



CARE BENE Network: Report Jan 1-Aug 31, 2005

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N2 : Beams in Europe for Neutrino Experiments (BENE)

BENE is the CARE network for Beams for European Neutrino Experiments. It comprises 13 countries. The table of the participants and their implication in the BENE Work Packages is given in the table below. The overall management is done by INFN-Na. A new Deputy Coordinator is needed, we await now a reply from our first choice candidate.

Participant number	Participant	PHYSICS	DRIVER	TARGET	COLLECTOR	NOVEL NEUTRINO BEAMS
1	CEA	X	C	X	X	C
2	UCLN	X				X
3	CNRS	X			C	X
	CNRS-Orsay	X			C	X
	CNRS-LPNHE	X			X	
	CNRS-CENBG	X				
	CNRS-IPNL	X			X	
	CNRS-LPSC					X
4	GSJ					X
7	FZJ		X	X		
8	TUM	X				X
10	INFN	C	X	X	X	X
	INFN-LNF	X				X
	INFN-Ba	X				X
	INFN-Ge					X
	INFN-GS	X				
	INFN-LNL	X	X			X
	INFN-Mi	X				X
	INFN-Na	X				X
	INFN-Pa	C				X
	INFN-Pi	X				
	INFN-Tr	X				X
	INFN-Ro3	X				X
	INFN-To	X				
16	CSIC	X				
	UBa	X				
	IFIC	X				
	UAM	X				
17	CERN	X	X	X	X	C
18	UNI-GE	X		X	X	X
19	PSI			X		
20	CCLCR	X	X	C	X	C
	CCLRC-RAL	X	X	C	X	C
21	ICL	X		X		X

This reports covers the first two thirds of 2005, Jan 1st to Aug 31. In this time, the BENE¹ Network has been

¹ BENE's mandate is that to promote clear awareness, in our particle physics peer community, a) the physics interest of superior accelerator neutrino beams (superbeams, betabeams, neutrino factories) b) the promising on-going developments of accelerator technology that will make them possible c) the opportunities that exist to to plan, fund and realize, on a realistic time scale, a much enhanced European accelerator neutrino complex .

1) significantly **tightened its international role and connection**, manifestly essential for any new EU neutrino complex to be conceivable. We have attracted and welcome in Europe, in two rounds, held in April (NNN05) and in June (NuFact05), the full international community working toward superior accelerator neutrino beams

2) **launching** the next natural step in our feasibility study and R&D program, **a one year International Scoping Study (ISS) on Neutrino Factories and Superbeams**, to be completed by August 2006. The study is now due to gain its first momentum at its first working meeting at CERN later in September.

The key events of 2005 have been so far:

1) the **NNN05 Workshop on Next Nucleon decay & Neutrino** detector held in Aussois, France, Apr 7-9, that reviewed the physics case and the technical challenges of very large mass detectors and further structured the international collaboration towards their realization

2) the **NuFact05 International Workshop, the 7th International Workshop on Neutrino Factories & Superbeams**, held in Frascati, Jun 21-26, that reviewed thoroughly the status of the field, physics, accelerators, detectors, including betabeams, and formally launched the ISS.

This corresponds to the present status of the physics prospects that BENE tries to promote. **Two main physics strategies have been consolidating** over the last few years:

- 1) use of the high neutrino rate ($>10^{20}$ /year) and energy (10-50 GeV) promised by the **Neutrino Factory**, in conjunction with a detector of large but not huge mass (50-100 Kt), necessarily magnetic (a dense magnetized iron detector, or, possibly, Li-Argon), a few 1000 Km away.
- 2) use of the lower neutrino rate (10^{18-19} /year) and energy (sub-GeV) offered by a **Betabeam**, in conjunction with a low density detector of very large mass (0.5-1 Mt) and volume, non magnetic (a Water Cerenkov detector, or possibly, again Li-Argon), a few 100 Km away. This is the same detector needed to extend the search for nucleon instability, supernovae and other astrophysical phenomena.

A first level of comparison has concluded that the two options have comparable merits. The second option appears to have somewhat lower performance, for neutrino oscillation physics, but offers also a synergy with other fundamental sectors of physics.

These preliminary conclusion are based on still not well agreed yardsticks and must now be re-scrutinized much more in depth.

The two strategies are also, to large extent, complementary. Both are and must be pushed very actively. We are confident that international collaboration can bring about, in due time, both type of facilities and we should seriously aim at hosting one of them in Europe.

NB It should be, however, kept in mind that more recently proposed, intermediate solutions with **higher energy** and higher rate **betabeams**, very attractive though possibly more difficult, deserve indeed continued attention.

Superbeams are less performing, per se. But they do offer a technical synergy with Neutrino Factories and a scientific synergy with Betabeams. So they **are likely to be integrated in both strategies**.

A superbeam facility technically largely coincides with the front end of a Factory. High power is the crucial keyword. If one solves the technical challenges presented by a several MegaWatt class proton driver and target and collection system, on the way to build a factory, a superbeam facility will be available essentially for free (not its detector, however!)

A betabeam and superbeam can instead use the same detector and their combination has some truly unique features. The oscillation signal is $\nu_e \rightarrow \nu_\mu$ in the first, $\nu_\mu \rightarrow \nu_e$ in the second, so that one calibrates the signal (and the background) of the other. T-reversal and CPT asymmetries, probably not accessible to a factory, can be measured.

Neutrino Betabeams are the subject of a complete 4 years Design Study that was approved in 2004, will last from 2005 to 2008 and produce a Conceptual Design Report (CDR) by early or mid 2009.

The ISS intends to bring Neutrino Factory and Superbeam to the same level of progress. The goal of the ISS is to prepare a longer and more in depth, full blown Design Study, so to have a CDR ready by 2010 or so in this sector too.

A proposal for a new superior neutrino facility will become thus possible, based on these two CDRs, at about the right time for new major investments in particle physics. When presumably LHC expenditures will be completed, its first results available and a decision on the ILC taken.

In the last part of 2005, BENE plans to

- 1) get work on the ISS seriously going. We will host its [first international meeting at CERN Sep 22-24](#).
- 2) prepare, for the BENE05 week that will be part of the CARE05 yearly meeting (Nov 22-24), a summary report of the present status of the studies. This will be based on the state-of-the art summaries reports presented at NuFact05. It will be submitted also to the CERN Directorate and ECFA.

The process started by BENE with the [“Physics with a multi MegaWatt proton source” Workshop at CERN](#), in May 2004, described in the 1st CARE/BENE annual report, has continued. The SPSC recommendations, following our participation to its strategic meeting in Villars, have been published and confirm a strong support for a new accelerator neutrino initiative in Europe. ECFA support has also been warm and constant. All this is most welcome, as the present time seems to be preparing important decisions.

CERN is setting up task forces that will look into its options for proton accelerator of the future (PAF) and into the physics opportunities of those future proton accelerators (POFPA). Those forces will have the decisive task of designing the best possible proton complex capable of best serving LHC and its upgrades, an ambitious neutrino program, some frontier aspects of kaon, muon and other fixed target physics, the nuclear physics of radioactive ion beams and possibly more.

The CERN SPC will supervise this work and debate and will be submitting to the Council his recommendations for a general strategic plan. The global process will last a few years and appears manifestly to be heading towards a round of major decisions in 2010 or so and, before that, to a preliminary round of smaller investments around 2007.

BENE must and will continue to make and strengthen its case in this general context. The immediate goal is the one of assembling a strong collaboration around the ISS, clustering the EU effort around an initially small but freshly re-motivated CERN task force.

N2.1 MEETINGS

The major events so far organized or co-organized by BENE in 2005 were:

1) [the 1st BENE Week Mar 16-18](#). This was the regular week of meetings of BENE related work packages, study groups and R&D projects. We had first a parallel meetings of the Target and Collector WP jointly, then a one day plenary session of all accelerator WP together, where the themes of each of them (DRIVER, TARGET, COLLECTOR, MUFROnt, MUEND and BETABEAM) and those specific of the HARP; MICE and MERIT R&D experiments were each covered by a few hours of presentations and discussion. A plenary session was devoted then to discuss the proposal of launching a Scoping Study. After half a day of PHYSICS plenary session, discussion on ISS was resumed and the agenda of BENE in 2005 was finalized.

2) the [NNN05 Workshop on Next Nucleon decay & Neutrino](#) detector held in Aussois, France, **Apr 7-9**. This is the 4th edition of this international Workshop, organized now in Europe for the second consecutive time with major contributions from the PHYSICS, DRIVER and BETABEAM working groups in BENE. The concept of a large Megaton water detector has emerged independently in the 3 regions, under the name of Hyper-Kamiokande in Japan, of UNO in the USA, MEMPHYS in the Western Alps in Europe, where the Li-Argon option is also well alive. The three designs have much in common, the collaborations have significant overlap and work in very close cooperation, with the aim of realizing commonly one such detector in the region that will offer the best and earliest opportunity. Cooperation ties were further strengthened in Aussois.

3) [a pre-meeting in London, May 6-7, of the International Scoping Study](#). This came after thorough discussion at the BENE Week in March, where it was decided, in particular, that the Study should include both Neutrino Factory and Superbeam. In London, it was decided there the Study would organized jointly by [the Neutrino Factory and Muon collider collaboration](#) in the US, [the Japan Neutrino Factory collaboration](#) and the [ECFA/BENE](#) network for future neutrino beams in Europe, where it would be hosted at CCRLC laboratories by the [UK neutrino factory collaboration](#) that has promoted it first. An important contributions from India is also foreseen. The coordinators of these 4 collaborations were given mandate to make a proposal for the leadership of the Study. The preliminary [Study Plan](#), with three study groups (Physics, Accelerator and Detectors), was approved.

4) [the NuFact05 International Workshop, the 7th International Workshop on Neutrino Factories & Superbeams](#), held in Frascati, Jun 21-26. This is the yearly international forum of the above mentioned regional communities and has grown remarkably in importance over the years. We were very proud to host it in Europe for the 3rd time and the BENE coordinator chaired the organization. It **replaced** beautifully **this year the traditional ECFA/BENE Summer Week**, enlarging its scope to a full international review of the status of the field, physics, accelerators, detectors, including betabeams. Its last day was devoted to a final discussion of **the ISS that was formally launched there on the morning of June 26**. It was decided also that the ISS should last one year and should be concluded at **NuFact06** (that will notably change its name to 8th International Workshop on Neutrino Factories, Superbeams & Betabeams) to be held in Irvine, Aug 24-30, 2006.

The NuFact Workshops has truly become the yearly meeting of a world-wide collaboration and its importance can also be judged from the satellite events that accompany it.

In 2002, the EU component (not yet known as BENE) first proposed and organized a NuFact International Summer School in the UK. After that first school, we had one in the USA in 2003, one in Japan in 2004 and this year the [4th NuFact05 International Summer School on Neutrino Factories & Superbeams](#) was organized by BENE in Italy, in the island of Capri from June 11 to June 20. 22 students, mostly but not all from Europe attended it. The aim of the school is to provide young particle physicists with an introduction to both particle and accelerator physics aspects of conventional and novel neutrino beams. The long-term goal of this series is to lay the foundation for a large international group of scientists with the diverse skills essential to secure the future of accelerator neutrino experiments. An essential task indeed, for BENE.

Satellite meetings of on-going R&D experiments carried out in world wide collaborations where also held. Among them, most important, the [12th Collaboration meeting of MICE](#), the Muon Ionisation Cooling Experiment, June 27-29 still organized by BENE in Frascati and a [Collaboration Meeting](#) of the MERIT Target Test Area Experiment a few days later at CERN. This is again an international effort, that BENE has been fostering too.

5) *important Meetings and Workshops of WP? do I fail to remember any?*

In addition, BENE has been present to all major neutrino events in the year. In 2005 we will mention only two most important and representative events, the International Neutrino Workshop [WIN05](#) early in June in Delphi and the [EPS HEP](#) Conference late in July in Lisbon, all attended by a significant BENE delegation with speakers in several sessions and/or panel discussions.

BENE has also made reports at regular ECFA meetings in the year. It also reports periodically to the Chairs of the CERN scientific committees (SPSC, SPC) and to the CERN Directorate.

N2.2 The International Scoping Study

Among the main concern of BENE has always been the promotion of a European Design Study (DS) of a Neutrino Factory & Superbeam complex, that we envisage to happen also within the broader international context of a World Design Study (WDS). As next call will only be within FP7, BENE has welcome the CCLRC proposal of a preliminary Scoping Study as a preparatory step in that direction.

After the meeting in London in May, the coordinator of BENE has participated to discussions with the representatives of the US-MC (S. Geer), NuFACT-J (Y. Kuno) and UKNF (K. Peach) collaborations. These resulted in a common proposal for the membership of the ISS Program Committee. Reflecting the Study Plan, after approval at NuFact05, this consists of Yori Nagashima (Physics Group: nagay@snow.dti2.ne.jp), Mike Zisman (Accelerator Group: mszisman@lbl.gov) Alain Blondel (Detector Group: Alain.Blondel@cern.ch). Overall leader is Peter Dornan P.Dornan@imperial.ac.uk.

The task of the 3 study groups will be

- 1) Physics: study of the reach of future accelerator neutrino beams. Neutrino factories and superbeams will be compared to each other and to neutrino betabeams.
- 2) Accelerator: study of the crucial issues in the sector: proton drivers, target and collection systems (common to Factories and Superbeams) and ionization cooling, acceleration and storage of muons (specific of Factories).

- 3) Detectors: study of the outstanding issues involved in the realization of neutrino detectors of adequate mass and performance for all the three beam options.

Emphasis will be on the identification of the crucial R&D areas in all sectors above, that the Design Study will have later to tackle in depth. The only subject left out of the ISS will be the accelerator aspects of Betabeam that are already covered by a DS.

After the completion of the ISS in August 2006, BENE will proceed to prepare the application for a FP7 DS, presumably for Spring 2007. A major aspect of the ISS will be the assembly of a large and solid collaboration of laboratory and university teams supported by all the European agencies willing to contribute funds and human resources to the DS. These teams will apply together for EC co-financing of the DS.

N2.3 Publications

An overview of BENE documents and publications can be found in:

<http://bene.web.cern.ch/bene/publications/>

From there one can link to the documents created by each work package. They are structured in the same way as it is proposed for the general CARE publication policy, i.e. CARE-Note/Report/Conf/Pub/Document.

Regular update of the database of publications by the work package convenors and the BENE deputy coordinator has been somewhat hindered by the resignation of E. Gschwendtner, unable to continue as deputy. It will now be resuming in earnest.

N2.4 Web Sites

The BENE Main Web Page has been improved and refurbished at <http://bene.web.cern.ch/bene/>.

It displays the general plan of BENE activities for about 1 year ahead. Basic informations are kept up to date. BENE federates several pre-existing working groups and relies on their several pre-existing Web sites

<http://muonstoragerings.web.cern.ch/muonstoragerings/Welcome.html>

<http://nfwg.home.cern.ch/nfwg/nufactwg/nufactwg.html>

<http://beta-beam.web.cern.ch/beta-beam/>

The process of re-organization into a unitary site, in tune with the BENE federative process, continues. In each BENE WP Web page, the fraction of the material relevant to the scope of WP is being reorganized in a coherent set of links.

A Mailing List of members, bene@cern.ch, is operational. In addition there exist mailing lists of each work packages. (hep-mgt-betabeam@cern.ch, hep-mgt-bene-collector@cern.ch, hep-mgt-bene-drivers@cern.ch, hep-mgt-bene-muend@cern.ch, hep-mgt-bene-mufront@cern.ch, hep-mgt-bene-physics@cern.ch, hep-mgt-bene-target@cern.ch). Other lists of more loosely connected colleagues are also maintained.

N2.5 Activities of BENE in 2004

BENE's further acceleration of initiative in 2005 is, in primis, the work of its Steering Committee that has created the necessary networking tools for this and organized the main meetings and the other events. Regular phone-conferences are the main tool of coordination in the interval between meetings.

The BENE SG tried first to tackle the cancellation of further FP6 calls for DS by preparing an application for a Neutrino I3 that would associate to BENE a few indispensable JRA's.

Although much work went into it, we failed to match the very tight application deadline. Luckily, discussion and preparation of the ISS started immediately after and greatly benefited of these preceding effort.

The following text and five tables highlight the progress of work planned for the year 2005 for each work package by listing the lowest level subtasks of the BENE detailed implementation plan. No major deviations are reported, with one notable exception in the driver sector (see below).

WP1 (PHYSICS) progressed greatly in completing the present round of preliminary assessments of the physics reach of the different beam and detector options. This is best documented in the material of the NuFact05 Workshop. As stated above, a Neutrino Factory with a large magnetic detector emerges as the most powerful tool for definitive neutrino oscillation studies. Betabeams do not trail much behind however. Before NuFact05 Proceedings appear, WP1 will summarize the state of the studies in his contribution to the BENE Report that will be produced in time for the November BENE week.

WP2 (DRIVER) has continued its comparative study of M-Watt proton driver designs. In particular, it stimulated the new CDR, in preparation at CERN, of a SC proton linac (SPL) of higher energy (3.5 GeV). It is also looking carefully at the Fermilab option of a still higher energy linac (8 GeV). It was less effective, so far, in stimulating more systematic studies of the Rapid Cycling Synchrotron option, where only slower efforts are being deployed by European (and non- European) labs and funding agencies. Finally, it is starting looking into the exciting recent idea of using Fixed Field Alternating Gradient (FFAG) machines also as MWatt p-drivers. It is also clear that the CERN PAF and POFPA task forces will bring this debate out to a much larger forum (and longer time scale).

The discussion and comparison of these options is being enlarged in consultations with other communities of potential users of the proton driver. The WP will closely follow the works of CERN PAF task force as the choice of the appropriate proton driver is a corner stone of the future of particle physics in Europe.

WP3 (TARGET) has progressed in the comparative studies of different target options. Its major achievement was the approval, in April 2005, of an experiment testing exactly the response of the most likely superbeam and neutrino factory target (liquid mercury jet) and collection system (solenoid) to the energy deposition density typical of the single proton shot produced by a future multi M-Watt driver. The proposal was approved, under the name of MERIT, to run in 2007 in the n-TOF line at the CERN PS, funded and manned by an international collaboration with large US and Japanese contributions.

WP4 (COLLECTOR) is in less good shape. The WP was centered around the IN2P3 labs that had unfortunately to decline their commitment to provide the CNGS horns. This will probably now be reorganized with the help of the CERN team that has inherited that task and the one of preserving the brilliant European tradition and know-how (Van der Meer) in the sector. ISS goals in this sector have been however defined in spite of these difficulties.

The main achievements of the 3 components of WP5 (NOVEL NEUTRINO BEAMS) are

- a) **WP5a (MUFRONT)**: progress on the design of the Front End of a neutrino factory. First indication of the range 6-10 GeV as the ideal proton driver energy for a neutrino factory, once all successive muon manipulations are also taken into account. Final approval of the MICE (Muon Ionization Cooling Experiment) at RAL in March. MICE is scheduled to start data-taking on April 1, 2007.

- b) **WP5b** (MUEND): progress on the design of the final (acceleration and storage) stages of a neutrino factory. Strong interest is going in the direction of FFAGs and the WP team is at the hearth of the proposal of EMMA, an innovative (“non-scaling”) electron model of FFAG that a world collaboration hopes to build in Daresbury.
- c) **WP5c** (BETABEAM): the WP keeps BENE informed and aware of the progress of the Betabeam Design Study in the Eurisol framework, that is systematically revisiting all aspects of the betabeam chain. New ideas are also emerging: higher energy betabeams are definitely very very interesting; so are monochromatic betabeams based on rare isotopes (Dysprosium) that undergo electron capture rather than beta decay.

A special role is emerging for a first very low energy betabeam (10-50 MeV neutrinos). This is likely to be the first betabeam that will come into existence, providing an indispensable proof of principle demonstration and quite relevant physics results in the area of neutrino-nucleus cross sections of astrophysical interest.

Work Package 1: PHYSICS

	Title	Original begin date (Annex 1)	Original end date (Annex1)	Estimated Status	Revised end date
WP1	PHYSICS				
1.1	Improvement of the WP Web Site	Jan. 2005	Mar 2005	95%	Continuously improving
1.2	WP Spring Meeting	Mar 2005	Mar 2005	100 %	
1.3	Assess physics analysis, motivate ISS	Jan 2005	Jun 2005	100%	Presented at Nufact05
1.4	WP Summer Meeting	Jun 2005	Jun 2005	100 %	Coincided this year with NuFact05
1.5	WP Fall Meeting	Nov 2005	Nov 2005	10 % already	Being prepared
1.6	Physics section of Interim Report	Jun 2005	Nov 2005	10 % already	Being prepared

Work Package 2: DRIVER

	Title	Original begin date (Annex 1)	Original end date (Annex1)	Estimated Status	Revised end date
WP2	DRIVER				
2.1	Improvement of the WP Web Site	Jan 2005	Mar. 2005	95%	Continuously improving
2.2	Finalize criteria of SPL vs RCS comparison	Jan 2005	Mar. 2005	20% It is going to take longer!!	Larger picture emerging, CERN committee being set up
2.3	Identify R&D beyond HIPPI, motivate ISS	Jan 2005	Mar. 2005	100 %	Presented at Nufact05, ISS launched
2.4	WP Spring Meeting	Mar 2005	Mar 2005	100 %	
2.5	WP Summer Meeting	Jun 2005	Jun 2005	100 %	Coincided this year with NuFact05
2.6	WP Fall Meeting	Nov 2005	Nov 2005	10 % already	Being prepared
2.7	Driver section of Interim Report	Jun 2005	Nov 2005	10 % already	Being prepared

Work Package 3: TARGET

	Title	Original begin date (Annex 1)	Original end date (Annex1)	Estimated Status	Revised end date
WP3	TARGET				
3.1	Improvement of the WP Web Site	Jan 2005	Mar. 2005	95%	Continuously improving
3.2	Summarize hi power target status, motivate R&D	Jan 2005	Mar. 2005	100 %	Presented at Nufact05, ISS launched

3.3	WP Spring Meeting	Mar 2005	Mar 2005	100 %	
3.4	WP Summer Meeting	Jun 2005	Jun 2005	100 %	Coincided this year with NuFact05
3.5	WP Fall Meeting	Nov 2005	Nov 2005	10 % already	Being prepared
3.6	Target section of Interim Report	Jun 2005	Nov 2005	10 % already	Being prepared

Work Package 4: COLLECTOR

	Title	Original begin date (Annex 1)	Original end date (Annex1)	Estimated Status	Revised end date
WP4	COLLECTOR				
4.1	Improvement of the WP Web Site	Jan 2005	Mar. 2005	95%	Continuously improving
4.2	Summarize collector progress, motivate ISS	Jan 2005	Mar. 2005	100 %	Presented at Nufact05, ISS launched
4.3	WP Spring Meeting	Mar 2005	Mar 2005	100 %	
4.4	WP Summer Meeting	Jun 2005	Jun 2005	100 %	Coincided this year with NuFact05
4.5	WP Fall Meeting	Nov 2005	Nov 2005	10 % already	Being prepared
4.6	Collector section of Interim Report	Jun 2005	Nov 2005	10 % already	Being prepared

Work Package 5: NOVEL NEUTRINO BEAMS

	Title	Original begin date (Annex 1)	Original end date (Annex1)	Estimated Status	Revised end date
WP5	NOVEL NEUTRINO BEAMS				
5.1	Improvement of the WP Web Site for the three areas of interest of the WP	Jan 2005	Mar. 2005	95%	Continuously improving
5.2	Review of existing designs for NuFact and Betabeams, motivate ISS	Jan 2005	Mar. 2005	100 %	Presented at Nufact05, ISS launched
5.3	WP Spring Meeting	Mar 2005	Mar 2005	100 %	
5.4	WP Summer Meeting	Jun 2005	Jun 2005	100 %	Coincided this year with NuFact05
5.5	WP Fall Meeting	Nov 2005	Nov 2005	10 % already	Being prepared
5.6	Novel beam sections of Interim Report	Jun 2005	Nov 2005	10 % already	Being prepared

N2.5 SIGNIFICANT ACHIEVEMENTS

- Organization of the NNN05 and Nufact05 International Workshops in Europe.
- Approval of the MICE muon ionisation cooling experiment at RAL
- Approval of the MERIT high power target and collection experiment at CERN
- Launch of the International Scoping Study on Neutrino Factories & Superbeams.

N2.6 List of all milestones and deliverables (D) during the reporting period

Deliverable/ Milestone No	Deliverable/Milestone Name	Workpackage /Task No	Lead Contractor(s)	Planned (in months)	Achieved (in months)
D	Nufact05 International Workshop	All WPs	INFN-Na	6	6
D	Launch of International Scoping Study on Neutrino Factories and Superbeams	All WPs	CCLRC, ICL, INFN-Na, Uni-Ge	-	6

N2.7 List of major meetings organized under BENE during the reporting period

Date	Title/subject	Location	Number of	Web Site Address
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			participants	
Mar 16-18 2005	BENE Week	CERN	70	http://nuspp.in2p3.fr/Bene/BENEWeekMarch05
Apr 7-9 2005	NNN05 Workshop	Aussois, France	110	http://nnn05.in2p3.fr/
6-7 May 2005	ISS preparation meeting	London	50	http://www.imperial.ac.uk/research/hep/events/nufact_meet.htm
12-20 Jun 2005	4th NuFact05 Summer School	Capri, Italy	22 students & 10 lecturers	http://nufact05school.na.infn.it/
21-26 Jun 2005	7th NuFact05 Workshop	Frascati, Italy	190	http://www.lnf.infn.it/conference/2005/nufact05/
26-29 Jun 2005	MICE 12 th Collab. Meeting	Frascati, Italy	50	http://www.lnf.infn.it/conference/mice05/