

ECFA Neutrino Review Panel

History:

- Plenary ECFA agreed the terms of reference for the Neutrino Panel at its 87th meeting in Frascati, June 2010

ECFA review panel for: future large infrastructures for neutrino oscillation experiments

Overview:

The ECFA review panel on 'Future infrastructures for neutrino oscillation experiments' will receive the Interim Design Report (IDR) from the International Design Study for the Neutrino Factory (the IDS-NF) and the mid-term report from the EC FP7 EUROnu Design Study. The IDS-NF IDR will cover the physics case for the facility and present the baseline for the accelerator complex and the neutrino detectors. The EUROnu Design Study is addressing future super-beam and beta-beam facilities in addition to coordinating the European Contributions to the IDS-NF. The EUROnu mid-term report will therefore describe the work of the EUROnu collaboration on the physics performance of the various facilities and describe the conceptual design of the accelerator complex and neutrino detectors appropriate to each of the facilities. In the case of the Neutrino Factory, the EUROnu mid-term report is likely to include a review of the IDS-NF IDR in addition to detailed descriptions of the work of EUROnu on the design of the Neutrino Factory.

Terms of reference

The ECFA review panel will note the timescale defined by the Strategy Session of CERN Council for development of the future neutrino-physics programme in Europe [1]. On the basis of the IDS-NF IDR and the EUROnu mid-term report and appropriate presentations from the IDS-NF and EUROnu collaborations, the review panel will:

- Review and comment on the IDR prepared by the IDS-NF collaboration. In particular, comment on:
 - The robustness of the case for high-sensitivity searches for leptonic CP violation and the high-precision measurement of the parameters of neutrino oscillations;
 - The specification of the baseline for the Neutrino Factory accelerator facility and neutrino detectors defined in the IDR;
 - The analysis of cost and schedule presented in the IDR; and
 - The plans of the IDS-NF collaboration for the preparation of the Reference Design Report (RDR) for the facility.
- Review and comment on the mid-term report prepared by the EUROnu collaboration. In particular, comment on:
 - The strengths of the super-beam, beta-beam, and Neutrino Factory facilities in addressing the key issues in the physics of neutrinos in the next decade;
 - The development of baselines for the super-beam and beta-beam accelerator complexes;
 - The development of baseline neutrino detector systems for the super-beam and beta-beam facilities; and
 - The plans of the EUROnu collaboration for the completion of the study and the preparation of a final report in which the performance, cost, and schedule for the implementation of the various facilities is compared.

The ECFA review panel will prepare a written report summarising its conclusions and documenting any comments on the work of, or recommendations for, the IDS-NF and EUROnu collaborations. The panel will report to the Chairman of ECFA and present its conclusions to ECFA as deemed appropriate by the ECFA Chairman.

Once the review of the IDS-NF IDR and the EUROnu mid-term report is complete, it will be necessary to consider how the role of the panel should be revised and whether its mandate should be extended. Consideration of the future role of the panel will need to include assessment of how the review process is received and the needs of the community.

Representation:

While the ECFA Neutrino Panel formally reports to the ECFA Chairman, it is important for the panel to be international in both scope and influence. The panel members must therefore be independent experts of international reputation, covering the necessary expertise in experimental techniques, accelerator science, neutrino detection systems, particle theory and phenomenology, and project management. In addition, the panel should include representatives from international community.

Steps taken since June 2010:

- Nominations for panel members solicited from:
 - ECFA members;
 - Future accelerator-based neutrino community:
 - Specifically via EUROnu Management Board, Nue2012 Workpackage managers, and IDS-NF Steering Group
- Extended discussion of nominees at R-ECFA meeting in Helsinki (October 2010) at which it was agreed that:
 - The panel required expertise in neutrino experimentation, neutrino theory, and accelerator systems. Panel would be composed of three recognised experts in each of these categories, plus a chair person;
 - The panel would be independent, i.e.:
 - Those who would be authors of either the Interim Design Report (IDR) of the IDS-NF or the mid-term report of EUROnu would be deemed ineligible to serve on the panel; and
 - Those who presently served the IDS-NF or EUROnu in an advisory capacity would be deemed ineligible to serve.

Proposed composition of the panel:

- **Chair:**
 - Prof. Francis Halzen (US, Wisconsin)
- **Accelerator specialists:**
 - Terence Garvey (CH, PSI)
 - David Findlay (UK, STFC/RAL)
 - Philippe Lebrun (CERN)
- **Experimental physicists:**
 - Koichiro Nishikawa (JP, KEK)
 - Patrick Decowski (NL, NIKHEF)
 - Ewa Rondio (PL, NSI)
- **Theoretical physicists:**
 - Gianluigi Fogli (IT, INFN/Bari)
 - Pepe Bernabeu (ES, Valencia IFIC)
 - Jukka Maalampi (FI, Jyi)