

STRATEGIC INSTITUTE PROGRAMME & ANNUAL REPORT 2004

SISTER

Swedish Institute for Studies in Education and Research

Articles:

**SISTER – TIME FOR REFLECTION
ON KNOWLEDGE POLICIES**

Enrico Deiano

**RESHAPING STRUCTURES
OF KNOWLEDGE PRODUCTION**

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**INTERNATIONALIZATION
OF SWEDISH RESEARCH**

Olle Edqvist



Institutet för studier av utbildning och forskning
Swedish Institute for Studies in Education and Research

Drottning Kristinas väg 33 D, 114 28 Stockholm SWEDEN

Telefon: +46 (0)8 545 252 60

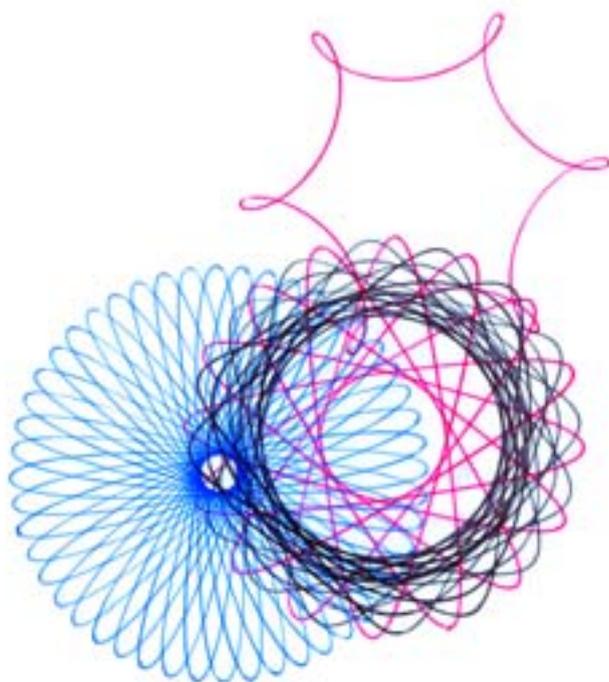
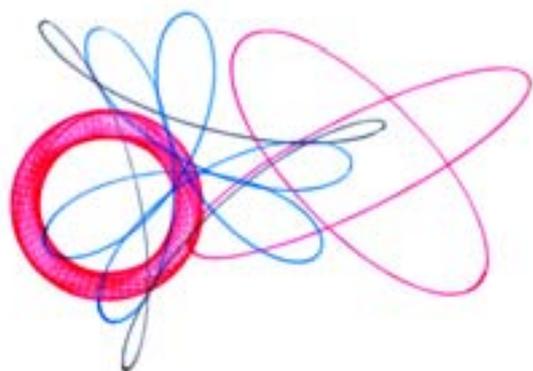
Fax: +46 (0)8 20 52 70

E-post: info@sister.nu

www.sister.nu

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SISTER

– TIME FOR REFLECTION ON KNOWLEDGE POLICIES

Enrico Deiacco *Managing director*

We live in a world where knowledge is not only a good thing in itself but also one of the important assets in a globalised economy. Thus, the question how our knowledge institutions will act, position themselves, and make strategic choices will be decisive for the future.

The renewal and adaptation of knowledge institutions in this changing international context of knowledge production will shape the research agenda of SISTER for the coming years. The growth of internationalisation is also one reason why we now shift to presenting our annual report in English and as a working language within our first Strategic Institute Program (SIP).

The mission of SISTER ...”is to study education, research and the innovation process in an international comparative perspective and to foster debate in this area”. This is a challenging task for any institute and much work over the year has been devoted to find a viable research strategy and supporting organisational forms that cuts across these three large themes.

SISTER was founded in the year 2000. However, the question of establishing an independent and non-partisan think-tank studying the ramifications, boundaries and development of the knowledge society has been debated for a long time before that. But it was only when four research foundations and four of the royal academies jointly determined to establish a new player on the market for ideas that this longstanding wish could be manifested. The first years have

not been without problems, but SISTER has now firmly established itself on the market of ideas and provided important input to the debate on the development of the Swedish knowledge society.

A clear strategic choice was made in 2004 when the strategy of the institute changed, focussing more on public policy analysis and research in areas of relevance for policymakers and knowledge needs for various actors in the Swedish landscape. This also included a change in work organisation focussing more on institutional analysis, highlighting Sweden’s development in an international perspective and providing practical advice for various actors in our field of competence.

An important instrument in accomplishing this change in strategy and work organisation has been the development and funding of a Strategic Institute Program, focussing on the role of universities and their future conditions. The programme will run over three years and is carried out in close collaboration with researchers located at Chalmers University and Lund University. Hence, the project will bring together not only individual researchers but also provide framework for interaction with three of the centres of excellence for research on innovation system, R&D and growth funded by VINNOVA. Thus, researchers from CESIS (KTH / SISTER/JIBS), RIDE (Chalmers) and CIRCLE (Lund) will be involved. The program is described in detail below, and by the project leader Maureen McKelvey in a separate article.

Another important theme is the ongoing internationalization of research and this three year project is described by Olle Edqvist below. Several of our projects and reports on strategic alliances and mergers between universities, the development of higher education, the role of post doc and various evaluations of large scale research programmes is also presented.

The idea with SISTER has proved to be valid. The Swedish research scene is in a state of rapid transformation due to past policy changes and changing external conditions, in particular the increasing role of European funding and collaboration.

There is a need for constructive reflection, deep institutional analysis and foresight. A good understanding of the changing conditions and policy alternatives is central for fostering the debate and for supporting policymakers. The information and proposals provided by stakeholders: the government, the government agencies and the universities and the research institutes are not enough. It is important that independent voices also are heard and help giving substance and solid, unbiased knowledge to the debate.

RESHAPING STRUCTURES OF KNOWLEDGE PRODUCTION

Maureen McKelvey *Professor* and Research director*

Debates rage about the role of universities and their future – or indeed futures – as universities will become more and more diversified in different countries, as time goes by. Universities struggle to find their particular solution to balancing their traditional roles of research, teaching and societal usefulness. On the one hand, many universities have focused on developing new areas of knowledge through research – and on widening the societal base of new knowledge through teaching. On the other hand, universities face the demand of producing immediately usefulness knowledge to students, businesses and society. The pressure on the university to quickly respond has been more forcefully articulated in recent years. *Knowledge Environments of Tomorrow*, (see p. 13–17) is a collaborative project between SISTER, Chalmers and Lund and raises questions about the on-going structural changes to the Swedish research and education system, about the universities as strategic actors and about the knowledge links between universities and businesses.

The Economist (February 26, 2005:63) frames current debates about universities in terms of three certainties – none of which hold in the modern economy. ‘There used to be three near-certainties about higher education. It was supplied on a national basis, mostly to local students. It was government-regulated. And competition and profit were almost unknown

concepts ... How that has changed.’ Looking into the future, *The Economist* stresses internationalization and competition as key issues.

Many observers are pointing out a structural crisis of the Swedish research and educational system, and yet the picture is complex. Swedish policy-makers are currently strongly stressing cooperation, specialization and concentration of resources. Swedish university leaders are reacting, but their agendas include many issues such as globalization, the increasing competition for students and faculty, and how to balance their mandate for teaching broad and interdisciplinary subjects with a mandate for strong research focus on specialized niches. In fact, for many years, Sweden has experimented with many forms of renewal – such as centers of excellence, regional colleges, and doubling the number of PhD students. The Swedish case indicates the complex interplay between policy-makers, university leaders, key individuals and research groups, students, and various stakeholders like businesses.

INTERNATIONAL LENSES

Indeed, debates around the world about universities reflect the importance of internationalization and demands to juggle many different roles. In terms of internationalization, one could argue that the university has always been international – if one examines the origins of the university in the Medieval period or the contact networks of today’s Nobel Prize winners.

* Maureen McKelvey is professor in Economics of Innovation at Chalmers, Gothenburg

But internationalization now clearly affects other dimensions. For example, Swedish researchers can access funding through the EU, and degrees granted by Swedish actors must be harmonized with European standards, following Bologna agreement. In terms of new demands, universities must redefine their traditional roles, in societies which now also expect the university to immediately and directly contribute to industrial dynamics and economic growth.

These issues can be briefly illustrated with my own workplace, Chalmers, where I am professor in ‘Economics of Innovation’. Chalmers has re-organized its interaction with society in the Chalmers innovation system, restructured its internal organisational structure and renewed its graduate teaching programmes. *The Times Higher Education Supplement* (5 November 2004: 1–15) ranks Stockholm University and Uppsala University rank at 139th and 140th in the world, and Chalmers as 39th within Europe. Hence, one could ask whether and to what extent that an elite, highly respected university which does well on the international rankings is still primarily Swedish. Financial flows from the Swedish policy system to teaching and research are certainly critical. And yet in the past decades, Chalmers can also be interpreted through other lenses than a purely Swedish one. Chalmers is now a place where many languages are spoken. Some graduate programmes attract students from 17 or more countries. Moreover, Chalmers research is dependent to 75% on non-government funding for research – that is, companies and often multi-national enterprises. This example illustrates that while Chalmers is an actor positioned in the Swedish policy context, it is also fundamentally an actor in international arenas.

DIVERSIFICATION

This project discusses futures of universities in plural because each actor has the possibility to make quite different strategic choices. We can conceptualize universities as complex organisational entities, which deliver a mix of goods, services and intangible to a wide range of consumers. Indeed, ‘universities’ are becoming an increasingly diverse group. For example, some may pursue a strategy of low-cost minimal service for mass education whereas others pursue a strategy of

high quality personal interaction with students. Yet others may strongly stress research – and all associated activities such as training of PhD students – whereas others will stress undergraduate training. Different strategies will likely turn out to be differently viable, when faced with an uncertain future, because the ultimate success and failure of university choices and strategies will depend to a large extent on variables outside the immediate control of universities. Such variables include things like student choices, education financing, and science policy in Sweden and EU.

THE MICRO AND THE MACRO

Studying universities as important and strategic actors within the Swedish innovation system implies that we must better understand the dynamic interactions and structural change which unites the ‘micro’ of individuals, universities with the ‘macro’ of their socio-political-economic contexts. The ‘micro’ side should focus on how and why individual researchers and groups as well as vice-chancellors and university presidents make decisions. This must be set into the ‘macro’ context of how and why incentives, resource flows and other aspects of the corporate R&D system and government policy system. Interestingly enough, in the short run, many of these variables are set but in the long run, many of them may be changed – thereby opening up for a dynamic evolution of the system.

UNIVERSITIES AS STRATEGIC ACTORS

This three year research project will analyze Swedish universities, set in terms of internationalization and new demands. The first research theme addresses financing. One aspect to address is how specific fields and research groups are currently solving financing issues: What are their strategies and what effect does it have on the ‘type’ of research and development being done? How do researchers access costly equipment, to pursue world-class research in narrow but very promising fields? Another major issue, as mentioned above, is that some observers state that in contrast to the presumption that Swedish is ‘world-leading’ in R&D, in fact Swedish universities have a major structural crises in terms not only of funding but also of taking on perhaps too many tasks for society. How are universities balancing the

demands of long-term employment contracts with the short-term demands of responsiveness, not only to businesses but also to policy-makers?

The second research theme asks whether, and how, universities are strategic actors. Many observers tend to see universities as organisations which treasure their heritage and react very slowly to external changes. Yet as argued above, universities are reacting but also becoming more diverse. The university is not only reactive but also pro active, implementing strategies to survive to meet new demands. What strategies are possible, today and for future? How does top management get the academic staff to head in new directions – and vice versa? How does the university balance the need to both teach and do research in fields with well-known sets of problems and answers – like civil engineering – and in fields with fast-moving and new sets of problems – like biotechnology? How do the changing flows of students, financing for teaching and research monies affect the individual university ability to react?

The third research theme focuses on universities interactions with society – particularly business – in the knowledge economy. In the knowledge society, many different types of actors need to develop and apply scientific and technological knowledge, in order to improve the quality and lower the price of their goods and services. It holds for public

health and the car industry as for ‘high tech’ industries like telecom. Companies are particularly important in coordinating and applying many types of knowledge to solve a practical problem. Debates have focused in recent decades on patents and technology transfer offices. This project will shift the debates towards the division of knowledge labour in society. How do universities as well as many different types of firms interact through specialization and differential competencies? Which businesses interact with which universities today? What is the ‘usefulness’ of universities not only to university spin-offs but also to the renewal within firms in traditional Swedish industries?

This project will bring not only the researchers involved but also parties interested in the future of the university on a journey. Along the way, we must apply and further develop relevant theoretical and conceptual tools for explaining the deep-going structural changes identified above. These theoretical and conceptual tools will be matched with an empirical analysis of the broader trends about universities and the Swedish system, involving quantitative data as well as case studies of specific phenomena and the futures. Our ambition is to use this 3-year, collaborative structure to deliver long-term relevant research results as well as deliver a series of studies which analyzes more immediate issues.

INTERNATIONALIZATION OF SWEDISH RESEARCH

Olle Edqvist *Researcher*

International cooperation in research is certainly nothing new, whether in research itself or in research policy. During the Enlightenment, with its growing interest for natural philosophy (or natural science), education abroad was more or less a necessity. After basic university studies, the young scholar went to university in Europe to learn more from the best scientists and scholars. Linnaeus sent his students on long journeys to other continents to collect plants and general information.

In most subjects scientific work is not nationally limited; people seek their contacts wherever they are in the world, and make use of the international journal literature. Sometimes the research question itself demands international cooperation: in the case of Linnaeus, the plants he was studying were to be found elsewhere in the world.

International cooperation can therefore take many forms. It includes cooperation to achieve research results; joint publication with the cooperation of authors from different countries; study and research abroad; conferences and seminars; the work of visiting foreign researchers in Sweden; and so on. Many scientific problems require very expensive equipment (large-scale facilities, rockets or ships) and the costs of these are such that international cooperation has become essential. Some tasks also require cooperation over national borders in order for data and observations to be gathered at all: this is common in the social sciences, where experiment in the normal sense is not possible, and it is important in some of

the natural sciences, for example, the geosciences and other sciences of the inventorying and taxonomic type. The basis of classical biology, for example, is the study of organisms from different milieus, and it was this kind of study that led Darwin to his theory of natural selection.

RESEARCH IS NO LONGER THE DOMAIN OF ANY SINGLE COUNTRY

There is ample evidence that the internationalization of research has been increasing rapidly in recent decades and that we are in the midst of a fundamental transformation of our entire scientific system. One indication of this is the pattern of publishing. Between 1986 and 1996, the proportion of articles published by multiple authors from different countries increased from 22 per cent to 40 per cent—almost doubling in ten years. This increase in multiple authorship is a general tendency over the whole scientific world, and Sweden is no exception here. The number of researchers working abroad for part of their career, the number of guest researchers and the exchange of post-doctoral students are increasing similarly. Why this change? It is without doubt a combination of different factors. One is the funding of research by the European Union, which requires cooperation between researchers in different countries. However, EU research funding only amounts to appr. 5 per cent of all research funding in the member countries, so this cannot be the only factor. Another reason, undoubtedly, is that the practical

obstacles to cooperation have been reduced: air travel and telephone calls are now cheap, and the Internet and e-mail have opened new opportunities for rapid communication.

RISING COSTS

Another factor can be the steadily rising costs of scientific equipment, which have enforced cooperation over the building of experimental facilities and different research tools such as research ships, rockets, establishments and databases. High energy physics (CERN), astronomy, space research and oceanography offer early examples. Others are synchrotron light sources and neutron sources, where the initial investment in and the costs of running research facilities are more than one single country can afford. Sometimes they are established by formal agreements between countries (CERN, ESA, EMBO/EMBL and so on); in other cases they are set up by bilateral agreement at a lower level.

As often as not, cross-disciplinary and multidisciplinary research of the type that tackles special complexes of problems will require cooperation in order to widen the knowledge base available to the researcher. These kinds of problem are often composite in nature and necessitate cooperation from several different disciplines, and sometimes different faculties. If the expertise is not to hand in the researcher's own university, he or she has to look for it in other environments and other countries. This pattern is often visible in EU-funded projects, but not only there. The researcher requires insights and networks of contacts outside his own discipline. Here, therefore, the driving force behind cooperation and internationalization is the need to widen the knowledge base in order to solve certain problems.

OTHER MOTIVATIONS

However, in many subject areas the basic driving force has to be sought in the internal rewards system within the university system. Besides the goals of high scientific quality, widening the knowledge base, getting access to equipment and material resources, and getting access to data, self-interested and immediate goals can also come into play—such as increasing research funding and achieving economies of scale in order to

recruit competent researchers and partners, postdoctoral students and PhD students. Prestige, curiosity and a desire to travel are often important driving forces for the individual researcher.

COUNTERVAILING FORCES

At the same time as the costs of research are increasing, so are the pressures for research to produce results—results for the country that is providing the funding. Great emphasis is currently placed on creation of spin-off companies and support for innovation by companies. There is greater pressure to patent research results in order to protect the exploitation of them, and indeed sometimes to keep them secret. Within industrial and defence research this has of course always been the case, but it is a growing tendency now in the fields of biotechnology and IT research, among others. There may therefore be forces working against internationalization and the open dissemination of the results of research.

THE PROJECT

In 2004 SISTER started a major research project on just this subject. The change in the extent of international research cooperation is posing new challenges and setting new tasks for Swedish research, the Swedish universities and Swedish research policy. So far they have not been brought to the forefront of attention for research policy and the research funding system, but within the research world there is an acute awareness of these new demands and changes.

It can also be said that neighbouring countries, like Finland (and Norway in the field of development assistance) place much greater weight on stimulating and systematically developing international research contacts. The interplay with the EU system is one element; the building up of bilateral contacts with other countries is another.

Another strong argument for strengthening international research cooperation is that many of the important challenges before us are international. In December 2004 the tsunami disaster reminded us of the threat of natural disasters in other parts of the world. Epidemics spread rapidly over national borders; and there are no national borders to climate change

and global warming. Most important of all, poverty knows no borders. In our own self-interest as well as out of solidarity, we should be trying to contribute to reducing poverty and suffering in Africa and other parts of the world.

There are therefore strong research policy reasons for Sweden to put together a clearer research policy picture of how we cooperate with the world around in the research area. Do we need new funding tools? Do international contacts need particular encouragement? Are we making the best possible use of EU research funding? Should we be doing more on questions of disease and poverty in the third world?

The research project that has started will look at the driving forces behind and the forms of international cooperation

within different subject areas. It will study a series of research projects and research teams, questions about the motivation for and the extent of international networks, and their development over time, by means of interviews and using other material.

The project is being conducted by Olle Edqvist with funding from the Bank of Sweden Tercentenary Fund (Riksbankens Jubileumsfond, RJF), the Swedish Foundation for Strategic Research (Stiftelsen för Strategisk Forskning, SSF), STINT and VINNOVA. It will be reported at seminars, in working papers, and with the publication of a monograph. It is expected to be completed in early 2007.

STRATEGIC INSTITUTE PROGRAMME

Knowledge Environments of Tomorrow – new conditions for universities and their effect on innovation and industry

INTRODUCTION

Powerful international forces of change are forcing Swedish and European universities to consider new strategic choices. A new approach is needed to the future positioning of the universities and to the way in which courses, research and forms of cooperation are financed and organised. The need among players for information and analysis on which to base strategic decisions is likely to grow considerably in the future, especially within academia, but also among research funding agencies, ministries and government. The Strategic Institute Programme focuses on fundamental issues and aims to meet high expectations with respect to timing and relevance. It will contribute to an increased understanding of the universities' importance to Sweden and the development of Swedish society and provide a better foundation for discussion about strategic choices and solutions within the Swedish university system. The programme is focusing on the future; on 2010 and well into the decade thereafter. The international perspective is a crucial aspect.

The aim is to be able to conduct a qualified and well-substantiated discussion on the necessary conditions and prerequisites to conduct research in Sweden in the future. Can the Swedish seats of learning hold their own in the international arena? Can they compete with the big name universities in the United States and Europe? There also needs to be a discussion about the requirements for providing higher education. Today there is tough competition for students, at least in some areas.

The anticipated results of the studies will provide input for analysis and interpretation of the structure of Swedish policy. New empirical data will shed new light on the interplay between the Swedish players that conduct research and provide education, research foundations and other players. The programme is measuring and evaluating the effects of current processes of change and also provides a platform for debate on alternative courses and choices for development.

BACKGROUND

During the 1900s there emerged what has been called the “three-hump model” for conducting research (universities-institutes-companies). Although universities had been involved in research activities for quite some time, it was not until the beginning of the last century that research was actually considered to be a natural part of the university concept. In Sweden it became a legal obligation – “the second mission” – with the same importance as teaching from 1909. Research conducted by companies was still very limited, but companies such as MoDo, LKAB and the young Astra (which was almost entirely built on research) started to conduct research at about the same time. And, as if by coincidence, the first industry research institutes were formed at the same time, during the years just prior to WWI. These three types of research players emerged in varying proportions in almost every country.

The three types of research players and the institutions have actually been in the process of drawing closer to each other for

quite some time. This has been happening in different ways, i.e. through specialisation and differentiation, but also by an exchange of functions among the various players, and in some cases, they have entered into mergers and strategic alliances.

One point of departure for *Knowledge Environments of Tomorrow* is the actual dynamics in the system of research execution. In a system like the Swedish one where there is a strong emphasis on research at universities and development by companies, this process has special characteristics, both within knowledge environments and at the policy level.

Another point of departure is the strong international and European influence we are seeing on the functions, focus and structure of the knowledge environments. The Lisbon Strategy and Bologna Process, for example, is likely to lead to increased

differentiation between knowledge environments and an emphasis on more vigorous research milieus in order to be competitive in Europe. The EU's research policies are also a contributory factor, through the Seventh Framework Programme and deliberations on a European research council and technology platforms to strengthen innovation systems.

The place of science in politics, the economy and media will grow in importance, but as yet we know little about the structures and driving forces behind this. A good deal of analysis still needs to be done on both the structures and the forces of change. The lists below summarise a few of the aspects of the processes of changes that we are seeing in full swing.

GLOBAL TRENDS

- Decreasing financial resources from governments
- Higher education is losing its intellectual independence
- Higher education is exposed to competition
- Higher education is being steered towards applied sciences, towards research applications
- Mass education and even universal admission to higher education
- Differentiation of functions among institutions as a response to the trend from elite to mass education to universal admission functions
- Fees as a source of income
- The "brain drain" phenomenon (or mobility of highly competent individuals) is intensifying within and between nations
- People in higher education are becoming increasingly concerned about their future prosperity and even their survival – which can no longer be taken for granted
- There is an internal decline in civic responsibility and an increase in the fragmentation of interests

CONDITIONS IN THE SWEDISH SYSTEM

- External sources of research funding at 65–75% (1990 around 50%)
- Government research funding, KTH around 90% (incl. research foundations + EU, 75% excl.)
- Doubling of "HÅS" (=full-year student equivalent)
- Numerous new programmes
- Rapid increase in research volume
- Significant increase in publications (about double)
- Very rapid increase in postgraduate studies
- Functional overload
- "Academification"
- Multiplicity, diversity
- The "third mission"
- Internationalization
- Fragmented labour market
- A more diverse universe of users – collapse of development pairings, government monopolies etc.

Source: Kerr, C, 1994, *Troubled Times for American Higher Education*. University of the New York Press.
Broström, A, Deiac, E, Sörlin, S, 2004, *Universities of Technology in the Global Market: reasons and potential for a strategic alliance between the Royal Institute of Technology (KTH) and Chalmers University of Technology*. Working paper 32:2004, SISTER.

There is little analysis, however, that sheds light on the current processes and looks into the future at 2010 and the decade thereafter. Nor are there very many studies or papers internationally that deal with these issues. Although we seem to have reached something of a plateau right now with respect to paradigmatic interpretations, such situations do not usually last very long.

One of the issues that is raised more and more in the public debate is the effects of the development described above at the systemic level within individual universities and on administrators, educators, researchers and students. Different hypotheses have been put forward on how the university system is responding to the changes in the world. Some argue that the development trend is towards increased stratification and differentiation of the Swedish university system, a greater emphasis on hierarchy, growing competition and differences in status, a growing dependence (particularly financially) on international market forces. At the same time, people are drawing attention to education's increased dependence on the local social/geographic/economic surroundings, the fact that academics working in the university system have less influence, the need for new leadership etc. As part of the programme, some of these ideas (which occasionally border on myth) will be subject to empirical analysis and examination.

A THREE-PART PROJECT

SISTER's work with the *Knowledge Environments of Tomorrow* strategic institute programme is organised as three sub-projects:

Sub-project 1: New Forms of Funding and Effects on Research and Education

Sub-project 2: From Public Service University to Global Player – differentiation and work distribution in the Swedish university system

Sub-project 3: The Interface of Research and Enterprise – from technology transfer to co-production

SUB-PROJECT 1: NEW FORMS OF FUNDING AND EFFECTS ON RESEARCH AND EDUCATION

Over the past few years the research funding debate has been intense. There has been heated discussion about the relative increase in R&D funding and its distribution between basic research, targeted research and demand-motivated research. The question of how much has gone to this or that expenditure item has, in our opinion, detracted from the issue of the major structural challenges that are being faced in the funding of higher education. The issues at hand include the amounts, focus, mix and effects of funding on research and education. Clearly the discussion on the funding of university research and the various circumstances that steer and affect universities needs to go into greater depth, and the issue of the focus and size of cash flows must also involve analysis of the significance of the resources – for education, for academic freedom, for the development of society – and the impact on, for example, economic growth and regional development.

There are many signs indicating that the Swedish university system today is under great financial pressure. Although there are a number of explanations as to why this is the case, there are of course no simple causal connections. The fact is that the number of players funding research has grown over the past 30 years and as a result, new and different research assignments and goals have entered the system. An important point of departure is the fact that the political economics of the funding system have changed drastically. The purpose of this sub-project is to analyse the new funding landscape and analyse the effects to better meet the future resource requirements and develop instruments to steer and give focus to research and education. This sub-project will deal with three main issues:

- New resources are available as a result of the emergence of new research funding players and the fact that universities now have a stronger role in society. Examples of new resources include centres of excellence, consortiums, competence centres and research schools, as well as “profiles,” “platforms” and “idea support.” What are the

risks and opportunities that accompany the new ways of working with research? What are the effects?

- Although discipline-oriented research will continue to be important, the knowledge boundaries between different disciplines will become increasingly fluid. What are the most effective means of supporting these kinds of interdisciplinary areas and the emergence of new knowledge fields?
- A new area for research and analysis that is beginning to emerge is the link between funding and the effects on the quantity and quality of research. How does the size of a university, institution or research group effect scientific productivity and scientific excellence? Does external funding contribute to or reduce productivity and scientific quality? And what qualities are we talking about in this context?

Due to the pluralistic and heterogeneous funding structure that has emerged in Sweden over the few past decades, it is possible to study the issues from both a micro and macro perspective.

SUB-PROJECT 2: FROM PUBLIC SERVICE UNIVERSITY TO GLOBAL PLAYER – DIFFERENTIATION AND WORK DISTRIBUTION IN THE SWEDISH UNIVERSITY SYSTEM

One of the most important factors affecting the universities of tomorrow is their growing role as an engine for social progress. For a number of years in succession the universities have typically been accepting a growing portfolio of assignments. They are now also starting to act selectively and more strategically. While it is true that they have enjoyed a great deal of self determination for quite some time and that this is increasing, it appears that they have only very recently realised what they can actually do with it. Words such as profiling, alliances and strategy are no longer merely education policy rhetoric; they are a reality.

The force behind this development is well known. Competition is on the increase – for students, researchers and resources, and it is increasing internationally as well; Lisbon

and Bologna are representative of initiatives in Europe. In addition to discussion about a European research council and European technology platforms, we can look forward to a situation where the competitive climate strengthens the process that is tentatively taking shape in Sweden. We are already beginning to see the results through new types of formations in the field. Alliances are being forged between universities and between universities and institutes, and new partnerships are being established between universities and companies. National boundaries have been breached by Öresund University, across the Baltic, and between Gothenburg and Oslo. In Europe where alliances between universities have been emerging since the beginning of the 1990s, the process has progressed even further.

The purpose of this sub-project is to analyse the universities' strategic choices and the ramifications for administration, governance and organisation. How should the system become specialised (differentiated) to make clearer choices regarding focus and direction and to compete with other countries for students, educators, researchers and patents?

Some fundamental issues that need to be discussed include to what extent universities are exposed to competition and what effect this is having. What will the seats of learning look like when profiling and strong research become words with substance? What do the processes of change look like on the demand side? What are the implications for the regional role of universities?

SUB-PROJECT 3: THE INTERFACE OF RESEARCH AND ENTERPRISE – FROM TECHNOLOGY TRANSFER TO CO-PRODUCTION?

University-based research is considered to be of crucial importance for socio-economic growth and the ability to deal with society's problems and risk situations. The Swedish paradox has been hotly debated over the past few years. The question of how to promote and increase the commercialisation of research is therefore an inevitable one. It is understandable that research and innovation policies in the

1990s dealt with creating instruments to get more out of the university system. Politicians have implemented a number of measures and created instruments so that research can generate a better yield. A few examples include the introduction of research foundations, the third mission, the EU's framework programmes, strengthened research councils and a general mustering of strength, as well as ideas regarding abolishing the system whereby professors/teachers own the intellectual property rights for their research (lärarundantaget).

The various policy instruments that have been introduced in the Swedish system over the past fifteen years have probably contributed to an increased understanding of cooperation and knowledge flows between research and enterprise. However, it is less clear what the economic and societal effects of the various measures have been.

One hypothesis is that the established policies are based on a mistaken assumption about how research is applied in industry. The instruments that have been implemented are based on an assumption that there is a gap between knowledge supply and demand and that this gap can be filled by different types of policy instruments such as licensing offices, incubators, contact secretariats, industry centres, technology parks etc. New research, however, challenges this way of thinking by asserting that the interplay between research, innovation and industrial dynamics is more complicated than that. The new research indicates for example that:

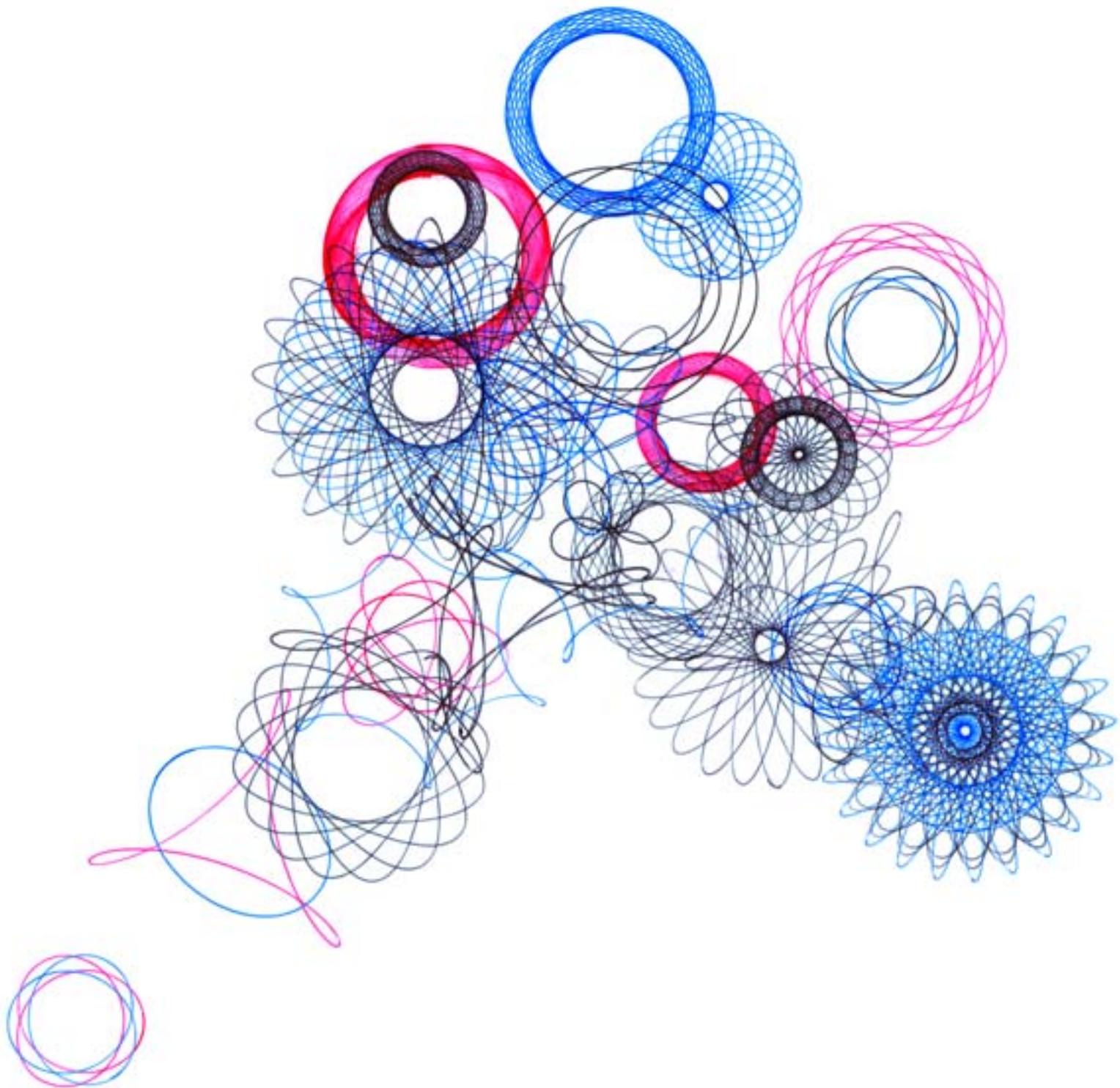
- the interplay between research and the commercial application of knowledge is more varied than was previously thought to be the case and differs from technology field to technology field. There is also a fundamental difference between science and technology, something that is often understated in debates and when policies are formulated;
- the effective commercial application of knowledge requires a) a strong receptive capacity, b) a well-developed knowledge seeking capacity, and c) an ability by businesses to integrate new and old fields of science;

- knowledge flows are often individual due, for example, to the mobility of researchers and innovators. Thus “intertwined systems” are needed for knowledge transfer based on social and cultural factors such as trust and long-term relationships, rather than the establishment by universities of licensing offices etc.

One could make a long list of the questions that need to be answered by the sub-projects: What effects does research have on companies' innovative activities? What is the importance of different kinds of knowledge when businesses obtain knowledge? What types of collaboration generate innovation? What is the future role of research institutes in the knowledge transfer processes? What is the importance of partnership programmes or strategic research initiatives on the innovative abilities of companies? What is the role of individual top researchers in the establishment of new technological fields? How does knowledge transfer vary between different technological fields? How are small and large companies conducting their R&D?

MULTI-SKILLED NETWORK

SISTER is working with three centres for innovation studies as part of this project: CIRCLE in Lund, CESIS in Stockholm and RIDE in Gothenburg. *Maureen McKelvey*, Professor of Innovation Economics at Chalmers University of Technology, is the Project Manager, and *Mats Benner*, senior lecturer at the Research Policy Institute at Lund University, is in the management group. A total of around ten researchers and analysts will be working with the project and the results will be reported in stages up to 2007. Activities that focus outwards will be arranged as part of the programme alongside the research and analysis work. These will consist of reports, articles and seminars and debates. The aim is for major media and knowledge institutions to use the programme to promote a broad and general debate about where Swedish universities is heading as a knowledge nation and what this means for different sectors and for individual options.



ANNUAL REPORT 2004

Research & assignments

Since January 2004 the Institute has been working according to a three-year programme of activities. Several of the major research programmes and assignments we conducted during the year are in their final phases or have recently been concluded. Clients who commissioned the projects carried out in 2004 include the EU, VINNOVA (Swedish Agency for Innovative Systems), STINT (Swedish Foundation for International Cooperation in Research and Higher Education), the Swedish Research Council, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), the Östergötland County Council etc. (see the complete list below).

Research activities and assignments in 2004 included developing projects already in progress and establishing new

ones. A few projects were concluded in 2004. Several of the projects are being run by networks and with research groups with links to universities and other research environments. SISTER has been running the project “Culture in the Knowledge Society: Culture as a sector of society and the challenges of cultural policy” in cooperation with researchers from the Royal Institute of Technology (KTH), Linköping University and University College of Borås since 2001.

Research into innovation and renewal of the economy is a highly prioritised area, but in Sweden it is characterised by the fairly large number of already active research environments, several of which have not yet reached their critical mass. SISTER has established CESIS in cooperation with KTH and Jönköping International Business School. CESIS stands for Centre of Excellence for Science and Innovation Studies.

For a list of abbreviations see pages 35 and 36.

PROJECTS IN 2004

Widening Participation in Higher Education

(in progress)

Sweden and the UK are two countries that have recently been actively pursuing policy initiatives to widen participation in higher education. Both countries share a common participation target of a 50 per cent participation rate by 2010. Through a country-comparative study, this project is aiming to identify policies and practices to find effective means of widening participation in higher education.

The four core objectives are:

- To reflect on and analyse Swedish policy for widening participation.
- To make an international comparison of widening participation policy and practice in the UK and Sweden.
- To develop recommendations for building on existing work and developing new approaches to effectively widen participation.
- To produce a final and comprehensive report for the Special Committee on Recruitment to Higher Education.

Funding: Swedish Ministry of Education's Recruitment Delegation (Rekryteringsdelegationen)

The International Aspects of the Swedish Public Research System since World War II

(in progress)

The purpose of this research project is to analyse and describe the international aspects of the Swedish public research system over the past fifty years. This includes Swedish research carried out abroad (expeditions etc), research collaboration with units and at facilities abroad, but also international funding of Swedish research and other important international influences as a part of the total Swedish public research system.

Swedish public research policy is dominated by national needs and concerns, and is largely based on traditional patterns which were established when the university system was much smaller and research with few exceptions was nationally executed. This is no longer a valid model and the present research policy and research funding do not constitute an appropriate response to the current and foreseeable challenges. There is clearly a shortage of public resources for linking Swedish research to international systems, particularly, but not merely, to the European research system. Internationally organised, funded and executed research and concomitant politics will play increasingly important roles for science.

Funding: SSF (Swedish Foundation for Strategic Research), Bank of Sweden Tercentenary Foundation, STINT (Swedish Foundation for International Cooperation in Research and Higher Education), VINNOVA (Swedish Agency for Innovative Systems)

**Human Resources in Research & Development:
Monitoring System for Career Paths and Mobility Flows**
(in progress)

The objective of the project is the collection and analysis of data sources and data banks in selected countries of the European Union on migration flows and career paths of academics and private sector R&D personnel. This relates, on the one hand to international mobility and, on the other, to mobility within and across sectors and regions, i.e. job-to-job mobility and career paths. The priority is less to compile and evaluate valid statements about particular migration quotas of the academic communities described, but rather to examine official data sources, academic surveys, studies etc. for the purpose of establishing:

- methodological and methodical approaches to a comprehensive and continuous inventory of migration movements among EU countries and between EU and non-EU countries;
- the identification of gaps in data (and availability), which impedes the establishment of a comprehensive inventory of migratory flows of researchers at all levels and dimensions. Some of the gaps are impossible to cover in the short and medium term. The project will document these gaps systematically and propose measures to overcome and limit them.
- the conditions necessary to harmonize future data registration within the EU from which it is possible to derive statements on a regular basis about inner-European migration of academics and R&D personnel and migration between EU and Third World countries.

Funding: EU

**Centre of Excellence – Stockholm Centre
of Innovation Studies, KTH CESIS**
(in progress)

CESIS is a long-term venture involving scientific studies of the connections between, driving forces behind, and effects of basic academic research, corporate research initiatives and development activities, technology development and innovations. The innovation initiatives of Swedish companies are a main focus of the research being carried within the framework of CESIS.

For more information www.infra.kth.se/cesis

Funding: VINNOVA

**Research Foundations
and the Swedish Research System**
(in progress)

It is almost ten years since the new research foundations were established. SISTER's foundation project aims to problematize and analyse the role of research foundations in influencing the Swedish system of education, research and innovation.

Funding: SSF (Swedish Foundation for Strategic Research), The Knowledge Foundation, MISTRA (Foundation for Strategic Environmental Research), Vardal Foundation, Bank of Sweden Tercentenary Foundation

Strategic Planning for STINT

(in progress)

STINT (Swedish Foundation for International Cooperation in Research and Higher Education) supports the internationalisation of research and higher education through numerous different programmes. In 2004 the foundation commissioned SISTER to plan and coordinate the production of documentation on new ways of promoting internationalisation. A work group has been formed consisting of Michael Gibbons, Yehuda Elkana and Said Irandoust. The group's work is focusing on describing the necessary conditions and prerequisites for internationalisation in the future and to suggest alternative action based on this information.

Funding: STINT

How can we raise the level of competence in the care sciences?

(in progress)

Care sciences is usually defined as an interdisciplinary and inter-professional research area based on knowledge and experience from a number of different fields such as medicine, care, social and behavioural sciences and technology etc. This study focuses on two fundamental challenges for the Vardal Foundation (*Vårdalstiftelsen*) ventures: the issue of the effects of development initiatives on established research environments and the issue of how interdisciplinary research within new areas can best be organised to achieve the necessary effects.

Funding: Vardal Foundation

Stockholm's Intellectual Capital

(in progress)

Stockholm's most important competitive advantage by far is its dominance in Sweden, which has grown over time, in recruiting and supplying well-educated individuals. However, the level of awareness of the importance of intellectual capital is extremely low, particularly considering the growing regional competition in Sweden and in an integrated Europe. This project aims to document the mobility of intellectual capital, particularly of human capital, and to develop indicators to measure this.

Funding: EU

Developing Stockholm as a "Knowledge City"

(in progress)

This research project, which is in the development phase, will focus on the development of scientific facilities and their impact on Stockholm's urban landscape. The project will highlight and contribute to the debate on how to continue to develop the various science regions in Sweden. The project also addresses the significance recently of scientific facilities from a cultural heritage and cultural environment point of view – an area where there has been little research.

Funding: Formas

The Entrepreneurial Faculty

(in progress)

KTH has a number of entities that support and work with “the third mission.” These include the incubator KTH Starthus, KTH Seed Capital, the alumni organisation, KTH Holding etc. The project’s intension is to attract members from the various faculties to build a culture that promotes the university’s “third mission.” Through visits to other institutions and comparisons with universities in other countries and how they organize their “third mission,” the project aims to inspire and identify best practice. During the spring of 2005 the project will develop a number of concrete measures to bring about a process of change under the leadership of Clas Wahlbin, former President of Jönköping University.

Funding: KTH (Royal Institute of Technology),
Teknikbrostiftelsen

Analysis of the Content of Applications Submitted to the Committee for Educational Science

(in progress)

During the period 2001–2003 the government allocated specific funds to support research in the field of education through the Swedish Research Council’s Committee for Educational Science (*Utbildningsvetenskapliga kommittén – UVK*). The project includes analysis of both announcement texts and documentation of the applications received and granted during the period. The project also includes studying the effects of the establishment of UVK in relation to other players in related areas, and making educational science a separate area for research funding.

Funding: Swedish Research Council

R&D for Change – A study of the R&D strategies of Swedish county authorities

(in progress)

The healthcare authorities’ clinical research and development responsibilities are defined in the Swedish Health and Medical Services Act. Funding is in the form of public funds, so-called ALF funds (at present around SEK 1.5 billion/year). Reorganisation is currently under way within several counties for the purpose of creating a cohesive regional healthcare structure, and this will involve a change in the role of university hospitals. This study is focusing on the Östergötland County Council, its R&D activities and the challenges it faces in the healthcare sector.

Funding: Östergötland County Council



Analysis of Seed Financing in the Stockholm Region

(in progress)

The project is an analysis of ALMI’s clients (consultation and lending) and recipients of innovation funding from ALMI and SIC. The analysis is based on data that sheds light on developments from 1993 to 2003.

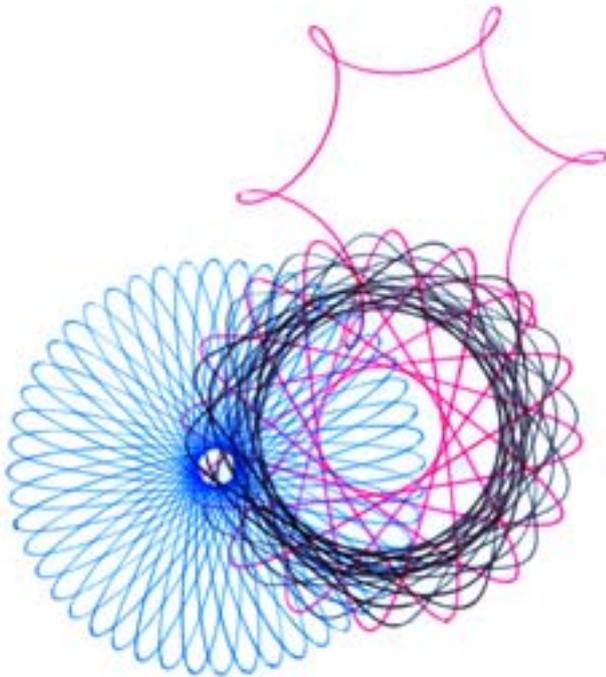
Funding: ALMI

Knowledge City – on knowledge establishments and the shaping of the urban landscape

(concluded in 2004)

What determines why scientific institutions are established in certain places? Which partners, interests and professions were – and are – involved in such decisions? What are the visions behind the knowledge city? The spatial character of city spaces in cities characterised by knowledge production, education and universities is determined, in various ways by this activity. This multifaceted issue will be the topic of a two-day workshop involving developers, city planners, architects and architectural historians as well as art historians, science historians and industrial history experts.

Funding: Akademiska Hus



Strategic Alliance Between KTH and Chalmers

(concluded in 2004)

Alliances are a response to a new international competitive climate. Within KTH and Chalmers there are arguments, circumstances and common value systems that speak in favour of a possible alliance. The emphasis of this study is on investigating the possibility of an alliance. The main advantage of an alliance is the strategic and long-term discussion about the future of both KTH and Chalmers that it will produce, rather than the potential for temporary efficiency gains. An alliance should be seen as a means of supporting the strategic focus rather than a goal for the universities' own ambitions.

Funding: KTH and Chalmers

The Research Institute Sector, Universities and the Swedish Innovative Landscape

(concluded in 2004)

In an international perspective, Sweden's research institute sector is very small. Swedish research policy has assigned the institutes a marginal role with recurring problems relating to basic funding and the brain-drain effect. This study highlights the roles of research institutes in the higher education system and the national innovation policies.

Funding: IRECO

Culture in the Knowledge Society: Culture as a sector of society and the challenges of cultural policy

(concluded in 2004)

Apart from its educational, integrative and emancipatory dimensions, culture also has a role as a branch of industry, a production organisation and a market segment. Culture, in other words, is a sector of society just like any other. This research programme addressed issues regarding a new way of looking at the cultural sector in a knowledge society and in a globalised economy: What is culture expected to achieve as a driving force for economic development? What is the professional role and professional identity of people working in the cultural sphere? What typifies the knowledge society's creative zones? What democratic role can culture play in an emerging knowledge society?

Funding: The Bank of Sweden's Tercentenary Foundation

The Government, Chalmers and Science

(concluded in 2004)

In this research project and book, Chalmers University of Technology's transformation from a school of arts and crafts to a university is set in a broad historical context. Higher education in science and technology, including research, form a central theme in the history of the industrial society's knowledge management and highlight how the government and the scientific community came together to address research policy. Chalmers was transformed when Swedish society was modernised. Its history, which was fraught with conflict, evolved during Sweden's political industrialisation in the beginning of the 1900s, but it has striking similarities with today's situation, because many educational institutions are seeking to change their name and gain scientific status.

Funding: Chalmers, Swedish Research Council and Magn. Bergvalls Stiftelse

Support Innovation in the Stockholm Region – System management

(concluded in 2004)

In Stockholm many players have an influence on the innovation environment as a whole. One purpose of this project was to create a common platform for discussion about development, promoting involvement and developing a joint vision and strategy. The first goal was to produce documentation based on which SISTER would conduct a study entitled "Innovative Processes in the Stockholm Region – implications for the regional growth programme (RTP) activities." The published paper was called: *Kunskapsregion Stockholm på världsmarknaden? – möjligheter och utmaningar för det regionala tillväxtprogrammet* (Stockholm, a knowledge region in the world market? – The regional growth programme's opportunities and challenges).

Funding: Stockholm County Administrative Board

New industry, new assignments, new competence requirements

(concluded in 2004)

This project was run under four main headings: 1) People with higher education in companies, 2) Local recycling of people with a science education in Uppsala industries, 3) Education, drop-out, and the functions of the labour market – Swedish experiences in a European perspective, and 4) new industry, new labour market conditions and new competence requirements. SISTER's main assignment was to assist with studies under headings 3 and 4.

Funding: VINNOVA

Communication

In 2004 SISTER employees published articles in international and Swedish journals and contributed policy reports and other materials to the Swedish debate. The Institute's staff members have summarized results and policy implications in articles, in interviews in the press and through the broadcasting media. They have also published books and participated in studies. Below is a list of publications published by SISTER.

In 2004 SISTER published two issues of its series called Skrifter (Booklets). Some of the booklets were published in cooperation with the Nya Doxa publishing firm. In 2004 SISTER also published three reports. These are also available on the website. Through the SISTER Alert newsletter, which is published in both paper and electronic format four times a year, SISTER provides information about these publications as well as the Institute's other activities. SISTER Alert is based on current events and provides links to the Institute's website which is regularly updated. SISTER continued to develop its seminar series in 2004 into a much-appreciated discussion forum and an open meeting place for researchers, publicists, government officials and politicians working within this area.

PUBLICATIONS 2004

Newsletter (*in Swedish*)

SISTER Alert - Meddelanden från Institutet för studier av utbildning och forskning (SISTER Alert – a newsletter from the Swedish Institute for Studies in Education and Research) is published four times a year with a paper distribution to around 1,200 subscribers and via e-mail to around 2,200 subscribers – a total increase of 1,200 in 2004. The newsletter provides information on current publications, seminars and other activities with which the Institute's staff members are involved. Each time the newsletter is sent out the activity on the website is greatly intensified in the form of more report orders, applications to attend seminars and new subscribers. SISTER Alert works with various art institutions to produce the cover pictures. In 2004 the cover pictures were of art exhibited by IASPIS (International Artists' Studio Program in Sweden). Previously the newsletter reported on the Institute's activities only, but in 2004 a themed editorial section was added. The first theme was the need for a strategic structure in the university sector and the other theme dealt with the increasing dependence of research and education on developments in a globalised world.

Books (*in Swedish*)

2004 : 10

Den mediala vetenskapen

(*Medial Science*)

Anders Ekström (red)

2004 : 11

Staten, Chalmers och vetenskapen

(*The Government, Chalmers and Science*)

Henrik Björck

Reports (*in Swedish*)

2004 :30

Utvärdering av det svenska medlemskapet i IIASA

(Evaluation of Swedish membership in IIASA)

Sverker Sörlin (Chairman), Mårten Carlsson, Britt-Marie Drottz-Sjöberg & Göran Melin

Evaluation conducted by SISTER, commissioned by Formas

2004 :31

Institutssektorn, högskolan och det svenska innovationslandskapet

*(The institute sector, universities
and the Swedish innovation landscape)*

Sverker Sörlin

2004 :32

(available in English)

Tekniska universitet på världsmarknaden?

**– motiv och förutsättningar för en strategisk allians
mellan KTH och Chalmers**

(Universities of Technology in the global market?)

*– Reasons and potential for an alliance between the Royal Institute
of Technology (KTH) and Chalmers University of Technology)*

Anders Broström, Enrico Deiacco & Sverker Sörlin

Reprints

2004:6

Postdocs abroad: inherited scientific contacts or establishment of new networks?

Göran Melin

Research Evaluation Volume 13 Number 2 August 2004

External principal

Lillemor Kim contributed a paper on the Swedish system of higher education to the omnibus volume entitled *Reforming Higher Education in the Nordic Countries*. This anthology comparing the Nordic countries edited by *Ingemar Fägerlind* and *Görel Strömqvist* describes how the higher education systems in the Nordic countries have responded to global changes and new expectations. *UNESCO's International Institute for Educational Planning* (IIEP) is behind this initiative.

SEMINARS 2004

In 2004 the Institute arranged/co-arranged the following conferences/seminars with external participation:

Research on Teaching in Higher Education – How has Swedish university research addressed the teaching issues?

16 March, 3–5 p.m.

An analysis and overview of the research on teaching in higher education commissioned by the Swedish Research Council's Committee for Educational Science was presented at this seminar.

Participants:

Lillemor Kim, SISTER

Ewa Ohlstedt, SISTER

Berit Askling, UVK/VR

Donald Broady, Uppsala University

Kenneth Abrahamsson, FAS

Medial Science

14 May, 10 a.m.–5 p.m.

At this seminar at Uppsala University, Anders Ekström presented the SISTER publication entitled *Medial Science* (Den mediala vetenskapen) which he edited. The questions addressed were: How is the medialisation of science affecting the view of the legitimacy of research and its future focus? And how does the role of research communication change when science, in an increasingly one-sided way, is described as an economic growth factor.

Participants:

Anders Ekström, Uppsala University

Sven Widmalm, Uppsala University

Sverker Sörlin, SISTER

Ulrika Björkstén, KVA (Royal Swedish Academy of Science)

Kaj Johansson, Göteborg University

Johan Kärnfelt, Göteborg University

Eva Åhren Snickare, The Nobel Museum

The Role of Industry Institutes

17 May, 3–5 p.m.

In the public debate in spring 2004 the importance of need-motivated research for growth was in focus. SISTER was commissioned by IRECO to analyse the role of the institutes in the innovation system. The results were presented at the seminar.

Participants:

Sverker Sörlin, SISTER

Enrico Deiano, SISTER

Johan Carlsten, Vice President of Chalmers University of Technology

Raising the Competence Level

17 November, 3–5 p.m.

The Vardal Foundation (*Vårdalstiftelsen*) arranged a seminar on healthcare sciences at SISTER's premises in connection with SISTER's strategic evaluation of four of the Foundation's initiatives: The Vardal Institute, junior research fellow positions (the so-called professor incubators) the Competence Development Programme and the 44 doctoral positions that the Vardal Foundation initiated.

Participants:

Lillemor Kim, SISTER

Per Janson, SISTER

Olivia Wigzell, Swedish Association of Health Professionals

Peter Aspelin, Karolinska Institute

The Internationalisation of Research

9 Nov. 10.15–noon

With a recently published article entitled "Post docs abroad: Inherited scientific contacts or setting up new networks?" by Göran Melin as the point of departure, the seminar opened a discussion on the changes in the international research landscape. Where is development heading? Does Swedish research policy need to be adjusted?

Participants:

Olle Edqvist, SISTER

Göran Melin, SISTER

Claes Wahlestedt, Centre for Genomics and Bioinformatics, Karolinska Institute

Knowledge City – workshop

11–12 November

A new research project entitled *Knowledge City* is studying knowledge establishments and the shaping of the urban landscape. What determines the establishment of scientific institutions in certain places? Which partners, interests and professions were – and are – involved in such decisions? What are the visions? As part of this project, SISTER organised a comprehensive workshop in cooperation with Akademiska Hus and Formas.

Participants:

Karl Alexandersson

White arkitekter

Karin Arvastson

Swedish National Heritage Board

Gunilla Bandolin

School of Architecture, KTH

Claes Caldenby

Chalmers

Eva Eriksson

Gotland University

Christian Frisenstam

NFR Arkitektkontor AB

Mats Karlsson

Lindholmen Science Park AB

Hjördis Kristenson

Lund University

Hans Lindh

Akademiska Hus

Julia Lindkvist

SISTER

Lars Marcus

School of Architecture, KTH

Johan Mårtelius

School of Architecture, KTH

Pehr Mårtens

SISTER

Mika Määttä

FFNS Arkitektkontor

Marie Nisser

INDEK, KTH

Mats Perner

Stockholm City

Planning Administration

Owe Swanson

White arkitekter

Sverker Sörlin

SISTER

Mårten Tiselius

Akademiska Hus

Tomas Tägil

Lund University

Lotta Werner Flyborg

WSP Group

Erik Westin

Akademiska Hus

Sven Widmalm

Uppsala University

Göran Åberg

City Planning Administration, Karlstad

Administration

FINANCIAL POSITION

Core grants from the founders in 2004 amounted to SEK 2.6 million. Annual fees from the 14 members amounted to SEK 0.7 million. The Institute's activities were also financed by project funds and other external contributions. In 2004 the Institute's costs excluding depreciation amounted to around SEK 8.9 million. Projects from 2003 that were extended were funded by research councils, research foundations etc. New projects are being funded by the Swedish Foundation for Strategic Research, the Bank of Sweden Tercentenary Foundation, the Knowledge Foundation, Formas, Akademiska Hus, the Vardal Foundation, EU Structural Funds, the Royal Institute of Technology and the Ministry of Education's Recruitment Delegation. External funding – commissioned assignments and research projects combined – accounted for almost 60 per cent of the income reported in 2004.

In 2004 SISTER turned the previous year's deficit into a small surplus of SEK 75,000. This is largely due to the cost savings and efficiency measures that were implemented relating mainly to payroll expenses and fees as well as the cost of the Institute's premises. The workforce has consisted on average of 9 individuals compared to 14 in 2003. Rental costs were reduced when one floor was cut from the office space.

The core grants of SEK 2.6 million and membership fees of SEK 0.7 million covered the cost of salaries for the administrative staff (a producer/public relations officer and an administrator), rent, depreciation and operating costs for telephones, postal services, datacommunication and office supplies. Salaries for all other staff members and other operating costs were covered by project grants and commissioned assignments.

From the beginning of 2002, the Board decided that SISTER will apply academia's customary supplement of 35 per cent to research funding players to cover joint costs. This does not apply, however, to EU projects and certain research funding players. Prices for commissioned assignments are adjusted according to the nature of the assignment, its duration and market prices for similar services, ensuring that the Institute's costs are fully covered.

Funds are distributed over the period in which they are to be used. The reason for this is that SISTER is the recipient of large research grants that span several years and are for work carried out by collaborating research groups. One project in particular should be mentioned in this context, namely, "Foundation Project 04" of which 40 per cent of the total amount is budgeted for work by collaborating research groups at various Swedish universities. Funds for these partners were deposited in a special clearing account and do not affect the Institute's result in the balance sheet.

STAFF

As of 31 December 2004 the Institute had ten members of staff: Managing Director Enrico Deiaco, Scientific Director Sverker Sörlin, three post-doc researchers, three research assistants, one public relations officer and one administrator. Other researchers and doctoral candidates who are employed elsewhere, mainly within academia, also work with the Institute's projects.

ADMINISTRATIVE OFFICE

The administrative office includes management, accounting and other administrative functions. The office also handles communication, seminar and conference arrangements, the publication of reports and booklets, as well as network building and contacts.

Three-year summary

	2004	2003	2002
Current assets as a percentage of current liabilities (%)	107	53	115
Net sales per employee (SEK 000)	1,031	828	768
Net sales (SEK 000)	9,282	11,589	10,757
Profit/loss from operations (SEK 000)	45	-1,346	-521

FINANCIAL STATEMENTS:

Income Statement and Balance Sheet

PROPOSED APPROPRIATION OF THE INSTITUTE'S PROFITS

The Board and the Managing Director propose that the 2004 profits of SEK 71,893 be carried forward.

For more information about the Institute's results and financial position, please refer to the Income Statement and Balance Sheet below and the notes that accompany them.

INCOME STATEMENT

<i>Amounts in SEK 000</i>	<i>2004</i>	<i>2003</i>
Net sales	539	1703
Grants, subsidies etc.	8,743	9,886
	<hr/>	<hr/>
	9,282	11,589
 <i>OPERATING COSTS</i>		
Other external costs	-2,672	-4,720
Personnel costs	-6,172	-7,693
Depreciation of tangible fixed assets	-393	-522
	<hr/>	<hr/>
	-9,237	-12,935
Profit/loss from operations	<hr/>	<hr/>
	45	-1,346
 <i>PROFIT/LOSS FROM FINANCIAL ITEMS</i>		
Interest income	31	121
Interest expense	-1	-3
	<hr/>	<hr/>
Profit/loss before tax	75	-1,228
Tax	-3	
	<hr/>	<hr/>
Profit/loss for the year	72	-1,228

BALANCE SHEET

Amounts in SEK 000

31 Dec. 2004 31 Dec. 2003

ASSETS

Fixed assets

Tangible fixed assets

Equipment, furniture & fittings

718 1,400

Total fixed assets

718 1,400

Current assets

Current receivables

Accounts receivable

10 60

Other receivables

69 193

Prepaid expenses and accrued income

639 545

Total current receivables

718 798

CASH AND BANK BALANCES

2,132 2,675

Total current assets

2,850 3,473

TOTAL ASSETS

3,568 4,873

EQUITY AND LIABILITIES

Equity

Non-restricted equity

Profit/loss brought forward

153 1381

Profit/loss for the year

72 -1,228

225 153

Current liabilities

Advance payments, project grants

1,272 1,271

Accounts payable

395 549

Tax liability

3

Other liabilities

650 1101

Accrued expenses and deferred income

1,023 1,799

Total current liabilities

3,343 9,150

TOTAL EQUITY AND LIABILITIES

3,568 4,873

STAFF

SISTER is a research institute that recruits researchers and analysts with well-established research expertise and an interest in policy-related issues. We also recruit analysts and assistants with a high level of professional competence and an interest in research, education and innovation.

The individuals listed below were employed in 2004 at the Institute in Stockholm.

COLLABORATORS

Managing Director

Enrico Deiacò, MA Economics, Stockholm and Göteborg Universities

Research and Scientific Director

Sverker Sörlin, Professor, Ph.D. History of Ideas and Learning, Umeå University

Financial Manager and Assistant to the Managing Director

Inger Lindbäck

Programme and Communication Coordinator

Pehr Mårtens, MA Social Anthropology, Uppsala and Stockholm Universities

Staffan Arvidsson, M.Sc. Business Administration, Stockholm University

Anders Broström, M.Sc. Engineering, Royal Institute of Technology (KTH) and Linköping University

Olle Edqvist, D.Eng., Royal Institute of Technology (KTH)

Per Elfner, M. Pol. Sc., Stockholm University

Per Jansson, Ph.D. Pol. Sc. Lund University

Maria Johansson, MA Comparative International Pedagogy, Stockholm University

Lillemor Kim, Ph.D. Pedagogy, Uppsala University

Göran Melin, Ph.D. Sociology, Umeå University

Sofia Sandgren, Doctoral Candidate, Industrial Dynamics, Royal Institute of Technology (KTH)

Carolina Sigfridsson, Social Scientist, Örebro University

ASSOCIATE RESEARCHERS

Mikael Sandberg, Senior Lecturer, Ph.D. Pol. Sc., Göteborg University

Julia Lindkvist, MA Art History, Stockholm University

Hans Lööf, Ph.D. Economics, Royal Institute of Technology (KTH)

LEFT THE INSTITUTE IN 2004

Staffan Arvidsson

Per Jansson

Hans Lööf

Sofia Sandgren

Carolina Sigfridsson

FUNDING FOR SISTER IN 2004 PROVIDED BY

Akademiska Hus
ALMI
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WHAT IS SISTER?

SISTER is an acronym for Swedish Institute for Studies in Education and Research.

In May 1999 a number of academies and research-funding foundations in Sweden established the Association for Studies in Research and Education for the purpose of conducting and promoting studies in research and education and to foster debate in this area. These activities are being carried out by the Institute for Studies in Research and Education, SISTER.

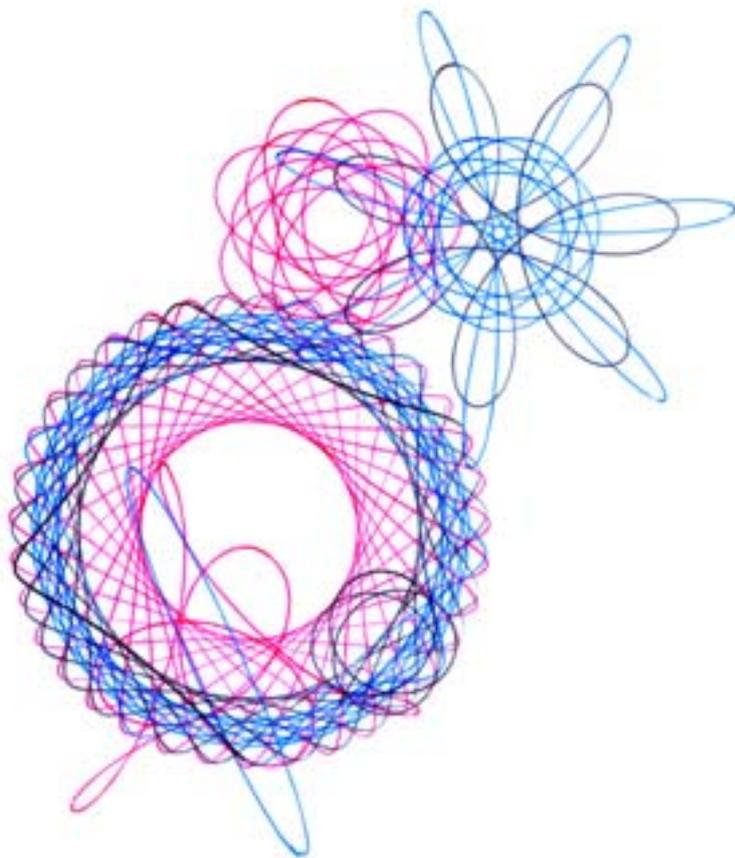
The Institute for Studies in Research and Education was launched on 1 January 2000. Its creation can be seen as a response to a need that had been discussed for some time for independent analysis and studies on the state of Swedish education and R&D systems. The Institute is independent of political interests and its activities are funded by core grants from the Association, research-financing funds, research councils and foundations etc. as well as through commissioned research assignments.

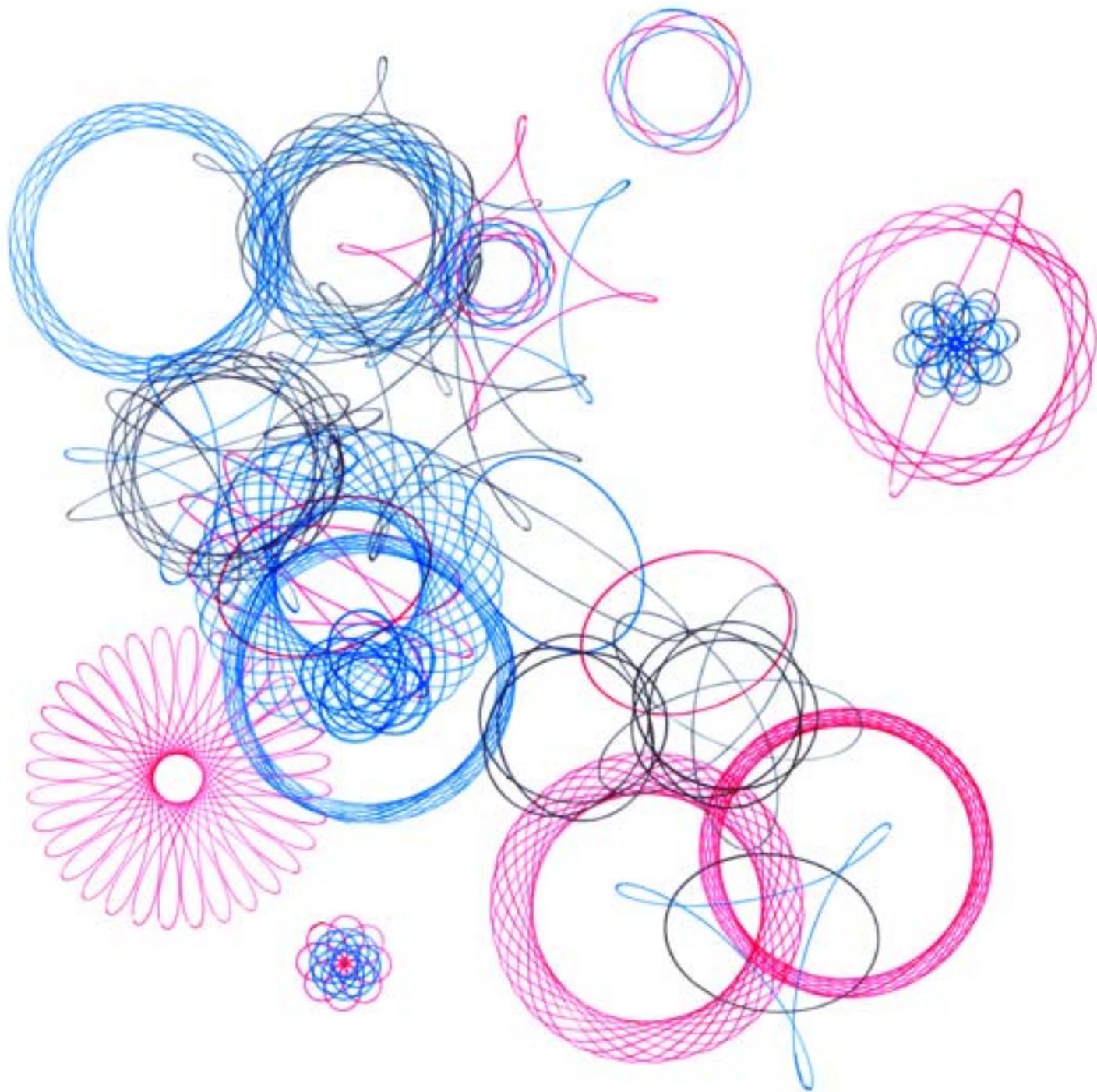
The Institute's work focuses on studies of research, education and innovation processes throughout society, i.e. covering the business community and industry as well as

various types of organisations and the public sector. The Institute works with self-initiated research and analysis, commissioned studies and outward-oriented activities.

The Institute's purpose is to study education, research and innovation processes in a comparative international perspective and to foster debate in this area. The Institute's self-initiated research is characterised by high scientific quality and relevance to higher education and R&D systems. A central objective of the Institute is to create an overview and a cohesive source of information on the rapidly growing R&D sector.

Government agencies, organisations and companies that can be expected to support and advance the Association's objectives can become members of the Association. Membership is granted by the Association's Board of Directors following a review of a written application. At the Association's annual meetings, where each member has one vote, decisions are taken on annual fees and members of the Association's Board of Directors are elected.





Spirographs

– a few words about the publication’s images and illustrator

Martin Ljungqvist is a young artist in his final year at the University College of Arts, Crafts and Design (Konstfack) in Stockholm. As an artist Martin Ljungqvist works with many different genres and media; from pure graphics to happenings and works that resemble social experiments. “Artist and disc jockey,” is how Martin introduces himself as I gather information for this text. A large audience witnessed his work for the first time at the art show Liljevalchs vårsalong 2004 where he exhibited a series of lengths of wallpaper with precise but irregular patterns on drafting film. The work was entitled Nebulae. The decorative pattern consisted of drawings made with a Spirograph with a scale of 1:1.

The Spirograph was originally invented as a popular science tool to attract young people to the mathematics of graphs. In Ljungqvist’s hand and works, the designs bring to mind many different things: scientific nuclear physics diagrams, DNA chromosomes, spiral galaxies and the religious Mandorla symbol. An encounter that can set a whole world rocking. Transferring the language of science – whether in popularised form or not – into the language of art has unexpected consequences and leads to multiple interpretations. What is

fascinating about these images is the tension that occurs between the precise abstractions of science and the sensuous capacity of art, between calculated order and the whims of fate. Another way to approach Ljungqvist’s Spirograph drawings is to see in them the fragmented inner workings of a clock. Spirals, springs and cogs have broken away and then regrouped in unexpected constellations. They dance defiantly, playfully and rhythmically before our eyes.

Unforeseen alliances, new combinations of knowledge and art and the meeting of popular and high culture can sometimes generate innovation and creative solutions. Martin Ljungqvist’s art works show that this is not just an interesting opportunity, but also something wonderfully exciting and beautiful.

Pehr Mårtens

Programme and Communication Coordinator