

EUROPEAN STRATEGY PREPARATORY GROUP

Minutes of the second meeting held on
Friday, 21 October 2011

Present: A. Aleksan* (telephone), C. De Clercq, K. Desch, M. Diemoz, K. Huitu,
P. Jenni, Y. Kuno* (telephone), P. McBride, T. Nakada (Chairman), D. Wark,
A. P. Zarnecki.

* part-time

Apologies: P. Braun-Munzinger, P. Chomaz, F. Zwirner

1. PROCEDURE

The minutes of the first ESGP meeting (ESPG 2011-001 / ESGP 001) were approved.

2. ACCELERATOR PHYSICS WORKING GROUP

The Accelerator Physics Working Group is a group of one. The group requires people outside of ESGP for discussion. R. Aleksan will present in November 2011 the plan and organization for the Working Group.

The current proposal of R. Aleksan is that the Accelerator Physics Working Group will address the following four topics:

1. Energy Frontier.
2. Intensity Frontier.
3. Applications to other fields of science.
4. Applications to societal challenges.

In general, does the ESGP Working Group structure need to be approved by Council? It became clear that the ESGP membership was decided by Council and cannot simply be extended. Some more thoughts are needed. The ESGP needs to agree on the working mode of individual groups.

3. NEWS FROM CERN COUNCIL

Council decided the schedule for the update of the European Strategy to Particle Physics at its session in September 2011. Council considered between a half-year to one-year delay compared to the proposal discussed so far. Concern was expressed about losing momentum, but a six-month delay was seen as being acceptable. The Open Symposium was delayed by six months, but the drafting of the Strategy was delayed by four months. Council should discuss the Strategy document in March 2013 and subsequently ask that the subject becomes an agenda item for the EU Council of Ministers meeting in May or June 2013. Ministers cannot approve unless they commit to implement it but they can take note. A possible scheme could be that there will be a special session of Council, at the same time and place as the Council of Ministers meeting, with the attendance of some Ministers to adopt the Strategy. This is the first time for this procedure with the Ministers, and details need to be worked out.

The role of the ESGP is to prepare the scientific input in an optimal way for the Strategy Group; the Strategy Group drafts the Strategy.

4. VENUES FOR OPEN SYMPOSIUM

Venue requirements for the Strategy Group meetings have been distributed to Council. Dates are fixed for the Open Symposium for 10-13 September 2012, and will include a Strategy Group meeting and an ESPG meeting. The venue should be close to an international airport so that people could arrive on Monday morning and leave after the last session on Wednesday, or attend easily part of the meeting. The Symposium should have modest fees: ~100 Euro with an additional fee for lunch. The timetable will include at least a 90-minute lunch break. The discussion of start/end time implies hosting the Symposium in a major city. Ideally, proposals should be submitted before the end of October 2011. The requirement of a large auditorium could drive the cost. Council should decide on the final venue by December 2012.

The venue requirements and proposals will be discussed at a future ESPG meeting.

5. ESPG PROCEDURES

The ESPG discussed the preparation of its Web and Sharepoint sites. Documents should be shared amongst the ESPG members and also made public if needed. The ESPG should agree on which links should be made available to the community.

The ESPG Web-site is at:

<http://europeanstrategygroup.web.cern.ch/EuropeanStrategyGroup/ESPG/Welcome.html>

The ESPG should agree on a common solution for community input. Moderated input should be made available on the Web and there should be a possibility to submit by email. The ESPG could ask people to register in order to be able to submit input. It will be useful to know the role of the people, collaboration, and the community providing input. The ESPG should expect a document from each country. Is this to be formally requested? A brief guidance for submission of contributions is required. Do we want to invoke the principle that all input is public information? It was agreed that input is public (published on the ESPG Web page) unless it is requested otherwise. People can submit the contribution through Sharepoint if they have a CERN account, in an email as an attachment or as a link and the ESPG Secretariat will download the document.

Input documents should be self-contained (no internal links except in the references) They should be less than 15 pages. Everything should be in PDF format and the default is public availability.

Solicited submissions: from the funding agencies and/or from the national societies. Should these submissions go through ECFA? Members of the ESPG could inform the Plenary ECFA and Strategy Group members to get broad response from each national community/society.

The ESPG will make a global announcement to get the input from individuals, funding agencies and from societies.

Submissions on scientific topics will be accepted through 15 July 2012 for input to be included in the Open Symposium, with a second deadline of 15 October 2012 for inclusion in the Briefing Book.

Other topics such as technology transfer, links to society, and outreach should be the responsibility of the Strategy Group.

6. WORKING GROUP REPORTS

Physics of Neutrinos Working Group (D. Wark)

There are many areas to be covered, including neutrino oscillations (long baseline accelerator LBNO); reactor measurements of θ_{13} ; short baseline/sterile neutrinos; neutrino propagation and many topics that may be part of ApPEC, including atmospheric neutrinos, solar neutrinos, supernovae and geoneutrinos.

D. Wark argues that there is a need to discuss proton decay and other underground physics together with LBNO since the facilities are linked.

There may be conflicts with the ApPEC roadmap. Some issues that are clearly particle physics, such as neutrino-less double beta decay, have been part of ApPEC since they are located at underground labs.

Other items include direct neutrino mass measurements, and cosmological indications of neutrino mass. Moreover, high-energy neutrino astronomy will have to be addressed somewhere in the report. Also, the ESPG will consider the worldwide strategy and include European participation in international projects.

There are a several topics that will be omitted since they require smaller scale efforts that can be handled at the national level.

Expect to ask for input through the Open Symposium, a European Neutrino Town Meeting and input solicited through a presentation to the international community at Neutrino 2012. It must be understood that the mandate of the ESPG is to gather and compile the scientific information for the Strategy Group and not to report about the Strategy Update processes in international conferences and workshops. That is a job for the President of Council and Scientific Secretary.

Discussion of fact-checking and proof-reading of final documents – the ESPG can ask for help from ESG members and private consultation. Advertising of activities of the Strategy Group is not the responsibility of the ESPG.

Science topics that are clearly particle physics and overlap with ApPEC need to be addressed. The ESPG should be sure to be inclusive. The final document will need to be consistent with the ApPEC roadmap. ApPEC is an observer in the Strategy Session. The non-accelerator astroparticle physics area has grown a lot since the last Strategy Group.

Flavour Physics and Symmetries Working Group: (T. Nakada)

Physics topics to be covered include: CP violation and rare decays in the quark sector; charged lepton flavor violation; Lorentz structure of muon and tau decays; and lepton universality. There are also areas such as other rare muon and tau decays related to new physics and lepton number violation.

Additional physics topics in symmetry and precision experiments are the electric dipole moment (EDM) measurements; $g-2$; CPT tests; Lorentz invariance tests; and baryon number violation. Neutrinoless double beta decay and direct measurements of neutrino mass will be covered in the Physics of Neutrinos Working Group. Top quark properties will be in the Energy Frontier section. Baryon number conservation tests with neutron anti-neutron oscillations will remain in the Flavour Physics and Symmetries Working Group, while proton decay is under the Astroparticle Working Group.

There are a large number of current (LHC, BEBCII, CERN, JPARC, PSI, TRIUMF, J-PARC, FNAL, RAL, PSI, ILL) facilities and proposed future facilities (LHC, Super-B factories, tau-charm factories, CERN, J-PARC, Project-X@FNAL, PSI, TRIUMF, RAL, ESS, Gatchina).

T. Nakada asked whether the ESPG should invite key people in the field to attend ESPG meetings. Certainly, the speakers for the Open Symposium should be involved. Otherwise, the ESPG does not see the need for these invitations at this point.

Physics at the High Energy Frontier Working Group (K. Desch)

The Working Group has prepared a draft document that can be used to solicit input from the community. This document includes a list of specific questions:

1. What have we learned from the first data of the LHC so far which has impact on the future strategy?
2. What are the consequences to be drawn from a discovery / an exclusion of a SM-like Higgs boson until the end of the 2012 LHC run? How well could the Higgs properties be measured at the LHC?
3. Does the exclusion of certain BSM models/parameters already have impact on the planning of future facilities?
4. Given the new input, what is the physics case for an LHC luminosity upgrade, a linear collider and a muon collider?
5. Which kind of R&D should be pursued for both accelerators and detectors of the above with which priority?

T. Nakada asked if the LHCb results are included when this request for information is made as it will impact on the future energy frontier strategy. There should also be a request for information on the implications for the other experiments such as g-2.

Question 1 in this draft document should be modified to include the Tevatron as well as early LHC results. The ESPG agreed that electron-proton interactions would be in Strong Interactions Working Group. Leptoquarks and composite sub-structure are related to LHeC, which is connected to the Strong Interaction Working Group. Some clarification is to be made.

The need for new accelerator facilities and parameters for these facilities will be in the respective physics sections while the challenging technical details and evaluation of the state of development of the technologies will be in the Accelerator Physics Working Group. Detector R&D will be in the respective physics sections. A summary could be included elsewhere.

Strong Interactions Working Group (A. P. Zarnecki)

Physics topics include hadron spectroscopy; low energy and high energy hadronic cross sections; nucleon structure; nuclear structure; photon structure; diffractive processes; and heavy flavours.

There is overlap with the NuPECC roadmap for many topics, including hadron spectroscopy – search for exotic states and search for excited states – and also with low energy hadronic cross sections. Future facilities include low energy machines, such as PANDA@FAIR, B-Factories, and tau-charm factories.

Nucleon structure, including structure functions, low-x physics, and spin structure, are rich fields of study. Proposed projects are at the SPS (Compass II), B-factories(?), LHeC, eRHIC, and JLab. Nuclear structure topics including structure functions on different targets, which overlaps with the NuPECC roadmap. Photon structure can be studied at LHC, LHeC and LC.

Heavy flavour structure functions and evolution of heavy quark PDFs are included here although there is some overlap with the Physics at the High Energy Frontier Working Group. Rare decays will go to Physics at the High Energy Frontier Working Group.

Hadronization and soft hadronic physics at all machines should be described even if not explicitly included in Strategy statements. Is there a need to build a new machine or are the Strategy implications mainly in theory or computing?

Jet production cross-sections, multiplicities and structure functions are standard measurements that are important as a tool for discovery. It is not clear that the ESPG wants to make a statement in this area. There will be many measurements in this area. Searches with jets will be in the Physics at the High Energy Frontier Working Group.

Heavy-ion collisions topics studied include NA61, LHC, FAIR, NICA and RHIC. There is some overlap with NuPECC. Structure functions with neutrinos could be included in the Physics of Neutrinos Working Group since they will be part of the LBNO section. It was agreed to leave them in the Strong Interactions Physics Working Group. Hadron production measurements aimed to study neutrino beam should also be included in a Working Group. This is R&D for the LBNO so it should be in the Physics of Neutrinos Working Group.

Heavy particle production overlaps with the work of the Physics at the High Energy Frontier Working Group and most topics except W and Z production move to the Physics at the High Energy Frontier Working Group, including top production.

The ESPG needs to define the low energy bound to resolve the overlap with NuPECC. The overlap with Theory is large. Topics such as PDF extraction, evolution equation and models for calculations involving heavy quarks can be included in this Working Group.

It is not possible to cover everything in the document, so it is important to set priorities based on physics importance and the scale of the resources required.

Communication with the community: through Web pages, direct contact with the community (spokespersons) and presentations at workshops and conferences. One opportunity will be the DIS'12 conference in Bonn. The ESPG needs to coordinate communications with collaborations so that there is not unnecessary, confusing and overlapping contact from multiple Working Groups.

Additional contact can be done through NuPECC delegates. Is this necessary? The ESPG could invite NuPECC for a presentation of their roadmap from 2010.

7. FUTURE PLANNING

The ESPG needs to inform Council of its method for gathering input and the contents for the briefing document. The ESPG should reach a conclusion before the end of the year and have a common call for input from all the Working Groups by early next year.

T. Nakada stated that the ESPG should set up a structure for the input and asked whether the ESPG should target groups or individuals for input. D. Ward stated that the ESPG needs to target some collaborations and individuals, particularly outside of Europe. Some targets for input include collaboration spokespersons, and lab directors (particularly outside Europe). How would the ESPG reach students and postdocs? There is no active formal group of “young scientists”. Each Working Group should come up with a list of who to contact for input.

K. Desch and M. Diemoz stated that the ESPG should take advantage of the previous briefing document during the present deliberations.

P. Jenni reported that there will be a CERN-PH physics workshop next week and he will give a brief report.

T. Nakada agreed that it is acceptable to report within an institute.

8. DATES FOR ESPG MEETINGS

28 November 2011

13 January 2012

The Chairman will set up a Doodle poll for additional meetings in 2012. Wednesdays are generally not good while Fridays are requested by many members.

Notes taken by P. McBride

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