

Horizon 2020 Framework Programme

HadronPhysicsHorizon

Call for Proposal

The first EU Calls for the Program Horizon 2020 will be issued early next year with the instrument of Integrating Activities.

The HadronPhysics3 Management Board, together with the selected Coordinator for the HadronPhysics project in Horizon 2020, will serve as **Steering Committee** to prepare the new Proposal to be submitted to the European Commission in the upcoming Calls.

Following the strategy adopted in the previous HadronPhysics projects, the Steering Committee is hereby launching an internal call for work packages to be included in the future Proposal.

The overall EC contribution is expected to be of the order of that of HadronPhysics3 for a duration of three years. Therefore the budgets of the new work packages cannot exceed on average the actual HadronPhysics3 budgets.

► SCIENTIFIC FRAMEWORK

An Integrating Activity shall combine, in a closely coordinated manner, following the FP6 Integrated Infrastructure Initiative (I3) model, three categories of activities: (i) Networking activities; (ii) Transnational access and/or service activities; (iii) Joint research activities.

All three categories are mandatory, since synergic effects are expected from these different components.

Therefore, the activities to be carried out in the context of our future Integrating Activity must include:

(i) Networking activities

These activities **should foster a culture of cooperation in the scientific communities** benefitting from the research infrastructures.

Networking activities should address (not exhaustive list):

- coordination of scientific and technological activities;
- foresight studies of new instruments, methods, concepts and technologies;

- organization of co-operations among theorists and experimentalists with exchange of results and expertise;
- ...

(ii) Transnational access activities

To provide transnational access to one or more infrastructures among those operated by participants.

Community financial support should never exceed 20% of the annual operating costs of the infrastructure to prevent it from becoming dependent on the Community contribution and should not include capital investments. This financial support will serve **to provide free of charge access to external users (including travel and subsistence costs)**. Access costs will be defined on the basis of an “**user fee**” relating to the operating costs of the infrastructure.

(iii) Joint research activities

These activities should be **innovative** and **explore new fundamental technologies** or techniques strengthening the efficient and joint use of the participating research infrastructures.

The Joint research activities should address (not exhaustive list):

- higher performance methodologies and protocols;
- higher performance instrumentations, including the testing of components, subsystems, materials, techniques and dedicated software;
- innovative solutions for data collection, management, etc;
- ...

The Joint research activities should NOT address the construction of equipments, major infrastructure updates, or similar.

► STATEGICAL FRAMEWORK

What the European Union wants to achieve through Horizon 2020 is apparent from the three key priorities of the Programme: **Excellence science, Industrial leadership, Societal challenges**.

The key priority block “**Excellence science**” includes the **Research Infrastructures** and therefore the instrument of Integrating Activities that we intend to use.

We have overhauled the scope of the project that we intend to submit in Horizon 2020 in order to fit the goals of the EU.

Starting from the overall project title: “**A horizon for Hadron Physics: mastering challenges in a globalized world**”

Acronym: *HorizonHadronPhysics (HPH)*

Then we have identified the main challenges that we intend to master, grouping them in a number of topical areas:

1) Mastering the **high-tech challenge**:

- development of new detector techniques with increased radiation hardness and high-speed readout
- significant developments on cryogenically cooled beam targets
- new acceleration techniques for future accelerators, like laser cooling of beams
- developing and integrating new infrastructures and accelerators like the energy conserving MESA
- ...

2) Mastering the **precision challenge**:

- Progress in understanding nature requires highest possible precision measurements, which are currently statistics limited to become effective as the ones concerning processes extremely rare or measurements where the statistical error must be drastically reduced to approach the theoretical uncertainty

3) Mastering the **complexity challenge**:

- Hadron Physics deals with non-perturbative problems. The successful systematic study experimentally and theoretically might very well provide the key for other fields requiring also non-perturbative solutions – like e.g. weather phenomena.

4) Mastering the **data challenge**:

- High-precision measurements require high-statistics data. Additionally, the most interesting data appear in rare processes asking for even more data to be taken. The experiments of the future will therefore deal with an unprecedented amount of data, requiring new analysis techniques, sophisticated pre-processing of data at the trigger level, intelligent and at the same time energy-efficient computer centers.

5) Mastering the **international collaboration challenge**:

- Successful Hadron Physics is done in international collaborations. This opens up the opportunity for young researches and students to spend time in different laboratories of participating countries and gain experience in a foreign research environment.
- Hadron Physics is a priority area for the American Government which is running and extending national laboratories in the field. The new facilities and the new generation of experiments complement nicely the field active in Europe. Therefore we plan a close collaboration between the US authorities (DOE and DOE funded groups) and the HPH participants. Preliminary discussions on how to achieve this have already started. Similar possibilities exist for Japan. Russia is already involved in the FAIR facility.
- Emerging countries like China, India, Thailand and Brazil have recently begun to invest in the field of Hadron Physics by participating e.g. in upcoming research European infrastructures like FAIR and/or building up own facilities. A truly global collaboration and exchange would profit all societies.

6) Mastering the **outreach challenge**:

- Hadron Physics is a fascinating field, which has the potential to draw and bind high-school students and young people into science. A compelling outreach program for the general public with some emphasis on school children should be implemented in HPH.

7) Mastering the **application challenge**:

- Techniques developed for Hadron Physics often have applications in other fields like medicine. Materials for polarized targets act as tracers for dedicated NMR spectroscopy.
- Hadron beams utilizing e.g. antiprotons offer unique possibilities in medical treatments that otherwise cannot be achieved.

The HadronPhysicsHorizon Steering Committee will assess the proposed work packages on the basis of a set of evaluation criteria in order to define the final Proposal.

The most promising, following strictly the EU guidelines, will then continue to an oral presentation. The person who is sending the proposal on behalf of a group (the acting spokesperson) shall also be prepared of orally presenting the proposed activity in a open Plenary Meeting, which shall be held at Bochum University from 26 to 27 November 2013.

► **TECHNICAL REQUIREMENTS FOR SENDING THE PROPOSAL**

Interested participants are invited to send a proposal **using the appropriate template (MS Word format)** which can be **downloaded** at

horizon.hadronphysics.eu

Completed documents must be uploaded on this website in MS-Word format (.doc or .docx) no later than

31st October 2013 at 17:00 CET.

Proposals sent via e-mail shall NOT be considered as validly received.



Ulrich Wiedner



Carlo Guaraldo

for the HadronPhysicsHorizon Steering Committee