"Description of Work" (Annex I)

PART A: CONTRACT DETAILS AND OBJECTIVES

1: **Full Title: Entering the high-precision era of flavour physics through the alliance of lattice simulations, effective field theories and experiment**

Short Title: FLAVIA*net*

2: **Proposal Number: FP6-035482-2**

Contract Number: MRTN-CT-2006-035482

3: **Duration of the project: 48 Months**

4: **Contractors and Places of Implementing the Project**

The Co-ordinator and other Contractors listed below shall be collectively responsible for execution of work defined in this Annex:

The Co-ordinator
1. Universitat de València Estudi General [UVEG] established in Spain.

Other Contractors
2. Universitat Autònoma de Barcelona [UAB] established in Spain;
3. University of Durham [UDUR] established in United Kingdom;
4. Universität Karlsruhe (TH) [UniKarl] established in Germany;
5. Istituto Nazionale di Fisica Nucleare [INFN] established in Italy;
6. University of Silesia [Univ. of Silesia] established in Poland;
7. University of Lund [ULUND] established in Sweden;
8. Centre National de la Recherche Scientifique [CNRS] established in France;
9. Universität Bern [UBERN] established in Switzerland;
10. Universität Wien [UNIWIEN] established in Austria;
11. Stiftung Deutsches Elektronen Synchrotron [DESY] established in Germany.

The Co-ordinator and other Contractors are referred to jointly as "the Consortium".

5: Project Overview

5.1 Overall Objectives

One of the most profound open questions in particle physics is the pattern of fermion masses and mixings, and the source of fermion replication. This is intimately related to the origin of CP violation, which itself has far reaching consequences being the key to understanding the surprising fact that the universe contains more matter than antimatter. Very general theoretical arguments call for the extension of the Standard Model (SM) by new degrees of freedom around the energy scale of 1 TeV, which could generate additional sources of flavour and CP violation. High-precision experiments in flavour physics can indirectly reveal the effects of new particles and interactions through experimental deviations from the Standard Model predictions. Moreover, once new particles are discovered, flavour physics can provide invaluable insight into their couplings and mixing patterns. Interpreting the experimental results in terms of the fundamental dynamics requires precise control of strong interaction effects. This is an area where close collaboration between theory and experiment is essential. Such collaboration is an aim of the network, which puts together the existing European expertise in the areas that are relevant for data analysis. A multidisciplinary approach, combining lattice technologies, effective field theories, higher-order perturbative tools and Monte Carlo event generators, should allow a more efficient use of the experimental data to improve our current understanding of the flavour dynamics, and possibly guide us towards a more fundamental theory. FLAVIA*net* will optimise the training of Europe's young scientific potentials in this area, will coordinate theoretical and experimental research efforts from major European institutes and will create a forum for the scientific exchange among the nodes involved.

5.2 Overall Approach and Methodology

The participating groups, each one with its own specific expertise, bring together a critical mass of theoretical and experimental research ready to be combined in a multidisciplinary framework. The distinctive and innovative feature of FLAVIA*net* comes from the unprecedented level of interplay among three (apparently) separate lines of research, namely: analytic theoretical tools, computer-based methods and data analysis.

FLAVIA*net* will achieve significant progress in several areas of flavour physics thanks to a structure organised in 6 Working Groups (WGs) fostering multidisciplinary exchanges: (1) Kaon physics, (2) B-physics, (3) Tau-charm and quarkonium physics, (4) Analytic approaches to non-perturbative QCD, (5) Lattice methods, and (6) Radiative return and Monte Carlo tools. The first three WGs correspond to particular quark systems, for which theory and experiment will be combined to provide tests of flavour dynamics within and beyond the SM, and to reach an unprecedented level of precision on SM parameters. These WGs will achieve a quantitative understanding of the interplay of strong and weak interactions, and of short- and long-distance effects, and they will be the appropriate forums for efficient exchanges among theorists and experimentalists. The last three WGs deal with tools and methods relevant for these problems. This matrix structure of "thematic" and "technical" WGs exemplifies the interdisciplinary approach of FLAVIA*net*: methods and tools developed in some subfields can be applied successfully to other issues. In addition, young researchers will have the opportunity to discover new domains of research and tools through collaboration on topics involving members of different WGs.

PART B: IMPLEMENTATION

1. Description of the joint Research/Training Project

FLAVIA*net* is organized in 11 nodes, involving outstanding research teams of 58 institutions and 15 different European countries. The chosen structure aims to 1) overcome the existing fragmentation of the field of flavour dynamics by uniting scattered theorists and experimentalists both at the national and international levels; 2) help structuring the European Research Area, by including in a collaborative project several groups from new Member States; and 3) provide a unique and cohesive but flexible framework for the training and professional development of early-stage researchers. The partners have been chosen with regards to the quality of their research, previous international collaboration and with the intention of creating stronger links between geographically distant and related but distinct subfields of flavour physics.

Table 1: FLAVIA*net* node structure

Node	Sc. in charge	Institutions involved
UVEG	A. Pich	UVEG, CSIC, U. Murcia, U. Groningen (Holland)
UAB	S. Peris	UAB, UB, UPC (Barcelona), U. Granada, U. Huelva
UDUR	M. Pennington	U. Durham, U. Oxford, U. Southampton
UniKarl	U. Nierste	TTP, EKP (Karlsruhe), RWTH (Aachen)
		TU, MPI (Munich), U Siegen
INFN	G. Isidori	Frascati, Bari, Bologna, Milano, Napoli, Pisa, Roma (1,2,3)
Univ. of Silesia	H. Czyż	U. Silesia, INP (Cracow), INS, ITP-WU (Warsaw)
ULUND	J. Bijnens	U. Lund, Helsinki IP (Finland), U. Oslo (Norway)
CNRS	S. Descotes-G.	LPT, IPN, LAL (Orsay), CPHT-X, LLR-X (Palaiseau)
		LPT (Strasbourg), CPT, CPPM (Marseille), LPTA (Montpellier)
		Ch. U. Prague (Czech R.)
UBERN	G. Colangelo	U. Bern, U. Lausanne, U. Zürich, CERN
UNIWIEN	H. Neufeld	U. Wien, U. Bratislava (Slovakia)
		U. Ljubljana, Ins. J. Stefan, U. Maribor (Slovenia)
DESY	R. Sommer	DESY (Zeuthen, Hamburg), Humboldt U. Berlin
		U. Bonn, U. Mainz, U. Münster

1.1 Research

In the rich research programme of FLAVIA*net*, we have singled out a series of milestones. The following schedule and tables give an account of these milestones and how the corresponding research effort will be structured among Working Groups and among nodes.

The conveners of the six working groups will coordinate the joint research effort in their different areas of expertise. They will define subgroups devoted to specific topics and establish a detailed schedule of activities and task assignments. At the Annual General Network Meeting, the conveners will provide a detailed report of the progress on the WG topics to the **Scientific Board** described below. These reports will be included in the annual scientific report of the network.

Table 2: FLAVIA*net* Schedule and Milestones [SoC=Start of Contract, m=months].

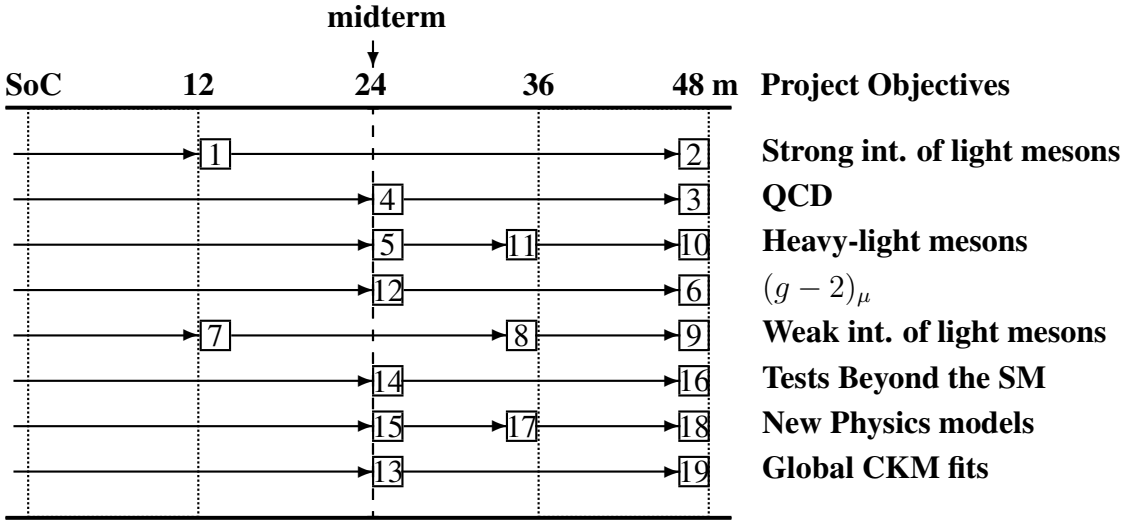

Table 3: FLAVIA*net* milestone tasks, according to Working Groups

Tasks		Working groups					
Strong sector of the Standard Model		1	2	3	4	5	6
1	Low-energy meson-meson interaction	$*$			$\bullet$		
2	Strong chiral low-energy couplings	$\bullet$			$*$	$\bullet$	
3	QCD parameters: m_q, α_s	$\bullet$	$\bullet$	$*$		$\bullet$	
4	Hadron spectroscopy		$\bullet$	$*$	$\bullet$	$\bullet$	$\bullet$
5	Light-cone distribution amplitudes		$*$		$\bullet$	$\bullet$	
6	Hadronic Vacuum polarisation and $(g-2)_\mu$			$\bullet$	$\bullet$		$*$
Electroweak sector of the Standard Model		1	2	3	4	5	6
7	$\lvert V_{us}\rvert$ ($K_{\ell 2}$, $K_{\ell 3}$, τ)	$\bullet$		$*$		$\bullet$	$\bullet$
8	Weak chiral low-energy couplings	$\bullet$		$\bullet$	$\bullet$	$*$	
9	Weak kaon matrix elements, ϵ'/ϵ and $\Delta I = 1/2$	$\bullet$			$*$	$\bullet$	
10	Non-leptonic B and D decays		$*$	$\bullet$	$\bullet$		$\bullet$
11	D and B semi-leptonic form factors		$\bullet$	$\bullet$	$\bullet$	$*$	$\bullet$
12	Radiative corrections in Monte Carlo generators	$\bullet$	$\bullet$	$\bullet$			$*$
13	Global assessment of CKM mechanism	$*$	$\bullet$	$\bullet$			
Physics beyond the Standard Model		1	2	3	4	5	6
14	Rare K and B decays	$*$	$\bullet$		$\bullet$	$\bullet$	
15	$b \to s$ transitions		$*$		$\bullet$	$\bullet$	$\bullet$
16	τ-charm tests of the Standard Model			$*$	$\bullet$	$\bullet$	$\bullet$
17	Supersymmetric GUTs		$*$			$\bullet$	
18	Signals of alternatives to supersymmetry	$\bullet$	$*$		$\bullet$	$\bullet$	
19	Global CKM fits for New Physics models	$*$	$\bullet$	$\bullet$			

Table 4: Task Assignments in the strong sector of the Standard Model

Team	Low-energy meson interactions	Strong ChPT coupl.	QCD parameters m_q, α_s	Hadron spectroscopy	Light-cone distribution amplitudes	Hadronic vacuum polarisation
Spain-V	CSIC	CSIC	UVEG	Murcia		CSIC
Spain-B	UPC	UAB	UAB*	UB		Granada
U.K.	Durham	Southamp.	Southamp.	Oxford	Durham*	
Germany-S			Aachen			UniKarl*
Italy	Frascati		Roma	Milano*		Bologna
Poland	Warsaw			Warsaw		Silesia
Nordic	Lund*	Lund	Helsinki			
France	Prague	Marseille*	Montpellier	Strasbourg	Orsay	Orsay
Switzerland	Bern	CERN	CERN	Bern		Bern
Austria	Bratislava	Wien		Ljubljana		Wien
Germany-N	Bonn	Mainz	Berlin			

Table 5: Task Assignments in the electroweak sector of the Standard Model

Team	$\|V_{us}\|$	Weak chiral coupl.	Weak K matrix elements	Non-lept. B and D decays	D and B semi-lept. form fact.	Rad. Corr. MC	CKM
Spain-V	UVEG	Groningen	Groningen*	UVEG	CSIC	CSIC	UVEG
Spain-B	UAB*	UAB	Granada	UB	UB		
UK	Southamp.		Southamp.	Durham*	Southamp.		Southamp.
Germany-S				Aachen	Siegen	UniKarl	Munich
Italy	Roma	Frascati	Roma	Bari	Roma	Bologna	Frascati*
Poland				Warsaw	Cracow	Silesia*	
Nordic	Lund	Lund	Lund	Oslo			
France	Orsay	Marseille	Marseille	Palaiseau	Orsay		Orsay
Switzerland	Bern	Bern*	CERN	Zürich	CERN		Lausanne
Austria	Wien	Wien		Maribor	Stefan		Ljubljana
Germany-N		Mainz	DESY	Munster	DESY*		Mainz

Table 6: Task Assignments in physics beyond the Standard Model

Team	Rare K and B decays	$b \to s$ transitions	τ-charm tests	SUSY GUTs	Non-SUSY models	CKM
Spain-V	CSIC		UVEG	UVEG	UVEG	
Spain-B	UAB		UAB*	UAB	UAB	
UK	Durham	Durham		Southampton	Southampton	Durham
Germany-S	Munich	UniKarl*	UniKarl	UniKarl*	UniKarl*	Munich
Italy	Frascati*	Roma		Roma	Napoli	Frascati*
Poland	Warsaw	Warsaw	Cracow	Warsaw	Warsaw	
Nordic						
France	Marseille	Orsay	Montpellier		Orsay	Orsay
Switzerland	CERN	Zürich		Zürich		
Austria	Wien	Stefan	Ljubljana			
Germany-N		DESY				

The previous tables show clearly that FLAVIA*net* will coordinate a joint research effort involving contributions from many different people, with different kinds of expertise. For each node, we have indicated the associated participant contributing more to a given milestone. Since the FLAVIA*net* milestones require inputs from different working groups, for each milestone we have indicated with a star the working group leader (working group and partner) responsible for the global coordination.

1.2 Training and Transfer of Knowledge (ToK)

The network as a whole undertakes to provide a minimum of 504 person-months of Early Stage (408) and Experienced (96) Researchers whose appointment will be financed by the contract. Quantitative progress on these appointments, with reference to the table contained in Part C and in conformance with relevant contractual provisions, will be regularly monitored at the consortium level. The network will provide Early-Stage Researchers (ESR) and Experienced Researchers (ER; we will often indicate both categories as YR or Young Researcher in what follows) with:

- Integrated access to the top-level training resources of each FLAVIA*net* node.
- A diversified and cutting-edge training programme in the most advanced techniques of modern quantum field theory and a broad knowledge of particle physics phenomenology.
- A mixed training in experimental and theoretical physics at the international level.
- The benefits coming from participation in a well-structured network that incorporates pre-existing international collaborations and provides opportunities for developing new ones.

The YRs will be included in the research plan and in the training programme of the network, following a well-defined and personal *Career Development Plan*, which will depend on the previous experience and, thus, will in general be different for ESR and ER. Progress in the training will be monitored and supported by the **Training Board** described below. The following levels of the training programme will be implemented:

Table 7: Training measures: 2-to-1 ratio between individual and common training

	Planned activities	Accompanying measures
Individual Training	• Collaboration with team scientists on network projects • Collaboration with other YR on a joint research project with teams supervision • Course work for MSc students	• At least two seminars locally at beginning and end of training • Visits and secondments to other nodes and home institutions • Presentations at Int. Conferences
Common Training	• General Network Meetings (yearly) • Topical Network Workshops • European Flavour Physics School (yearly)	• Talks by young researchers • Involvement in organisation and scientific planning

- **Individual Training.** YRs will be assigned two mentors, a theorist and an experimentalist. Periodic interviews will be organised to build the Career Development Plan, check progress and determine if and how the training needs of the YRs are being fulfilled. This will also provide valuable feedback on the quality of the training schools.

- **Intra-Node Training.** Specialised courses and discussions will be organised in each node in order to allow for an efficient and regular training, with interactions between experimentalists and theorists, among experts in different areas, and between young and senior researchers. The YRs will present their results at local seminars.

- **Inter-node training.** Information on the courses offered to PhD in the different nodes will be collected and made available to the ESRs. Short bilateral visits between node teams for collaboration will be organised and funded by the inviting institution. During such a visit, the invited young researcher will be able to give a seminar presenting his/her activities, in order to spark collaborations between the nodes.

- **Network Training.** Communication and collaboration inside the network will be steered by the network and node coordinators, in collaboration with the Training and Scientific Boards. The YRs will be encouraged to present their results at the regular or topical workshops organised by the Scientific Board, and also at international conferences. An Internet forum for questions and expert answers will be created on the FLAVIA*net* web site to allow for fast and efficient problem solving.

The *Training Programme* will be realised with the *Training Measures* summarised in Tables 7 and 8. At the *Inaugural Network Meeting*, there will be a review of all the current and planned activities; the draft schedule listed in Table 8 will be confirmed, with possible adaptations required by scientific progress in the field. The network-wide training activities are organised in three categories:

- **Annual General Network Meetings.** These meetings are aimed at reviewing new results, ideas and techniques and at providing the researchers with a thorough overview of the status of the domain. They will keep researchers informed of the cutting-edge progress of research both inside the network and in the wider community of particle physics. The YRs will attend these meetings, make presentations at them and help organise sessions.

- **Annual European Flavour Physics Schools.** The Training Board will be proactive in ensuring that one of particle physics schools in Europe is designated the *European Flavour Physics*

Table 8: Network wide training activities.

Period	Activity	Description
Year 1 1st semester	Inaugural Network Meeting Training Workshop	 *Flavour Physics at the LHC*
Year 1 2nd semester	European Flavour Physics School General Network Meeting	*Research School for Young Researchers*
Year 2 1st semester	Training Workshop Training Workshop	*Effective Field Theories* *B-Physics*
Year 2 2nd semester	European Flavour Physics School General Network Meeting	*Research School for Young Researchers*
Year 3 1st semester	Training Workshop Training Workshop	*Flavour Physics Beyond the SM* *Flavour physics from Lattice QCD*
Year 3 2nd semester	European Flavour Physics School General Network Meeting	*Research School for Young Researchers*
Year 4 1st semester	Training Workshop Training Workshop	*K-physics* *Flavour Physics beyond the LHC*
Year 4 2nd semester	European Flavour Physics School General Network Meeting	*Research School for Young Researchers*

School covering the themes of FLAVIA*net*. The network will play a major role in organising these annual schools, targetting not only the YRs of the network, but also PhD students working in related fields in Europe.

- **Topical Training Workshops.** These will be focused on more detailed presentations of specialised topics. The YRs will be expected to attend about half of these workshops, to present their research results and help organise at least one such workshop.

FLAVIA*net* researchers will benefit from the network training activities and will have access to a large body of knowledge through lectures and direct collaborations with the best experts in the field. No local or national research programme in this field could achieve the same impact on the training of YRs. FLAVIA*net* will foster a close collaboration between theorists and experimentalists on well-defined targets, helping to spread new ideas, theoretical progress and most recent experimental results among the network teams. The collaboration of theorists and experimentalists will be particularly important for the development of new ideas for future experiments in flavour physics.

The early-stage and experienced researchers involved in FLAVIA*net* will be trained to acquire a large set of relevant complementary skills, in particular communication skills (preparation and presentation of talks, preparation of publications, team work and project-based plans, IT skills, cultural skills, language courses) and organisational and management skills (organisation and management of network events, leadership skills, responsibility in scientific projects and in the training of younger students). Moreover, the broad physics area covered by the project guarantees an important interdisciplinary component in the training of the YRs, which will be of great help in their future careers. The YRs will become familiar with a large diversity of mathematical tools and methods, will acquire intensive computational skills and will broaden their knowledge of advanced technologies.

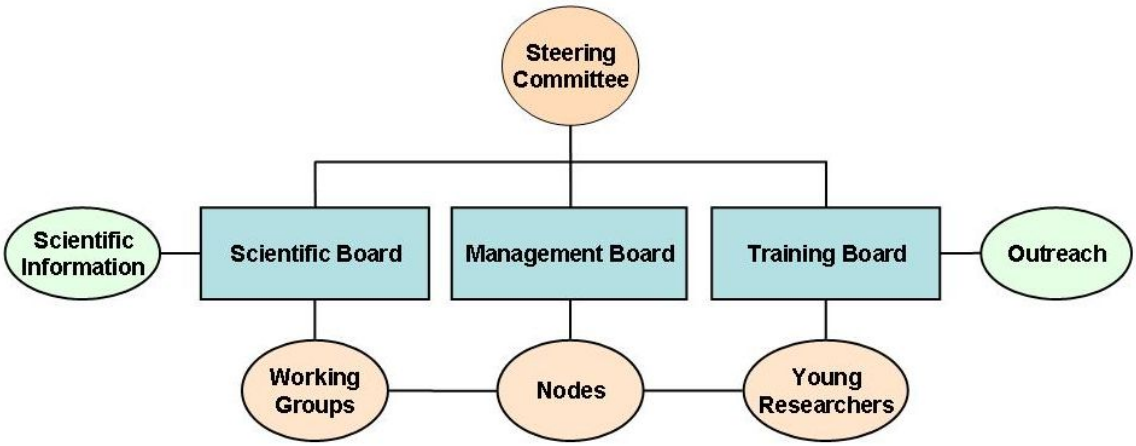

Figure 1: FLAVIA*net* organisational structure

2. Management

The management of FLAVIA*net* is structured to deal with the three different aspects of the network:

- **The Management Board** is responsible for the overall financial management of the whole network. It is formed by the scientists in charge of the nodes, S. Peris (Barcelona), M. Pennington (Durham), U. Nierste (Karlsruhe), G. Isidori (Frascati), H. Czyż (Katowice), J. Bijnens (Lund), S. Descotes-Genon (Orsay), G. Colangelo (Bern), H. Neufeld (Wien) and R. Sommer (Zeuthen), and will be chaired by the *Network Coordinator* A. Pich (Valencia). This board will monitor the distribution of funds among the nodes, will supervise the funding status periodically, and will prepare the network financial reports. The network coordinator will be in charge of the contract negotiations and will report directly to the Management Board. The Management Board will meet regularly, at least twice a year.

- **The Scientific Board** is responsible for monitoring and coordinating the research programme of the network, and for its periodic evaluation. It is composed by all conveners of the six working groups (J. Bijnens, G. Isidori, P. Ball, U. Nierste, N. Brambilla, M. Jamin, M. Knecht, E. Pallante, G. Colangelo, R. Sommer, H. Czyż and J. Kühn), the node coordinators, and several contact persons with relevant experimental collaborations: M. Davier and R. Faccini (BaBar), P. Križan (BELLE), F. Bossi (KLOE), T. Nakada (LHCb) and A. Ceccucci (NA48/P326). It will be chaired by G. Colangelo as the *Research Programme Coordinator*.

  In collaboration with the Training Board, the Scientific Board will organise the annual network meetings and several mini-workshops on specific research subjects which will take place several times each year. It will monitor the research progress towards the objectives of the network and will prepare the scientific reports. U. Nierste will be the *Scientific Information Coordinator*, responsible for the edition of the annual scientific reports and the FLAVIA*net* web site. The Scientific Board will meet regularly, at least twice a year.

- **The Training Board** will be in charge of the network training programme and its periodic evaluation, and it will be responsible for the establishment of adequate advertisement and recruitment procedures for the early-stage and experienced researchers. It is composed of M. Davier

(Orsay), S. Descotes-Genon (Orsay), P. Križan (Ljubljana), P. Hernández (Valencia), T. Mannel (Siegen), C. Sachrajda (Southampton), and chaired by N. Brambilla (Milano) as the *Training Programme Coordinator*. The Training Board will meet regularly, at least twice a year.

In collaboration with the Management and Scientific Boards, the Training Board will be responsible for the organisation of several training activities, including schools, tutorials and courses. It will monitor the progress of each YR through his/her Career Development Plan. The Training Board will also be in charge of promoting outreach activities related with FLAVIA*net*; S. Descotes-Genon will be the *Outreach Coordinator*.

The coordination among these three layers of the FLAVIA*net* organisation scheme will be guaranteed by

- **The Steering Committee.** It is formed by the coordinators of the research and training programmes, scientific information and outreach, M.R. Pennington as the *Network Deputy Coordinator*, and chaired by the network coordinator. This committee will provide to the network coordinator any necessary help in the global management and organisation, and it will be responsible for monitoring the overall progress of the network. In particular, the network deputy coordinator will be responsible for supervising the recruitment process of early-stage and experienced researchers. The Steering Committee will meet regularly, at least twice a year and at other times as often as necessary (sometimes through video-conference).

The University of Valencia, which is a major Spanish higher-education center with a long experience in managing research funds, will be the managing institution. Its central administrative services will receive the EU funding and will distribute it to the different nodes. Then the funds will be directly managed by each node coordinator, on the basis of the planned funds allocation. Each one of the eleven Contractors constituting the Consortium will be fully responsible for the funds and contracts allocated to its node, and will provide the corresponding audit certification. The node coordinators will report directly to the Management Board. In addition to the recruitment plans, the funds distribution will take into account an adequate coverage of the training and outreach activities, and the establishment of a small managing infrastructure (a part time secretarial assistant for administration and web-based services) in the coordinator's host institution.

2.1 Recruitment of early-stage and experienced researchers

Graduate students will be recruited in most of our nodes in order to obtain a PhD in physics for research activities within FLAVIA*net*. Their appointment will be for a period between one and three years. In a few cases, this period could be reduced to less than one year, to support part of a PhD project being carried out in a different institution with other funds. ER appointments will be for two years. The institutes of our network have a long experience in providing training support to ERs, while our research goals offer suitable challenges for their scientific creativity.

All the institutions of the network are equal-opportunity employers, as explicitly stated in all their vacancy announcements. Network ESR and ER positions will be advertised in several ways to reach the largest audience, including e-mails directly addressed to all European high-energy groups and announcements on relevant internet sites (FLAVIA*net* web site, Pan-European Researcher's Mobility Portal). For each position, the selection among the applicants will be done by the members of the node, with a consultative advice of the Training Board to ensure the adequation between the profile of the applicant, the subjects to be studied during his/her appointment, and the global situation of the

network. The Deputy Coordinator will supervise the whole process and will report to the Steering Committee.

Particular emphasis will be put on gender issues and applications from adequately qualified female candidates will be duly encouraged. FLAVIAnet will help promoting women in science in the field of particle physics where they are poorly represented. The Training Board, which is chaired by a female scientist, will pay particular attention to ensure an adequate gender balance in the recruitment process and that gender issues do not interfere with the career plan of female young researchers.

2.2 Networking and dissemination of Results

FLAVIA*net* will make an appropriate use of modern communication technologies to establish a flexible and efficient coordination structure, to facilitate easy and fast interactions among the network members, to guarantee a world-wide advertisement of activities and vacancies, to achieve an optimum international dissemination of the scientific results and to promote adequate outreach activities:

- Network communications will be performed through e-mail exchanges, telephone calls, video-conferences and regular meetings. The frequent organisation of mini-workshops will allow rapid discussion and communication of results on specific topics, and will foster new collaborations. Physicists outside the network will be invited, whenever the coordinators consider their presence important for the scientific objectives. Short-term visits between members of the network, specially young researchers, will be encouraged to enhance the collaboration among the FLAVIA*net* teams.

- The research progress of FLAVIA*net* will be carefully followed. The assessment of the results of all teams, and of the overall progress of the project, will be conducted at the annual meeting of the network, when the future directions of the research programme will be adjusted. These meetings, and the careful analysis of the research results, will be the basis of the yearly report, prepared by the Scientific Board. A maximum diffusion of the FLAVIA*net* outcomes will be given. All scientific results will be posted at the international high-energy physics electronic archives and published in high prestige international journals, including extended reviews whenever this is considered useful. All network documents will be posted in the FLAVIA*net* web server. FLAVIA*net* will put forward a series of outreach activities, under the supervision of the Outreach coordinator.

- The network web server, located at the address http://ific.uv.es/flavianet/, will be the central communication node. The server will advertise network meetings, mini-workshops, schools, and other training activities, as well as the ESR and ER positions offered by the network. It will also post internal reports and will communicate scientific results to the particle physics community. FLAVIA*net* will publish through its web server lectures and presentations at the network meetings and schools.

3. Indicators of Progress and Success

3.1 Quantitative Indicators of progress and success to be used to monitor the project

3.1.1 Research Activities

In reporting on progress with the implementation of its research plan the network will provide information and data on the following:

- Organisation of (or participation in and presentations to) specialized workshops and conferences (number; dates, places, title of event).

- Scientific exchanges among network teams (number, nature, when, where, who).

- Individual and joint publications, directly related to the work undertaken within the contract (number, references).

- Development of new scientific collaborations (number, references).

- Scientific impact of the network results (citations, awards, ...).

- Interest expressed in the network website (number of hits; number of participants to the scientific forum).

- Visits of Senior Researchers from inside and/or outside the network (number, name, place and time of visit).

3.1.2 Training and Transfer of Knowledge (ToK) Activities

In reporting on progress with the implementation of its training and ToK plan the network will provide information and data on the following:

- The rate of recruitment of ESR and ER for each participant and for the network as a whole (ratio of person-months filled/offered).

- The nature and justification for adjustments, if any, to the original overall number of person-months of ESR and ER as well as to the breakdown of this overall number among the participants (see table contained in Part C).

- The time and duration of each individual appointment.

- The number, names and level of involvement of senior researchers directly associated with the tutoring/supervision of the recruited ESR or ER, at each participant.

- The number of ESR that are expected to present their PhD thesis and when.

- The number and place of the short visits and secondments.

- Number of visits of the ESR and ER to their home scientific community.

- Attendance at network meetings by the ESR and ER (number, names, place, date).

- Participation in (and presentations to) workshops and conferences by ESR and ER (number, names, place, date).

- Organisation of training events (e.g. schools, training workshops/seminars) at individual participant sites (number, attendees' names, place, date).

- Organisation of network-wide training events (number, attendees' names, place, date).

- Meetings organised by the ESR or ER themselves (number, place, purpose).

- Participation in training events organised outside the network (number, attendees' names, place, date).

- Number of internet tutorial and computer based training courses developed/used.

3.2 Qualitative Indicators of progress and success to be used to monitor the project

3.2.1 Research Activities

In reporting on progress with the implementation of its research plan the network will provide information and data on the following:

- General progress with research activities programmed at individual, participant team and network level.

- Highlights on more particularly innovative developments (novel concepts, approaches and methods).

- Citation index for individual and joint publications directly related to the work undertaken within the contract.

- Expected scientific breakthroughs.

- Overall progress and possible problems encountered with individual work packages and/or network-wide research activities.

- Nature and justification for adjustments, if any, to the original research work plan and/or timetable.

- Progress on cross interaction among disciplines represented within the network.

- Access to / use of state-of-the-art infrastructure and facilities.

- Highlights on wider societal components of the project, such as public outreach activities.

- Highlights on the scientific community recognition of the network research contribution (awards, invitation to conferences, . . .).

3.2.2 Training and Transfer of Knowledge (ToK) Activities

In reporting on progress with the implementation of its training and ToK plan the network will provide information and data on the following:

- General progress with training and ToK activities programmed at individual, participant team and network level (type of guidance, supervision, coaching or mentoring in place to support ESR and ER).

- Highlights on the development of more particularly innovative approaches to training and ToK (e.g. specific training packages of network-wide relevance).

- Highlights on the exploitation of the "complementarities" between network participants with respect to training and ToK.

- Nature and justification for adjustments, if any, to the original training / ToK plan and/or timetable (e.g. opportunities for new collaborations regarding training activities).

- Career development plans as elaborated by the ESR and ER involved in the project.

- Career development opportunities/prospects for ESR and ER involved in the project.

- Achievements regarding the acquisition of complementary skills such as communication, language skills, computer skills, project management, team building, etc.

- Achievements regarding the training/ToK on specialised instruments/methods.

- Level of satisfaction of the trainees (e.g. as expressed in response to questionnaires).

3.2.3 Management

In reporting on progress with its management the network will provide information and data on the following:

- Effectiveness of the "internal" communication and decision making between the co-ordinator, team leaders, supervisors, down to the ESR and ER, including feedback processes.

- Effectiveness of the communication between the network and the Commission Services (frequency, efficiency, timely feedback's), particularly regarding the conformance with contractual provisions and the implementation of contingency plans where needed.

- Network self-assessment through benchmarking activities (exchange of best practices among participants and/or development of ad hoc performance indicators regarding cost management, staff selection, measurement of research/training/ToK outputs, young researchers' involvement, etc.).

- Overall quality and efficiency of the "external" communication strategy of the network (Cordis; personal, team and network web sites updates; newsletters; etc.).

- Effectiveness of the recruitment strategy of the network in terms of equal opportunities (including gender balance) and open competition at international level.

- Development of any specific planning and management tool(s) and databases.

Contract Preparation Forms

EUROPEAN COMMISSION

6th Framework Programme on Research, Technological Development and Demonstration

Marie Curie Actions :
Research Training Networks (RTN)

A4b

Proposal Number1	035482-2	Proposal Acronym[2]	FLAVIAnet

Overall Indicative Periodic Project Deliverables by Participant

Participant No	Early Stage Researchers			Experienced Researchers (4-10 years)		
	Full-time Person Months	Indicative number of researchers	Type B fellowship (%)	Full-time Person Months	Indicative number of researchers	Type B fellowship (%)
1	0	0	0%	24	1	0%
2	48	4	0%	0	0	0%
3	48	4	0%	0	0	0%
4	12	1	0%	24	1	0%
5	48	3	0%	24	1	0%
6	36	2	0%	0	0	0%
7	36	1	0%	0	0	0%
8	48	2	0%	24	1	0%
9	48	2	0%	0	0	0%
10	36	3	0%	0	0	0%
11	48	2	0%	0	0	0%
Sub-Total	408	24		96	4	

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Marie Curie Actions :
Research Training Networks(RTN)

A5b

Proposal Number1	035482-2	Proposal Acronym[2]	FLAVIAnet

Overall Maximum Community Contribution

Year	Eligible expenses for the activities carried out by the researchers					Eligible expenses related to the activities of the host organisations				Maximum EC contribution
	A Monthly Living Allowance	Transnational Mobility B Travel Allowance	Transnational Mobility C Mobility Allowance	D Career Exploratory Allowance	E Participation expenses of the eligible researchers	F Research/ training/transfer of knowledge	G Management and Audit Certification	H Overheads	I Other types of eligible expenses	
	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	(in euros)
1	81683,06	6000,00	20855,25	16000,00	12400,00	134000,00	20000,18	27093,83	0,00	318032,32
2	639248,76	15000,00	153576,45	30000,00	86800,00	170000,00	52000,00	109462,52	0,00	1256087,73
3	586794,41	9750,00	140183,85	8000,00	78800,00	169000,00	30000,00	99252,83	0,00	1121781,09
4	160074,36	750,00	40870,05	2000,00	23600,00	133000,00	42000,00	36029,44	0,00	438323,85
5	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
6	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Total	1467800,60	31500,00	355485,60	56000,00	201600,00	606000,00	144000,18	271838,62	0,00	3134225,00