

U. Prerequisites for the realization of the center

U.1 Economic plan

Summary of proposed spending, The CosmoParticle Collaboration

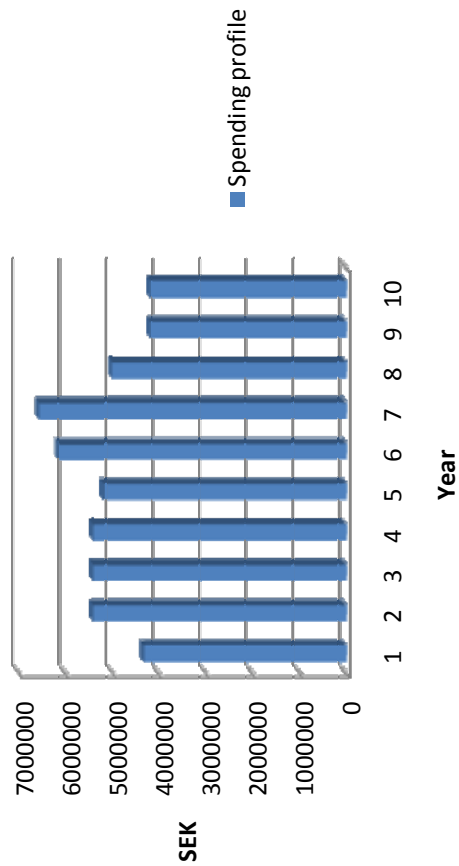
Appendix U.1		Number	SEK/mo.	Social costs	Cost/yr/ pers.	Person- yrs	All sums with overhead excluded				
Assoc. profs (>4 yr)	2	40000	1,55	744000	12						
Junior researchers	5	33000	1,55	613800	20						
Postdocs	12	29000	1,55	539400	24						
Graduate students	5			300000	20						
					76						
						Sum/10 yrs	45547080				
						Travel					
						15'/pers/yr	1140000				
						Mtrls					
						10'/pers/yr	760000				
						Lectures, workshops, IAB etc	4352920	435292 per yr			
						Total	51800000				
Year		PD Res.assthd. stud.	lecturers	Tot.pers.	Cost/yr	Travel & materials	Spending profile	Surplus/d deficit	Fraction of total nominal funding	Sum incl OH	
1	2	3	2	0	3520200	175000	635292	4330492	849508	0,016	5846164
2	2	5	2	0	4747800	225000	435292	5408092	-228092	-0,004	7300924
3	2	5	2	0	4747800	225000	435292	5408092	-228092	-0,004	7300924
4	2	5	2	0	4747800	225000	435292	5408092	-228092	-0,004	7300924
5	2	2	2	2	4394400	200000	585292	5179692	308	0,000	6992584
6	4	0	2	2	5519280	200000	435292	6154572	-974572	-0,019	8308672
7	4	0	3	2	5909280	225000	435292	6569572	-1389572	-0,027	8868922
8	2	0	3	2	4506840	175000	335292	5017132	162868	0,003	6773128
9	2	0	1	2	3726840	125000	335292	4187132	992868	0,019	5652628
10	2	0	1	2	3726840	125000	335292	4187132	992868	0,019	5652628
Total person-yrs	24	20	20	12	76	Sum	51850000	69997500			69997500
						Incl OH					

Comments to the budget: We have chosen to put emphasis on funding of junior researchers, with a rather rapid build-up the first few years of funding. A low number of graduate students are funded, these will be placed in Work Packages where they are most needed. A larger number of graduate students will be funded by the Faculty. The junior researchers, who may at most keep their position for four years, will have a chance to compete for one of our two Associate Professorships, which come into play after four years. The exact date of these opening will be discussed and decided with the help of the International Advisory Board, IAB. There will be an agreement with the Faculty and the Department that these positions are made permanent after CPC funding ends (the age structure of the Department actually is nicely compatible with this plan, which has a precedent in another, previous, Linnaeus grant of the Faculty).

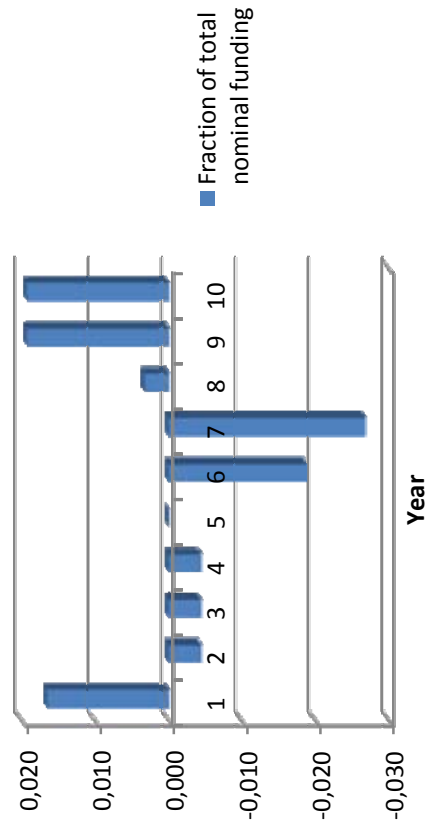
"Other costs" include visits of the IAB, invitation of guest lecturers, and during the first and the fifth year CosmoParticle Symposia (where we also expect contribution from other funds such as the Wenner-Gren Foundation and the Nobel Institute for Physics). Our spending profile is such that we will some years have a surplus at the per cent level and other years a deficit of the same order of magnitude (see Figures below). This is not larger than it can be handled by agreements with the respective Departments.

We have dealt with the rise of salaries in a simplified way by adding a 30% increase after year 5. Of course there is also a $\pm 40\%$ uncertainty stemming from the outcome of the VR reviews year 2 and 5. We plan to apply for external funding for investments, therefore we have no Appendix U.3.

Spending profile



Accumulated surplus/deficit normalized to nominal total budget



U.2 Size of environment the first year

CosmoParticle Collaboration - year 1

Costs	Co-funding from			Total	Other funding (e.g., VR support; teaching)
	Linnaeus	Stockholm University			
Direct costs					
Salary per employed: Researchers/Teachers (Professors)					
Professor Lars Bergström	0	320	800	480	Note: All professors (except Fransson, who has more) have 40% research guaranteed in definitions of their position.
Professor Claes Fransson	0	500	800	300	
Professor Ariel Goobar	0	320	800	480	
Professor Sten Hellman	0	320	800	480	
Professor Klas Hultqvist	0	320	800	480	
Professor Kerstin Jon-And	0	320	800	480	
Professor Mark Pearce	0	0	900	900	
			0		KTH: External
			0		
Junior researchers/postdocs					
Junior researcher 1	614	0	614	614	
Junior researcher 2	614	0	614	614	
Junior researcher 3	614	0	614	614	
Postdoc 1	539	0	540	540	
Postdoc 2	539	0	540	540	
Junior researcher Seo-Hee Seo	0	614	614	614	
Graduate students					
Grad student 1	300	0	300	300	
Grad student 2	300	0	300	300	
Sum personnel	3520	2714	11311		
Other costs					
The CosmoParticle Inaugural Symp. Gust lectures, Workshops of Work Packages, Visit of Internatioanl Advisory Board, etc	200				
Materials, travel	435	0	150	150	
Investments written off	175	0	0	0	
Sum direct costs	4330	2714	11461		
Indirect costs					
Administration 18 %	779	488	1268		
Lokaler 17 %	736	461	1197		
Summa indirekta kostnader	1516	950	2465		
Total sum	5846	3664	13927		

Summary, years 1 to 10 (see Appendix U.1 for more details)

	Total Linnaeus	Co-funding from University
Year 1	5846	3664
Year 2	7301	3664
Year 3	7301	3664
Year 4	7301	3664
Year 5	6993	3664
Year 6	8309	3664
Year 7	8869	3664
Year 8	6773	3664
Year 9	5653	3664
Year 10	5654	3664
Total	70000	> 36640

Comment: We have for co-funding only included salary contributions for the professors signing this application. As some of the more junior signatories will enter associate professor status during the 10-year period, this is a lower limit of the co-funding. We have also not taken into account office space, secretarial help and other costs where the University contributes. Thus these numbers (taken constant, equal to the first-year amount, over the 10 years) only serve as proof that the co-funding is larger than the required 50%. In reality, it will rather add up to the same order as the VR Linnaeus funding .

U.3 Investment needs for new equipment

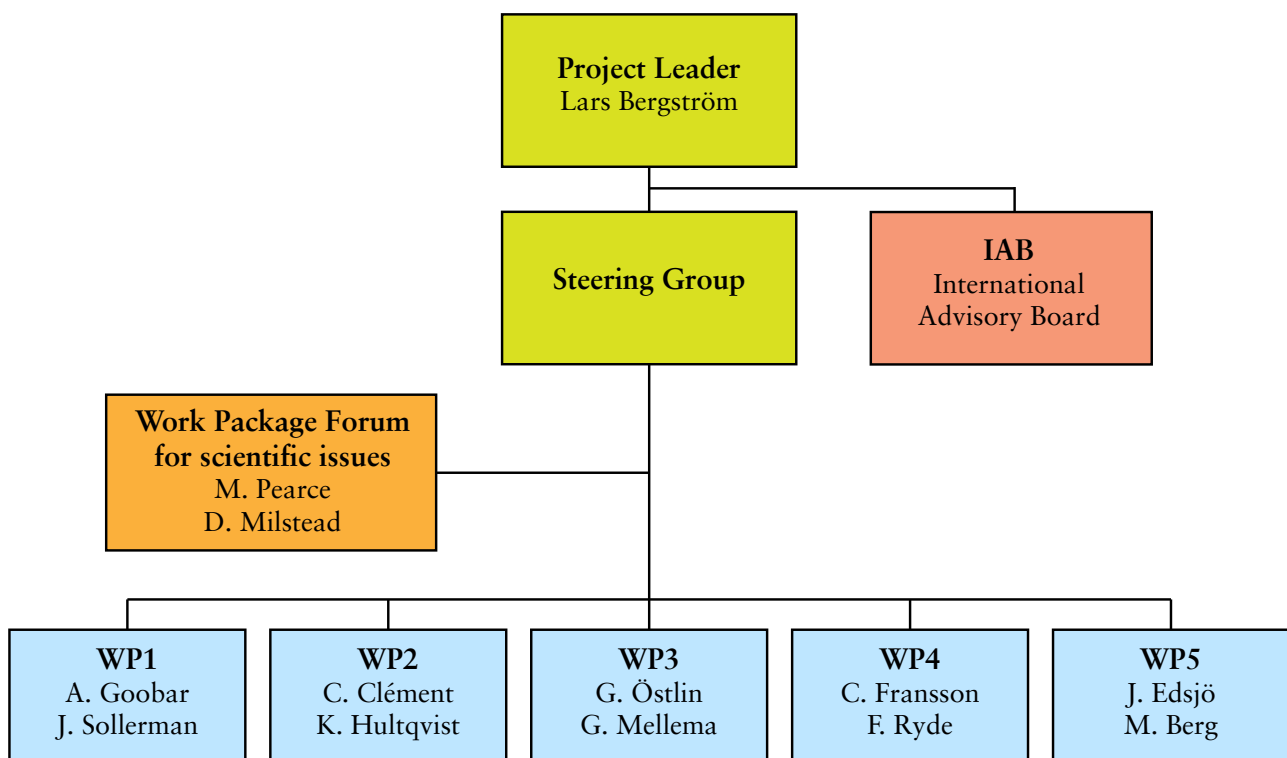
No funds for equipment is applied for in this application.

U.4 Organization plan

The project involves four research groups from three different departments at two universities, Stockholm University (SU) and the Royal Institute of Technology (KTH). The group from KTH is relatively small, and will be supported by funds administered from SU. The groups at SU involved are the Cosmology, Particle Astrophysics and String (CoPS) of the Physics Department (Fysikum), the High Energy Astrophysics group at the Astronomy Department at SU, and the Experimental Particle Physics group at Fysikum. The first two groups are already collaborating successfully (with the KTH group) in the VR-funded HEAC excellence centre, with the addition of experimental particle physics (including the AMANDA/IceCube neutrino telescope group) opening the main new collaborative opportunities.

The CosmoParticle Collaboration, CPC, will be led by the coordinator, Lars Bergström. He will form a Steering Group, composed of representatives of the participating research groups. Initially the Steering Group will be formed by the signatories of this application. The composition of the Steering Group will be subject to revision at regular intervals. The Steering Group handles policy decisions, in consultation with the International Advisory Board (see below), decides on resource matters and formulates work plans. The Steering Group meetings will be documented through written minutes. In addition, the work package conveners together form the Work Package Forum, where scientific progress and coordination issues will be discussed. For important policy decisions, an International Advisory Board (IAB) will be formed. This board will meet in Stockholm at least once per year (more often if needed), at which occasions status reports and encountered problems will be frankly discussed, and after which the IAB will be asked to give advice. The IAB will also be asked to write a report directly to the Vice Chancellor of the university in connection with the planned reviews of the project. To ensure that the opportunity of Nordic collaboration is taken into account, one representative from the NORDITA institute will be adjoined to the IAB.

Organization of the CosmoParticle Collaboration (CPC)



The daily work will be performed within the framework of “work packages”. These will be defined, and their leaders appointed, by the Steering Group in consultation with the IAB. The organization of the work will be reviewed and adapted as our understanding of the field develops, the five work packages defined in the application corresponds to what we see as the most relevant tasks at present, with a view to encourage cross- group collaboration. For efficient distribution of information in the collaboration, several web tools will be used (a web site, a discussion forum, etc.)

The distribution of funds in terms of junior researchers (‘forskarassistent’, like a 4-year postdoc), postdocs and students will be as indicated in this application for the first two years (if possible, given the time constraint for the start-up, we will ask the IAB for guidance) . After that, internal informal proposals from the different work packages will be reviewed by the Steering Group, which will consult the IAB for guidance. In the application we have requested funds for 2 permanent positions, after 4 years (with reservations for changes in the tenure system at the universities, which is presently being considered by a government report). The scientific description of these will go through the same internal reviewing using the expertise of the IAB. The departments are expected to be able to contribute to tenure after the 6 years of full funding contained in this proposal. Of course the 5 junior researchers will be expected to be strong contestants for these positions.

In fact, representing active and forward looking groups at the respective university, we anticipate that a larger number of permanent positions will be announced with specifications fitting CPC. Likewise, we have not listed many graduate students, as faculty and other sources of money will likely be available at our disposal. At the Physics Department, SU, for example, funds for new students is based on past performance of the groups, something which is positive for the groups entering CPC. We point out that unlike HEAC, the CPC proposal mainly focuses on research, not education of graduate students.

Appendix U.5 Leadership in the environment

The CosmoParticle Collaboration, CPC, will be led by the coordinator, Lars Bergström, who has been the group leader of the CoPS group, during the first three years since it formed in 2004. (Bergström is also the scientific secretary of the Nobel Committee for physics of the Royal Swedish Academy of Sciences.) He has a large international experience, and is editor for two of the most important journals in particle physics and cosmology (JHEP and JCAP). He is a frequently invited plenary speaker at large international conferences, symposia and workshops, where the topic is usually on detection methods for dark matter. He has acted as convener of working groups and session chairman at a number of conferences. He has been in the organizing committee of several symposia (including Nobel Symposia), and in the International Advisory Committee of many other. He is a board member of the Department of Physics, and is, and has been, member of several committees of the VR (at the moment, one of the Research Infrastructure Committees, the one for astrophysics and subatomic physics). He is member of the Peer Review Committee on one of the large EU collaborations in astroparticle physics (ILIAS).

Stockholm University will, in case of a successful application, provide further leadership training in the form of condensed and focused leadership courses.

Bergström will remain in active service during the 10 years of duration of a Linnaeus grant. The same is true for all proposed leaders of the work packages, which ensures continuity. The leadership structure will be reviewed after 2 years, and then after another 3 years. In case of needed, or wanted, changes in the leadership functions, there is a plentiful pool of other young presently promising people for eventual replacements. The International Advisory Board and the Research Council will be consulted in case there appear uncertainties when the leadership functions are discussed.

The main generation change expected in the period of the grant comes after four to five years when some people in the research groups retire, and when the first junior researcher grants of CPC expire. The CPC will do everything it can - while of course maintaining excellence – to ensure that the quite favourable gender ratio that CPC has now for graduate students and postdocs will be transferred to the upcoming permanent positions.

U.6 Strategies for stimulating the development of the research environment

In order to stimulate the development of the research environments, the university will take all conceivable measures to facilitate collaboration within the university and, if required, with other universities. The university will also support the dissemination of results from the centres by providing support in issues regarding publication and documentation, assisting in the compilation of websites, arranging seminars and press conferences etc. General administrative support, including personnel administration, economic and legal issues, will also be provided by the university. The Vice-Chancellor will closely monitor the development of the centres. The Vice-Chancellor will delegate a substantial part of the responsibility for the successful development of Linnaeus centres to the faculties.

The Faculty of Science has for a number of years supported strategic recruitments to the departments of the faculty in order to strengthen the research environments. In doing so the faculty has made available substantial start-up grants and thereby facilitated the recruitment of scientists with high international recognition. In addition the highly efficient and skilful support in the recruitment process by the Faculty office has contributed to the establishment of the present scientific environment housing a number of world leading scientists. The Faculty will offer the same support to the centres in their processes to recruit new excellent scientists to their programs. In addition all efforts will be made to guarantee the rapid establishment of the centers, by offering administrative support to facilitate contacts within the Faculty and the university.

U.7 Stockholm University's processes for supporting and monitoring the management of the centre

Several measures will be taken in order to ensure that the centres will have the best possible support to realize their objectives, that evaluation and accounting requirements are met and that the centres and the surrounding university environment will benefit mutually from each other.

Stockholm University recognizes the importance of high quality leadership for the successful outcome and therefore Centre directors will attend an academic leadership course regularly offered. Members of the Steering Group and research group leaders will also be encouraged to attend this course. This will ensure that the leaders in the centres have adequate qualifications with respect to management, the university accounting system etc. Scientists who are recruited to the centres, or promoted to leading positions at a centre during the funding period, will also be offered to attend this course.

Stockholm University will carry out annual evaluations of the activities of each Linnaeus centre. Annual reports will be required describing the progress of scientific work, including both scientific publications and public outreach but also the financial situation. In addition, there will be regular contacts between the directors of the centres and the faculty deans. Special attention will be given to matters related to the management of the centres. If needed, the deans will take appropriate action to rectify problems that may have arisen.

Annual seminars will also be organized, where the results of each project are presented and discussed. These seminars will be open not only to scientists but also to media and the general public.

The Vice-Chancellor will delegate to the faculty boards the formulation of strategies and the planning for the future financing of the centres, and also in other respects the ensuring of the persistence of the centres after the funding period has come to an end.

U. 8 The relation between the general research strategy of the University and the proposed centre

Stockholm University is a centre for higher education and research, organized into four faculties: sciences, humanities, social sciences and law. Its 39,000 students and 5,600 employees make Stockholm University one of Sweden's largest educational establishments and one of the largest employers in the Stockholm area.

Extensive research is carried out at the university within all four faculties. The university has a total annual budget for research of about SEK 1.8 billion (equal to about 200 million Euro). The university has 420 full-time professors, 547 senior lecturers and 112 postdoctoral fellows. The share of women

professors is comparatively high (approximately 20 percent). Some 1,900 students are registered in graduate studies, and the university awards around 260 PhD degrees every year. About 50 per cent of the students graduating with a PhD are women.

A prime mission of Stockholm University is to conduct research of high international standard. The university has identified 15 competence profiles in research. The minimum requirements for being selected to this list of profile areas have been that the research within the area is at the forefront of research in Sweden and enjoys high international status. Stockholm University believes that striving for international excellence is necessary in order to maintain its national and international reputation. On the other hand, a wider approach in which research is also being conducted within a large number of areas is necessary to generate the potential to absorb new thoughts and ideas rapidly. The possibilities of conducting high-quality basic research would, in the absence of the wide approach, be hampered. The university thus believes in combining excellence with diversity in research.

Another main strategy of the university is to support cross-scientific research and interdisciplinary cooperation, and to eliminate obstacles to such activities. The university encourages its researchers to cooperate not only between faculties but also with other institutions of higher education. Stockholm University believes that such cooperation stimulates research of high international quality. Cooperation with other institutions of higher education in the Stockholm area is particularly important. Several research institutes at the university are co-organized with other institutions. At the international level, the university encourages researchers to engage in projects financed by the EU, and 94 projects are currently receiving such funding.

The university stresses the importance of strengthening and multiplying international research contacts. We are currently in the process of reviewing our agreements with other institutions of higher education around the world. We are also developing methods to assess the position of the university within the international community of universities. The more prominent university rankings are being monitored and analyzed, and methods such as citation analysis are being introduced to assess the impact of our research at an international level.

Stockholm University maintains a broad and diversified dialogue with the surrounding community. The geographic location of the university offers unique opportunities for cooperation with government agencies, organizations and industry. The university plans to take further advantage of these opportunities. Our income from commissioned research has increased steadily in recent years, and the university intends to strengthen its ties with industry in order to create stronger innovative environments in cooperation with companies and other institutions of higher education. The many industries and institutions of higher education in the Stockholm-Uppsala region offer unique opportunities in this regard.

The strategic plan of Stockholm University calls for new research-based companies to be established. Consequently, the university has recently decided to develop the commercialization of research results further and to establish more active support for commercialization and innovation. The driving force for this process within the university is a desire to strengthen the profile of Stockholm University not only as an institution devoted to basic research, but also as an institution endowed with entrepreneurial potential.

Research at the Faculty of Science and the Linnaeus center “The CosmoParticle Collaboration (CPC)”
The Faculty of Science at Stockholm University is the largest in Sweden and enjoys strongest international reputation, in some areas the scientists are internationally leading. The present status is the result of the long-term strategy of the faculty to promote research in areas of excellence, but also securing a broad research basis of high quality. In the present strategic plan, covering 2007-2011, a new effort has been identified – to identify new growing scientific areas and scientists with the potential to become internationally recognized.

The close links with the strong research environments has since long been a Hallmark of the undergraduate programs at the Faculty. Presently some 20 BSc programs and about 40 programs leading to an MSc are offered. Especially the latter are closely related to the most successful research areas. It is believed that this will not only be beneficial for the students graduating with an MSc but also for the scientific environment within the Faculty.

The proposed Linnaeus center “The CosmoParticle Collaboration (CPC)” will bring together research groups present at Stockholm University and KTH in a new and fruitful way. Some of these groups have

successfully collaborated within a centre of excellence (HEAC), and this new Linnaeus centre will bring in new expertise in adjacent and supporting research areas. This will include recruiting a couple of new senior scientists, but the major efforts will be to support more junior promising scientists. The objective of the project as such requires contributions from a number of different areas and the CPC will be crucial in providing the required arena for fruitful collaborations.

Most of the scientists at CPC are already active in and contributing to one of the leading profile research areas at Stockholm University – “Astrophysics and Particle Physics”.

The proposed research also fits very well with the strategic plan of the Faculty of Science, as these areas are recognized as of high strategic importance for the University. With all of these things taken together, the Linnaeus center CPC would be an excellent way of strengthening these areas and has the highest support from Stockholm University.