

## EUROPEAN STRATEGY PREPARATORY GROUP

Minutes of the eighth meeting held on  
Tuesday, 22 May 2012

Present: R. Aleksan, P. Braun-Munzinger P. Chomaz, C. De Clercq, K. Desch,  
M. Diemoz, K. Huitu, P. Jenni, M. Krammer, Y. Kuno, P. McBride,  
T. Nakada (Chairman), D. Wark, A. P. Zarnecki, F. Zwirner

Apologies: E. Tsesmelis (Scientific Assistant)

### 1. PROCEDURE

The minutes of the seventh ESPG meeting (ESPG 2012-004 / ESPG 007) were approved.

### 2. THE OPEN SYMPOSIUM

The ESPG discussed the scientific programme for the Open Symposium and reports were made on various meetings preparing this event.

A ‘town meeting’ on the ILC was held in Paris to discuss the community input to the Open Symposium. The community expressed disappointment that there was no explicit talk on the Linear Collider. T. Nakada had a telephone exchange with F. Le Diberder, explaining that speakers were expected to give a global view and to present a strategy with a global view without biasing the strategy process from the beginning. P. Jenni reiterated the above position by stating to some of the Paris meeting participants that the ESPG did not want to focus on specific facilities but rather on the global physics view. K. Desch, who also attended the Paris meeting, reported that the titles of the talks were of concern to the ILC community, as well as of combining the subjects of the energy frontier and flavour physics into one session as the discussion may become tangled and not clear. This was also the concern of T. Wyatt, the invited speaker. A single talk of 30 minutes would not provide enough time to cover all the topics.

D. Wark reported on the ‘town meeting’ on neutrinos held at CERN. Participants at this meeting expected that the Open Symposium would allow the community to present all the options and to lay out the strategy. However, the ESPG’s view is to leave the global perspective aspects to the discussion session rather than to the individual presentations.

In view of the above points, T. Nakada concluded that the ESPG should make an additional communication to the community stating that global views are expected from the talks and from the community input, rather than presentations of individual experiments and facilities. These inputs from the community will come from the written submissions and also during the extensive discussion periods at the Open Symposium. To this end, K. Desch proposed that a short summary of what the ESPG expects from each talk would be helpful. P. Braun-Munzinger stated that the Open Symposium sessions should focus on the physics case and speakers should not take sides on one particular project. The process for the update of the European Strategy has several fundamental (and complicated) questions to address that require a global view and that take into account activities in other regions. It was proposed that a more detailed description of the sessions could be added to the scientific programme. This will be considered for further discussion.

K. Desch underlined that the structure of the discussion would need to be carefully structured. In both cases above - the Linear Collider and neutrinos - the discussion could be structured along the lines of a) the physics arguments and b) implementation in Europe or elsewhere. T. Nakada reminded the ESPG that although the high-energy machine can be built only once, a long-baseline neutrino facility is somewhat different as there could still be multiple such facilities. Further discussion will be required in the period leading up to the Open Symposium.

The ESPG also discussed organisational issues for the Open Symposium:

- The Open Symposium Web-site has been updated and is available at <http://espp2012.ifj.edu.pl>. The links are mostly fine. The Contact page should indicate that questions on the scientific programme be addressed to the ESPG or T. Nakada. The poster is also essentially fine.
- All speakers for the Open Symposium are confirmed except M. Turner. T. Nakada will keep contacting him.
- Registration is now open and 46 people have already registered. The ESPG members would also need to register. The list of participants will be updated once per week. There is an absolute maximum capacity of the main auditorium of 550. The local organisers cannot guarantee two-way communication between the main auditorium and the satellite hall. The ESPG would like to ask the local organisers to nevertheless continue investigating the possibility.
- Financial support for the speakers and scientific secretaries is not available from the local organisers. Although speakers are expected to fund their own travel, the ESPG would like to enquire with CERN for financial support to cover registration fees for the speakers and scientific secretaries.
- A dedicated email address could be set up so that people not able to attend the Open Symposium could send in their comments for the discussion periods. Moreover, real-time input will also be investigated. Care should be taken to ensure that there is enough time for the discussion periods.
- There are two Web pages with the call for submission – one from the Open Symposium Web pages and the other from the Strategy Group Web pages. They should be converged to a single unique page.

The ESPG also discussed the detailed structure of the scientific sessions at the Open Symposium:

#### Introductory Session

- T. Nakada will chair this session and provide the guidelines of what is expected from the Open Symposium.
- Two talks are expected from the local authorities and one from the Polish Ministry. The talk from the representative of the Ministry will be confirmed towards the end of June following a meeting in Poland.
- The overview talk by A. Masiero will provide a broad introduction to the Open Symposium and will not overlap much with the dedicated talks in the subsequent individual sessions. The talk should be broad in its outlook without highlighting in any particular way specific projects and theoretical models.

#### Physics at High Energy Frontier and Flavour Physics

- Y. Kuno will chair the morning session while two people would be needed to chair the afternoon session. The Scientific Secretary for the High Energy Frontier is Alison Lister and is still to be defined for the Flavour Physics session.

- The talk on the high-energy frontier experiment results by G. Dissertori should focus on the results that are key to the strategy, such as the Higgs searches and tests of the Standard Model.
- F. Teubert’s talk on experiment results for flavour and symmetries should cover not only the quark flavour sector but also the charged lepton flavor and other measurements on the fundamental symmetries.
- T. Wyatt’s talk on next-step facilities should include the comparison of the capability on Higgs studies at the LHC and Linear Colliders. Some discussion would be included on the projects that need R&D, such as the muon collider.
- The ESPG also discussed how to include Super-B (Cabibbo Lab). The focus of the talk should be on the science and on possible measurements at Super-B together with Belle and LHCb.
- C. Grojean’s talk should stress the issue on how to proceed in the further understanding of electroweak symmetry breaking, in view of the Higgs status at the LHC. Regarding implications on possible new physics from direct and indirect measurement, it should consider the connections between measurements at the energy frontier and flavour physics, including a discussion on the possibility of distinguishing models and the implications of precision measurements.
- Given the extensive scope of the presentations of T. Wyatt and of C. Grojean, it would seem to be prudent to increase the time for each of these talks to 35 mins. from 30 mins.
- G. Isidori’s talk on charged lepton flavour and symmetry physics implications should include a presentation on charged lepton flavour violation and direct implications for new physics models. This would include a discussion on the electric dipole moment,  $g-2$  and  $\mu \rightarrow e$  transitions.
- The ESPG discussed the order of the presentations. It concluded to move G. Isidori’s talk to before the lunch break and to move T. Wyatt’s talk to after the lunch break (with 20 min. discussion). The lunch break will be between 12.35-14.00. All other talks will have 5 min. discussion time following each presentation.

#### Physics of Neutrinos

- D. Wark will chair this session. Enrique Fernandez Martinez (CERN) will be the Scientific Secretary.
- The talk by P. Hernandez on phenomenology of neutrino oscillations and the current situation should include standard neutrino oscillations, sterile neutrinos and matter-enhanced flavour changing neutral currents, and will consider both short- and long- baseline. Double  $\beta$ -decay, and neutrinos in cosmology and astrophysics are not included in this session and will be covered in the Astroparticle session.
- The main issue of discussion is short-baseline versus long-baseline experiments in Europe. The two types of experiments are coupled in terms of people, money and beams.
- The session should also discuss the next generation super-beam neutrino projects and the longer-term projects based on beta beams and the neutrino factory.

#### Astroparticle Physics, Gravitation and Cosmology

- The summary talk on the ApPEC/ASPERA road-map by C. Spiering should focus on the subjects not likely to be treated by the other speakers, such as axion searches.
- The word ‘science’ should be added to the titles of the talks.

- Further discussion on this session will take place at the next meeting of the ESPG.

### Accelerator Science and Technology

- R. Aleksan will chair this session and the Scientific Secretary will be Frank Zimmermann.
- There will be two talks, each of 35+5 mins. plus a 40-minute global discussion period at the end. The talks will identify the projects at the energy and intensity frontiers and provide the status of on-going activities, the main achievements of the R&D and identify critical issues facing the projects. The session will also attempt to give the readiness and a schedule of when individual projects could be constructed. Project costs will not be included since it is unlikely that it will lead to a useful discussion, but some cost comparisons could be made. The physics reach of each project will not be in this session.
- The high-energy frontier includes LHC at 14 TeV, HL-LHC, HE-LHC, Linear Collider (ILC, CLIC), LEP-3, other Higgs factories, muon colliders, plasma accelerators, eRHIC, LHeC and VLHC. The intensity frontier includes neutrino facilities, upgrades to existing facilities, high-luminosity flavour facilities, Higgs, g-2 and muon beams.
- There will be meetings with the speakers and the scientific secretary together with T. Wyatt to define the talks and see how it all fits together.

### Instrumentation, Computing and General Infrastructure

- The Scientific Secretary of the session will be Erika Garutti.
- The talk by A. Cattai on detector R&D will provide the results of a survey, which is underway but may not be fully ready at the time of the Open Symposium.
- The session will include a consideration of technical capabilities, such as test beams and the preservation of technical infrastructure and know-how at the large laboratories (cryogenics, magnets and large detectors).
- The talk by T. Boccali has been extended to 20 min. and will include software.
- The ESPG decided to add 10 min. discussion time after each individual talk with no overall final discussion at the end of the session.

### Particle Physics Theory

- K. Huitu will chair the session.
- The talk by L. Alvarez-Gaume on the role of theory for particle physics will provide an overview of all branches of particle physics theory with some historical perspective. The talk will consider what particle theory does for the field and how it is currently organized, together with comments for the future.
- The talk by C. Davies on quantum field theory on the lattice will review the spectrum of current problems in particle physics addressed with this methodology and will comment also on the organisational aspects and on the role of Europe on the global scene.
- Both of the above talks will take into account, where relevant, input submitted by the community.
- The overall discussion at the end of the session will not only cover the subjects touched in the two talks, but also the issues: CERN synergies with regional/national/local theory groups (in Europe and in the rest of the world); relations with EU programmes; relations with experiments (“embedded” theorists, collaboration between experiment and theory to optimize analysis

and presentation of experimental data, access by theorists to experimental data, etc); development of software packages.

#### Synthesis of All the Sessions

- This consists of the regional talks plus the final closing discussions.
- The regional talks should consider projects that are being built or are to be built and that would have an impact on the European Strategy. One of the aims would be to educate the community on the plans and the associated road-maps would serve as interesting decision points.
- The final closing discussion will cover the entire Open Symposium programme. As the ESPG is making the input to the European Strategy, the community should have the opportunity to speak on strategic input.

The next meeting of the ESPG will review the status of the two sessions on Strong Interactions and Astroparticle Physics, Gravitation and Cosmology. The final closing discussion will also be put on the agenda of the next ESPG meeting.

### **3. PREPARATION OF THE BRIEFING BOOK**

The Briefing Book would be needed six weeks in advance of the Erice meeting. The timetable for its preparation is therefore:

- First draft of complete skeleton (internal deadline) – 5 October
- Deadline for submission – 15 October
- First complete draft – 22 October
- Final draft – 16 November
- Completed draft – 7 December

The draft will be prepared either in WORD or LATEX version (to be decided).

### **4. DATES FOR ESPG MEETINGS**

12 June 2012 (start at 13:00 with lunch starting at 12:30)

24 July 2012 (start at 11:00)

There will be a meeting of the ESPG in Krakow on 9 September 2012 (start at 14:30)

The European Strategy Group meeting will be at CERN on 19 June 2012 (14:00-18:00).

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