

ECFA/11/272/Draft
Original: English
1 June 2012

ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

PLENARY ECFA

90th meeting

Geneva – 24 and 25 November 2011

Draft Minutes

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LIST OF PARTICIPANTS

Chairman:	T. Nakada	Switzerland
Secretary:	K. Long	U.K.
Members:	T. Akesson	Sweden
	C. Alexa	Romania
	Th. Alexopoulos	Greece
	D. Barney	IPPOG
	U. Bassler	France
	S. Bertolucci	CERN
	Ph. Bloch	CERN
	C. Bloise	Italy
	A. Blondel	Switzerland
	O. Brüning	CERN
	R. Brenner	Sweden
	Ph. Burrows	U.K.
	A. Buzatu	Romania
	J. Chyla	Czech Republic
	J. Collot	France
	S. de Jong	Netherlands
	V. Del Duca	Italy
	M. Dell'Orso	Italy
	C. De Los Heros	Sweden
	A. De Roeck	CERN
	K. Desch	Germany
	M. Diemoz	Italy
	Z. Dolezal	Czech Republic
	U. Dosselli	Italy
	E. Eigen	Norway
	E. Elsen	DESY
	R. Ferreira Marques	Portugal
	B. Foster	U.K.
	J. Fuster	Spain

T. Garvey	Switzerland
S. Gascon-Shotkin	France
Th. Gehrman	Switzerland
M. Giorgi	Italy
G. Giudice	CERN
F. Halzen	U.S.A.
P. Hansen	Denmark
M.J. Herrero	Spain
R. Heuer	CERN
K. Huitu	Finland
E. Kajfasz	France
Y. Karyotakis	France
S. Katsanevas	IN2P3
M. Klein	U.K.
J. Kuehn	Germany
M. Krammer	Austria
D. Lacour	France
R. Leitner	Czech Republic
F. Linde	Netherlands
L. Lönnblad	Sweden
A. Lucotte	France
M. Merk	Netherlands
L. Merola	Italy
G. Mikenberg	Israel
J. Mnich	DESY
K. Moenig	Germany
V. Muccifora	Italy
Th. Müller	Germany
O. Napoly	France
P. Osland	Norway
G. Pasztor	Hungary
R. Patterson	US
R. Petronzio	Italy

	R. Roosen	Belgium
	Ch. Schwanda	Austria
	F. Sikler	Hungary
	S. Stapnes	Norway
	B. Tomasik	Slovakia
	Nick Van Remortel	Belgium
	V. Vercesi	Italy
	D. Wark	U.K.
	P. Watkins	U.K.
	B. Wosiek	Poland
	C.E. Wulz	Austria
	A. F. Zarnecki	Poland
Apologies:	G Barreira	Portugal
	J.-C. Brient	France
	M. Cavalli-Sforza	Spain
	V. Cerny	Slovakia
	K. Desch	Germany
	J. Kalinowski	Poland
	P. Malecki	Poland
	V. Matveev	Russian Federation
	E. Nappi	Italy
	Th. Peitzmann	Netherlands
	P. Schleper	Germany
	U. Uggerhoej	Denmark
	C. Vander Velde	Belgium
	M. Yamauchi	Japan
	D. Zeppenfeld	Germany
	F. Zwirner	Italy
Minute-Writer:	J.Pym	CERN

The meeting was called to order at 2.05 p.m. on Thursday, 24 November 2011.

1. APPROVAL OF THE DRAFT MINUTES OF THE EIGHTY-NINTH PLENARY ECFA MEETING HELD IN GRENOBLE/EPS ON 23 & 24 JULY 2011

(Item 1 of the agenda) (ECFA/11/270/Draft)

The Minutes of the Eighty-Ninth meeting of Plenary ECFA (ECFA/11/270/Draft) were approved.

2. APPROVAL OF THE AGENDA

(Item 2 of the Agenda) (ECFA/11/271)

The Agenda (ECFA/11/271) was adopted.

3. CHAIRMAN'S REPORT

(Item 3 of the Agenda)

The CHAIRMAN presented his report¹ on the Committee's activities since the joint session with the EPS HEP conference in Grenoble in July, covering the ICFA/ILCSC meeting in Mumbai in August, the CERN Council Session on 15 and 16 September, the ICFA Seminar at CERN from 3 to 6 October, the RECFA visit to Spain on 7 October, the EPS HEP Board meeting on 14 October, the DESY Scientific Council on 14 and 15 November and the various Detector R&D and Neutrino Review Panel meetings.

The Committee took note of the Chairman's report.

4. CABIBBO LABORATORY AND SUPERB FACTORY

(Item 4 of the Agenda)

PETRONZIO presented his report on the recent approval of the INFN's SuperB project and on the establishment of a consortium to set up a dedicated organisation named "Cabibbo Lab".

GIORGI presented his report on the prospective b-physics projects at Cabibbo Lab.

The Committee took note of the reports on SuperB developments by Petronzio and Giorgi.

¹ All the transparencies presented at the meeting are available at: <http://indico.cern.ch/event/61998>

5. SUPERKEKB AND BELLE II

(Item 5 of the Agenda)

DOLEZAL presented the report on behalf of Yamauchi, who had been unable to attend the meeting.

In reply to a question from EIGEN (Bergen) about the expected background levels in the first layer of the vertex detector, GIORGI pointed out that discrepancies existed between the two communities in the estimate of the luminosity-related background, essentially due to double-pair production. He suggested a joint workshop be organised with a view to achieving a better understanding of the issue.

Responding to comments from KARYOTAKIS (Annecy), who asked whether the b-physics community had elaborated any scenarios regarding the next machine to be built and what would be the consequences for future upgrade strategies for the LHC, GIORGI underlined that there was no single path to new physics. SuperB was designed as a super flavour machine aimed at exploring the b sector and the tau sector including polarisation and then running at threshold. Kaons were another promising sector for new physics but would require an extremely difficult experiment with very high intensity to be built. Hadron machines measuring flavour with high intensity and high luminosity would thus be important.

The CHAIRMAN added that it would be important for the flavour community to give some common input on that topic for the update of the European Strategy for Particle Physics.

PETRONZIO (INFN) observed that, from the theoretical viewpoint, the processes could be divided into those which were mass-decoupled and those which were not decouple. The reason for the latter depended strongly on the coupling, and the former depended on a combination of coupling and masses. A tiny effect could be explained by a ratio or the product of new couplings over large masses. Since the effects were small the experiments should be complementary and a more global view should be taken, which was something that certainly needed to be debated in the framework of the Strategy update.

In reply to further remarks from MERK (NIKHEF), who, noting that the number of b quarks produced at the b-factories was lower than the number produced at the LHC, albeit with a cleaner background and higher efficiency than at the LHC, wished to know whether a future was thinkable in which a factor of ten in luminosity could be obtained in order to produce more b pairs, DOLEZAL said that it was difficult to foresee how another factor of ten increase could be achieved. New inventions such as crab cavities in 2007 had brought about a twofold increase in luminosity, but there were no other such inventions on the horizon.

GIORGI added that continuous injection, which had been tried and tested in both PEP-II and KEKB, was crucial for SuperB because it allowed the same level of luminosity to be maintained, even with polarisation.

The Committee took note of Dolezal's report and of the views expressed during the discussion.

The meeting was adjourned at 4.00 p.m. and resumed at 4.30 p.m.

6. FRASCATI REPORT
(Item 6 of the Agenda)

MUCCIFORA presented her report.

The Committee took note of Muccifora's report.

7. CERN REPORT
(Item 7 of the Agenda)

HEUER presented his report.

The Committee took note of Heuer's report.

8. DESY REPORT
(Item 8 of the Agenda)

MNICH presented his report.

The Council took note of Mních's report.

9. IPPOG REPORT
(Item 9 of the Agenda)

BARNEY presented his report.

In reply to a question from OSLAND (Bergen), BARNEY said that the total IPPOG budget was about 50 kCHF plus 100 kCHF for the Masterclasses alone. The figures included the salaries of the two staff working part-time for IPPOG, one at CERN and one in Germany who was responsible for organising the Masterclasses.

The CHAIRMAN remarked that a stable long-term funding solution needed to be found for IPPOG now that it had proved its worth and was engaged in large-scale outreach activities aimed at a wide international audience.

The Committee took note of Barney's report.

10. ENDORSEMENT OF NEW ECFA MEMBERS

(Item 10 of the Agenda)

The CHAIRMAN presented the list of proposed new members of Plenary ECFA.

The Committee unanimously elected new members of Plenary ECFA:

- Professor K. Rummukainen, Finland, replacing Professor K. Huitu from 1 January 2012
- Professor K. Fountas, Greece, replacing Professor T. Alexopoulos from 1 January 2012
- Professor B. Wosiek, Poland, replacing Professor P. Malecki from 1 January 2012
- Professor R. Tsenov, Bulgaria, replacing Professor J. Stamenov from 1 October 2011
- Professor B. Tomasik, Slovakia, replacing Professor V. Cerny from 1 January 2012
- Professor H. Abramowicz, Israel, replacing Professor G. Mikenberg from 1 December 2011
- Professor C. Wulz, Austria, replacing Professor M. Krammer from 1 December 2011.

11. APPOINTMENT OF ECFA CHAIR

(Item 11 of the Agenda)

The CHAIRMAN stated that he would be standing down at the end of 2011, six months ahead of the scheduled end of his term of office, following his election in June 2011 to the position of Scientific Secretary of the European Strategy Sessions of the CERN Council. In accordance with the procedure agreed by Plenary ECFA in July 2011, five willing candidates had been identified and, at its meeting in Madrid on 7 October 2011, Restricted ECFA had converged on a single candidate, Professor M. Krammer (Vienna), whose appointment was now submitted to Plenary ECFA for approval.

On the proposal of Restricted ECFA, Plenary ECFA unanimously decided to appoint Professor M. Krammer Chairman of ECFA for the period 1 January 2012 to 31 December 2014.

KRAMMER, supported by BERTOLUCCI, thanked Nakada for his outstanding work as ECFA Chairman since July 2009.

12. ENDORSEMENT OF DETECTOR PANEL

(Item 12 of the Agenda)

KARYOTAKIS presented his report, outlining the remit of the proposed ECFA Detector R&D Panel, as follows:

- Receive R&D proposals and make recommendations after evaluation.
- Evaluate and monitor the progress of R&D programmes on request.
- Help to create a coherence of the global R&D effort by encouraging synergy between different activities and advising funding agencies.
- Overview the European effort for detector R&D.

He further explained that the panel would have a purely reviewing and advisory role and would not initiate or assume any coordination of the R&D programmes. Its primary function would be to review large R&D projects involving many laboratories and requiring significant resources. The panel would report to ECFA and, on that basis, the ECFA Chairman would report to the European Strategy Session of the CERN Council. While the panel's main focus would be R&D projects related to accelerator experiments, it would be entitled to expand its field of expertise to R&D on non-accelerator particle physics detectors, if so requested. After presentation to ECFA, the panel's reports would become publicly available. The panel chairman and members should be world detector experts, nominated by RECFA, and the panel should be hosted and operated by a European laboratory. The inaugural members had already been appointed by RECFA ([see presentation on Indico](#)) and it was proposed that the panel be hosted by DESY with a first kick-off meeting in May 2012.

The Committee took note of the report by Karyotakis and unanimously decided to endorse the remit, composition and host laboratory of the new ECFA detector R&D panel as proposed.

13. END OF SESSION

(Item 13 of the Agenda)

The meeting was adjourned at 6.20 p.m. on Thursday, 24 November 2011 and resumed at 9.00 a.m. on Friday, 25 November 2011.

14. LC DETECTOR DEVELOPMENT AND GRANADA WORKSHOP

(Item 14 of the Agenda)

FUSTER presented his report.

The Committee took note of Fuster's report.

15. ILC TDR

(Item 15 of the Agenda)

FOSTER presented his report.

In reply to comments from the CHAIRMAN, who remarked that the purchasing power parity cost distribution method relied crucially on prior knowledge of the contributions of each participant, which was not yet the case for the ILC, FOSTER acknowledged that point, adding that the scheme of contributions would depend entirely on the decision on hosting. Interestingly, given the decline in Japanese construction costs and the favourable exchange rate of the yen compared to Western currencies, the cost of building the ILC in Japan would be slightly lower than previously anticipated, whereas the cost of building it in the USA would be prohibitive in the present climate.

In reply to LONG (Imperial College London), who noted the improvement in cavity gradient but wished to know what contingency plans were in place in the event of the required 35 MV/m not being reached, FOSTER said that he was personally convinced that 35 MV/m would be reached. However, according to the present calculations, cavities with gradients within 15% of 35 MV/m could be accepted provided that they were matched in such a way as to ensure that the power reached them in the right area.

ELSEN (DESY) pointed out that the existing cavity production statistics included all the very early ones. The cavities now being manufactured for the X-FEL were all consistently within 90% of 35 MV/m.

Responding to remarks by the CHAIRMAN on the benefits of industrialisation and competition between suppliers in the production of such components, FOSTER said that the most cost-effective way to build an ILC would probably be to find a single-source supplier with one large factory producing all the components, who would thereby derive maximum benefit from the learning curve. However, recourse to single-source suppliers undeniably presented major drawbacks in terms of cost and the risk of bankruptcy over the long construction period for a machine like the ILC. The ideal solution would thus be to maintain competition by having several suppliers but keeping their number small enough to ensure they could each profit from the economies of scale brought by mass industrialisation.

The Committee took note of Foster's report.

16. CLIC CDR

(Item 16 of the Agenda)

STAPNES presented his report.

The Committee took note of Stapnes' report.

17. GENERAL DISCUSSION ON THE LC PROJECTS

(Item 17 of the Agenda)

The CHAIRMAN, observing that the mandate of the Global Design Effort (GDE) for the international linear collider was due to end upon submission of the Technical Design Report (TDR) in 2012, said that the International Linear Collider Steering Committee (ILCSC) had called on the three participating regions (Asia, Europe, Americas) to bring forward ideas on post-TDR organisation. Discussions among the European representatives at the ILCSC and representatives of the CLIC project had led to a general consensus that, given the long time-frame and the imperative need to take the LHC results into account, a flexible framework was required. Such a framework would have as its starting point the two current projects, ILC and CLIC, and would federate them into one team which would assume responsibility for machine construction as and when a physics-based decision on the best-suited technology was taken.

The name of such an organisation as well as the individuals to be appointed to the various management positions would require further discussion over the coming years, and the whole scheme would also be shaped by whatever decisions emerged from the update of the European Strategy for Particle Physics.

The Committee took note of the Chairman's report.

18. NEUTRINO PANEL REPORT

(Item 18 of the Agenda)

HALZEN presented his report on the ECFA Review Panel for future accelerator-based neutrino facilities, underlining the main conclusions reached.²

² See transparencies at: <http://indico.cern.ch/materialDisplay.py?contribId=32&materialId=slides&confId=161998>

BLONDEL further remarked that having a "triad" of self-contained neutrino facility projects (betabeam, superbeam, neutrino factory) would constitute a risk only if the projects were unrelated. In actual fact, considerable efforts were being made within the community to interlink the three ideas so that one would be able to lead to another in an incremental way, e.g. a superbeam from CERN to the Pyhäsalmi mine could lead incrementally towards a neutrino factory, while a Fréjus betabeam could evolve to a superbeam. However, there would be no way of linking a betabeam incrementally to a neutrino factory due to the vast energy difference. In the context of the European Strategy for Particle Physics, the neutrino community was planning a "town meeting" in the summer of 2012 in order to review the situation and come forward with a common recommendation for a priority roadmap. In that regard, the ECFA Panel report had been extremely valuable.

The CHAIRMAN, thanking the neutrino panel and in particular F. Halzen for the work done on a vast topic with a somewhat limited mandate, said that, with Plenary ECFA's agreement, the final report could now receive the official ECFA stamp and become a public document. That would bring the Panel's mandate to an end but, in view of the expected need for another review around the time of the update of the European Strategy for Particle Physics, he proposed that the Panel be left dormant until such time as it was needed again.

The Committee took note of Halzen's report and unanimously agreed to endorse the final report by the ECFA Review Panel for future accelerator-based neutrino facilities and to assign it an ECFA reference number thereby making it public.

The Committee further agreed to suspend the Panel's mandate until such time as it became necessary to review the neutrino field anew, probably around the time of the update of the European Strategy for Particle Physics in 2013.

The meeting was adjourned at 11.05 a.m. and resumed at 11.35 a.m.

19. US PARTICLE PHYSICS

(Item 19 of the Agenda)

PATTERSON presented her report.

In reply to LONG (Imperial College London), PATTERSON said that even though she had not mentioned the Muon Ionization Cooling experiment (MICE) in her presentation, it was certainly part of the U.S. programme of muon accelerator activities.

Responding to a question from HEUER (CERN) on the choice of technology for the dark matter direct detection experiment and the location of the detector, PATTERSON

observed that the choice between a liquid xenon or liquid argon TPC would be taken in the coming months and that the positioning of the detector underground or on the surface was no longer considered to be an issue.

In reply to a question from DE ROECK (CERN), PATTERSON said that the DPF planning workshop was an open meeting intended to be coupled directly with the process launched in Europe aimed at the update of the European Strategy for Particle Physics.

In response to a question from DE LOS HEROS (Uppsala), PATTERSON said that it was relatively rare for the funding for major HEP projects to be secured at local level, unlike in Europe. Most funding for such projects was centralised with the DoE, with States sometimes making minor contributions in certain specific cases.

The Committee took note of Patterson's report.

20. MID-TERM REPORT FROM GREECE

(Item 20 of the Agenda)

ALEXOPOULOS presented his mid-term report on the status of high-energy physics in Greece.

The Committee took note of the report by Alexopoulos.

21. MID-TERM REPORT FROM PORTUGAL

(Item 21 of the Agenda)

FERREIRA MARQUES presented his mid-term report on the status of high-energy physics in Portugal.

The Committee took note of Ferreira Marques' report.

22. MID-TERM REPORT FROM SWEDEN

(Item 22 of the Agenda)

LÖNNBLAD presented his mid-term report on the status of high-energy physics in Sweden.

The Committee took note of Lönnblad's report.

23. LHeC CDR

(Item 23 of the Agenda)

KLEIN presented the preliminary, unrefereed conclusions of the study group on the design for a possible Large Hadron Electron Collider (LHeC) at CERN.

BRÜNING presented his report on the latest work by the LHeC collaboration.

In reply to a question from ELSEN about the flexibility of the linac ring option with respect to the electron-beam energy for fixed protons, BRÜNING explained that the luminosity of a linac ring would be directly proportional to total beam power, so with a full limit of the maximum usable power it would be $1/x$ dependent.

Responding to a question from FOSTER, who wondered whether it would be feasible to build an LHeC demonstrator using a CLIC linac, BRÜNING observed that the bunch structure obtained with the CLIC linac would not be compatible with that required for the LHeC where the lepton bunch structure needed to match that of the LHC proton beam. However, CLIC's test facility could be used as an injector complex for a ring-ring LHeC. Similar synergies might also be possible with TESLA-type technologies but such decisions could only be taken once the linac-ring or ring-ring technology choice had been made. From the technical level, the LHeC collaboration was convinced that both technologies would be feasible so it was then a question of which would suit CERN best.

In reply to BURROWS, who wished to know whether any thought had gone into the costing procedures, KLEIN said that the civil engineering costs had already been estimated by a potentially interested contractor and amounted to approximately one third of the overall project cost, currently estimated at around one billion units. According to preliminary indications, the ring-ring option would appear to be cheaper than the linac-ring option. Whatever the scenario, neither the cost nor completion time were comparable to those of a linear collider.

In reply to a further question from the floor, KLEIN underlined that it would already be a considerable achievement to integrate one detector into the LHC design and that it was practically impossible to design two detectors for the LHeC.

Responding to another question from the floor about the extent of rapidity coverage, KLEIN said that one-degree coverage was possible for the central detector and that fps-like stations had been considered and simulated for the forward proton detectors. It would be very difficult to go down to half a degree.

BRÜNING added that two options had been studied initially, namely a ten-degree layout for high luminosity and a one-degree layout with full acceptance. The fact that a single layout had been achieved, which gave the full performance reach with one-degree acceptance, could be considered a great success.

In reply to a question from CHAIRMAN who asked whether there was any preference between the linac-ring and ring-ring options from the experimental point of view, KLEIN said that was not necessarily the case in terms of the detector itself, but in terms of the physics it was clear that the linac-ring option had certain problems with positron intensity while the ring-ring option had difficulties with polarisation. On balance, the ring-ring detector looked to be marginally better than the linac-ring option from the experimental viewpoint.

Concluding, the CHAIRMAN said the possible next steps after submission of the Conceptual Design Report had been discussed in Restricted ECFA. Although it would not be appropriate to make any firm statement about a future LHeC project before completion of the European Strategy update, it did appear desirable for ECFA to take some position on the matter. Restricted ECFA therefore wished to propose to Plenary ECFA the establishment of an ECFA Panel, chaired by T. Müller, with a mandate to come forward with a recommendation to Plenary ECFA at its next meeting, at the Paul Scherrer Institute, in July 2012. That would fit well with the timing of the Open Symposium of the European particle physics community scheduled for September 2012.

KLEIN, expressing his support for the proposal, said that the findings of the 24 referees currently assessing the draft TDR should be made available to the panel to assist its members in coming forward with an informed recommendation for Plenary ECFA within the proposed time-frame.

HEUER said that he could fully support the proposed establishment of an ECFA study panel and the timescale for a recommendation to Plenary ECFA.

The Committee took note of the reports by Klein and Brüning and unanimously agreed to set up a study panel to be chaired by T. Müller (Karlsruhe), with the other members to be nominated by him and endorsed by Restricted ECFA in due course, with the mandate of:

- 1) studying the draft CDR for a Large Hadron Electron Collider (LHeC) at CERN, together with the findings of the 24 referees,
- 2) presenting its conclusions to Restricted ECFA at its meetings in the first half of 2012, and

- 3) coming forward with a recommendation for a formal position by Plenary ECFA at its meeting at the Paul Scherrer Institute in July 2012, to serve as input for the European Strategy for Particle Physics, notably the Open Symposium scheduled for September 2012.

24. APPEC ROADMAP

(Item 24 of the Agenda)

KATSANEVAS made his presentation.

Responding to a question from KLEIN, who asked whether it was normal that ICECUBE had not yet detected any neutrinos, HALZEN underlined that the detector had been designed in such a way that it took five years to accumulate data to the level of five sigma. Since ICECUBE had only been commissioned in early 2011, it was unsurprising that no signals had yet been detected. As far as gamma-ray bursts were concerned, data was expected to be forthcoming within the next three years, otherwise gamma-ray burst would have to be allowed as the sources of the cosmic rays.

In reply to OSLAND (Bergen), who requested further details on the statement that dark matter might possibly be proven or disproven on a ten-year timescale, KATSANEVAS said that with the LHC constraints, the constraints of direct matter searches and input from indirect astroparticle physics searches over the coming ten years, it was certainly hoped that tangible progress would be made towards resolving the dark matter question. The US community had held an interesting workshop on that subject at Snowmass in the summer and something equivalent should be organised in Europe.

The Committee took note of Katsanevas' report .

25. EUROPEAN STRATEGY UPDATE

(Item 25 of the Agenda)

NAKADA gave a brief oral report of the latest developments in the European Strategy for Particle Physics update process.

The Committee took note of Nakada's report.

26. CLOSING

(Item 26 of the Agenda)

The meeting rose at 4.00 p.m.