##### Work package 3 description: NEU2012: Structuring the accelerator neutrino community

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| **Work package number** | WP3 | **Start date or starting event:** | M1 |
| **Work Package title** | NEU2012 |
| **Activity type** | COORD |
| **Participant id** | **INFN** | CERN | UNIGE |  |  |  |  |  |
| **Person-months per beneficiary:** | 3.6 | 21.6 | 20.6 |  |  |  |  |  |

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| **Objectives:**The “European Strategy for Particle Physics” emphasizes the importance of accelerator-based neutrino experiments, and sets the milestone for the next major undertaking in this field in 2012. The NEU2012 goal is to offer a platform for consolidating the European neutrino community and enhancing collaborative work and exchanges in view of delivering at the end of 2012 an agreed programme of neutrino experiments, based on upgrades of existing infrastructures and/or on the proposal of a new one.Among the possibilities the following will be considered and evaluated:* Upgrade of CNGS (CERN Neutrinos to Gran Sasso, c.f. Table B1.1); understanding of the ultimate upgrade potential (neutrino flux, neutrino spectra, flux monitoring and far detector design and location).
* A new neutrino facility, including a ring, (beta-beam or a neutrino factory complex) offering much higher rate and purer flavour content, allowing for a more ambitious programme of complete determination of the physical quantities governing neutrino oscillations: mass splits, flavour mixings and charge-parity violating phase.

The NEU2012 network should be the forum where the community will discuss the results of the CNGS upgrade studies, the solutions proposed by EuroNu for its beam options, the outcome of international design studies in progress in Japan and USA and of the state of the art R&D projects in progress or being proposed, in particular, in the framework of EuCARD. |

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| **Description of work:****Task 1. NEU2012 Coordination and Communication**The activities of this task are to oversee, co-ordinate the work and do the financial follow-up for all tasks in NEU2012. It shall ensure the consistency of the WP work according to the project plan and coordinate the WP technical and scientific tasks with the tasks carried out by the other work packages when it is relevant. The coordination duties also include the organization of WP internal steering meetings, topical workshops, working sessions and reviews as necessary and contributions to the Annual Meetings. Participants from inside and outside the consortium will be invited. In addition to the coordination work, this task will take responsibility for the production of a final document making the synthesis of the findings of the two other tasks, proposing an agreed programme of neutrino experiments, based on upgrades of existing infrastructures and/or on the proposal of a new one.**Task 2. Getting the most out of existing neutrino facilities**This task will scrutinize the performance of operating neutrino facilities, i.e. of the CNGS in its international context and assess their potential for performance improvement. The parameters of importance are the neutrino flux, neutrino spectra, flux monitoring abilities and far detector design and location. The performance shall be evaluated depending on the evolution of physics needs. A synthesis on the upgrade option will be prepared, including flexibility and risk analysis, to clarify the best upgrade paths.**Task 3. Road map to the next European accelerator neutrino facility**This task will contribute to a synthesis on the European and worldwide research performed on possible future new facilities while surveying the coherence with the physics needs. It will conclude with recommendation for the choice of the next global accelerator neutrino facility, taking into accounts the technological risks and possible synergies with all other programmes worldwide. To fulfil this goal, both the potential of existing accelerators for a new neutrino facility and the new neutrino facility options will be evaluated, using all the results available from all design studies worldwide.The following Institutes have declared their strong interest in the NEU2012 activities: CEA (F), STFC (UK), CSIC (Spain), UCLN (Belgium), UniSofia (Bulgaria), CNRS-IN2P3 (F), CHIPP(CH), MPG-MPIK (D), Crackow U (Poland), UAM (Spain), Imperial (UK). Outside Europe, Osaka U. and KEK (J), FNAL/BNL/LBNL (USA), TIFR (India). |

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| **Deliverables of tasks**  | **Description/title** | **Nature** | **Delivery month** |
| 3.1.1 | NEU2012 Website operational | O | M6 |
| 3.1.2 | Final NEU2012 guidelines for an accelerator neutrino experiments programme | R | M48 |
| 3.2.1 | Performance analysis and physics potential of upgrades of existing neutrino facilities | R | M40 |
| 3.3.1 | Proposal of the next global accelerator neutrino facility for Europe to build or help build.  | R | M40 |

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| **Mile-****stone** | **Description/title**  | **Nature** | **Delivery month** | **Comment** |
| 3.1.1.1 | Calendar of workshops & conferences concerning NEU2012  | O | M6 |  |
| 3.1.2.1 | Intermediate review of NEU2012 recommendations on neutrino experiments | R | M24 | Road map for a programme of neutrino experiments |
| 3.1.3.1 | NEU2012 first annual workshop | O | M12 |  |
| 3.1.3.2 | NEU2012 second annual workshop | O | M24 |  |
| 3.1.3.3 | NEU2012 third annual workshop | O | M36 |  |
| 3.1.3.4 | NEU2012 final annual workshop | O | M48 |  |
| 3.2.1.1 | Intermediate review of NEU2012 recommendations on existing accelerator neutrino facilities. | R | M24 | Road Map for upgrading existing accelerator neutrino facilities |
| 3.3.1.1 | Intermediate review of NEU2012 recommendations on new accelerator neutrino facilities. | R | M24 | Road Map to new accelerator neutrino facilities |