high intensity neutrino oscillation facilities. The design study will review the three currently accepted methods to realize such a neutrino facility (the so-called neutrino Superbeams, Beta Beams and Neutrino Factories) and do cost and risk assessments as well as a critical physics evaluation of these facilities.*
- 15 beneficiaries coordinated by **STFC-RAL**
- Project duration: 01.09.2008 – 31.08.2012
- Type of project: DS (Design Study)
- Total budget of 13.5 M€.
- EC contribution of 4 M€.



EuCARD

- **EuCARD:** European Coordination for Accelerator Research and Development
- Abstract: *EuCARD will contribute to the formation of a European Research Area in accelerator science, effectively creating a distributed accelerator laboratory across Europe. It will address the new priorities by upgrading European accelerator infrastructures while continuing to strengthen the collaboration between its participants and developing synergies with industrial partners. R&D will be conducted on high field superconducting magnets, superconducting RF cavities which are particularly relevant for FLASH, XFEL and SC proton linacs, two-beam acceleration, high efficiency collimation and new accelerator concepts.*
- 39 beneficiaries coordinated by **CERN**
- Project duration: 01.04.2009 – 31.03.2013
- Type of project: IA (Integrating Activity)
- Total budget of 32 M€.
- EC contribution of 10 M€.



ULICE

- **ULICE:** Union of Light Ion Centres in Europe
- Abstract: *ULICE responds to the need for greater access to hadron therapy facilities for particle therapy research. Full exploitation of all different resources, unrestricted spread of information and the improvement of existing and upcoming facilities are provided by using grid-based data sharing.*
- 21 beneficiaries coordinated by **CNAO**
- Project duration: 01.09.2009 – 31.08.2013
- Type of project: IA (Integrating Activity)
- Total budget of 9.5 M€.
- EC contribution of 8.4 M€.

AIDA

- **AIDA:** Advanced European Infrastructures for Detectors at Accelerators
- Abstract: *The AIDA project addresses the upgrade, improvement and integration of key research infrastructures in Europe, developing advanced detector technologies for future particle accelerators, as well as transnational access to test beams and irradiations facilities. The project concentrates on four areas of detector development (sLHC, Linear Colliders, neutrino facilities and Super-B factories), with an emphasis on activities and infrastructures common to all four areas.*
- 38 beneficiaries coordinated by **CERN**
- Project duration: 01.02.2011 – 31.01.2015
- Type of project: IA (Integrating Activity)
- Total budget of 26 M€. EC contribution of 8 M€.

ENSAR

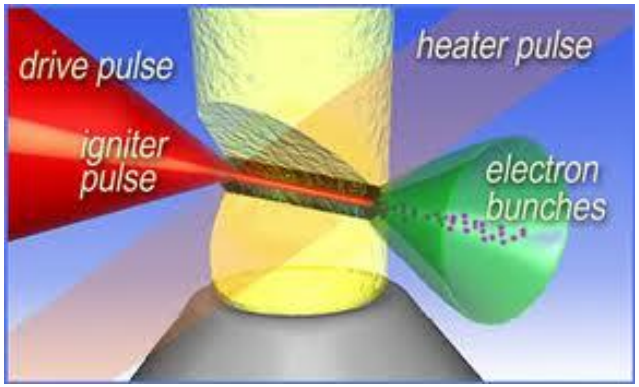
- **ENSAR:** European Nuclear Science and Applications Research
- Abstract: *ENSAR is the Integrating Activity of Nuclear Scientists from almost all European countries performing research in three of the major subfields of Nuclear Physics: Nuclear Structure, Nuclear Astrophysics and Applications of Nuclear Science.*
- 30 beneficiaries coordinated by **GANIL**
- Project duration: 01.09.2010 – 31.08.2014
- Type of project: IA (Integrating Activity)
- Total budget of 11 M€.
- EC contribution of 8 M€.

TIARA

- **TIARA:** Test Infrastructure and Accelerator Research Area
- Abstract: *The main objective of TIARA is the integration of national and international accelerator R&D infrastructures into a single distributed European accelerator R&D facility. This will include the implementation of organisational structures to combine existing individual infrastructures, ensuring their efficient operation and upgrades, and the construction of new infrastructures as part of TIARA.*
- 11 beneficiaries coordinated by **CEA**
- Project duration: 01.01.2011 – 31.12.2013
- Type of project: PP (Preparatory Phase)
- Total budget of 9 M€.
- EC contribution of 3.9 M€.

ICAN

- **ICAN:** International Coherent Amplification Network
- Abstract: *This project studies a novel laser concept for High Energy Particle acceleration, known as CAN for Coherent Amplification Network that would guarantee high peak power and high average powers while exhibiting high efficiency, >30%. The approach is based on fibre amplification. The proposed technical evaluation will be performed by combining the expertise, know-how, and knowledge of world leading experts coming from optical science, technology and industry, including femtosecond fibre optics, instrumental optics, astronomy, manufacturing, and marketing.*
- 4 beneficiaries coordinated by **CNRS**
- Project duration: 01.10.2011 – 31.03.2013
- Type of project: CSA (Supporting Action)
- Total budget of 0.6 M€.
- EC contribution of 0.5 M€.



CRISP

- **CRISP:** Cluster of Research Infrastructures for Synergies in Physics
- Abstract: *CRISP is creating synergies and developing common solutions for an initial group of eleven ESFRI-PPs (European Strategy Forum on Research Infrastructure preparatory phase) projects in the field of Physics, Astronomy, and Analytical Facilities. Its ultimate aim is to supply the best service to the rapidly growing and largely diversified user community, and to ensure that the large investments made at the national and international levels result in significant progress in science. The eleven projects are ESRFUP, FAIR, ILL 20/20, SLHC, SPIRAL2, ESS, XFEL, ELI, EuroFEL, ILC-HiGrade, and SKA.*
- 16 beneficiaries coordinated by **ESRF**
- Project duration: 01.10.2011 – 31.09.2014
- Type of project: CNI-IP (Implementation Phase)
- Total budget of 16 M€.
- EC contribution of 12 M€.

LAGUNA-LBNO

- **LAGUNA-LBNO:** Design of a pan-European Infrastructure for Large Apparatus studying Grand Unification, Neutrino Astrophysics and Long Baseline Neutrino Oscillations
- Abstract: *The Astroparticle Roadmap of ApPEC/ASPERA strongly recommends that: "a new large European infrastructure of 100'000-500'000 ton for proton decay and low-energy neutrinos be evaluated as a common design study together with the underground infrastructure and eventual detection of accelerator neutrino beams". The LAGUNA FP7 design study will study seven pre-selected locations (Finland, France, Italy, Poland, Romania, Spain and UK), perform a detailed geo-technical assessment of the giant underground cavern needed, and determine costs and the full impact of including long baseline neutrino physics with beams from CERN.*
- 40 beneficiaries coordinated by **ETH Zürich**
- Project duration: 01.09.2011 – 31.08.2014
- Type of project: DS (Design Study)
- Total budget of 11 M€.
- EC contribution of 4.9 M€.

HiLumi LHC

- **HiLumi LHC:** FP7 High Luminosity Large Hadron Collider Design Study
- Abstract: *HiLumi LHC is part of an overall project that will federate efforts and R&D of a large community towards the ambitious HL-LHC luminosity upgrade of the Large Hadron Collider. HiLumi LHC involves participants from outside the European Research Area (ERA), in particular leading US and Japanese laboratories, which will facilitate the implementation of the construction phase as a global project. The proposed governance model is tailored accordingly and may pave the way for the organization of other global research infrastructures.*
- 15 beneficiaries coordinated by **CERN**
- Project duration: 01.11.2011 – 31.10.2015
- Type of project: DS (Design Study)
- Total budget of 21 M€.
- EC contribution of 4.9 M€.

More information …

EU Projects office website http://cern.ch/cerneu

CERN & H2020: 2011 Green Paper

Introduction to the response of CERN (May 2011):

- In a challenging post-crisis period, the EU needs to step up support for research and innovation in order to ensure, in a global competitive environment, the sustainable development and leadership of European science and technology, which are necessary for the upturn and growth of European economy and for the prosperity of Europe.
- To maximise the impact and benefits for European citizens, the EU should continue to actively support both basic and applied research and enhance their synergies to hasten the innovation cycle.
- Training and mobility of young scientists and engineers, further integration of science and society, and better support for the development of pan-European Research Infrastructures should be among the priorities for the next framework programme.

CERN & H2020: input to the EC

- In March 2012, CERN and DG EAC had a discussion on the programme orientations of the future Marie-Curie actions, notably on the Innovative Training Networks, Research and Innovation Staff Exchange Scheme, and CO-FUND actions.
- In May 2012 the EC Director in charge of the Framework Programme visited CERN to present H2020 according to the EC proposal. He had an extensive discussion with CERN DG on some key elements of the legal aspects and rules for participation of Horizon 2020:
  - participation of European intergovernmental research organizations
  - third country participants without EC contribution
  - IP under H2020 and Consortium Agreements
  - financial management and simplification
  - alternatives to time sheet recording

CERN & H2020: input to the EP

Following invitation by the ITRE Rapporteur, the Director-General of CERN submitted to the European Parliament a number of Amendments to the H2020 proposal:

- ✓ In addition to the typical ERC Grants, support should be also given to projects in those fields where excellence is delivered by teams within large collaborations.
- ✓ CERN called for increased budget for Marie Curie actions, and ITNs in particular.
- ✓ The participation of European countries with less advanced S&T base should be encouraged and promoted in order to foster excellence in all member and associated states, and to avoid the creation of innovation/excellence divide.
- ✓ CERN called for a dedicated Science in Society programme to be supported under H2020.

Summary and conclusions

- CERN has been very actively involved in FP7 and is amongst the top 50 participants in terms of funding received.
- The main pillars of its participation are the Research Infrastructures, e-Infrastructures and Marie-Curie programmes.
- These programmes will continue and will be hopefully strengthened under Horizon 2020.
- CERN is looking forward to the adoption of the new Framework Programme for Research and Innovation and is expecting to continue its active participation.
- EU projects strengthen CERN's existing collaborations and create new links with European universities, laboratories and industrial partners, thus complementing the main R&D programmes of the Organization.