Gamma-ray Spectroscopy in Europe

Perspectives in FP7
The FP7: news and opportunities

FP7 – What’s new?

Main new elements compared to FP6:

- Duration increased from 5 to 7 years (except for Euratom FP)
- Annual budget increased significantly
- New structure: Cooperation, Ideas (ERC), People, Capacities, Euratom and JRC activities
- Basic research (~ €1 billion per year): European Research Council
- Funding of research infrastructures
- Flexible funding schemes
- Simpler procedures

Budget distribution 2007-2013

- Developing nuclear fission and fusion capabilities
- Collaboration between industry and academia
- Basic research at the scientific frontiers
- Mobility and career development
- For a knowledge-based European economy (42% research infrast.)

December 2006
Objectives:

- optimise the use and development of the best research infrastructures in Europe.

- give significant contribution to boosting European research potential and its exploitation, as well as to reinforce European research communities.

- The EU actions should stimulate the coordinated development and networking of these infrastructures.

Support to existing research infrastructures: more than 60% of the operational funds
Integrating activities

Support existing research infrastructures:

- aim to provide a wider and more efficient access to and use of the existing research infrastructures.

- aim at structuring better, on a European scale, the way research infrastructures operate, and at fostering their joint development in terms of capacity and performance.

- to develop synergies and complementary capabilities in such a way as to offer an improved access to researchers.

- Likewise, infrastructure operators and users should be in a better position to tackle new or unexpected developments in their field, for instance in relation to state-of-the-art instrumentation, with a more co-ordinated approach.
Integrated Infrastructures Initiatives (I3)

An I3 shall combine:

i. Networking activities

ii. Trans-national access and/or service activities

iii. Joint research activities.

All three categories of activities are mandatory as synergistic effects are expected from these different components.

Next Call: Spring 2008
(2010 and 2012)
FP6: I3-EURONS (2005-2008)

Integrated Infrastructure Initiative of European nuclear structure scientists from 21 countries

8 Transnational Access Facilities:
GSI, UCL-CRC, GANIL, JYU-JYFL, INFN-LNL, ECT*, RUG-KVI, CERN-ISOLDE

11 Joint research Activities:
ACTAR, AGATA, Charge Breeding, DLEP, EXL, INTAG, ISIBHI, LASER, RHIB, SAFERIB, TRAPSEC

8 Networks:
MANET, CARINA, GAMMAPOOL, EWON, NUPECC, PANSI3, SHE, TNET

Total funding: ~15 M€
GAMMAPOOL NETWORK: Coordination of gamma spectroscopy resources

Campaigns running ex-Euroball equipment

Nuclear structure studies 2005-2006

Rising (GSI): fast and stopped beam, g-factor measurements
- until 12/2008

Clara (LNL): neutron rich nuclei, reaction mechanism
- until 12/2007

Jurogam (JYFL): proton-rich and superheavy
- until 6/2008

Newgam (GANIL): Neutron wall + Exogam

AGATA demonstrator

Cluster BGO coincidence system (Liverpool)

Jurogam II

Characterization of detectors for AGATA

Minor requests/loans:
- Oscar, Demon, Exogam
- Hypergamma, Indra

3D Scanning system (GSI)

Cluster BGO coincidence system (Liverpool)
Gammapool
http://gammapool.inl.infn.it

Coordination of the resources for gamma-ray spectroscopy in Europe

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The objective of the GAMMAPOOL network is to improve the coordination of the European resources used for high-resolution gamma-ray spectroscopy and especially the equipment from the EUROBALL spectrometer including complementary equipment. These resources are available to the European nuclear physics community for experimental campaigns at accelerator laboratories offering unique new physics opportunities. The network facilitates novel programmes in gamma-ray spectroscopy of nuclei under extreme conditions.

Through this network, state-of-the-art equipment for gamma-ray spectroscopy is available to European research collaborations that plan to perform world-class experiments in dedicated campaigns at the major research infrastructures. Collaboration meetings are held in order to encourage new collaborations and to discuss and exchange information in the wide European nuclear physics community about novel possibilities arising from the use of the GAMMAPOOL equipment and the scientific achievements.
Gammapool Workshop
ECT*, May 8-12, 2006

Highlights from the gamma-ray campaigns in Europe

General discussion on:
→ Problem of Resources
→ Opportunity for a wider gamma-ray spectroscopy network
Future Network for Gamma-ray Spectroscopy

The objectives will be:

• to provide a common forum for the high-resolution $\gamma$-ray spectroscopy community;
• to promote collaborative ventures between experimental research groups and between experimental and theoretical researchers;
• to strengthen the collaboration with other research communities addressing similar physics questions using different tools;
• to provide the wider community with information regarding potential opportunities at various facilities within Europe;
• to form working groups to address specific tasks where additional expertise is required;
• to ensure transfer of knowledge by organising training activities for young scientists;
• to promote a network of European laboratories for the development of new detection technologies for gamma rays and to repair and maintain detectors;
• to encourage and support interdisciplinary ventures for the use of gamma-ray spectroscopic techniques in other fields (i.e. medicine, security, imaging, mine detection, etc.);
• to promote the transfer of knowledge and technology to society.
How do we want to proceed?

Let's discuss together here

Two main subjects to discuss:

1) to improve and ensure the best use of the equipment in dedicated campaigns and enhance synergies among the research groups on a European scale for frontline research utilizing high-resolution gamma-ray spectroscopy under different experimental conditions. → tomorrow

2) to improve the collaboration between the different institutions to maintain this equipment in good working conditions and to perform R&D on new detectors techniques. → today
What can be funded by FP7?

1) Collaboration meetings
2) Workshops
3) Visits of researchers/technicians (weeks or months)
4) Training activities

Road map

- May 11: decision and writing group for LoI
- June 15: deadline for LoI submission
- Mid September: Presentation (and discussion) at the EURONS/EURISOL Town Meeting, Helsinki
- End 2007: Final version. → EURONS2 writing group.
EURONS

Network Activities

N1 MANET - Management Network  A. C. Mueller (IN2P3- IPNO) / C. Scheidenberger (GSI)
N2 CARINA - Challenges and Advanced Research in Nuclear Astrophysics C. Angulo (UCL)
N3 GAMMAPOOL - Coordination of the resources for gamma-ray spectroscopy in Europe S. Lenzi (INFN Padova)
N4 EWON - East-West-Outreach - European Nuclear Physics Network S. Harissopoulos (NCSR Demokritos) and R. Broda (U-Warsaw)
N5 NuPECC - NuPECC Mapping Studies S. Körner (NuPECC)
N6 PANSI3 - Network for Enhanced Dissemination of Information on Nuclear Research within EURONS H. Leeb (AIAU)
N7 SHE - Transfermium element synthesis, properties and reactions A. Villari (GANIL)
N8 TNET - Network to coordinate the Nuclear Structure and Reaction Theory work J. Tostevin (U-Surrey)

Joint Research Activities

JRA1 ACTAR - Active Target Detectors for the Study of Extremely Exotic Nuclei using Direct Reactions H. Savajols (GANIL) / P. Roussel-Chomaz (GANIL)
JRA2 AGATA - Advanced Gamma Tracking Array W. Korten (CEA)
JRA3 Charge Breeding - Advanced charge breeding of radioactive ions O. Kester (GSI)
JRA4 DLEP - Detection of Low Energy Particles from exotic β-decays O. Tengblad (CSIC)
JRA5 EXL - Exotic nuclei studied with Light hadronic probes N. Kalantar (RUG-KVI)
JRA6 INTAG - Instrumentation for Tagging P. Butler (CERN)
JRA7 ISIBHI - Ion Sources for Intense Beams of Heavy Ions G. Ciavola (INFN-LNS)
JRA8 LASER - Laser techniques for Exotic nuclei Research P. Van Duppen (KU-Leuven)
JRA9 RHIB - Reactions with High-Intensity Beams of exotic nuclei T. Aumann (GSI)
JRA10 SAFERIB - European Joint Research Activity on Radiation Protection Issues related to Radioactive Ion Beam Facilities P. Thirolf (LMU)
JRA11 TRAPSPEC - Improvements and developments of ion traps, spectrometers and detectors for low-energy nuclear physics experiments N. Severijns (KU-Leuven)
Opportunities in the FP7

**Networking activities:** To foster a culture of co-operation between the participants in the project and the scientific communities benefiting from the research infrastructure.

*Could include (non exhaustive list):*

- joint management and pooling of distributed resources;
- development 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;
- provision of consultancy and training courses to new users;
- foresight studies for new instrumentation, methods, concepts and/or technologies;
- promotion of clustering and concertation actions amongst related projects;
- coordination with national or international related initiatives and support to the deployment of global approaches to science;
- dissemination of knowledge;
- internal and external communication.
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 by industry;
- innovative software solutions for making new user communities benefit from computing services.
Evaluation criteria

1. Scientific and/or technological excellence (award)
   • Clarity of the objectives and quality of the concept.
   • Contribution of the overall project to the provision of integrated services and to the coordination of high quality research.

Quality and effectiveness of the co-ordination mechanisms and associated work plan: The extent to which the Networking Activities will foster a culture of co-operation between the participants, and enhance the services to the users.

2. Quality and efficiency of the implementation and the management (selection)
   • Appropriateness of the management structure, the management procedures, and the implementation plan to achieve the objectives of the project. Quality and relevant experience of the individual participants and quality of the consortium as a whole (including complementarity, balance, critical mass).

3. The potential impact (award)
   • Contribution at the European level of the access and service activities towards an improved access to - and use of - the pool of research infrastructures and new opportunities of access and use for researchers from across the EU.
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.

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.
Service activities

To provide specific research infrastructures related services to the scientific community.
This may include:

- **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.

- 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.