Mittuniversitetet

MID SWEDEN UNIVERSITY

An Advanced Radiation Detector Network in Europe

Format of the COST-proposal

Background

- Initiative taken at the Silicon Sensor Alliance Meeting at CERN on September 15
- Preliminary proposal submitted on September 25
- Invitation to submit full proposal on November 16
  - Evaluation score: 18.17 of 20.00 (cut-off at 14:00)
  - We have to improve on science and innovation
  - Still strong competition; around one third of the full proposals will be funded
- Deadline for full proposal on January 15.

Rating of the proposal

- **RIGHT FOR COST?**
  Is COST the best mechanism for achieving the Action's objectives?
  4. Meets all the criteria for COST; no other suitable funding instrument for this proposal.
  3. Generally matches COST criteria, but some changes needed in Full Proposal (to be specified to Applicants)
  2. Not really for COST; another funding instrument would be more suitable (to be specified to Applicants).
  1. Completely unsuitable for COST.
  A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS LOW SCORES IN THE FOLLOWING CRITERIA
- **RATING 3.67**
- ***Parts of the project should be organised by the industries and do not belong to a COST action***

Rating of the proposal

- **SCIENCE**
  Does the proposed Action address real current problems/ scientific issues?
  4: Highly exciting and interesting proposal on a very important and/or timely topic
  3. Interesting proposal on an important topic.
  2. Some interesting aspects, but lacks clarity and/or coherence.
  1. Serious lack of substance and/or relevance
- **RATING 3.50**

Rating of the proposal

- **INNOVATION**
  Is the proposed Action innovative?
  4. Highly innovative: identifies a significant new problem and/or a significant new approach.
  3. Some notable innovative aspects.
  2. Not very innovative: the topic is already well-studied and/or the proposal largely follows a well-trodden approach
  1. Not at all innovative.
- **RATING 3.50**

Rating of the proposal

- **IMPACT**
  Would the proposed network make a significant difference in terms of knowledge, capacity building, social impacts, etc?
  4. Important impacts very likely in several respects.
  3. Some notable impacts likely.
  2. May be some minor impacts.
  1. Unlikely to make any significant impacts.
- **RATING 3.67**

Rating of the proposal

- **PRESENTATION**
  Is the proposed Action presented in a clear and understandable way?
  4. Very clearly written; well argued; makes a compelling case.
  3. Well written; the argument is easy to follow.
  2. Poorly written, but with some effort the argument is clear enough
  1. Poorly written, many errors, disorganised, hard to follow the argument
- **RATING 3.83**

COST

- **COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level. COST contributes to reducing the fragmentation in European research investments and opening the European Research Area to cooperation worldwide.**
  - The goal of COST is to ensure that Europe holds a strong position in the field of scientific and technical research for peaceful purposes, by increasing European cooperation and interaction in this field. This research initiative makes it possible for the various national facilities, institutes, universities and private industry to work jointly on a wide range of Research and Development (R&D) activities.

Sections of the full proposal

- Part A. 1.- Abstract.
  Part A. 2.- Keywords.
  Part B. 1.- General background.
  Part B. 2.- Current state of knowledge.
  Part B. 3.- Reasons for the Action.
  Part B. 4.- Complementarity with other research programmes (if appropriate).
  Part C. 1.- Main/primary objectives.
  Part C. 2.- Secondary objectives.
  Part C. 3.- How will the objectives be achieved?.
  Part C. 4.- Benefits of the Action.
  Part C. 5.- Target groups/end users.
  Part D. 1.- Scientific focus.
  Part E. 1.- Coordination and organisation.
  Part E. 2.- Working Groups.
  Part E. 3.- Liaison and interaction with other research programmes.
  Part E. 4.- Gender balance and involvement of early-stage researchers.
  Part F. 1.- TIMETABLE.
  Part G. 1.- List of the relevant countries.
  Part G. 2.- Include the economic dimension amount.
  Part G. 3.- Additional Information.
  Part H. 1.- Who?.
  Part H. 2.- What?.
  Part H. 3.- How?.
  Part II. A.- List of experts (minimum 5 COST Countries)
  Part II. B.- Additional Information NOT PART OF THE MoU.

Notes on proposal format

- The proposal is written in a web form
  - No figures
  - Almost no formatting
  - The font will always be 12 pt Times
- Strict limits on length of different sections

Part A

- Part A. 1.- Abstract.
  - **A. ABSTRACT** *Maximum 200 words, maximum 5 keywords or very short phrases General remark: Be very clear and precise as this section will form the basis for COST information web site and booklets and reporting!*
- Part A. 2.- Keywords.

Part B1 – 2

- **B. BACKGROUND** *Maximum 2-3 pages up to 2250 words*
  - **B.1 General background**
    - Define the research topic in such a way that it is clear that the network will address real current problems or scientific issues.
    - Inform about the wider relevance of the Action (why is it desirable to launch it as COST Action).
    - Explain why COST, which funds only networking and capacity-building activities and not research, is the best mechanism for support. State reasons why COST seems to offer the appropriate framework for the Action, compared to other research frameworks such as ESF, ESA, EUREKA! or the EU Framework Programme.
    - Describe the advantages or benefits which should arise from carrying out your project within the COST framework.
  - **B.2 Current state of knowledge**
    - Summarise the previous research in the field of the proposal.
    - Describe the current state of the art, including relevant research within the EU Framework Programmes and other EU fora, comparison of EU research with that in other parts of the world.
    - Explain how the Action will be innovative in addressing either a new problem or a new approach to an existing problem.

Part B3 – 4

- **B. BACKGROUND** *Maximum 2-3 pages up to 2250 words*
  - **B.3 Reasons for the Action**
    - Reasons for launching the Action, emphasising immediate and future benefits and envisaged applications (understandable for non-specialists readers!).
    - Indicate whether the Action is mainly aimed at European economic/societal needs, or at scientific/technological advance, or both.
    - Clearly distinguish between objectives, expected results and the means that are needed to achieve them. The impact of COST comes from concrete outcomes, not just activity; so indicate how the Action will aim for maximally productive outcomes.
  - **B.4 Complementarity with other research programmes (if appropriate)**
    - Relevant links to and complementarity with any current and/or planned European research projects, such as ESF, FP, EUREKA! (bear in mind that avoiding duplication is one of the goals of COST)

Part C

- **C. OBJECTIVES AND BENEFITS** *Maximum 2 pages up to 1500 words*
  - **C.1 Main/primary objectives**
    - Standard text as first item of this section (as this sentence will be quoted word for word in point 2 of the Memorandum proper, it should be extremely concise): The main objective of the Action
    - The impact of COST comes from concrete outcomes, not just activity. Therefore indicate clearly what should be achieved through the Action.
  - **C.2 Secondary objectives**
    - List and explain secondary objectives (whenever possible in quantitative terms, which will make it easier to evaluate how well the Action may achieve its goals).
  - **C.3 How will the objectives be achieved?**
    - Distinguish between objectives (aims of the Action) and means needed (manpower, equipment, etc.) to achieve these objectives (avoid any reference to method and means e.g. scientific problems to be solved as well as research tasks as they belong to section D (Scientific programme) detailed below).
  - **C.4 Benefits of the Action**
    - Describe expected benefits (with reference to section B).
  - **C.5 Target groups/end users**
    - Reflect on the likely end users of the expected results.

Part D

- **D. SCIENTIFIC PROGRAMME** *Maximum 3-4 pages up to 3000 words*
  - **D.1 Scientific focus**
    - Describe the most important research tasks to be coordinated by the Action.
    - Provide a structured, but not too detailed work plan flexible enough to permit the inclusion, at the implementation stage, of disciplinary perspectives and activities not foreseen during the preparation of the proposal. Keep the framework of the Action open and flexible.
    - Explain the human and technical means to achieve the objectives described in section C.
    - Remember that this section must be clear to non-specialists (even if the description may be more “technical”).
  - **D.2 Scientific work plan methods and means**
    - Do not mention explicitly the names of individual scientists, specific research institutions or other bodies (only exceptionally, if the Action cannot be implemented without the participation of a specific Institution, you should clearly mention this with the relevant explanation); Always remember that scientists who have not participated in the preparation are also entitled to join if their countries sign the MoU.
    - Focus on work plan and methods of the Action and not on its organisation.
    - If you plan Working Groups, you may mention their objectives and what they will achieve.

Part E

- **E. ORGANISATION** *Maximum 2 pages up to 1500 words*
  - **E.1 Coordination and organisation**
    - Give a clear picture of the management and organisation of the Action.
    - Reflect the fact that a COST Action is implemented through a concerted action, which means that the research is carried out in and financed by the participating countries, while COST provides the necessary co-ordination.
    - Use organisational features common to all COST Actions, but also allow for limited Action-specific variations (e.g. you may want to introduce a Steering Group, an Editorial Board, STSM manager, etc.). Consult “Rules and Procedures for implementing COST Actions”.
    - Mention milestones – major achievements that are crucial to the future direction of the Action.
    - Explain how the coordination of national research will be implemented (including the creation of possible common research teams, conferences and workshops, short-term scientific missions or other exchanges between laboratories, training schools, websites, etc.).
    - Be aware of the obligation to set up an Action specific website that will not duplicate general information already available from the COST website (e.g. signatory list, MC list, etc.) and to keep it updated: Include a plan to keep this website up to date, both to serve the needs of the participants and with the specific aim of ensuring the dissemination or exploitation of the results of the Action.
    - As a rule, do not list names of interested research establishments and scientists.(This will be part of the Additional Information.)

Part E

- **E. ORGANISATION** *Maximum 2 pages up to 1500 words*
  - **E.2 Working Groups**
    - Working Groups are a useful way of extending the Action beyond the membership of the Management Committee and of sharing workloads.
    - An Action has normally 4, but not more than 6 Working Groups.
    - If you plan Working Groups, explain their organisation.
  - **E.3 Liaison and interaction with other research programmes**
    - Address possible liaisons and interaction with other COST Actions and other European and international research programmes, such as ESF, FP, EUREKA!, etc.
    - Indicate how these interactions will be organised: by exchange of information, meetings, by joint seminars or any other means.
  - **E.4 Gender balance and involvement of early-stage researchers**
    - This COST Action will respect an appropriate gender balance in all its activities and the Management Committee will place this as a standard item on all its MC agendas. The Action will also be committed to considerably involve early-stage researchers. This item will also be placed as a standard item on all MC agendas.
    - *Please add any additional support the Action plans concerning gender balance and the involvement of early-stage researchers. Explain how you intend to realise capacity building.*

Part F

- **F. TIMETABLE** *Maximum page up to 500 words*
  - Give a clear picture of the timescale of the Action and an explicit estimate of the total duration of the Action, preferably in the first paragraph. (This estimate will be quoted in the Memorandum proper and will determine the period for which the MoU enters into force.)
  - Bear in mind that the normal duration of a COST Action is normally four years, unless there are specific cases to be approved by the CSO, on the basis of a justification provided in the proposal.
  - Use relative time scales (Year 1, Year 2, etc) rather than specific years.

Part G

- **G. ECONOMIC DIMENSION** *Maximum page up to 500 words*
  General remark: The purpose of this section is to provide an estimate of the total manpower expressed in person-years dedicated to the activities of the Action for each year and the total duration of the Action (Normally, up to 10 person-years per country: 2 per Management Committee and typically 4 Working Groups). An average of 100.000 € per scientist including overhead can normally be used as basis for the calculation. Additional expenses, such as equipment, instruments and/or infrastructure, should be added to the total. Please round up the total to the next full Million.

Part H

- **H. DISSEMINATION PLAN** *Maximum 2 pages up to 1500 words*
  - **H.1 Who?**
    - Identify the target audiences for the dissemination of the results of the Action (in particular findings and recommendations), e.g. other researchers working in the field; other research frameworks; research Institutes and Academia; Standards Bodies; industry (represented by manufacturers and service providers); European level policy makers; Government policy makers, regional planners and policy makers; general public.
  - **H.2 What?**
    - Describe the dissemination methods you intend to use.
    - For each of your audiences you may choose several of the existing possibilities, e.g.
      - posting of general information on a public website;
      - posting of working documents on a password protected website;
      - set up of an electronic communication network (internet discussion forum, e-mail network, etc.);
      - publications: state of the art reports, interim reports, case study reports, proceedings, guidelines, manuals, final reports;
      - events: workshops, seminars and conferences organised by the MC, contributions to other national and international conferences and symposia;
      - articles in peer-reviewed scientific and technical Journals;
      - non-technical publications.
  - **H.3 How?**
    - Describe how these dissemination methods will be used.
    - Note that dissemination goes beyond publication of results.
    - Take into consideration the progress of the Action as well the results of its evaluation in updating the dissemination plan during the course of the Action.

Part II

- **Part II Additional Information** *Maximum 10 pages*
  - *General remark: The main purpose of the second part of the proposal is to facilitate the assessment of the proposal and the nomination of National Representatives to the Management Committee (MC). This part will not be element of the MoU. To some extent, however, the information contained in it may also be useful, when the Action starts and a detailed work programme is being planned. Note that part A (List of Experts) is mandatory as the information given here is important for the later nominations to the MC.*
    The structure of the Additional Information is not standardised and you are at liberty to structure it in any logical way. A suggested guideline is given hereafter under the following subheadings:
  - **A. LIST OF EXPERTS**
    - *Two lists should be submitted. The first is a list of experts who have been consulted during the drafting of the proposal and who have already expressed interest in participating in the Action. The second list, if appropriate, covers those experts who may well be interested but who have not been contacted, or who have not yet replied, during the pre-proposal planning. Please highlight the experts that might be part of the Management Committee (give full contact details). For the others, please list only title, institution and e-mail.*
  - *General remark: The main purpose of the second part of the proposal is to facilitate the assessment of the proposal and the nomination of National Representatives to the Management Committee (MC). This part will not be element of the MoU. To some extent, however, the information contained in it may also be useful, when the Action starts and a detailed work programme is being planned. Note that part A (List of Experts) is mandatory as the information given here is important for the later nominations to the MC.*
    The structure of the Additional Information is not standardised and you are at liberty to structure it in any logical way.
  - **ADDITIONAL INFORMATION**

Assessment criteria

- The assessment criteria contains 14 different topics, essentially following the format of the proposal.
- The formal cut-off is at 40 points out of 56 but to be funded the proposal will need to score far above the cut-off
- The schedule for the continued work is
  - Deadline for full proposal: January 15
  - External experts panel meeting: January 29
  - Domain committee hearings: February 12
  - Domain committee chair consensus meetings: March
  - Final list of new Actions proposals: March 25
  - New Actions approval meeting by Committee of Senior Officials: May 24

OBJECTIVES, DELIVERABLES AND EXPECTED SCIENTIFIC IMPACT

- A successful action will deliver:
  - D1. A well established network between sensor developers, application developers and industry thus addressing the fragmentation in the field and improving the efficiency of the research.
  - D2. Roadmaps for the research and development of the various technologies needed to produce radiation detectors leading to more focussed work and increased scientific quality.
  - D3. A detector manufacturer network capable of supplying the European large research institutes and industry with radiation detectors
  - D4. Opportunities for young scientists to work with academy and industry in the field of radiation detection

OBJECTIVES, DELIVERABLES AND EXPECTED SCIENTIFIC IMPACT

- The expected impact from the action is:
  - Transfer of innovations made at the large research institutes back to the Member States.
  - Decreased development costs and less overlapping research due to coordinated actions
  - Enhanced technology transfer due to the collaboration between academia and industry.
  - Increased business for the industry and access to projects and deliveries not feasible before.
  - Efficient use of scattered production capacity in terms of more resources available
  - Increase in the number of spin-offs through the need of highly skilled market players

SCIENTIFIC PROGRAMME AND INNOVATION

- **WP1 Coordination and network building** This WP will focus on the establishment of the network and common questions around the market, IP and dissemination.
  - T11 Coordination of the network: includes activities to coordinate the different tasks within the network and to make sure that there are working interfaces between tasks and that no overlaps exist
  - T12 Market Outlook: provides the framework to form and discuss a joint vision on the emerging market opportunities. There will be important market opportunities in medical imaging, safety and security, materials research, big science experiments, industrial process control and automation, etc. (Focus on impact)
  - T13 Mapping of intellectual property: is carried out to guide research activities from the intellectual property point of view and to facilitate exploitation of market opportunities. Sharing of IP is promoted as one element in joint exploitation plans.
  - T14 Dissemination: of individual Key Technologies will mostly be implemented through presentations at scientific workshops and seminars. In addition, the COST Activity will be present in various events in Europe and in its Member States. A public internet site will be created.

SCIENTIFIC PROGRAMME AND INNOVATION

- **WP2 Technology roadmap** The roadmap provides the framework to form and discuss a joint vision on the development of novel enabling technologies for radiation detectors. The generic nature of the technologies is highlighted by the fact that the same radiation detectors can be used for experiments at the research institutes and for medical X-ray imaging at hospitals. The work is focused on a number of key technologies which are allocated different tasks within the WP.
  - T21 The sensor chip: is a key element with requirements largely depending on the application. Requirements to be addressed are radiation hardness, sensor thickness, leakage current and noise, uniformity, tiling properties. Production aspects should be taken into account.
  - T22 Readout electronics: is designed by a small number of groups. The high cost has led to formation of consortia inside the big collaborations and independent consortia as the MEDIPIX consortium.
  - T23 Hybridisation: is the connection of the sensor chip to the readout chip typically using bump bonding. The aim in many applications is to make a large area detector with seamless tiling between the modules requiring vertical interconnects through the readout chip. The pre-treatment should be standardised allowing smaller producers to deliver components for hybridisation to manufacturers with high capacity.
  - T24 System integration and packaging: Detectors are often used in large experiments or integrated into large area modules. Specific problems are to supply the unit with power, to communicate with the device, sometimes cool it, and protect it from environmental effects without loosing efficiency. This activity has traditionally been done at institutes but growing size of the experiments requires more efficient production methods that are likely to be found in industry.

SCIENTIFIC PROGRAMME AND INNOVATION

- **WP3 The manufacturer network** The detector market in Europe is dominated by a number of small or medium size companies. In order to appear as a reliable supplier with sufficient capacity, consortia have to be formed between these suppliers where aspects as process compatibility, use of proprietary technologies at second source suppliers and similar questions are addressed. Aspects as interfaces between sensor manufacturing, hybridisation and system integration in a production environment should be addressed. The output of the WP should be a description of a supply chain for radiation detectors with different specifications. The manufacturer network is also responsible for exploitation issues. Is this the reason for the comment of one evaluator?

SCIENTIFIC PROGRAMME AND INNOVATION

- **WP4 Activities for young researchers** It is important to attract new scientists to this rapidly growing field. These activities for young researchers include:
  - Opening up opportunities for master thesis projects at the participating organisations
  - Directed information to students in the relevant academic fields.
  - Promotion of opportunities for exchange of young scientists between the partners.
  - Support for conference participation of young researchers.
  - Organisation of workshops where young scientists present their work .

ORGANISATION

- **Coordination** of the Action is carried out by the Coordinator assisted by a Management Committee (MC) with one participant from each partner. The MC has the overall responsibility for the action.
- **Working groups** (WG) are created for each task. Working group meetings is a practical tool to carry out activities in a coordinated way. The working groups of all tasks in a WP jointly form the Working group for the WP. Working groups report to the Management Committee. Usually 4 – 6 WG per Action
- **Scientific workshops** and seminars are organized approximately twice. These occasions are mostly organized as satellites to other principal meetings, such as the annual IWORID workshop. This is the responsibility of T14.
- **Short Term Scientific Missions** (STSMs) will be launched to support implementation of research on key technologies. Decided by the MC on the initiative from a WG.
- **Training Schools** will be organized to disseminate recent advances on Key Research Activities to speed up uptake of new technologies. This is also an important tool to support young researchers. Responsibility of WP4. Important

Questions

- Which are the scientific challenges in this field?
- How can we describe the aspects of innovation in this field?
- Who is interested to join?