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Subject: 2016 RECFA visit to Sweden
ECFA/Secr./16/1730

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Dear Minister, dear Director-General,

It is my privilege to write to you on behalf of the European Committee for Future Accelerators (ECFA), which met in Lund on 21 and 22 May, 2016, in accordance with its mandate to visit CERN's Member States on a rotational basis and to report its findings to the national scientific authorities.

During the first day of the meeting, the Committee was presented with an overview of the activities conducted by the particle physics and astrophysics communities in Sweden, including activities in theoretical and experimental physics. The Committee was also given insight into the organisation of the Swedish HEP community and Sweden's funding policies. In addition, as has now become a tradition in RECFA's visits, the Committee heard presentations on activities in accelerator science, outreach and education, and grid computing. Tours of the MAX IV facility, which is almost ready to go, and of the ESS construction site were the highlights of the visit.

All in all, the Committee came away from its visit with a very positive impression of the Swedish particle and astroparticle physics communities and their activities. Sweden's physicists make substantial contributions to world-class projects and have high visibility. The Committee believes that this success is largely attributable to stable national funding in recent years, as well as to the funding structure that allows for both investment in infrastructure and support for research projects. In particular, the support for the LHC scientific programme through the LHC Consortium has led to coordinated and steady development. The Committee commends the activities of the Consortium and believes that its continued support is crucial for the future of the LHC programme in Sweden.

The Committee was pleased to learn that the core funding for the LHC detector upgrades (ATLAS and ALICE) has recently been secured. However, it was also made aware of the fact that funding for the personnel needed to produce the deliverables is still missing. The lack of technical staff to support detector-related activities is worrisome. Given the significant contribution of Swedish groups to detector R&D and construction, it is of paramount importance to preserve the positions and the expertise of the technical support teams.

Since, as the Committee has learned, technology transfer works well in Sweden and a large number of Swedish companies are closely involved in particle detector projects, it might be worthwhile considering the formation of a national laboratory for instrumentation. Such a move could well turn out to be the most efficient way to promote the Swedish community's excellence in detector development and construction.

The Committee was impressed by the accelerator physics activities associated with the new facilities, MAX IV and ESS, and at the FREIA laboratory at Uppsala University. These centres offer excellent opportunities for developing accelerator science in Sweden and for training future accelerator physicists, who are in high demand. The Committee considers that these activities could be better coordinated through a coherent national initiative involving both the universities and the accelerator facilities.

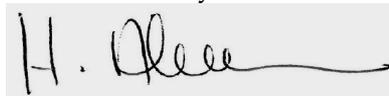
The grid computing effort organized through the Nordic Tier-1 (NDGF-T1) centre of the Worldwide LHC Computing Grid (WLCG) is a success story. In Sweden itself, the NDGF-T1 is the second-largest national research infrastructure after MAX IV. For the purpose of operating shared supercomputer-like facilities, Sweden's grid experts have developed special middleware known as ARC. This is another success story whereby ARC is already used by about 20% of the WLCG sites worldwide and usage is increasing. This achievement has put a heavy maintenance load on the existing team responsible for grid operations. The Committee recommends that adequate funding be provided to ensure that the existing achievements and expertise are preserved.

Sweden's level of research in theoretical physics is outstanding. Special praise goes to the group of theorists at Lund University who have provided and continue to provide the most essential tool used by the experimental community -- the so-called Monte Carlo simulation of particle interactions, without which it would be virtually impossible to interpret the accelerator data in terms of relevant physical quantities. At the other end of the spectrum is the very formal theory community, also of a very high level. During the previous visits the Committee has already pointed out that a better bridge between the two communities could benefit Swedish particle physics in general.

The Swedish community is conducting a vigorous outreach programme, which has reached out, in particular, to technical universities that do not have their own particle physics research programmes. This programme has brought these universities closer to CERN and its exceptional infrastructure and educational opportunities. The Committee was pleased to note that all PhD students are expected to contribute to outreach. However, it was surprised to learn that no special funding is provided to facilitate these important activities.

In summary, the Committee wishes to express its strong appreciation for the broad and successful experimental and theoretical particle and astroparticle physics programme in Sweden and hopes that its comments and recommendations can help the community to prosper even further.

Yours sincerely,



Professor Halina Abramowicz
ECFA Chair

cc: Prof. Bengt Lund-Jensen - Chair of LHC Consortium,
Prof. Olov Sterner - Dean of Faculty of Science of Lund University,
Swedish PECFA Members