

ESGARD Overview

FP6 -- The EU Framework programme

The European Union is launching a new Framework Programme ([FP6](#)). It is a unique opportunity to apply for funding in order to develop a coherent accelerator R&D program for Particle Physics in line with the recent recommendations of ECFA ([ECFA/01/213](#)).

FP6 area of activities are :

1. **Integrating EU Community Research (13345 M \hat{I}). Seven thematic priorities can apply for funding through Network of Excellence or Integrated Project (but subatomic physics is not in the priorities).**
2. **Structuring European Research Area (2605 M \hat{I}).**
3. **Strengthening Foundations of EU Research.**

Area 2 follows the "bottom-up" approach and is consistent with the ESGARD mandates. It is subdivided into the following :

- 2.1 **Research Innovation**
- 2.2 **Human resources, training and mobility (e.g. fellowships and research training networks)**
- 2.3 **Support for Research Infrastructures (655 M \hat{I})**
- 2.4 **Science and Society**

ESGARD is mainly concerned by 2.3 (but also plans to address 2.2 in the near future). Support for research infrastructures is subdivided into 5 domains

- 2.3.1 **Transnational Access (TA), aiming at providing access to single given infrastructure for research teams.**
- 2.3.2 **Integrated (Infrastructure) Activities (IA), supporting integrated provision of infrastructure related services to the European research community (190 + 65 M \hat{I}) -----> CARE**
- 2.3.3 **Communication Networks (e.g. GRID, dense communication)**
- 2.3.4 **Design Studies (DS), concern future European facilities or world-wide significant projects by supporting feasibility studies and technical preparatory work (70 M \hat{I}) -----> DS**
- 2.3.5 **Construction of New Infrastructure (CNI), which is a support towards optimizing the EU nature of key newly approved infrastructure of Europe-wide interest.**

The most relevant categories for accelerator R&D for HEP are IA, DS and to a lesser extent CNI.

ESGARD

ORIGIN :

The European Committee for Future Accelerator (ECFA) is in charge of making recommendations on the long-range planning of European H.E. facilities. Accordingly, ECFA considers accelerator R&D as a very important aspect and a high priority item (report on the “Future of Accelerator-based Particle Physics in Europe” (ECFA/01/213).

In consultation with ECFA the directors of CCLRC, CERN, DAPNIA/CEA, DESY, LNF, IN2P3/Orsay and PSI met on October 8th, 2002, and decided to form the ESGARD (European Steering Group on Accelerator R&D). They asked Roy Aleksan (DAPNIA/CEA) to coordinate this group with the administrative support of the CEA.

MANDATE :

The mandate of ESGARD is to develop a proposal to optimize and enhance the outcome of the Research and Technical Development in the field of accelerator physics in Europe by

- promoting mutual coordination and facilitating the pooling of European resources
- promoting a coherent and coordinated utilization and development of infrastructures
- promoting inter-disciplinary collaboration including industry

This proposal is aimed at preparing and conducting a coherent set of bids to apply for EU funding in the 6th Framework Programme.

MEMBERS :

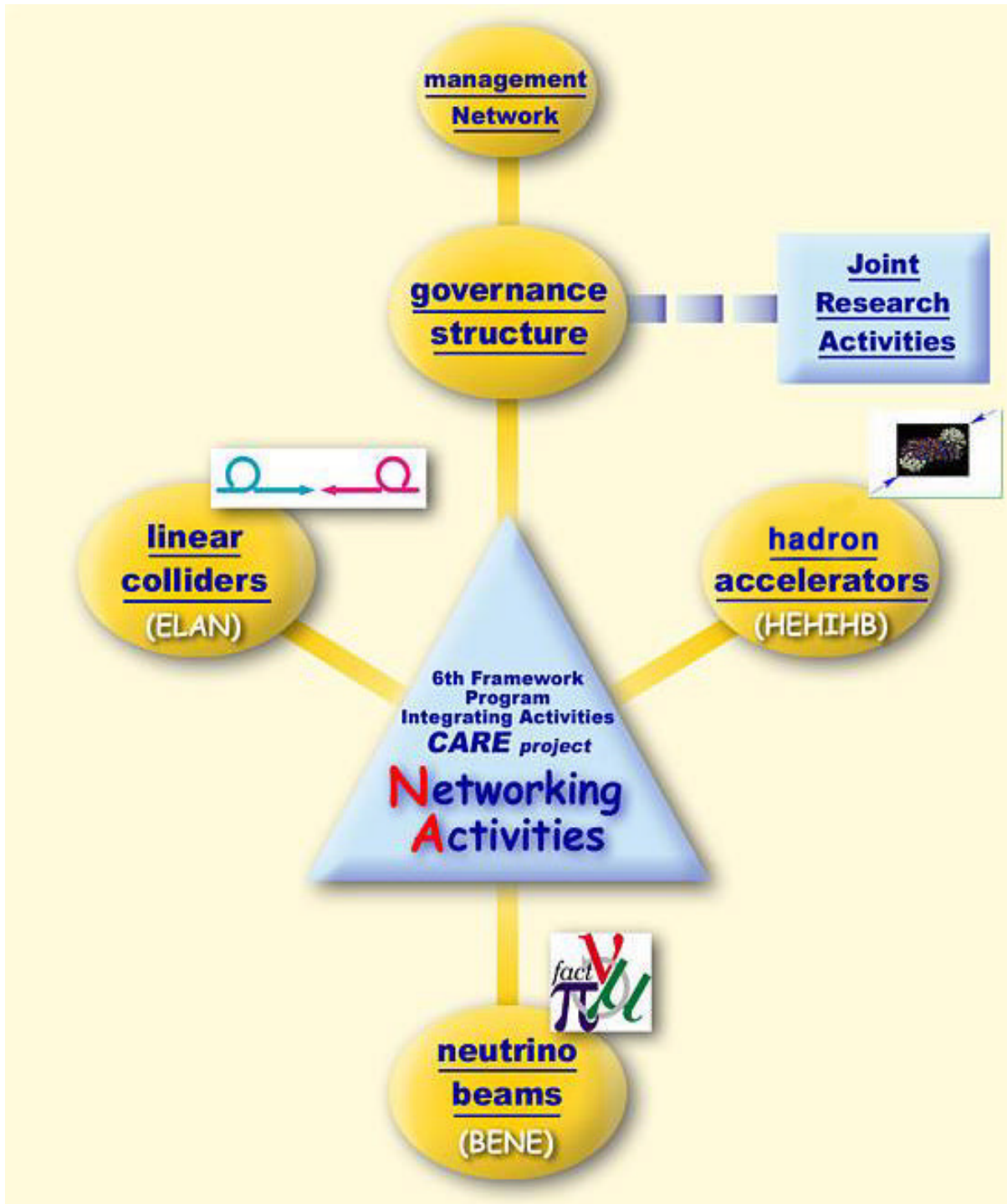
R. Aleksan (Chairman, CEA/DAPNIA), A. Antonelli (LNF), G. Guignard (Secretary, CERN), H. Haseroth (CERN), P. Norton (CCLRC), F. Richard (Orsay/IN2P3), D. Trines (DESY), A. Wrulich (PSI).

RELEVANT ACTIVITIES FOR BIDS

- **Integrated Activities (IA)** contains three parts:
 1. **Networking Activities (NA)** (mandatory), pooling resources among a consortium of participants, financing meetings, workshops, special training courses, travels, management expenses, manpower for web and data bases.
 2. **Transnational Access (TN)** (optional), promoting access to infrastructures through peer review evaluation. Funding is directed to finance parts of operating costs (consumables), travels, subsistence.
 3. **Joint Research Activities (JRA)** (optional), developing high performance and innovative techniques (research) to improve the services provided by existing infrastructures, financing mainly resources and some hardware (perhaps 30%).

- **Design Studies (DS)** are related to future European or World-wide relevant facilities. Our group might be concerned by feasibility studies dealing with conceptual foundation of potential new infrastructures and by technical preparatory work for testing critical components and subsystems.

- **Construction of New Infrastructure** concerns newly approved infrastructures (e.g. LHC) of EU-wide interest, by topping up the projects on particular aspects. The criteria are similar to those for IA.





**N2: Coordination of studies and technical R&D
for electron linear accelerators and colliders**

Acronym: ELAN,

Coordinator: F. Richard (CNRS-IN2P3-Orsay)

12 countries, 54 Institutes, 9 Companies, 380 persons

Main Objectives: Coordination of R&D on electron accelerators at the European level. Evaluating the various technologies for improving the present infrastructures and defining a roadmap for future electron accelerators and colliders, including new techniques of acceleration.

Expected Budget 2004-08	Requested EU Funding
3.8 M€	1.9 M€

CERN request: 280 k€



N3: Beams for European Neutrino Experiments

Acronym: BENE

Coordinator: V. Palladino (INFN-Na)

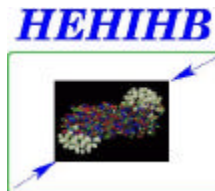
12 countries, 51 Institutes, 204 persons

Main Objectives: The aim of this NA is to coordinate and integrate the activities of the accelerator and particle physics communities working together, in worldwide context, towards achieving superior neutrino beam facilities for Europe.

The final objectives are: 1) to establish a road map for upgrade of our present facility and the design and construction of new ones, 2) to assemble a community capable of sustaining the technical realisation and scientific exploitation of these facilities and 3) to establish and propose the necessary R&D efforts to achieve these goals.

Expected Budget 2004-08	Requested EU Funding
1.9 M€	1.5 M€

CERN request: 150 k€+ 200 k€for a postdoc



N4 : Coordination of studies and technical R&D for high-energy high-intensity hadron beams

Acronym: HEHIHB,

Coordinator: H. Haseroth (CERN)

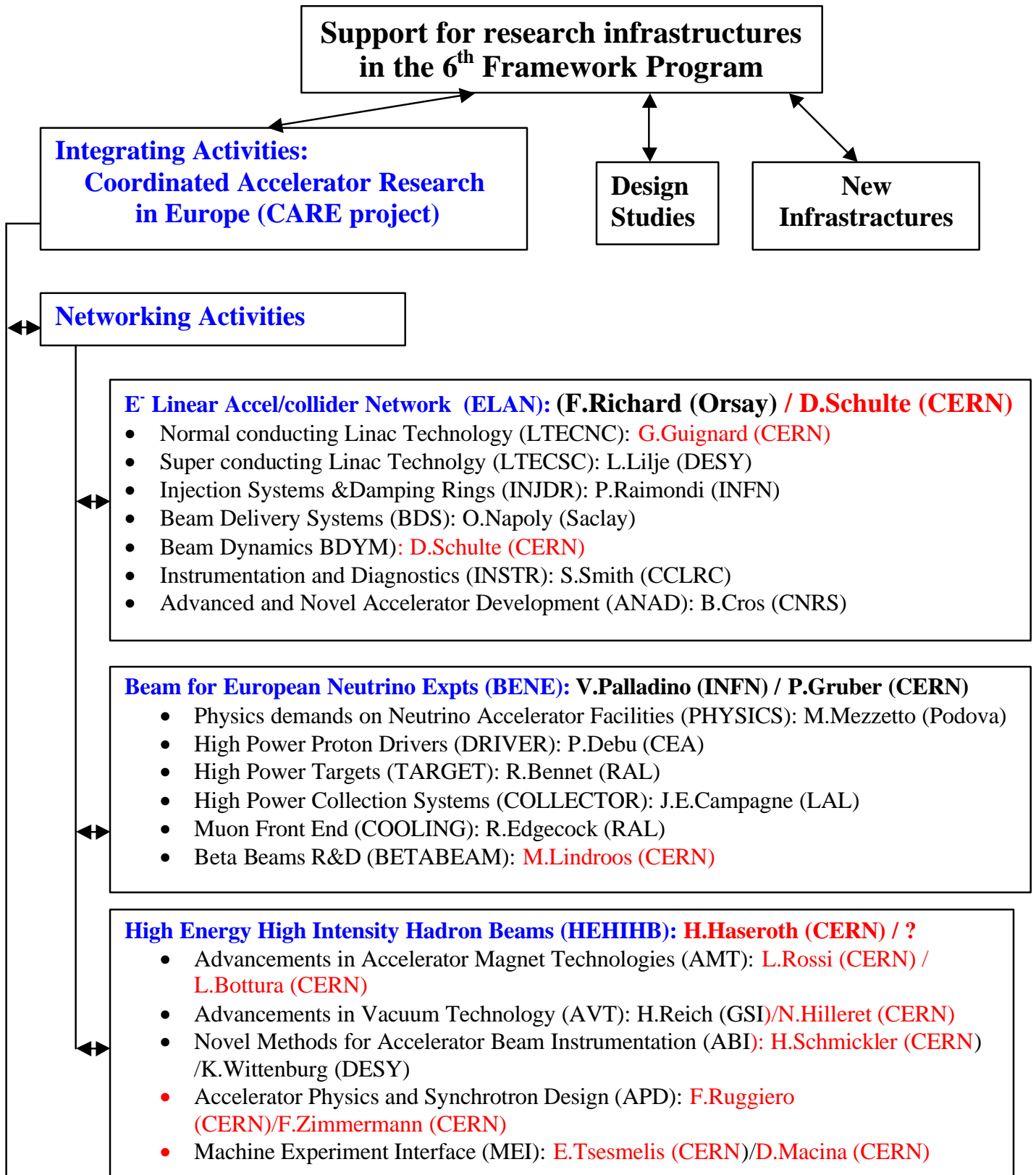
14 countries, 34 Institutes, 380 persons

Main Objectives: Evaluating the various technologies for achieving hadron beams with energies and intensities above those currently at hand and defining a roadmap for the construction for a future hadron collider after the LHC.

Expected Budget 2004-08	Requested EU Funding
1.4 M€	1.0 M€

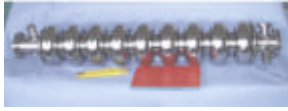
CERN request: 700 k€

ESGARD Networking Activities





JRA1 Acronyme: SRFCAV Coordinator: D.Proch, DESY



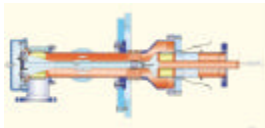
The development of the superconducting cavity technology for the acceleration of electrons with gradient exceeding 35MV/m

6 Laboratories, 4 Companies, 4 Countries

Expected (2004-07): 11.7 M€ (4.6 FC + 7.1 AC),

Requested: 3.8 M€

JRA2 Acronyme: SRFTECH Coordinator: T.Garvey, CNRS



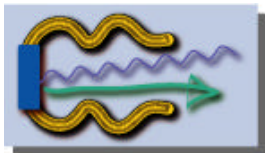
The development of the subsequent necessary superconducting RF technolog (couplers and LLRF).

9 Laboratories, 5 Countries

Expected (2004-07): 6.3 M€ (4.0 FC + 2.3 AC),

Requested: 4.0 M€

JRA3 Acronyme: PHIN Coordinator: A.Ghigo, INFN



An R&D program for improving the technology of photo-injector, in particular to match the severe requirements necessary for demonstrating the 2 beam acceleration concepts

8 Laboratories, 6 Countries

Expected (2004-07): 5.5 M€ (2.7 FC + 2.8 AC),

Requested: 4.0 M€

CERN request 1.24 M€

JRA4 Acronyme: HIPPI Coordinator: R.Garoby, CERN



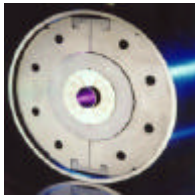
The integrated developments of normal and superconducting structures for the acceleration of very high-intensity proton beams as well as challenging beam chopping magnets

8 Laboratories, 6 Countries

Expected (2004-08): 14.3 M€ (11.6 FC + 2.7 AC),

Requested: 4.0 M€ CERN request 0.71 M€

JRA5 Acronyme: NED Coordinator: A.Devred, CEA



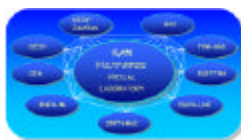
The development and mastering of the technology for reaching high magnetic field ($>15T$) and density currents ($>1500A/mm^2$), with the construction of a large-aperture dipole magnet

7 Laboratories, 4 Companies, 7 Countries

Expected (2004-08): 6.0 M€ (3.3 FC + 2.7 AC),

Requested: 3.9 M€ CERN request 1.22 M€

JRA6 Acronyme: GAN Coordinator: F.Willeke, DESY



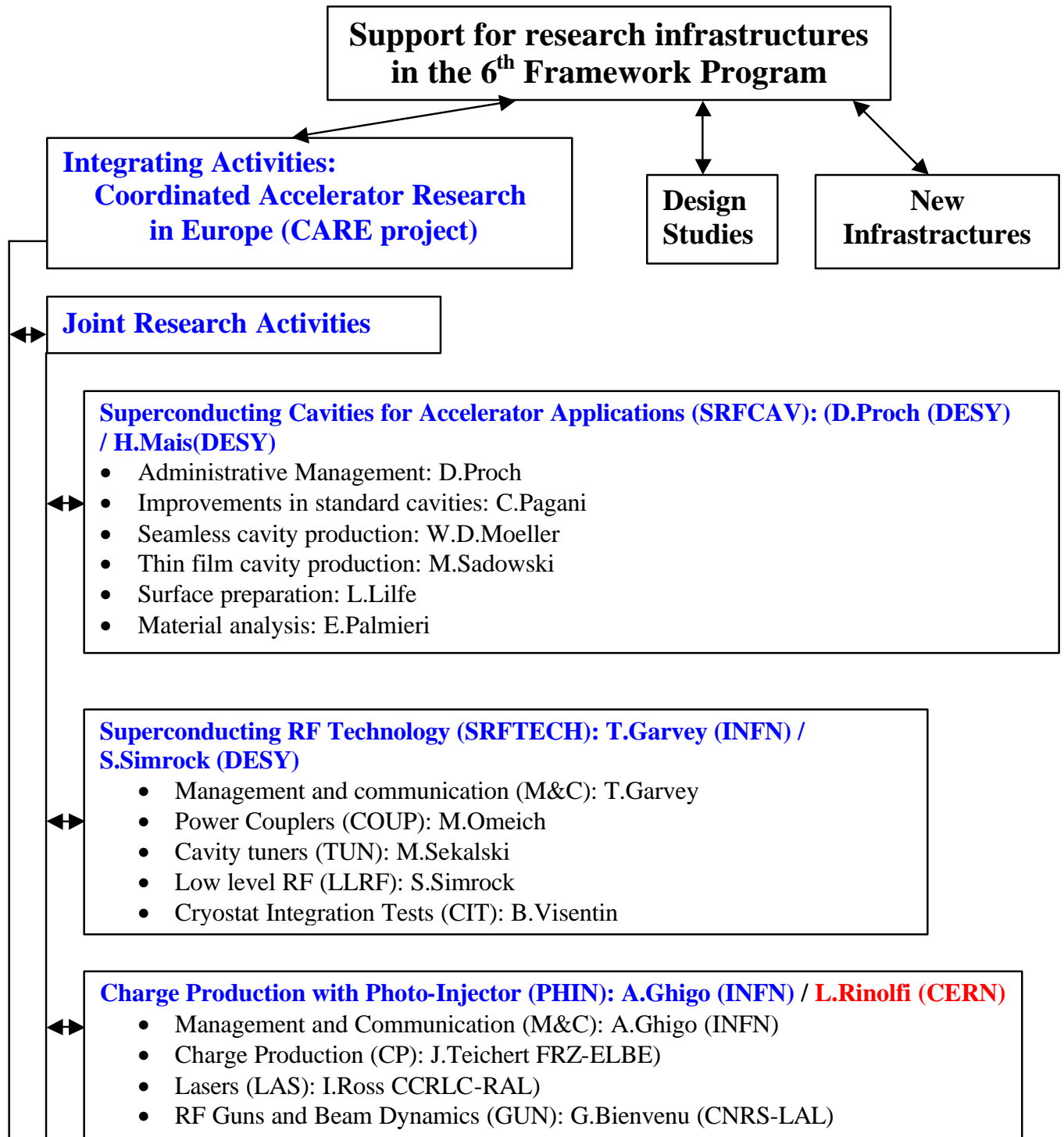
The development, as part of the Global Accelerator Network concept, of a unique tool, the Multi-purpose Virtual Laboratory, allowing one to control and operate various infrastructures remotely

8 Laboratories, 3 Countries

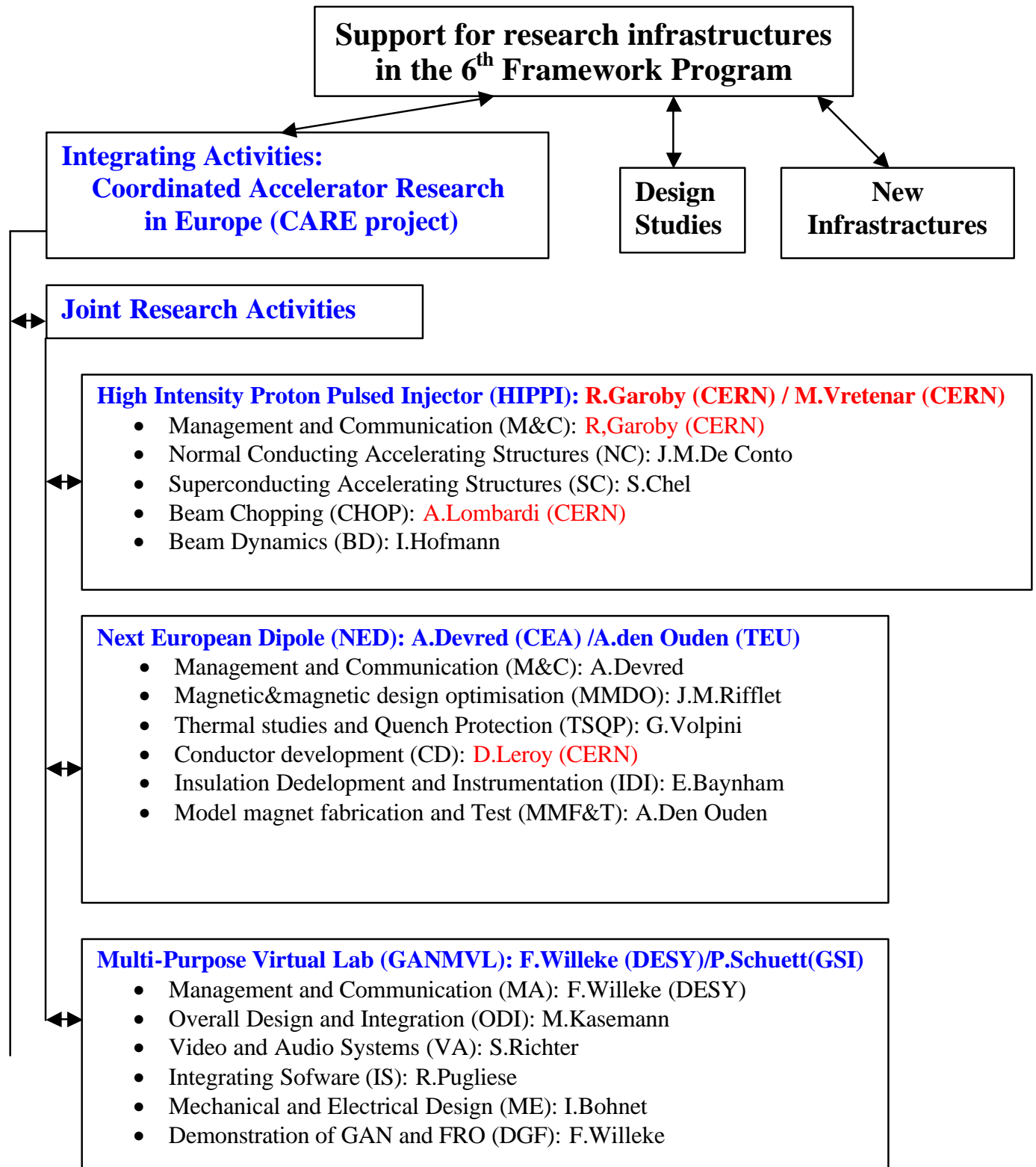
Expected (2004-07): 5.3 M€ (4.1 FC + 1.2 AC),

Requested: 2.8 M€

ESGARD Joint Research Activities



ESGARD Joint Research Activities (continued)



1. Design Study for a Neutrino Factory

DS-list

The proposal shall aim at a Conceptual design Report for a Neutrino Factory. The activities shall include evaluation of the various options for the different sections of the accelerator complex, identification of the R&D required and investigation of possible Technical Preparatory Work bids.

2. Design Study for Light Quark and F Factories at LNF

The proposal shall aim at the study of a light quark factory by increasing the energy reach of DAΦNE as well as at the study of a high-luminosity Φ factory obtained by increasing the currents and the number of bunches, and by squeezing the beam sizes in DAΦNE also.

3. DS for a Staged Approach to a Multi-TeV Linear Collider

The proposal shall aim at a multi-TeV, high luminosity e+e- collider design. Making use of the staged approach possibility, the DS shall elaborate within an international collaboration a path to establish the technical feasibility of the two-beam scheme and to generate a conceptual design. The DS work shall cover the technical developments, prototyping and testing of the critical components and sub-systems.

4. Design Study for a Global Linear Collider

The proposal aims at laying the foundation for a future research facility of world-wide relevance, the Global Linear Collider, with the participation of European organizations. According to ILC SG, a core group should be formed to make an international design based on previous work, but reexamined once a recommendation for the choice of the technology has been done. The DS goal is to form the European branch of this core group. It mentions R&D needed before the construction of a GLC and the design items independent of the technology which are in the scope of the work.

5. Draft of a delayed proposal for an LHC luminosity upgrade

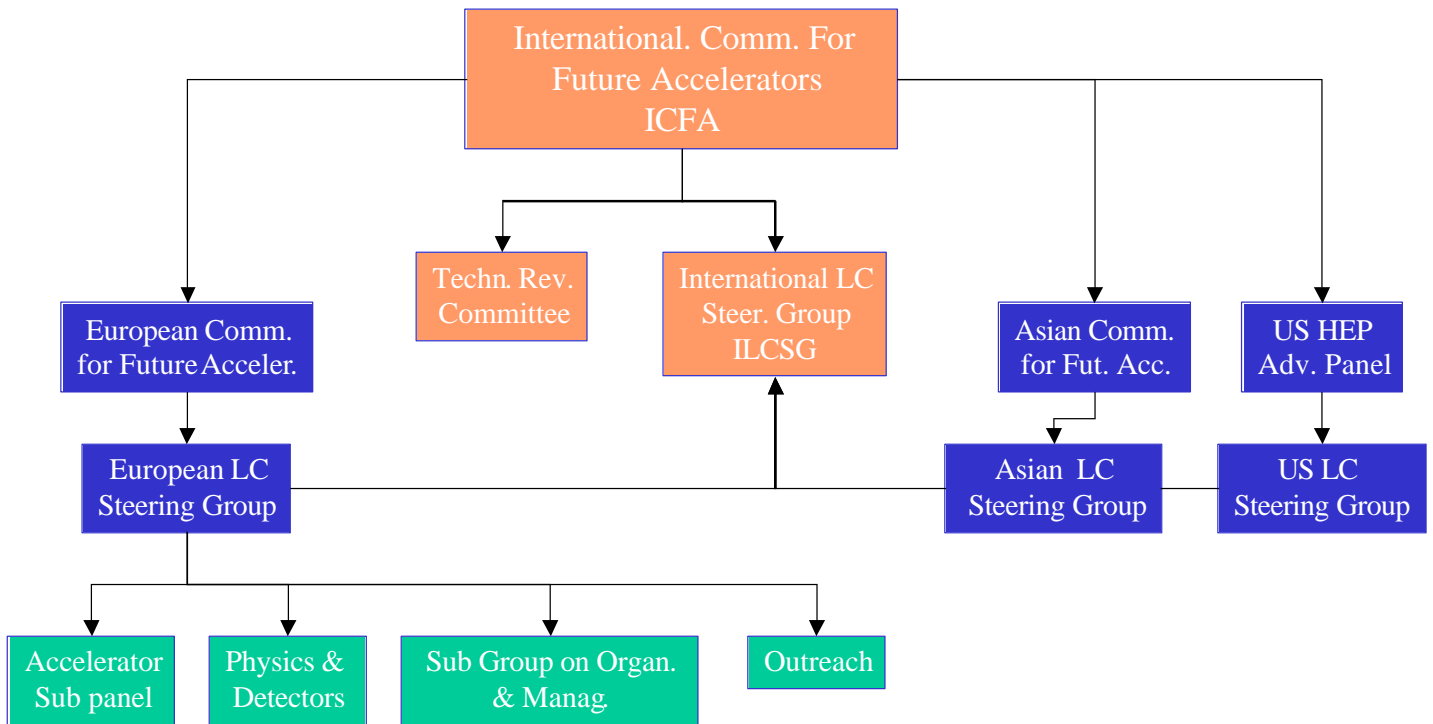
CERN is considering to propose (in 1 or 2 years) a design study for the LHC concerning the luminosity up-grade. This implies the optimisation of the final design of the IR (Intersection Region) and the choice of conventional bunches versus very long bunches. This investigation requires an assessment of intensity limitations in general.

FP6 Milestones

Important dates and EU funds available for the first call
In red, actions concerning ESGARD

Action	Call Date	Total amount available	Bid Deadline	Comments
Transnational Access (TA)	December 17, 2002	190 M€	April 15, 2003	(65 M€a year later)
Integrated Activities (IA)	December 17, 2002		April 15, 2003	Decision: July 18, 2003 If YES, CARE kick-off meeting envisaged Nov. 17-22, 2003
Communication Network Development (CND)	December 17, 2002	50 M€	May 6, 2003	
Design Studies (DS)	October, 2003	70 M€	March 2004	(Dates recently changed)
Construction of New Infrastructure (CNI)	July 1, 2003		March 2004	

The International Promotion Scheme for Linear Collider



International Linear Collider Steering Group (ILCSG)

This committee has been mandated by ICFA to promote the Linear Collider and to coordinate the world-wide activities.

The primary role of the Steering Committee is to promote the construction of an Electron -Positron Linear Collider through worldwide collaboration. In so doing the Committee will give particular attention to Outreach, Science, Technology and Organization of the LC project. The Steering Committee will report to ICFA

Chair: M.Tigner

Planned activity concerning accelerator design:

- set up preliminary international design team (“core team”) by middle of 2003
- set up committee of wise men in (middle?) 2003 who recommend technology in spring 2004 using criteria given by ILCSG
- decision on technology by ILCSG in 2004
- set up international design team

Subcommittees:

-- **Accelerators**

chair: G.Loew, members: Dugan, Raubenheimer, Toge, Yokoya, Yoshioka, Brinkmann, **Guignard¹**, + ??

Activity: in gestation

-- **Physics Committee:**

Worldwide Study of Physics and Detectors for Future Linear Colliders will serve as a sub-committee of the ILCSC to advise ILCSC on important physics and detector matters.

Recent activity: Paper on physics potential of LC.

¹ In red, members from CERN

Charge and Composition of the ILCSCG

Mandate

1. Engage in outreach, explaining the intrinsic scientific and technological importance of the project to the scientific community at large, to industry, to government officials and politicians and to the general public.
2. Based upon the extensive work already done in the three regions, engage in defining the scientific roadmap, the scope and primary parameters for machine and detector. It is particularly important that the initial energy, the initial operations scenario and the goals for upgradeability be properly assessed.
3. Monitor the machine R&D activities and make recommendations on the coordination and sharing of R&D tasks as appropriate. Although the accelerator technology choice may well be determined by the host country, the ILCSCG should help facilitate this choice to the largest degree possible.
4. Identify models of the organizational structure, based on international partnerships, adequate for constructing the LC facility. In addition, the ILCSCG should make recommendations regarding the role of the host country in the construction and operation of the facility.
5. Carry out such other tasks as may be approved or directed by ICFA.

Composition

Directors

KEK: Y.Totsuka SLAC: Jonathan Dorfan DESY: Albrecht Wagner
CERN: Luciano Maiani FNAL: Michael Witherell

LC Steering Group Chairs

Asian: Won Namkung European: Brian Foster N. American: Jonathan Dorfan

Other

Chair: Maury Tigner
China(IHEP Director): Hesheng Chen
Russia (BINP Director): Alexander Skrinsky
ICFA outside LC regions: Carlos Garcia Canal
Asia Rep. : Sachio Komamiya
Europe Rep. : David Miller
N. American Rep. : Paul Grannis

European Linear Collider Steering Group (ELCSG)

This committee has been mandated by ECFA to promote the Linear Collider and to coordinate the European activities.

Chair: B.Foster (ECFA chair)

Subcommittees:

-- Accelerators

chair: R.Brinkmann, members: Walker, S.Smith, Raimondi, Napoly, Garvey, Schulte, Guignard, Hübner¹

Activity: see ESGARD

-- Organisational Matters (SGOM)

chair: G.Kalmus

members: Torsten Akesson , Ian Corbett, Umberto Dosselli, Jos Engelen, Joel Feltesse, Lorenzo Foa, Eva Groniger-Voss¹, Peter von Handel, Kurt Hubner¹, Helmut Krech, Chris Llewellyn Smith, Norman McCubbin, Guy Wormser

Activity: Report on Organisation and Management of a Global Linear Collider Project in preparation. Oral report to ECFA by G:Kalmus in Plenary ECFA meeting on 4 July 2003.

¹ In red, members from CERN

Charge and Composition of the ELCSCG

Mandate

In the short term, the ELCSC should interact with the ICFA working group in the definition of the mandate, size and composition of the ILCSG.

In the longer term, the ELCSC should provide the basis for a coherent European view on a LC by:

- facilitating a common understanding among the European particle physics community of the aims and goals of the LC project in the context of the road map of particle physics as elucidated in the ECFA report on the long-term perspective of particle physics;**
- coordinating a coherent approach to national governments in future political discussions.**

The ELCSC should interface the European view to the ILCSG and work with it in furthering the overall goals of the international LC project.

It should report regularly to ECFA and RECFA on progress and developments.

Composition

- The ECFA chair (B.Foster)**
- The Chair of the ECFA LC physics study group (D. Miller)**
- The Director General of CERN (L. Maiani)**
- The Chairman of the Board of Directors of DESY (A.Wagner)**
- One Director of the other European laboratories active in linear collider work (e.g. in France, Italy, UK) (S. Bertolucci)**
- One other person representing the other European laboratories active in linear collider work (e.g. in France, Italy, UK) (F. Richard)**