FALC FUNDING AGENCIES FOR LARGE COLLIDERS

FUNDING AGENCIES FOR LARGE COLLIDERS

ANNUAL REPORT 2009-2010

December 2010

Prepared by:

Walter F. Davidson, P.Phys., FRSC
Chair, FALC 2010-2011
National Research Council Canada
Ottawa, Ontario
Canada K1A 0R6

FUNDING AGENCIES FOR LARGE COLLIDERS

ANNUAL REPORT 2009-2010

The purpose of this second annual report is to present a succinct up-to-date public account of the status of global coordination in particle physics as viewed by the Funding Agencies for Large Colliders group (or FALC). The first FALC Annual Report in 2007-2008 provided a detailed summary of the FALC deliberations and actions since its inception in 2002. The FALC composed of representatives from the main funding agencies in the Americas, Europe and Asia, meets twice yearly to discuss the status and perspectives of the field.

FALC met four times in the period 2009-2010 in Madrid, Quebec, Mumbai, and Geneva. The membership currently includes representatives from Canada, China, France, Germany, India, Italy, Japan, Korea, Spain, the United States, and the United Kingdom. At this time Canada chairs the FALC for the period 2009-2011.

The Chair of the International Committee on Future Accelerators (an international forum of leading particle physics researchers established in 1976) attends FALC meetings, as do the chairs of the International Linear Collider Steering Committee and the Director of the International Linear Collider Global Design Effort. In addition, one laboratory director from each region participates.

Since its last report, FALC continued to reaffirm its unique role as a venue for funding agencies to communicate with one another information about their respective programs, plans, and issues related to future large projects. As a recognized forum to learn collectively about the status of global projects, these exchanges serve as precursor discussions for future multilateral projects.

Given that this body constitutes a unique forum for inter-regional discourse among funding agencies, there has been increased recognition of the merits of expanding the membership, role, and mandate of FALC throughout all three regions. An action plan to this end has been developed. FALC also considers it valuable to receive reports on large facilities dedicated to related fields, such as particle astrophysics.

In June 2010, the CERN Council representative briefed FALC members about the intensive discussions between CERN and the European Commission with a view to the establishment of a more formal connection between the European particle physics community and the European Commission in Brussels.

FALC has also been informed about new CERN Council procedures to give Europe a framework to harmonize its particle physics program, to engage with the particle physics community active in other regions of the world, and to pursue the implementation of an overarching European Strategy for Particle Physics. CERN Council has followed up actively on the links to the astroparticle physics community established through the body Astroparticle Physics European Coordination (ApPEC), an interest grouping of European funding agencies.

A recurring agenda topic during the period covered in this Report has been the initiative by CERN to enlarge the laboratory, both scientifically and geographically. The CERN Council representative to FALC introduced the work of the CERN Council Working Group charged with examining the Geographical and Scientific Enlargement of CERN. As part of this dialogue, FALC members were informed about invitations to non-member States to offer opinions about how they might link into the future role of CERN in global accelerator projects and non-accelerator experiments.

There was an emerging consensus on global opening of CERN and a study was carried out on a new definition for Associate Membership. The Working Group reflected on governance structures for future global projects and how Europe, through CERN, could take part in global accelerator projects in other regions. Once the Working Group has completed its work on scientific enlargement, CERN Council intends to launch a longer-term study and status update within the framework of the European Strategy.

Most recently, a status report was given to FALC members about the Geographical and Scientific Enlargement of CERN within the framework of the European Strategy Sessions of CERN Council. FALC was informed about a Resolution embodied in the "Green Paper on Geographical Enlargement of CERN" adopted on 16 June 2010 by CERN Council. This document's purpose was to encourage non-European states that already take part in CERN's scientific program to establish more formal institutional links with the organization by becoming Member States or Associate Member States.

The FALC has noted that there are three overarching areas that require emphasis in moving forward with the planning for a linear collider: (1) economic and societal benefits; (2) outreach; and (3) internationalization of the field. FALC is currently examining these three areas.

Worldwide, there are two proposed routes undergoing research and development to achieve a Teraelectronvolt-scale electron-positron linear collider. The first is the International Linear Collider (ILC) and the other is the Compact Linear Collider (CLIC). The technology behind the ILC is at a more mature state of development than the CLIC technology being developed at CERN, in that a Global Design Effort (GDE) has been underway for five years. FALC has been kept abreast of developments on both the ILC GDE and CLIC, on a regular basis. FALC has welcomed the increased collaboration between the ILC GDE and CLIC, which allows for more effective use of resources and promotes communication between the two project teams.

The Director of the GDE, assisted by a Regional Director, has given a series of briefings to the FALC members on the plans for the ILC Technical Design Phases (TDP I and II). High-priority risk mitigating R&D and studies of cost reduction were central topics for the Phase 1 interim report in mid 2010. The TDP II is scheduled for completion in December 2012. The GDE has been exploring a post-2012 strategy.

Progress reports on the ILC GDE covered accelerator R&D, the evolution of the technical design of the ILC baseline, the ILC/CLIC collaboration, and a perspective of plans post 2012. The majority of GDE resources have been expended on the critical super-conducting radiofrequency cavities. The ILC Research Director has reported on progress on ILC detector development where there are two validated detectors under consideration. Recent status reports by the ILCSC representative have underlined the significance of the physics case, the technical advances achieved, the presence of strong support from the particle physics community, the overriding importance of political engagement from the nations involved, the need for outreach to a wider public, and the path forward towards the realization of a linear collider.

The governance of a future global linear collider has been discussed. FALC has received ongoing status reports on the study of ILC governance which had looked at the disparate governance issues in major cognate projects such as ALMA and ITER and what could be learned from them. Experience gleaned from such existing projects has been incorporated into recommendations on funding models for the ILC, including legal status, management structure, agreements, in-kind contributions, contingency issues, and operating costs. FALC has received status reports on the work of ICFA and the ILCSC, including the approach to, and guiding principles behind, ILC governance and the site selection process.

FALC has received regular progress reports on the work of ICFA and the ILCSC. Progress reports have also included the status of the Large Hadron Collider, a planned upgrade of the LHC, The Tevatron and Project-X in the United States, the KEK and J-PARC facilities in Japan (including the Super KEKB proposal), the Super-B proposal in Italy, and the field of the astroparticle physics.

Prompted by the CERN Director General, the issue of data preservation in particle physics has been discussed by FALC, where a coherent global approach to this matter was called for. FALC was informed that the LHC physics centre at CERN has been tasked with the preservation of particle physics data. While this initiative might take time, the development of a coherent plan and strategy ought to ensure that such important historical, but still very useful, particle physics data from projects such as HERA at DESY, are saved and not lost.

In its deliberations, FALC grappled with the definition of a Global Project and how this might differ from an international project. The degree of international participation, the nature of the governance, the size of the project, and the level of formalization of international commitments and agreements were all considered key attributes of global projects.

FALC has also devoted considerable attention to the issue of the definition of, and participation in, what may be termed “Global Projects”. It was acknowledged that a facility must be open and accessible; that an official steward is required for the construction and operation of the facility; that intermediate scale projects need regional distribution; and that support must be distributed in such a manner that is perceived as equitable. Members discussed the value of in-kind contributions to the construction phase, which would involve industry. The question of whether the operational costs of Global Projects should be shared or covered by the host nation was debated but without closure. The definition of a Global Project should be based beyond financial implications but also measured by intellectual content, e.g. knowledge-based contributions.

FALC accepted an invitation to make a presentation about its work and mission to the Open Session of CERN Council on 18 June 2010. The presentation was well received and raised awareness of FALC in that community and beyond.