



EURO ν

A High Intensity Neutrino Oscillation Facility in
Europe

- Introduction
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- Tasks
- Link to other activities
- Future dates



Introduction

- Original plan:
 - Submit NF DS proposal to FP6
 - Were to be 3 rounds of DS; NF proposal to 2nd
 - 2nd & 3rd rounds cancelled by EC!
 - EURISOL approved in round 1
- 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



EUROv (or EUROnu)

- 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€
- Negotiations slow, but complete!
- Project started: 1st September
- Duration: 4 years – completion in 2012, as required
- GA signed
- EC funding: any day now



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 Cientificas	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



Associates



- Some funding available for travel
- Meetings possible at associates
 - Argonne National laboratory, USA
 - Brookhaven National Laboratory, USA
 - Fermilab National Accelerator Laboratory (FNAL), USA
 - Institute of Applied Physics in Nizhny Novgorod, Russia
 - Joint Institute for Nuclear Research, Dubna, Russia
 - TRIUMF Laboratory, Canada
 - University of Geneva, Switzerland
 - US Neutrino Factory and Muon Collider Collaboration
 - Virginia Polytechnic Institute, USA

 - Aachen, Germany
 - Weizmann Institute, Rehovot, Israel



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		

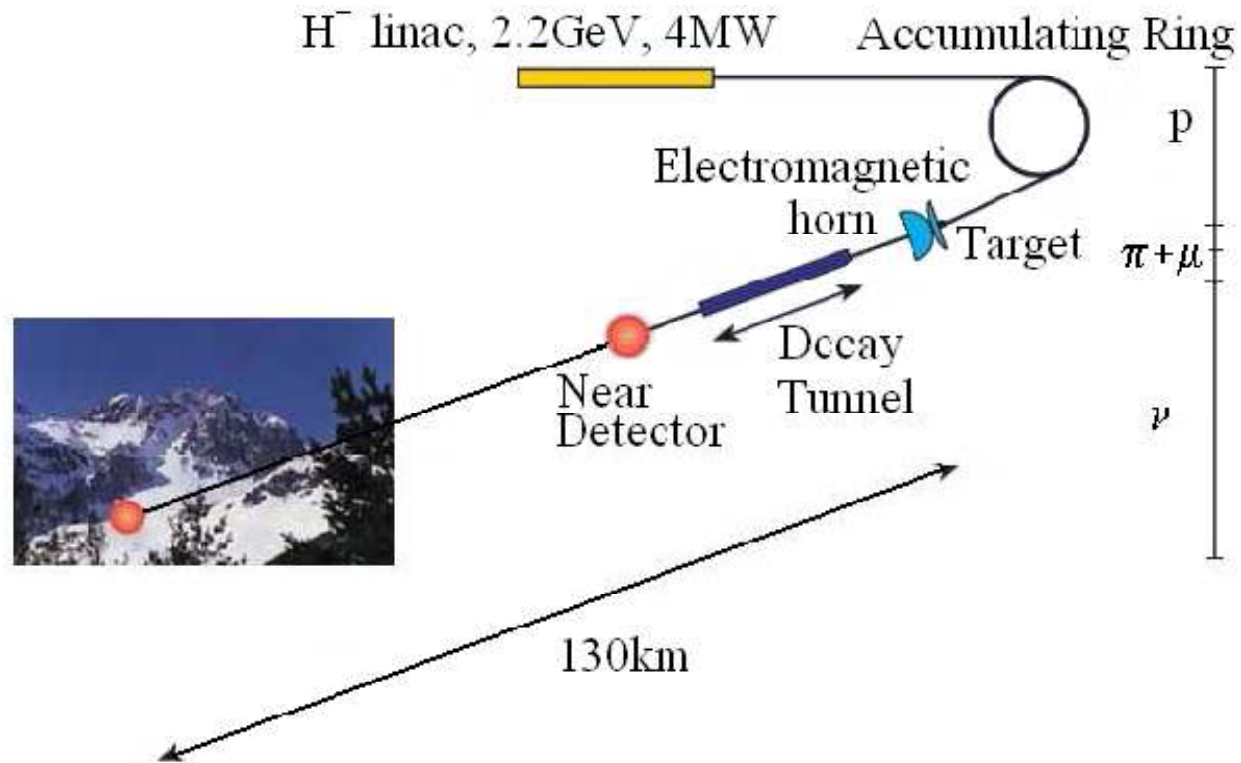


Management Tasks

- Coordination:
 - day to day admin
 - delivery of final report (Design Reports for SG)
- Oversight:
 - day to day scientific monitoring
 - delivery of milestones and deliverables
- Knowledge management
- Comparison:
 - definition of comparison criteria:
physics performance, cost, safety
 - comparison for final report



Super-Beam Tasks



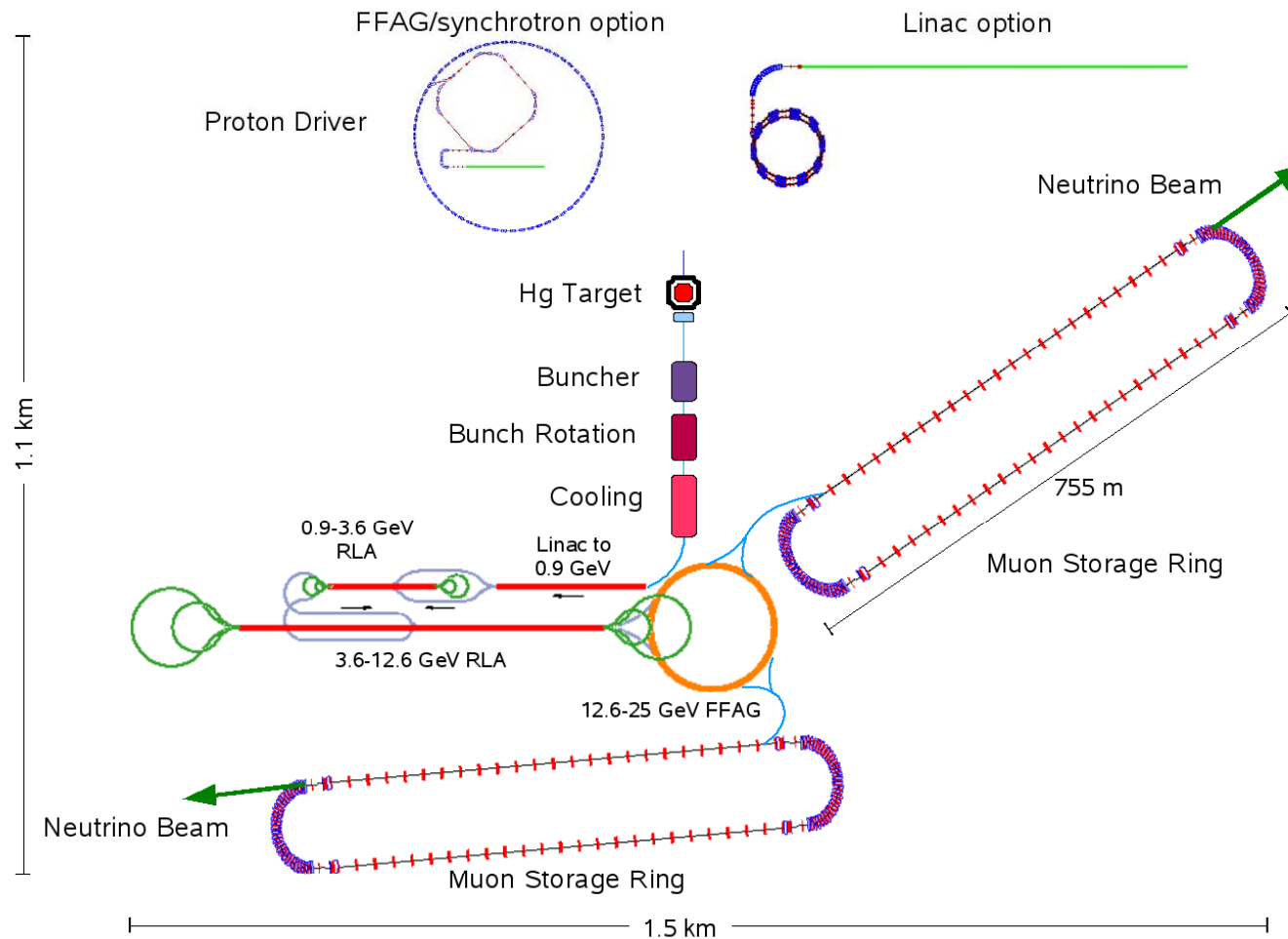


Super-Beam Tasks

- Proton driver:
 - 4MW SPL – work only on special requirements
- Target:
 - preferred solutions for SB and NF
 - study of hadro-production for optimal geometry
- Pion Collection:
 - horn design
 - pulsing system
- Target/horn integration + target station
- Neutrino beam characteristics for physics studies



Neutrino Factory Tasks



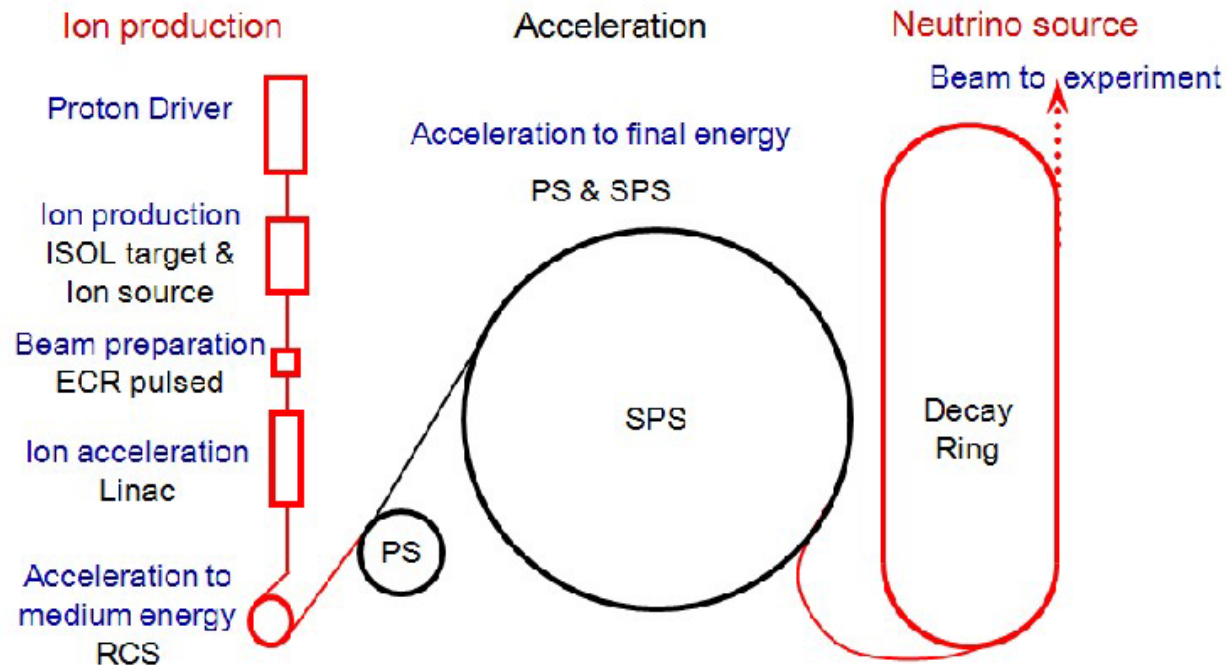


Neutrino Factory Tasks

- Proton beam handling:
 - Differences cf Super-Beam
- Muon frontend:
 - Design
 - Performance evaluation
- Acceleration:
 - Ditto
- Integration:
 - end-to-end simulations
 - optimisation of overall performance
 - determination of performance for physics



Beta-Beam Tasks



- Baseline Beta-beam studied in EURISOL
- Enhancements studied in EUROnu
 - higher Q isotopes such as ^8Li and ^8B



Beta-Beam Tasks

- Production ring:
 - for production of ${}^8\text{Li}$ and ${}^8\text{B}$
 - study layout, lattice and technical components
- 60 GHz ECR source:
 - bunching of ${}^6\text{He}$ & ${}^{18}\text{Ne}$, plus ${}^8\text{Li}$ & ${}^8\text{B}$
- Collection device:
 - extraction of ${}^8\text{Li}$ and ${}^8\text{B}$
 - extraction efficiencies
- Decay ring:
 - modifications for ${}^8\text{Li}$ and ${}^8\text{B}$



Detector Tasks

- Performance and “cost”:
 - Magnetised Iron Neutrino Detector
 - (large) water cherenkov
 - near detector(s)

Physics Tasks

- Physics performance
- Optimisation:
 - baselines and energies
 - synergies: experimental setups and facilities
- Systematics



Link to Other Activities

- “Associate” members
- Ex-officio members of GB & CB:
 - ECFA
 -
 -
 -
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- IDS-NF
 - International Design Study for NF
 - Asia, Europe and US
 - Similar aims to EUROnu, but for NF only
 - WP3, 5 and 6 form European contributions
- IAP: 5 members from Europe, US and Japan



Next Steps

5 th Feb 08:	Kick-off meeting
1 st September 08:	Official start
29 th /30 th September 08:	MB planning meeting (Brussels)
13 th November 08:	CB planning meeting
October 08 to Jan 09:	WP kick-off meetings
23 rd -27 th March 09:	1 st EUROv annual meeting (CERN)
23 rd -24 th :	parallel + IDS
25 th -26 th :	plenary
27 th :	panel meetings
March/April 10:	2 nd annual meeting (US)
" " 11:	3 rd annual meeting and review (RAL)
" " 12:	4 th annual meeting (Paris)