

## II. CONTENT OF CALLS IN 2011

### 1.1 Support to existing research infrastructures

#### 1.1.1 Integrating Activities

The aim of *Integrating Activities* is to bring together and integrate, on a European scale, key research infrastructures, in order to promote their coordinated use and development. This will ensure that European researchers have a wider and more efficient access to the high performing research infrastructures they require to conduct their research, irrespective of the location of the infrastructures. The main characteristic of an Integrating Activity will be its capacity to mobilise a comprehensive consortium of several research infrastructures<sup>5</sup> in a given field and other stakeholders (e.g. public authorities, technological partners, research institutions), from different Member States, Associated countries and other third countries when appropriate. An Integrating Activity shall combine, in a closely co-ordinated manner, following the FP6 Integrated Infrastructures Initiatives (I3) model:

- (i) *Networking activities*, to foster a culture of co-operation between research infrastructures and scientific communities and help developing a more efficient and attractive European Research Area;
- (ii) *Trans-national access and/or service activities*, to support scientific communities in their access to the identified research infrastructures;
- (iii) *Joint research activities*, to improve, in quality and/or quantity, the services provided by the infrastructures.

All three categories of activities are mandatory as synergistic effects are expected from these different components. It is recommended that at least one third of the EU contribution is allocated to the transnational access/service activities. Further details about the I3 model are provided in section VII.

Consortia are encouraged, whenever appropriate, to give due attention to international related initiatives, foster the use and deployment of standards, carry out research on impacts of the involved research infrastructures (direct and indirect, on social, environmental and economic levels) as well as of the project itself and build on e-Infrastructure standards and services, when available. Consortia are also encouraged to organise, whenever appropriate, the efficient curation, preservation and provision of access to the data collected or produced under the project.

**Funding scheme:** Combination of *Collaborative Projects* and *Coordination and Support Actions*.

**Expected impact:** Integrating Activities are expected to have a structuring impact on the ERA and on the way research infrastructures operate, evolve and interact with similar infrastructures and with their users. Operators of infrastructures will develop synergies and complementary capabilities in such a way as to offer an improved access to researchers. Likewise, a more co-ordinated approach between infrastructure operators, users and public authorities will enable to optimise the development and sustainable operation of the identified research infrastructures. In addition, a closer interaction between a large number of scientists active in and around a number of infrastructures will facilitate cross-disciplinary fertilisations and a wider sharing of knowledge and technologies across fields and between academia and industry.

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<sup>5</sup> Exceptionally, the consortium may include only one research infrastructure providing access, if this facility is of a truly unique nature. Other participants (e.g. technological partners, research institutions) must be included for the implementation of the other two mandatory categories of activities (networking and joint research).

- **INFRA-2011-1.1.19. Laser sources.** *A project under this topic must provide and facilitate access to the key laser facilities in Europe in the area of high-field science and short-pulse spectroscopy. It should aim to integrate these facilities and resources with a long term perspective. It should also stimulate new scientific activities in view of future new advanced European Laser facilities such as the Extreme Light Infrastructure ("ELI") and the High Power laser Energy Research facility ("HiPER").*

#### *Physics and Astronomy*

- **INFRA-2011-1.1.20. Research Infrastructures for hadron physics: Studying the properties of nuclear matter at extreme conditions.** *A project under this topic must provide and facilitate access to the key research infrastructures in Europe for studying the properties of nuclear matter at extreme conditions. Such a project should in particular aim at new users and new user consortiums across Europe that gear up to prepare experiments at the future Facility for Antiproton and Ion Research ("FAIR"). The project should aim to integrate these facilities and resources with a long term perspective.*
- **INFRA-2011-1.1.21. Research Infrastructures for advanced radio astronomy.** *A project under this topic must provide and facilitate access to the key research infrastructures in Europe for advanced radio astronomy, including Very Long Baseline Interferometry. It should aim to integrate these facilities and resources with a long term perspective. A project under this topic should also stimulate new scientific activities aimed at taking full advantage of new experimental possibilities which will be offered by the future Square Kilometre Array ("SKA") and Atacama Large Millimeter Array ("ALMA").*
- **INFRA-2011-1.1.22. Research Infrastructures for optical/IR astronomy.** *A project under this topic must provide and facilitate access to the key research infrastructures in Europe for optical and infrared astronomy. It should aim to integrate these facilities and resources with a long term perspective. A project under this topic should also stimulate new scientific activities aimed at taking full advantage of new experimental possibilities which will be offered by the future European Extremely Large Telescope ("E-ELT").*
- **INFRA-2011-1.1.23. Research Infrastructures for astroparticle physics: High energy cosmic rays, multi-messenger approach.** *A project under this topic must provide and facilitate access to the key research infrastructures in Europe for multi-messenger astronomy and astroparticle physics. It should aim to integrate these facilities and resources with a long term perspective. A project under this topic should also stimulate new scientific activities aimed at taking full advantage of the possibilities offered by the High Energy Stereoscopic System ("HESS"), the Pierre Auger Observatory, the Major Atmospheric Gamma-ray Imaging Cherenkov Telescope (MAGIC) and the new possibilities which will be offered by the future Cherenkov Telescope Array ("CTA") and Kilometre Cube Neutrino Telescope ("KM3NeT").*

#### **1.1.2 ICT-based e-Infrastructures**

The e-Infrastructures activity supports a number of interrelated topics designed to foster the emergence of new research environments in which 'virtual communities' of scientists and engineers are empowered to share and exploit the collective power of the European ecosystem of scientific and engineering facilities. Such topics in 2011 address the deployment of e-Science environments based on the seamless integration of underlying e-Infrastructure technology layers and services; and the support to advanced data infrastructures building on

## VII. COMPLEMENTARY INFORMATION

### 1. The Integrated Infrastructure Initiative (I3) model

Integrated Infrastructure Initiatives (I3) should combine, in a closely co-ordinated manner: (i) *Networking activities*, (ii) *Trans-national access and/or service activities* and (iii) *Joint research activities*. All three categories of activities are mandatory as synergistic effects are expected from these different components.

(i) *Networking activities*. To foster a culture of co-operation between the participants in the project and the scientific communities benefiting from the research infrastructures and to help developing a more efficient and attractive European Research Area. Networking activities could include (non exhaustive list):

- joint management of access provision and pooling of distributed resources;
- strengthening of virtual research communities;
- definition of common standards, protocols and interoperability; benchmarking;
- development and maintenance of common databases for the purpose of networking and management of the users and infrastructures;
- spreading of good practices, consultancy and training courses to new users;
- foresight studies for new instrumentation, methods, concepts and/or technologies;
- promotion of clustering and coordinated actions amongst related projects;
- coordination with national or international related initiatives and support to the deployment of global and sustainable approaches in the field;
- dissemination of knowledge; internal and external communication;
- promotion of long term sustainability, including the involvement of funders and the preparation of a business plan beyond the end of the project.

(ii) *Trans-national access and/or service activities*.

#### Trans-national access activities

To provide trans-national access to researchers or research teams to one or more infrastructures among those operated by participants. These access activities should be implemented in a coordinated way such as to improve the overall services available to the research community. Access may be made available to external users, either in person ('hands-on') or through the provision of remote scientific services, such as the provision of reference materials or samples or the performance of sample analysis. EU financial support should never exceed 20% of the annual operating costs of the infrastructure to prevent it from becoming dependent on the EU contribution and should not include capital investments. This financial support will serve to provide access 'free of charge' to external users, including all the infrastructural, logistical, technological and scientific support (including training courses, travel and subsistence for users). Access costs will be defined on the basis of 'user fees' related to the operating costs of the infrastructure.

The research infrastructures must publicise widely the access offered under the grant agreement to ensure that researchers who might wish to have access to the infrastructure are made aware of the possibilities open to them. They must maintain appropriate documentation to support and justify the amount of access reported. This documentation shall include records of the names, nationalities, and home institutions of the users within the research teams, as well as the nature and quantity of access provided to them.

The selection of researchers or research teams shall be carried out through an independent peer-review evaluation of their research projects. The research team, or its majority, must

come from countries other than where the operator of the infrastructure is established (when the infrastructure is composed of several research facilities, operated by different legal entities, this condition shall apply to each facility) except in the case of a distributed set of resources or facilities offering remote access to the same services. Only research teams that are entitled to disseminate the knowledge they have generated under the project are eligible to benefit from research services to the infrastructure under the grant agreement. The duration of stay at a research infrastructure shall normally be limited to three months.

*Service activities for Integrating Activities*

To provide access to scientific services freely available through communication networks (e.g. databases available via Internet). Only services widely used by the community of European researchers will be supported. In such case, projects of potential users would not normally be subject to peer review. However, in such cases, the services offered to the scientific community will be periodically assessed by an external board.

*Service activities for e-Infrastructures*

To provide specific research infrastructure related services to the scientific community. This may include (non exhaustive list):

- procurement and upgrading communication infrastructure, network operation and end-to-end services;
- Grid infrastructure support, operation and management; integration, test and certification; services deployed on top of generic communication and computing infrastructures to build and serve virtual communities in the various scientific domains;
- deployment, quality assurance and support of middleware component repositories;
- data and resources management (including secure shared access, global scheduling, user and application support services) to foster the effective use of distributed supercomputing facilities; federated and interoperable services to facilitate the deployment and wide use of digital repositories of scientific information.
- vertical integration of the different services in support of specific virtual research communities, including virtual laboratories for simulation and specific workspaces.

(iii) *Joint Research activities*. These activities should be innovative and explore new fundamental technologies or techniques underpinning the efficient and joint use of the participating research infrastructures. To improve, in quality and/or quantity, the services provided by the infrastructures, these joint research activities could address (non exhaustive list):

- higher performance methodologies and protocols, higher performance instrumentation, including the testing of components, subsystems, materials, techniques and dedicated software;
- integration of installations and infrastructures into virtual facilities;
- innovative solutions for data collection, management, curation and annotation;
- innovative solutions for communication network (increasing performance, improving management, exploiting new transmissions and digital technologies, deploying higher degrees of security and trust) and introduction of new end-to-end services (including dynamic allocation of resources and innovative accounting management);
- novel grid architecture frameworks and policies, innovative grid technologies, or new middleware solutions driving the emergence of high level interoperable services;

- advanced Service Level Agreements and innovative licensing schemes, fostering the adoption of e-Infrastructures and the use of other types of Research Infrastructures by industry;
- innovative software solutions for making new user communities benefit from computing services.

## **2. Evaluation criteria for Integrating Activities and ICT based e-Infrastructures**

### *1. Scientific and/or technological excellence (relevant to the topic addressed by the call) (award)*

- Soundness of concept and quality of objectives
- Progress beyond the state-of-the-art (e.g. improved performance and capacity of the proposed integrated Research Infrastructures and e-infrastructures)
- Quality and effectiveness of the methodology to achieve the objectives of the project, in particular the provision of integrated services.
- Quality and effectiveness of the Networking Activities and associated work plan. The extent to which the co-ordination mechanisms will foster a culture of co-operation between the participants, and enhance the services to the users.
- Quality and effectiveness of the Trans-national Access and/or Services, and associated work plan. The extent to which the activities will offer access to state-of-the-art infrastructures, high quality services, and will enable users to conduct high quality research.
- Quality and effectiveness of the Joint Research Activities and associated work plan. The extent to which the activities will contribute to quantitative and qualitative improvements of the services provided by the infrastructures.

### *2. Quality and efficiency of the implementation and the management (selection)*

- Appropriateness of the management structure and procedures.
- Quality and relevant experience of the individual participants
- Quality of the consortium as a whole (including complementarity, balance, critical mass).
- Appropriate allocation and justification of the resources to be committed (staff, equipment...), by work package and participant.

### *3. The potential impact through the development, dissemination and use of project results (award)*

- Contribution at the European level towards structuring the European Research Area taking into account the EU objective of balanced territorial development for optimising the use and development of the best research infrastructures existing in Europe.
- Appropriateness of measures for the dissemination and/or exploitation of project results and knowledge, for the management of intellectual property and for spreading excellence.
- Contribution to socio-economic impacts, including for promoting innovation and developing appropriate skills in Europe.