Proposal Evaluation Form

EUROPEAN COMMISSION Horizon 2020 - Research and Innovation Framework Programme		**Evaluation Summary Report**

Call: H2020-MSCA-ITN-2016
Funding scheme: MSCA-ITN-EJD
Proposal number: 721967
Proposal acronym: BigDAPHNE
Duration (months): 48
Proposal title: Big DAta in PHysics NEtwork
Activity: MSCA-ITN-EJD

N.	Proposer name	Country	Total Cost	%	Grant Requested	%
1	UNIVERSITA DI PISA	IT	774,184	19.85%	774,184	19.85%
2	UNIVERSITY COLLEGE LONDON	UK	1,093,152	28.03%	1,093,152	28.03%
3	UNIVERSITA DEL SALENTO	IT	516,123	13.24%	516,123	13.24%
4	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	FR	788,627	20.23%	788,627	20.23%
5	ARISTOTELIO PANEPISTIMIO THESSALONIKIS	EL	727,161	18.65%	727,161	18.65%
	Total:		3,899,246		3,899,246	

Abstract:

BigDAPHNE aims at implementing an innovative and interdisciplinary joint doctorate program realized by synergies of world experts in universities, research institutes and non-academic stakeholders. The scientific objectives address fundamental questions of our universe while the training focuses on the common challenge of Big Data. The search for new phenomena at particle accelerators, deep sky surveys and gravitational interferometers meets the technical challenge of handling and analyzing huge data sets, whose size is steadily increasing since the last decades. Alike trends are observed in data produced from the most diverse sources in society. The ability of managing large data volumes has become a precious skill in many sectors, from business to security, life science and social welfare. The technologies enabling the manipulation and prompt analysis of these data are rapidly changing, therefore up to date competences in these fields are very attractive both for the non-academic and academic stakeholders. We propose a doctorate program to empower researchers in fundamental physics via training in the topics of sustainability and scalability of software projects, Big Data management and analysis techniques. This training program complements a solid training in physics and it will be implemented through structured courses and secondments in companies which are either leaders in big-data technologies or power users of cutting edge data analysis strategies. The courses will be organized and delivered by world experts in the various disciplines assuring a very high quality teaching. Researchers will work in a multi-disciplinary international environment and will gain specific skills on Big Data technologies making them strong candidates for leading roles both in the academic and the industrial sector. BigDAPHNE will contribute to populate the, so far tiny, community of EU data scientists, in answer to a pressing need of society clearly identified by the EU Community.

Evaluation Summary Report

Evaluation Result

Total score: 82.80% (Threshold: 70/100.00)

Form information

SCORING

Scores must be in the range 0-5.

Interpretation of the score:

    0– The **proposal fails to address the criterion** or cannot be assessed due to missing or incomplete information.

    1– Poor. The criterion is inadequately addressed, or there are serious inherent weaknesses.

    2– Fair. The proposal broadly addresses the criterion, but there are significant weaknesses.

    3– Good. The proposal addresses the criterion well, but a number of shortcomings are present.

    4– Very good. The proposal addresses the criterion very well, but a small number of shortcomings are present.

    5– Excellent. The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Criterion 1 - Excellence

Score: **4.10** (Threshold: 0/5.00 , Weight: 50.00%)

Quality, innovative aspects and credibility of the research programme (including inter/multidisciplinary, intersectoral and, where appropriate, gender aspects)
Quality and innovative aspects of the training programme (including transferable skills, inter/multidisciplinary, intersectoral and, where appropriate, gender aspects)
Quality of the supervision (including mandatory joint supervision for EID and EJD projects)
Quality of the proposed interaction between the participating organisations

Strengths
+ The proposed research program is of very good quality, clearly focused and precisely defined.

+ It is timely and credible, as it foresees to handle big data produced by upcoming, already approved experiments (Virgo, Euclid and the upgrade/continuation of the LHC).
+ The proposal is multidisciplinary, since it combines several fundamental research fields and generic data-handling techniques.
+ The training program is very carefully planned, combining academic training, secondments, network-wide thematic 2-week schools, shorter workshops etc.
+ The training program includes transferable skill, which will be beneficial for the careers of the young researchers.
+ The planned synchronous hiring of all the ESRs and timing of all the events is a convincing idea and has the potential to create a positive influence on the young scientists community .
+ The non-academic sector has a strong role in the training program.
+ The supervision measures are adequate and in line with the requests for an EJD. Joint supervision by two institutions and a joint degree are arranged. All ESRs have also a foreseen mentor in the non-academic or academic partners where they will be seconded.
+ All the listed institutions have long-standing experience and high standards in supervision and PhD awarding.
+ The organizational structure of the network guarantees a meaningful and coherent interaction between the participants and partners.
+ The young researchers will be exposed to different research environments, which will be beneficial for their future careers.

Weaknesses
- Data collection, data storage and data analysis are on their own not an entirely original and innovative research program. The proposal does not convincingly describe the originality of the research program with respect to the physics objectives.
- The proposal does not sufficiently describe how a common research program in particle physics, in dark energy and in gravitational waves will be implemented beyond the aim of big data analysis. In particular, it is not clear how PhD students can be involved in so diverse areas while benefitting from the program as a whole.
- Information on the local courses and details on the training during secondments are not clearly specified.
- Some details are missing concerning supervision: e.g. to support the statement in the proposal that adequate supervisors, with complementary expertise, have already been identified for each ESR; e.g. to concertize the actual implementation of the joint supervision (reports, contacts between the two supervisors etc...).
- The potential synergies among the participants (i.e. what can be expected as an added benefit from the existence of the network, beyond actual needs) are not sufficiently addressed in the proposal.

Overall comments

The project proposes a research plan of excellent quality, timely and credible, a very valuable training program and high quality supervision. However, it is not clear what the innovative aspects specific to this project are, within the 'big data' trend, and what federates the different research directions, beyond the common denominator of 'big data'.

Criterion 2 - Impact

Score: **4.10** (Threshold: 0/5.00 , Weight: 30.00%)

Enhancing the career perspectives and employability of researchers and contribution to their skills development
Contribution to structuring doctoral / early-stage research training at the European level and to strengthening European innovation capacity, including the potential for:
a) meaningful contribution of the non-academic sector to the doctoral/research training, as appropriate to the implementation mode and research field
b) developing sustainable joint doctoral degree structures (for EJD projects only)
Quality of the proposed measures to exploit and disseminate the project results
Quality of the proposed measures to communicate the project activities to different target audiences

Strengths
+ The program is extremely relevant and credible in enhancing careers and employability of the formed ESRs. The central tenant is that bright minds are in any case attracted by the fascination of fundamental research in particle physics and cosmology, but permanent positions in academia are scarce and so providing them with highly valued skills like big data handling capability makes them easily employable in a variety of job markets.
+ The proposal clearly spells out the positive impact in academic, non-academic and collateral careers.
+ The proposed network has the potential to establish a sustainable joint doctoral degree in physics among the participating institutions, mainly thanks to the transversal nature of data handling and through the sharing of best practices.
+ The meaningful contribution of the non-academic sector to the training program will potential strengthen the links between the academic institutions and the non-academic communities.
+ There are standard but appropriate plans for dissemination and exploitation of results.
+ A selection of new and innovative methods of communication to different audiences (such as schools, undergraduates and policy makers), appropriate for the project, is proposed.

Weaknesses
- The potential impact on the career of the ESRs with respect to future research projects in other physics domains is not sufficiently addressed in the proposal.
- Some details are missing on the measures to actually implement a sustainable joint degree structure, for instance on how to overcome the stated differences in rules among the institutions.
- Some of the outreach measures are not fully credible (the 'emotional documentary' on the excitement of selected moments of the life of PhD students in data science does not sound very plausible).

Overall comments

The potential impact of the project on ESR careers and on planting the seeds for a sustainable joint PhD program is very high. However, some details are missing in the description of concrete measures.

Criterion 3 - Quality and Efficiency of the Implementation

Score: **4.30** (Threshold: 0/5.00 , Weight: 20.00%)

Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources (including awarding of the doctoral degrees for EID and EJD projects)

Appropriateness of the management structures and procedures, including quality management and risk management (with a mandatory joint governing structure for EID and EJD projects)
Appropriateness of the infrastructure of the participating organisations
Competences, experience and complementarity of the participating organisations and their commitment to the programme

Strengths

+ The work plan is very coherent, with a good balance between fundamental research aspects (WP1 and WP2), applications to industry and research (WP3 and WP4) and collateral tasks (management, dissemination).
+ The deliverables, the milestones and the allocations of tasks are clearly listed in the proposal.
+ There is a well defined management structure, including joint governing structures, with clear composition, dependencies and rules.
+ Special emphasis is put on the recruitment (Admissions Committee) and supervision (ESR Supervision Team, Supervisory Board). A special attention is given to gender aspects, as testified by the balance in the governing bodies in favor of women.
+ In general, the risk assessment plan is well prepared and recognizes almost all the major risks.
+ All the participanting institutions have high quality and absolutely adequate infrastructure.
+ The participating teams are very well experienced within their domain of research. Most groups have experience with previous EU projects.
+ The beneficiaries as well as the partner institutions are highly committed to the network program.

Weaknesses

- The benefit of some of the secondments to industrial partners (e.g. TfL, ENEL) to the training of the ESRs is not sufficiently clear.
- Due to the large number of different tasks, the management of the network is rather complicate and there is the risk that the network will not be run in a very efficient way.
- Progress monitoring lacks specific information on timeline and frequency of monitoring.
- Potential synergies and cooperations among the participating institutions are not sufficiently addressed in the proposal.

Overall comments

The project presents a work plan which is coherent and realistic. The management structures are well thought out. There are however some concerns on secondments, the possible inefficiency of management and the creation of a synergy among the institutions.

Operational Capacity

Status: **Operational Capacity: Yes**

If No, please list the concerned partner(s), the reasons for the rejection, and the requested amount.

Not provided

Exceptional funding of third country participants/international organisations

A third country participant/international organisation not listed in [***General Annex A to the Main Work Programme***](#) ***may exceptionally receive funding if their participation is essential for carrying out the project (for instance due to outstanding expertise, access to unique know-how, access to research infrastructure, access to particular geographical environments, possibility to involve key partners in emerging markets, access to data, etc.). (For more information, see the*** [***Online Manual***](#) ***)***

Based on the information provided in the proposal, we consider that the following participant(s)/international organisation(s) that requested funding should exceptionally be funded:
(Please list the Name and acronym of the applicant, Reasons for exceptional funding and the Requested grant amount.)

Not provided

Based on the information provided in the proposal, we consider that the following participant(s)/international organisation(s) that requested funding should NOT be funded:
(Please list the Name and acronym of the applicant, Reasons for exceptional funding and the Requested grant amount.)

Not provided

Use of human embryonic stem cells (hESC)

Does this proposal involve the use of hESC?

No

If yes, please state whether the use of hESC is, or is not, in your opinion, necessary to achieve the scientific objectives of the proposal and the reasons why. Alternatively, please also state if it cannot be assessed whether the use of hESC is necessary or not because of a lack of information.
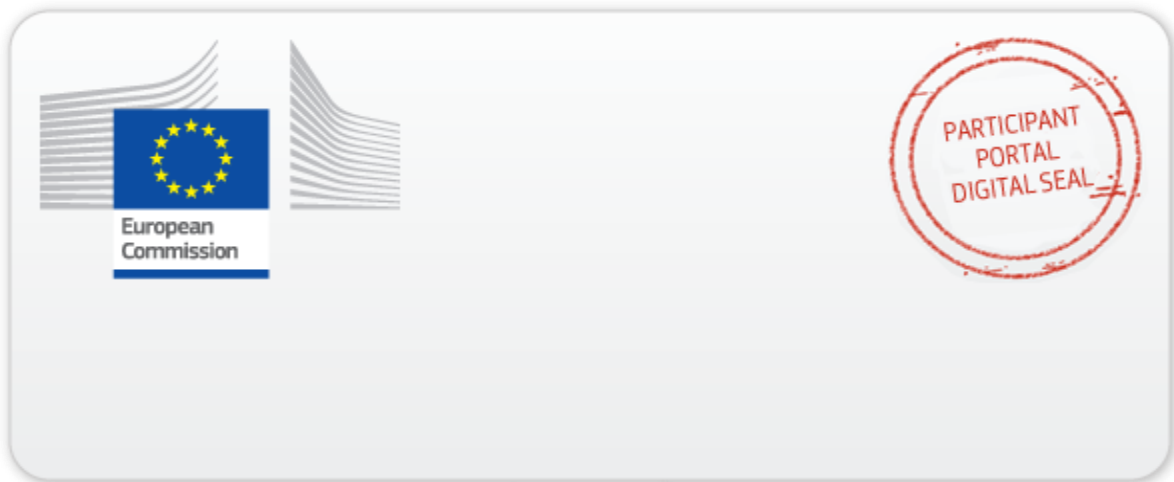
Not provided

Remarks

Approve with reservations?

No

If yes, please specify the reasons:

Not provided

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