



Coordinated Accelerator R&D for Neutrinos in Europe

**EUROnu = A High Intensity Neutrino Oscillation
Facility in Europe**

- **Introduction**
- **Aims**
- **Structure**
- **Link to international activities**
- **Increasing contributions/resources**

Introduction

- **Originally:**

- **Number of neutrino related DS for FP6**
- **EURISOL (Beta beam) approved in round 1**
- **Others (e.g. NF) planned for later rounds**
- **2nd & 3rd rounds cancelled by EC!**

- **New plan:**

- **Submit to FP7**
- **But, CERN Strategy Group report in July 06**
- **Made important recommendations for us**



Strategy Group

“.....studies of the scientific case for future neutrino facilities and the R&D into associated technologies are required to be in a position to define the optimal neutrino programme based on the information available in around 2012; Council will play an active role in promoting a coordinated European participation in a global neutrino programme”

- **Crucial R&D for 2nd generation facilities (post T2K)**
- **Include 3 main European candidates:**
 - **CERN to Frejus Super-Beam**
 - **Neutrino Factory**
 - **Beta-Beam**
- **Performance and “cost” comparison**
- **Present outcome to SG**
- **Done in collaboration, not competition**



EURO_v (or EURO_{nu})

- **Created end 2006**
- **15 partners, coordinator STFC**
- **Submitted proposal: May 07; total cost 14.5M€, EC 4.8M€**
- **Outcome: August 07 – ranked first, negotiate for 4.0M€**
- **Project started: 1st September 2008**
- **Duration: 4 years – completion in 2012, as required**
- **Website: <http://euronu.org>**
 - **some information is public**
 - **more interesting stuff requires registration**



Partners



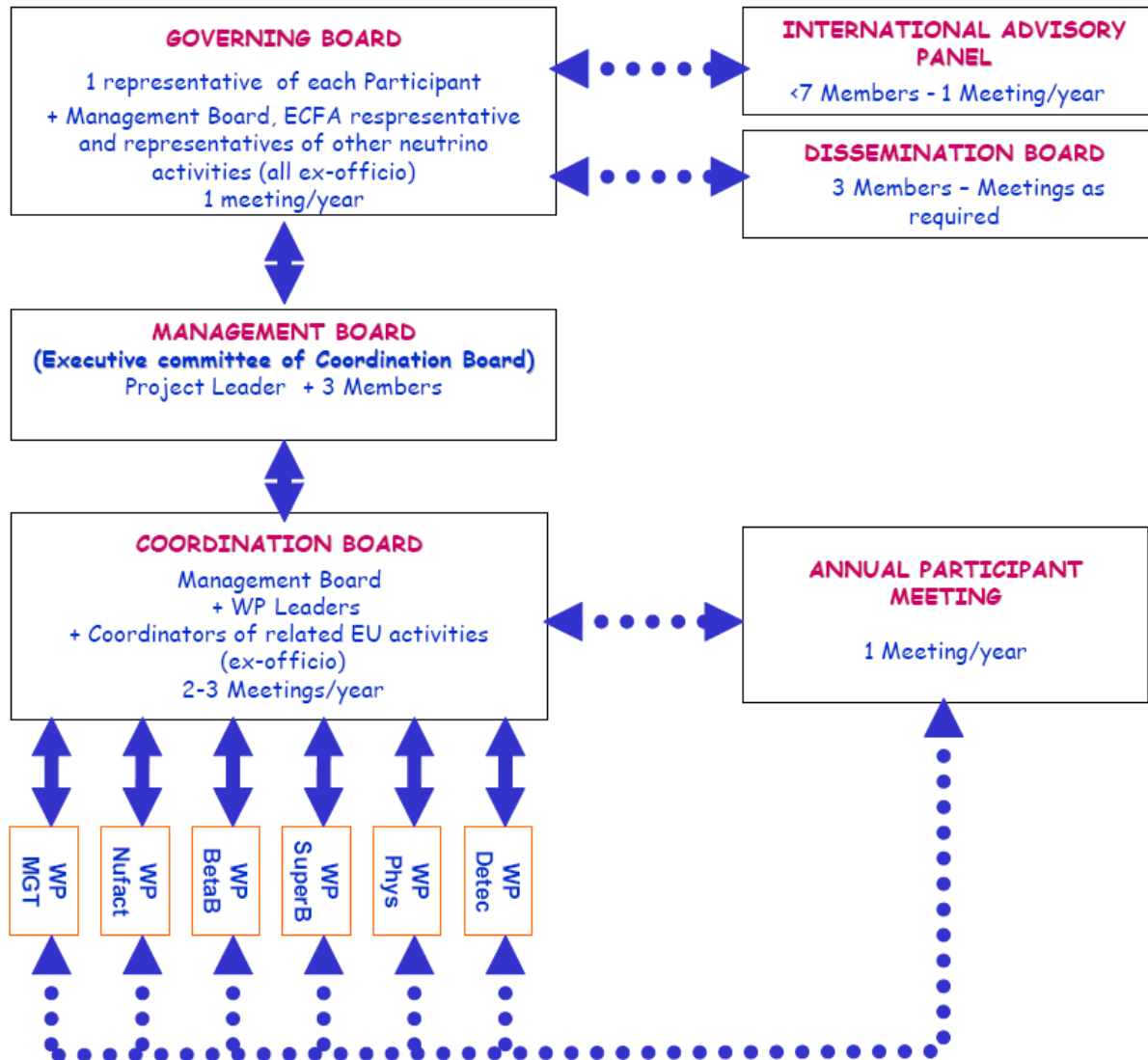
Participant no. *	Participant organisation name	Part. short name	Country
1 (Coordinator)	Science and Technology Facilities Council	STFC	UK
2	Commissariat à l'Energie Atomique	CEA	France
3	European Organisation for Nuclear Research	CERN	Switzerland
4	University of Glasgow	Glasgow	UK
5	Imperial College of Science, Technology and Medicine	Imperial	UK
6	Consejo Superior de Investigaciones Científicas	CSIC	Spain
7	Centre National de la Recherche Scientifique	CNRS	France
8	Cracow University of Technology	CUT	Poland
9	University of Durham	UDUR	UK
10	Istituto Nazionale di Fisica Nucleare	INFN	Italy
11	Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V. (Max-Planck-Institut für Kernphysik, Heidelberg)	MPG	Germany
12	The Chancellor, Masters and Scholars of the University of Oxford	UOXF.DL	UK
13	Sofia University St. Kliment Ohridski	UniSofia	Bulgaria
14	University of Warwick	Warwick	UK
15	Université Catholique de Louvain	UCL	Belgium

Structure

Work package No	Work package title	Type of activity	Lead participant No	Person-months	Start month	End month
1	Management and Knowledge Dissemination	MGT	1	92	1	48
2	Super-Beam	RTD	2	333	1	48
3	Neutrino Factory	RTD	5	282	1	48
4	Beta Beam	RTD	3	295	1	48
5	Detector Performance	RTD	4	199	1	48
6	Physics Reach	RTD	6	206	1	48
	TOTAL			1407		



Management structure



Management structure

- Management Board:**

Coordinator			
Edgecock (STFC)	Dracos (CNRS)	Long (Imperial)	Efthy...los (CERN)

- Coordination Board:**

WP	Coordinator	Deputy
1	Edgecock (STFC)	
2	Zito (CEA)	Densham (STFC)
3	Pozimski (ICL)	Martini (CERN)
4	Wildner (CERN)	Hansen (CERN)
5	Soler (Glasgow)	Cervera (Valencia)
6	Hernandez (Valencia)	Donini (Madrid)

Delivering SG Aims

- **Funding: will deliver EUROnu obligations**
- **Insufficient to meet SG requirements**
- **Being addressed in two ways:**
 - **International collaboration:**
 - associates in EUROnu
 - with IDS-NF
 - with other (mainly EC) projects
 - **Request for additional CERN contributions:**
 - through Nu Panel
 - particular focus on CERN skills/interest

Associate Members

- **Some funding available for travel**
- **Meetings possible at associates**
 - **Aachen, Germany**
 - **Argonne National laboratory, USA**
 - **Brookhaven National Laboratory, USA**
 - **Brunel, UK**
 - **Fermilab National Accelerator Laboratory (FNAL), USA**
 - **GANIL, France**
 - **INO, India**
 - **Institute of Applied Physics in Nizhny Novgorod, Russia**
 - **Joint Institute for Nuclear Research, Dubna, Russia**
 - **Lisbon, Portugal**
 - **TRIUMF Laboratory, Canada**
 - **University of Geneva, Switzerland**
 - **US Neutrino Factory and Muon Collider Collaboration**
 - **Virginia Polytechnic Institute, USA**
 - **Weizmann Institute, Rehovot, Israel**

International Collaboration

- **International Design Study for a Neutrino Factory**
 - **WP3 and IDS Accelerator study: same thing**
 - **full integration between WP5 & 6 and IDS**
- **International Advisory Panel**
 - **Connection with International Activities**
 - **Membership:**
 - Ewart Blackmore (TRIUMF)**
 - Swapam Chattopadhyay (CI)**
 - Steve Holmes (FNAL)**
 - Hitoshi Murayama (Tokyo)**
 - Mike Zisman (LBL) – chair**

Request to CERN

- **Some thought already given to this**
- **Also suggested by IAP**
- **Formal request from Nu Panel**
- **Work in CERN EUROnu Team, on all WPs**

	2010	2011	2012	2013
Accelerator physicist	2	3	3	3
Engineer/technical support	3	4	5	5
Safety expertise	0.5	1	1	1
Costing expertise	0.5	0.5	1	1
Total	6	8.5	10	10



Conclusions

- **Coordinated study for future nu osc facilities**
- **Performance, cost, safety, risk comparison**
- **Deadline 2012 – that's when we finish anyway!**
- **Official part of CERN Strategy**
- **Close international collaborations**
- **Additional resources required to do complete job**
- **Step after EUROnu:**
 - ESFRI Roadmap**
 - Preparatory Phase for new facility**