



**Universitätsförderung / ETH-Rat Mittel
projektgebundene Beiträge**

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Projekt **C-15 Swiss Center of Advanced Studies in Particle Physics
in the LHC Era**

Projektleiter/in

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Datum 14 February 2011

Unterschrift Projektleiter/in:

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Kritische Stellungnahme zum Gesamtprojekt aus der Sicht der Projektleitung:

A) Inhalt

1. Geben Sie eine kurze Beurteilung des Projektverlaufs: Welche Ziele wurden 2010 erreicht? Welche konnten nicht erreicht werden? Wo steht das Projekt im Verhältnis zur ursprünglichen Projektplanung (Meilensteine)?

The progress of the project in its third year is nominal, with the LHC operational since November 2009. Some of the partner institutes have already agreed to increase the matching funds in order to face the difficult year 2012.

Several of the goals set for 2010 have been reached, whilst others are in a less advanced stage. The reasons for this are mainly (1) the delayed start of operations of the LHC, which took place in November 2009 at centre of mass energy of only 900 GeV and February 20010 for 7 TeV, (2) the approval of the ProDoc request only in 2009, and (3) the difficult situation regarding the outreach structure, funding and activities.

Goals reached include:

- PostDocs already hired:

All 9 PostDocs hired in the 'Centre' are well integrated in their respective experiment groups, where they also have teaching duties and often supervise younger PostDocs, PhD and Master students. They were heavily involved in data taking and physics analysis during the whole year, where the excellent functioning of the LHC and the detectors has allowed harvesting an unexpectedly large amount of high quality data for a newly commissioned machine, getting physics insight already in this first 12 months. A major event for demonstrating the huge potential of the LHC and its data was the International High Energy Physics Conference in Paris, where many of the PostDocs presented part of their achievements (for details please refer to the reports from the individual 'Unterprojekte');

- replacement of the PostDocs:

PostDocs with more experience, hired by some of the groups, have been offered permanent positions elsewhere – thus demonstrating their excellence and proving at the same time the high quality of the international competition organised by CHIPP for the selection of the PostDocs. At the ETHZ, Dr. Sordini left in February for a permanent position in Lyon, whereas at the University of Berne, Dr. Kordas left in January for a tenured position at the University of Thessaloniki. For both PostDocs, qualified successors were identified and approved by the CHIPP Executive Board in an effort to minimise the gap between departure and starting (for details please refer to the reports from the individual 'Unterprojekte');

- cooperation C-15 - CSCS Manno:

The three PostDocs hired primarily in view of improving and intensifying the collaboration between the LHC experiment groups and the CSCS Manno have been active in the follow-up of the implementation of the collaboration agreements between the institutes and the supercomputing centre Manno (LCG Tier 2 Centre). The contact persons' role in this cooperation has led to their participation in many tests of the computing grid and their attendance of several meetings with Manno and CERN. Due to different requirements in each experiment group, not all PostDocs had the same intensity of interaction and cooperation. Overall, it can be noted that the decision to hire three PostDocs specifically for this task has benefited the whole system (for details please refer to the reports from the individual 'Unterprojekte');

- full implementation of the granted ProDoc request:

After the delayed start of the ProDoc educational programme in 2009, it is now well established as a Swiss wide educational programme in particle physics with special emphasis on the physics programme of the Large Hadron Collider (LHC) at CERN. The five institutes concerned at EPFL, ETHZ and the

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Universities of Berne, Geneva and Zurich have agreed to allow their students to attend any doctoral level course organized in the two regional sites (*arc lémanique*, Zurich region) and to get credit for their participation. For the academic year 2009/10, most of the PhD students made use of this Swiss-wide offer.

For the ProDoc research modules, which are individual for each of the participating institutes, a total of 9 ProDoc PhD students have been selected and assigned to the three LHC experiments with Swiss participation (2 each in Berne, Geneva, EPFL, and ETHZ, 1 at University of Zurich [Research Module request pending]). Many of them are supervised by the C15 PostDocs – as foreseen in the project planning (for details please refer to the reports from the individual 'Unterprojekte');

- outreach:

the committee with representatives active in outreach from all institutes, lead by the CHIPP Outreach Coordinator (PD Dr. H.-P. Beck, Berne), has continued to harmonise the outreach activities in particle physics across Switzerland. One meeting and several individual contacts took place, allowing the partners to benefit from experiences gained and from exchange of material.

In addition and following a consultation with the SNF, a concept for a sustainable outreach structure has been developed, containing a number of well identified work-packages necessary to implement the concept. The request is now being submitted to the publication division of the SNF. The nomination (and the funding) of a new national node for the CERN LHC communication group succeeding Gerber (ETHZ) is part of the concept and therefore still open.

Efforts at the partner institutes on general outreach activities have continued at the level of senior members (CERN based events, visits to CERN, public lectures, interviews) including educational aspects (3ème cycle, presentations at high-schools, lectured to high-school teachers, pupils).

Several students have presented talks at the Annual Meeting of the Swiss Physical Society in Basel. EPFL has organised an 'Open Day' (29/30 May 2010), where a live screen offered a connection to CERN and where various posters, several models, experiments and detector components have been presented. Several institutes (Geneva, Berne, Zurich, ETHZ) have participated successfully in the European Physics Master classes (for details please refer to the reports from the individual 'Unterprojekte').

Prof. Pohl (Geneva, CHIPP Chair) plus one representative each from EPFL, ETHZ, Berne and Zurich have accompanied Federal Councillor D. Burkhalter during his visit to CERN (23 August), thereby making the link between CERN and the Swiss particle physics community and introducing CHIPP as the Swiss wide contact point for this field;

- CHIPP Prize 2010:

As in the previous years, CHIPP has organised a competition to identify the best PhD student in Experimental or Theoretical Particle Physics and to offer a price of 3000 CHF and a diploma for the winner, who presents his/her activities during the CHIPP Plenary. The 2010 prize was awarded to Alexander Kish from University of Zurich; for the laudatio see report from 'Unterprojekt ETHZ'. The organisation of the competition has been transferred from the University of Berne to the ETHZ/PSI (Prof. Klaus Kirch);

- workshops and Schools in particle physics:

CHIPP has continued to organise (and to be co-organiser of) a number of Workshops, Schools and Courses in 2010:

a) PhD School Ascona, 13-24 Jan 2010: The 2nd CHIPP PhD Winter School (Organizers: Prof. G. Dissertori, Prof. Th. Gehrman, Prof. A. Ereditato) was concluded very successfully on 24 January. It had taken place at Monte Verità in Ascona and had the following topics: neutrino physics, experimental methods and detectors. The School was well attended with some 50 participants (10% from foreign institutes);

b) Course on Astrophysics at very high energies, Les Diablerets, 14-20 March 2010: The course offered 28 hours of lectures by three speakers from abroad (Heidelberg, Stockholm, US Naval Research Laboratory) plus five hours about NASA's Fermi mission hands-on and three hours about ISDC

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activities. 104 participants ($\frac{1}{3}$ physicists, $\frac{2}{3}$ astronomers) from 20 countries attended the School (33 from Swiss institutes);

c) WS on High Energy Frontier, 1/2 Sept 2010, Zurich: This CHIPP workshop assembled 54 registered participants, mostly from the Zurich area (weak participation from the western part of Switzerland and of the responsible professors). There was a good, useful and motivating discussion between the PhD students and the PostDocs across the collaboration border lines. The programme covered mainly the status and future of LHC and the first physics analysis steps of the LHC experiments in great detail. Two interesting contributions came from theory and the two talks on CLIC and on detector studies for future e^+e^- colliders received considerable interest. Unfortunately, there was no talk about the new plasma wake field accelerator technologies (no suitable speaker available);

d) WS on Physics of Symmetries and Interactions PSI 2010, PSI, 11-14 October 2010. The WS has attracted 146 participants from 17 countries (46 from CH) and saw 65 oral presentations and 30 posters. The 15 speakers (13 from abroad) did focus on the physics at the low energy, high precision frontier without neglecting complementary approaches. A lively atmosphere was a proof of the motivated and interested active participants, who have also expressed a strong wish to meet again in two to three years;

e) Zuoz School: Gearing up for LHC physics, G. Dissertori (ETHZ) has been one of the lecturers (Experimental Signatures and SM/BSM Physics);

f) School on Flavour Physics (Berne, July 2010): The fourth School on Flavour Physics was organized in the framework of the European Flavianet Network and attracted 43 students (of which 18 from Berne). It offered a broad view of various aspects of flavour physics, both experimental and theoretical. The students – some of which were supported by EU funds – showed a very high commitment to lectures and exercises. Unfortunately, no student from another Swiss university attended;

g) Zurich PhD Seminar (August 2010): The annual PhD seminar of the Zurich area has assembled all PhD students in particle physics from ETHZ and University of Zurich and gave an excellent overview of the activities in this field.

- preparation of 2011 activities:

The preparation of the 3rd CHIPP PhD Winter School (Organizers: Dr. A. Hamilton, Prof. M. Pohl), which will take place in January 2011 and will focus on Astro-Particle Physics and Cosmology, has started in late spring 2010. The last two months of the year have been very work intensive (selection of lecturers, lecture timetable, accommodation and meals, travel arrangements and support for visa applications), also because the advertisement had generated quite a lot of interest (31 registrations);

- funding of C-15:

The funding for 2012 has been further discussed with SUK, who agreed to extend the project period into 2012 and allowed us to transfer the unused funds still available at the end of 2011 for this purpose. However, no new financial support has been provided for this extension.

Within CHIPP, first discussions have been held regarding the funding period 2013-2016, resulting in a preliminary agreement of the institutes concerned to apply with a follow-on request, based on the SUK guidelines (bottom-up 'Kooperations- und Innovationsprojekt', collaboration among at least two universities, co-funding leading to a sustainable support at the end of the period). A first sketch project is already under review by the University of Zurich and the Project Leader is discussing the matter individually with the partner institutes.

- promotion of FOLIS (Fonds for Large Infrastructures):

The dialogue with SER regarding the FOLIS funding has continued at several occasions during the year. Whereas there will be no new funding line for 2012, the SER intends to include a credit line for the funding of Swiss participation in international large infrastructures in the next bill on Education, Research and Innovation (2013-2016) to Parliament.

- joint M&O request

The task of submitting a joint FORCE request on the Maintenance and Operations cost for the three LHC experiments, in which the Swiss institutes are participating, has been transferred from University

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of Zurich to EPFL. Prof. Nakada has attended the CERN meetings of the Resource Review Board on behalf of CHIPP, with a mandate of State Secretariat of Education and Research, and has – together with the CHIPP Administrator – collected the input for the request from all institutes concerned. The consolidated request was submitted to SNSF in time.

- Round Table 'International':

The question of the Swiss representation in the bodies and committees responsible for new infrastructure projects at international scale has been actively discussed in a meeting with SNF, SCNAT, SER, and CRUS in Spring 2010. All participants acknowledged the need for this dialogue and the SCNAT has volunteered to call such meetings at an annual basis. However, no solution has yet been proposed for a duly authorized Swiss representation.

- joining the SCNAT:

In spring 2010, CHIPP has met with the President of SCNAT and discussed with him the possibility of CHIPP joining the Swiss Academy of Natural Sciences. The President and the Secretary General were both very enthusiastic about such a prospect and preparatory activities have started in June. At present, the Statutes (for transforming CHIPP into an Association according to Swiss law, which is a prerogative for joining the SCNAT) are well advanced and all the other documents for the formal request are ready. A decision from the SCNAT Delegiertenversammlung is expected in May 2011.

Goals partly reached include:

- Outreach:

The implementation of the coordinated outreach activities has (again) been hampered by the lack of funds. For this reason, only the coordination structure has been fully implemented (see above), whereas the setting-up of the up-dated web page and other elements have not yet been tackled.

- Funding of C-15:

Whereas the SUK approved the request to extend the programme into 2012, no additional funds have been provided. Fortunately, the SUK has decided to not reduce the 2011 funding and has agreed that the Centre can transfer the unused funds of 2011 into 2012, which allows continuing with the Centre's work, albeit at a reduced level.

- Promotion of FOLIS:

Despite the continued contact and dialogue between CHIPP and the SER, the FOLIS funding is not part of the 2012 bill for Education, Research and Innovation. This means, that the Swiss participation in several large, international projects might either not be possible in a timescale compatible with the project schedule or be limited below the capacities and competences of the groups. As the 2012 bill is only a transitory one-year bill, the effect might not be as important as initially feared and partly compensated in case the FOLIS budget line is approved in the 2013-2016 bill;

Goals not reached include:

- PhD courses:

PhD courses at the five partner institutes have been opened successfully for all PhD students (see above: ProDoc). However, due to the late start of the programme (November 2009), the originally proposed joint examinations have not been introduced in 2010. The group leaders will discuss the matter again in early 2011; for the time being, the examinations take place at the individual home institutes.

Milestones:

The list of milestones not yet achieved last year has been further reduced. All milestones related with the teaching and common PhD programmes have been reached. In the list of scientific milestones, it has been possible to advance by several months the availability of the first LHC physics data thanks to the excellent working condition of the LHC machine and detectors and the extremely high motivation of the students, the PostDocs and the senior members of the experiment groups.

Administrative milestones:

Activity	Date planned	Date achieved
Teaching coordination with other schools settled	1 Jan. 2008	Spring 2010
Lecture programme for the first year defined	1 Feb. 2008	Spring 2010
Start first PhD student	1 Feb. 2008	November 2009
Start first lectures	Spring 2008	Spring 2010

scientific milestones:

Activity	Date planned	Date expected
First workshop on LHC physics	June 2008	achieved
Initial physics results available	Jan 2010	achieved in July 2010

2. Welches sind die Ziele 2011? Entsprechen sie den geplanten Zielen? Gibt es Veränderungen in der Projektplanung?

The year 2011 should be a year where all activities ran at nominal level (as would have been the case already in 2009 and 2010, had there not been the delay in the LHC operation).

Goals:

- PostDocs already hired:

continuation of data taking, detector maintenance and physics analysis (all year), except for those who will complete their appointment in the course of 2011 (Schmid, Ronga);

- cooperation C-15 - CSCS Manno:

continuation of the follow-up of the implementation of the collaboration agreements between the institutes and the supercomputing centre Manno (LCH Tier 2 Centre);

- PhD students:

continuation of the full implementation of the ProDoc programme including a common education programme for particle physics PhD students in all Swiss institutes, with special emphasis on the physics programme of the Large Hadron Collider (LHC) at CERN. In the Research Modules, the PhD students will follow their physics analysis and the work for the publication of results.

The ProDoc coordinator Andrew Hamilton has obtained a tenured position in South Africa and will leave the University of Geneva in July 2011. He will be replaced at the PostDoc level, with a 50% charge to coordinate the ProDoc educational programme;

- Preparation and organisation of the PhD examinations:

Centralisation of PhD examinations is made difficult by the very diverse local rules and regulations at the participating institutions. It is thus likely that examinations on PhD level courses and schools remain a local responsibility. On the other hand, the participation of a CHIPP representative in the thesis defence of the C-15 PhD students will be discussed.

- outreach:

The CHIPP Outreach Group will continue to be the coordinating element for all outreach activities of the partner institutes regarding the LHC and the Swiss participation in the three detectors. In case the SNF funding for the outreach activities is granted, a real harmonisation of the outreach activities can be started, aiming at fostering the public awareness of the Swiss LHC contribution. This includes also the up-dated web page and the nomination of the Swiss node of the CERN Communication Network. All institutes will continue their effort on general outreach activities (CERN based events, public lectures) including educational aspects (links to high-school teachers, pupils). The participation at the Annual Meeting of the Swiss Physical Society will be continued.

Motivated by the enthusiastic response from the 2010 event, the PhysiScope of University of Geneva, the Universities of Berne and Zurich, and ETHZ will continue to participate in the European Physics Masterclasses.

- CHIPP Prize:

advertisement of the CHIPP Prize 2011 (Q2/2010), evaluation of the candidates and award of the prize.

- continue and organize workshops in particle physics:

a) PhD School Leukerbad, Jan 2011: The 3rd CHIPP PhD Winter School (January 2011) will deal with astroparticle physics and cosmology and will take place at Leukerbad. The structure of the School is very similar to the successful previous ones. For more details see <http://www.chipp.ch/WinterSchool2011/index.html>;

1 b) Workshop on Heavy Particles at the LHC, ETHZ/Uni Zurich, 5-7 Jan 2011

The workshop will compare Tevatron and new LHC measurements of W-, Z- and top-quark production cross-sections against theory predictions and study the implications of the new data for physics beyond the Standard Model. Early LHC data already offer new opportunities for precise studies.

c) WS on Astroparticle Physics (Q2/2011): Beginning of July 2011, Prof. Pohl (Geneva) and Prof. Nakada (EPFL) will organise a workshop on astroparticle physics in the French speaking part of Switzerland;

d) WS on the C15 mid-term results (Q3/2011): During summer 2011, Prof. Straumann (Zurich) will organise a workshop on the mid-term results of the 'Centre', bringing together all the results produced during the first three years of this project. The workshop will take place in the Zurich area;

e) WS on Neutrinos (Q4/2011): In December 2011 Prof. Baudis (Zurich) and Prof. Ereditato (Bern) will organize together a workshop on neutrino physics (location tbd);

The EPFL will organize a series of lectures by Dr Isidori from INFN Frascati National Laboratory on heavy flavour and physics beyond the Standard Model in the framework of the 3ème Cycle for physics PhD students.

The University of Zurich and the ETHZ will again organise the PhD seminar mandatory for all particle physics PhD students in the Zurich area (August).

- funding of C-15: The discussion regarding the involvement of the universities concerned and the co-funding mechanisms for the funding period 2013-2016 will continue early next year in order to be ready for the planned submission of the proposal in September 2011.

- promotion of FOLIS (Fonds for Large Infrastructures): The dialogue with SER and other agencies regarding the FOLIS funding will continue. Preparing for the period 2013-2016, where the FOLIS budget line is expected to be included in the Bill, CHIPP will suggest to set up for FOLIS a joint Steering Committee (analogous to the FORCE Lenkungsausschuss) involving the same partners present in the FORCE Lenkungsausschuss. This measure allows to maintain an open dialogue and a clear input based on scientific needs;

- Round Table 'International': CHIPP will participate actively in the continuing dialogue on the identification and designation of official Swiss representatives in the bodies and committees responsible for new infrastructure projects at European and international scale;

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- CHIPP as a member of SCNAT:

The request for Membership will be submitted to SCNAT in early February; the decision of the Delegiertenversammlung is expected for late May 2011.

B) Finanzen

3. Wie beurteilen Sie gesamthaft die Verwendung der Bundesgelder?

As mentioned in the Annual Report 2009 (section 5), the funds for 2010 have been redistributed between the partner institutes as follows:

- Berne: 199'000 CHF (was: 204'000 CHF);
- Geneva: 205'000 CHF (was: 186'000 CHF);
- Zurich: 300'000 CHF (was 314'000 CHF);
- ETHZ: 203'000 CHF (was: 213'000 CHF);
- EPFL: 197'000 CHF (was: 187'000 CHF).

Thanks to this modified distribution of funds at the beginning of the year, the funds for 2010 have been largely used as planned. The consumption factors for the individual partner institutes lay between 80% and 90%. The same factors are achieved for the salaries; this fact is explained by the stable PostDoc situation that has developed.

In addition, we have shifted – as announced – all income under 'Tagungskosten' to 'Saläre'. The benefit of limiting the funding for 'Betriebsmittel' and 'Tagungskosten' is clearly visible in the 2010 accounts: the amounts transferred from 2009 have been sufficient to pay all expenses occurred in 2010, and the amounts still in these budget lines will most probably suffice to cover the foreseeable expenses for the years 2011 and 2012. This means that we request also for the year 2011 to inject all the funds paid from SER/SUK and ETH-Rat to the salary line (see below).

Again, for reporting purposes, the expenditures associated with the project lead (central administration, accounting, 'Betriebsmittel', 'Tagungskosten', etc.) have been distributed equally to all the project partners (20% each). Further, the costs for the three shared PostDocs – linking the experiments with the CSCS Manno – are also split between the partner institutes concerned (ATLAS: BE & GE; LHCb: EPFL & ZH; CMS: ETHZ only).

4. Werden allfällige hohe Überträge Ihrer Meinung nach im nächsten Jahr verwendet oder sollte das Gesamtbudget angepasst werden?

The carry-over to 2011 amounting to 202 kCHF (18% of the 2010 funds) will be set aside for the extending project running time of one year (2012), which has been approved by SUK in summer. These funds – together with the unused funds of the year 2011 – will allow the project to continue producing scientific output also in the extension year. However, the reduced funding for that year

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(compared to the steady state situation of 2008 to 2010) will certainly limit the Centre's activities and have possibly an impact on reaching a sustainable PhD and PostDoc programmes as set out in the project proposal.

Therefore, the overall funding level for the project should not be reduced. The distribution of the funds among the institutes may change considerably in 2012, since not all PostDocs will still be at the institutes (departures for having found a permanent position elsewhere must be expected) and since local means might be injected into the project at levels differing from institute to institute. The overriding goal of the Project Leader is however to ensure the functioning of the Centre in the year 2012, in order to be ready for a possible continuation of the project in the period 2013-2016 without interruption.

5. Gemäss Verfügung des SBF und des ETH-Rates ist die Projektleitung verpflichtet, für jede wesentliche* inhaltliche oder finanzielle Änderung die Zustimmung der Schweizerischen Universitätskonferenz einzuholen.

Wollen Sie der SUK einen Antrag vorlegen? ja
nein (weiter bei Punkt 6)

Bitte formulieren Sie hier Ihren Antrag:

Applying the instructions received from SUK (letter of 29 June 2009) regarding the redistribution of funds between budget lines, we would like to inform that we plan to shift the totality of the 2011 income to 'Saläre'.

In contrast, we will not alter the distribution of the fund between the partner institutes. There are too many unknown elements regarding the continuation of some of the PostDocs and therefore regarding the effective costs occurred by a given institute in 2011. In consequence, it makes not much sense to adapt the funding distribution at the beginning of the year, but to have the flexibility to shift the funds between institutes, if need be. In addition, SUK has agreed (when approving the extension into 2012) that at the end of 2011 all the remaining funding will be transferred into one single account (i.e. the carries-over from the SUK institutes and the ETH-Rat institutes will be merged).

Therefore, the distribution of funds for 2011 will be as follows (all fresh funding goes into 'Saläre'):

- Berne: 100'000 CHF;
- Geneva: 123'000 CHF;
- Zurich: 275'000 CHF;
- ETHZ: 229'000 CHF;
- EPFL: 171'000 CHF.

6. Bemerkungen:

The ending of some of the PostDocs positions and the uncertainties associated with the zero-revenue year (2012) and the further future of SUK and ETH-Rat support for the period 2013-2016 places a

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heavy burden on the project and makes project management rather difficult. Short-term assignments for the replacement of PostDocs are investigated, as is the possibility of the institutes concerned to increase their matching funds (universities) or to create this instrument already in 2012 (ETH).