IGS Institute for Governance Studies

University of Twente
Enschede - The Netherlands

Self assessment report of Science, Technology and Innovation Studies University of Twente, 2000-2007

Enschede, September 2008

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"Dynamics and Governance of Science, Technology and Innovation"

University of Twente

Research group:	Science, Technology and Innovation Studies (STIS)
Programme director:	Prof.dr. N.E.J. Oudshoorn
Review period:	2000-2007[1]
Date:	September 2008

[1] Due to very specific circumstances, most notable the fire that completely destroyed our department in 2002, the research group's move to another faculty, and the change in procedures of research evaluations in The Netherlands, the period between this review and the previous review (1995-1999) is longer than the usual 6 years. Moreover, it is important to notice that the fire put severe constraints on the activities of the group in 2003 and beyond, which may have affected the output of the group in the period under review.

1.

Mission, profile and institutional context

Mission and profile

The mission of the Science, Technology and Innovation Study (STIS) group is to contribute to the analysis and understanding of the dynamics and governance of science, technology and innovation. Our basic assumption is that science, technology and innovation (STI) should be considered as social processes. Understanding these processes is important because of a rising demand for insights into the dynamics of socio-technical change among various audiences, articulating new and urgent questions for STI and society at large. Due to the development of new technologies, policymakers and other societal actors face problems that require new insights and policies. Genomics, nano-technology and e-health are examples of fields of technology that involve expectations of economic profit and concerns about social and cultural changes that stir debate among many diverse actors and provide challenges for governance.

A key feature of the STIS research programme is that we take the practices of scientists, engineers and policymakers involved in techno-scientific innovations as important input to phrase our research problems and to develop our methods. In the past decade, this distinctive feature has developed into the major strength and profile of our group. This is exemplified by the fact that theoretical approaches (most notably the 'transition of technical regimes' and the 'multi-level perspective' -- MLP) and technology assessment approaches ('constructive technology assessment' -- CTA -- and 'strategic niche management' -- SNP) have been very influential in shaping conceptual thinking about technological change among STI researchers and STI policymakers, predominantly but not exclusively in Europe.

Institutional context

The STIS group has achieved its present position building on three full chairs (Oudshoorn; Hoppe; Rip, followed by Kuhlmann in 2006) and eight senior researchers. The group has established a strong position within the University of Twente (UT). The UT has a long tradition of combining research and teaching in the technical, social and behavioral sciences. Recently, the UT has come to profile itself as a University of Technology that aims to study 'technology in context' (Route 14. UT Strategic Plan 2009 – 2014). Given its mission and expertise, the STI group has made, and will continue to make, important contributions to this profile by building bridges between the technical and the social sciences. As said above, we consider engineering and technical sciences, and related governance agencies, as major partners in, and audiences of,

our research. The institutional embedding of our research within the UT has been organized in such a way that it facilitates and strengthens these collaborations. To intensify our collaboration with the engineering and technical disciplines, we have explicitly chosen to integrate a part of our research in two of the four technical research institutes of our university. Our research on the dynamics and governance of information and communication technologies (ICT) has been included in the UT's Institute for Telematics and Information Technology (CTIT), whereas our research on nano-technology has been included in the UT's Institute for Nano-Technology, MESA+. To facilitate collaboration with social sciences (in particular management and policy studies), the other part of our research has been integrated in the research programme of the UT's Institute of Governance Studies (IGS) (see appendix 1).
On a national level, we have increased our interaction with social and technical scientists in several programmes funded by the Netherlands Organization for Scientific Research (NWO)- and grants from the Technology Foundation STW and the Rathenau Institute. Internationally, we have intensified our collaboration with social scientists in EU-funded research programmes and research grants from various foreign research councils (including Norway and Germany). See section 10 below.

Interdisciplinary profile and teaching

STIS is an interdisciplinary group that combines input from a number of social sciences, history and other humanities. Currently, the staff of the STIS group covers the disciplines of sociology, history, political science, policy studies, and science and technology studies, with expertise in substantive areas of science, technology and innovation. In 2005 interdisciplinary collaboration was strengthened by merging three formerly independent departments (Philosophy of Science and Technology; History of Science and Technology; and Policy Studies – altogether described in the present self assessment report as the STIS group) and a recently established research group (Health Sciences) into a new department: Science, Technology, Health and Policy Studies (STeHPS).
The STeHPS staff teaches in various bachelor and masters programmes, and coordinates the masters programmes of Health Sciences, Policy Studies in Public Administration, and Science and Technology Studies in Philosophy of Science, Technology and Society. Staff also contributes to programmes of the UT's technical faculties, the international Master Programme in European Studies, and the programmes of the Dutch National Graduate School of Science, Technology and Modern Culture (WTMC) and the Dutch National Huizinga Institute for Cultural History that provides training for PhD students in history. In the period under review, staff members played an important role in the management, development and coordination of the WTMC programme by serving as scientific director (Rip 2000-2005), chair of the board (Oudshoorn 2005- present) and coordinator (Rommes 2005-2008;

Halffman 2008-2011). An emeritus staff member was also appointed to serve as chair of the board of the Huizinga Institute (Cohen, 2006-present). Staff has also substantially contributed to professional education, in particular by developing and running (late 1980s – present) an international "R&D Evaluation Course" for research (funding) managers (Rip; Van der Meulen; Kuhlmann).

Scope of review

This external review concerns an assessment of research and *not education.* The contributions of STePHS members to teaching programmes are mentioned here to inform the external reviewers about the relations of our research programme to teaching programmes. The scope of this review is restricted to assessing the quality of research of staff members who work on science, technology and innovation studies (STIS) and does *not include* the staff members of STeHPS who work on *Health Sciences*.[2] Moreover, the education of *PhDs will not be included* in this assessment because most PhD students receive their training from WTMC or Huizinga Institute. Both these programmes were evaluated by international panels in 2005 with positive results.

[2] Research into Health Sciences only dates from 2005. Therefore it is not feasible to include it into this quality assessment.

2.

Programme design in brief

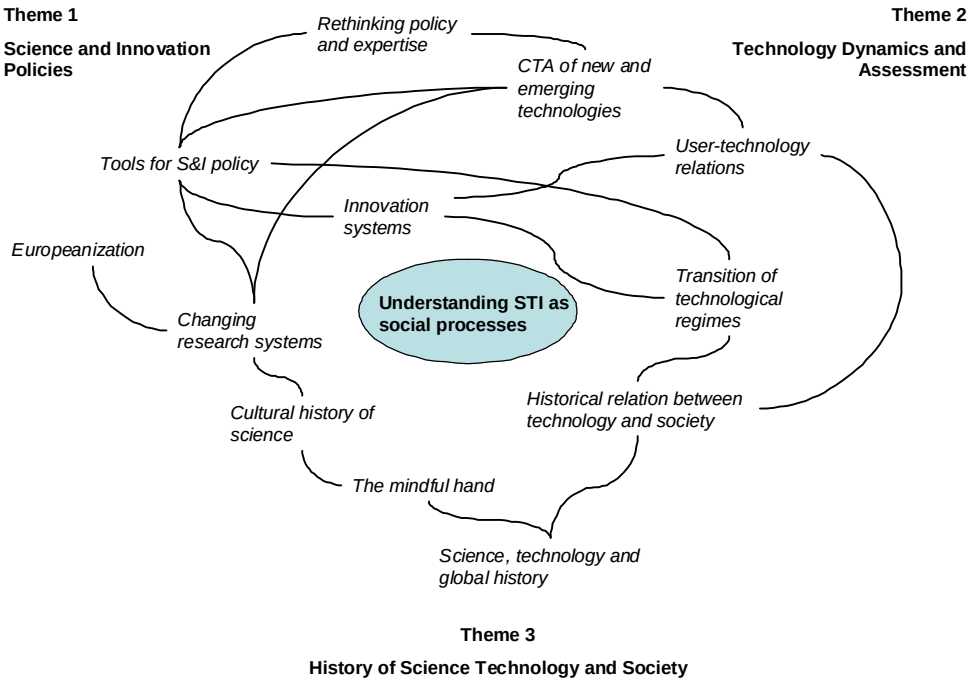
Our research programme focuses on the dynamics and governance of science, technology and innovation. The study of the nature and actual dynamics of the processes of STI is considered as a goal in itself, but is also an important prerequisite to investigate the governance of STI. The view that STI should be considered as social processes underlies the design of our research programme. The programme aims to cover the whole spectrum of the 'life trajectory' of techno-scientific developments, ranging from historical to forecast and policy studies.
In the 1995-1999 programme, which focused on the societal construction of science and technology, the research programme was oriented toward theory-informed and comparative studies of the development of science and technology with a particular interest in understanding the evolving and stabilizing structures in which science and technology developments are embedded. The program of 2000-2007 continued this research agenda but added a more explicit focus on cultural dimensions of technological change (see Themes 2 and 3 below) and innovation policy (see Theme 1 below).

In the period under review, the research programme consisted of three research themes:

Theme 1: Science and Innovation Policies
Theme 2: Technology Dynamics and Assessment
Theme 3: History of Science, Technology and Society

The first theme addresses problems and specific issues concerning the *governance* of STI. The second theme focuses on the dynamics of technological development and the *assessment* of related *socio-technical change.* The third theme takes up specific issues related to scientific and technological change and shows our interest in *longer-term developments* and transformations.

The three themes are closely interrelated, and there has been quite a lot of fruitful project collaboration between and across these three main themes, the graph below illustrates patterns of interrelation and collaboration.



Themes of the research programme

3.

Academic results and societal contributions

Theme 1: Science and Innovation Policies

Introduction

Science and innovation are both a key resource and a cause for concern for industry and policy making in modern society. The production and use of scientific knowledge and its relevance for technological and other innovations have increasingly become objects of policy making. Understanding the changing governance of science (in a broad sense) and the conceptualization of the research and innovation system are key issues for contemporary science, technology and innovation studies. Research on 'Science and Innovation Policies' analyzes transformation processes of the research and innovation system, the role of governance and policy making in this transformation and the processes by which scientific knowledge contributes to policy making and innovation.

Research questions

During the period under review, research on science and innovation policies was guided by three main research questions.

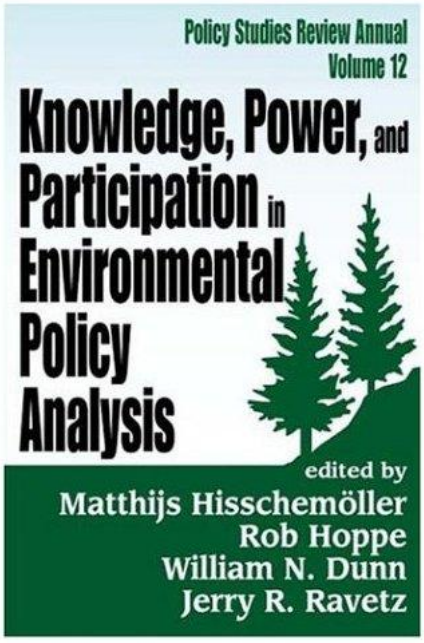
1. In most countries today, the relationships between scientific *research* performers and *government* are *mediated* by specific, dedicated organisations and policy instruments. Patterns of mediation and organisational forms can and do vary substantially across national environments. Part of our research programme aimed to describe, analyze and assess the (dys)functions of discursive and non-discursive practices in *boundary work for dealing with different types of policy problems*, as manifested in the interaction between knowledge institutes and representatives of politics, policy and interests, as well as in the functioning of intermediary organisations. The main body of research on this question included the "Rethinking" program funded by NWO and additional funding bodies, as well as several studies of intermediary organizations.
2. The second line of inquiry focused on the *dynamics of research and innovation systems*. The main research question was how to understand transformation processes as a result of the dynamics of science and technology and political interventions. Most of this work was done in the context of the EU funded Network of Excellence PRIME (with two STeHPS members sitting on the executive committee). Since 2006 considerable research was

funded by the German Research Council (DFG) in the context of an international research group "Governance of Research".

3. The third line of research focused on *instruments for science and innovation policies*, especially evaluation, foresight and funding instruments. This research line aimed to apply such instruments for specific policy bodies and was done in close cooperation with and (co-)funded by these bodies (national and international). The main question was how to optimize these instruments within the specific policy contexts.

Contributions to theoretical and methodological developments in the field

Has scientific research an impact on policy-making? Our research[3] revealed that science-based policy advice occurs in a surprising variety of forms and practices. Although many analysts try to identify and typify overall national styles in the governance of expertise, or large mono-directional transitions in science-based advice to policy making (e.g. mode 1 to mode 2, normal to post-normal), this analysis shows that there is rather a complex ecology of competing patterns. At least three major ways of organizing expertise for governance were revealed: etatist/corporatist, market/neo-liberal and deliberative patterns. The competition between these patterns is more than just a matter of "what form of advice works best". The debate often carries ideological overtones, as the models chosen involve the relative importance and reliability of the market, government bureaucracies, parliament, or the networks of deliberative democracy. What is at stake in some of these debates is exactly how "what works best" should be understood and defined (Halffman and Hoppe 2005).

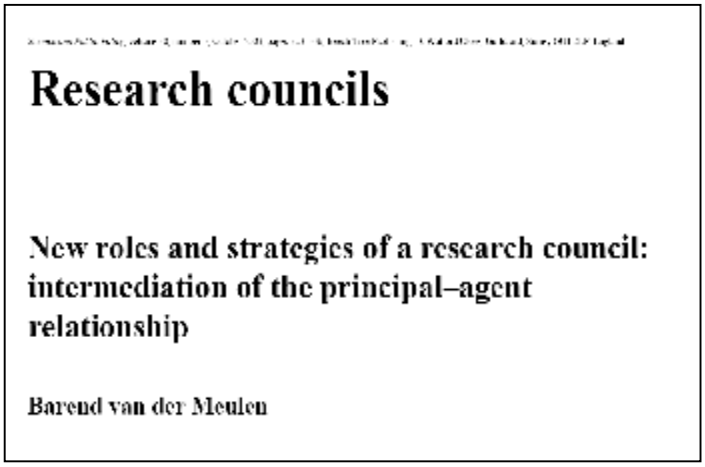


On the basis of a thorough understanding of the nature of boundary work (Hisschemöller, Hoppe, Dunn and Ravetz 2000; Halffman 2003), several theoretical tools were developed and tested to grasp this diversity at the levels of discourses on and practices in institutions and policymaking processes. Among these is an

[3] In 2002, research on boundary work and intermediary organizations between science and policy received a great push by a grant from NWO for the multi-university and interdisciplinary programme "Rethinking political judgment and science-based expertise: boundary work at the nexus between research and policy by (Dutch) knowledge institutes." The programme analyzed a wide range of cases of science-based advice to policy makers in the Netherlands (Scientific Council for Government Policy--WRR, Center for Economic Policy Analysis--CPB, Environmental Assessment Agency/National Institute for the Environment and Public Health --MNP/RIVM and Alterra) as well as abroad (Denmark, Norway, Belgium, EU, see Halffman, 2008).

8-fold typology that is built around two axes, predominance of either the experts or the policy makers in the advisory process, and perceived functional distance or proximity of science and policy. (Hoppe 2005).
So far, very little research on differences and similarities in views on science/politics boundary arrangements and science/politics boundary work among boundary workers themselves, the practitioners, has been done. In Hoppe and Huys (2003) a qualitative analysis of the discourses of experts in narrating and evaluating four well-known cases of boundary work (BSE-crisis in UK, IPCC and the Kyoto process, Nature Balances by RIVM/MNP and the freight-only Betuwe railway connection) was carried out. Experts account for boundary work in terms of the black-and-white stereotypes (e.g. "politics on top, science on tap"; "speaking truth to power"). But considerable evidence was also found of couplings of self-contradictory front-back office discourse. This presents considerable problems in identifying and justifying 'best practices' in boundary work and boundary arrangements/institutions.
At present, Hoppe and Halffman are editing and writing a book (in English) that will sum up the findings (up till the end of the "Rethinking" research, see footnote 3) of the boundary work research line. It is expected that a full draft will be delivered to an international publisher in 2008, with anticipated publication in 2009.

For the agricultural sector a historical study was made of the Advisory Council for Agricultural Research, which existed from 1957 to 2000 (Dijksterhuis and Van der Meulen 2007). The analysis showed the institutionalization of boundary work through the development of specific secretarial competencies (committee work) and infrastructures (large number of subcommittees and working groups, but also inventories of research projects) and the ability of the organization to use these competencies and infrastructures to respond to contextual changes such as environmental issues, the emergence of bio-technology and the crisis in agricultural policy.
Following an evaluation study of the Norwegian Research Council (Arnold, Kuhlmann and Van der Meulen 2001) a series of studies looked into the functioning of research councils. Rip (2001) conceptualized the peer review system as a way to aggregate interests. Using a principal-agent perspective, Van der Meulen (2003) analysed the possibilities of research councils to develop new strategies and Van der Most analysed the role of research councils in the emergence of policies for nano-technology (PhD thesis, forthcoming). These studies showed that research councils' ability to respond is constrained by their relation with the government and current practices of researcher-involvement in council's decision making. The changing context of research councils and especially the introduction of the "user" as a stakeholder for research councils was also studied (Shove and Rip 2000; Davenport et al 2003).



Van der Meulen in *Science and Technology*, 2003

In the period under review a number of studies were done to understand these changes as a result of the interaction between processes of knowledge production (new fields of S&T), policy processes and the existing ecology of policy and research organizations. Some of the early work on this was published in Van der Meulen and Rip (2001). In PhDs studies, the impacts of the transformation of the research system were studied for university researchers (Morris 2004) universities and university management. Research on university research in a changing research system showed how universities turn into heterogeneous organizations with many trans-organizational units and virtual institutes. (Rip 2004) Studies on the evaluation of (academic) research showed how this evolved as a specific practice and how it shapes the governance of research. (Rip 2003; Van der Meulen 2002, 2007)

Research collaboration is a key mechanism for linking distributed knowledge and competencies into novel ideas and research venues. The need for effective inter-institutional knowledge flows is of particular importance in emerging domains of research, and also a challenge for public research systems with a high degree of institutional differentiation. Motivated by concerns about favorable institutional conditions for the conduct of scientific research, (Heinze and Kuhlmann 2007, 2008[4]; Heinze et al. 2007) research collaboration in the emergent domain of nano-science within the highly segmented German public research system was analyzed (funded by the German DFG). Another study suggested that strong nano-technology clusters emerge where there is co-location of scientific and technological fields associated to coordinated technology platforms (Robinson et al. 2007).

[4] Heinze, Th. And S. Kuhlmann, 2008, Across institutional borders? *Research Policy* 37: 888-899.

The Europeanisation of research and science policy was also examined (Redclift et al 2000, Van der Meulen 2001, Hackmann 2003) The main result of these studies was that Europeanisation of research is unlike other Europeanisation processes because of the direct relationships between researchers at the European level. For national policy bodies the implication is that they do not act at a level between the local and the European level. For understanding processes of the research system, European research systems will be more complex and the assumption of many science policy studies that science organizations are part of national systems have to be reconsidered. Based on this work and other research (e.g. Kuhlmann 2001[5], drawing also on work on the governance of research and innovation policy, e.g. Kuhlmann and Shapira 2006) the ERA-Dynamics project was begun in 2006, a collaborative project involving nine research teams: The project was led by the hypothesis that different knowledge dynamics correspond positively (or negatively) to different 'mixes' of governance patterns and policy instruments: 'One size does not fit all!' (Kuhlmann and Larédo 2007).

One of the collaborative international evaluation projects by the STIS Group and partners (Arnold et al. 2004)

More recently, the focus on the governance of research has been expanded toward innovation studies (Kuhlmann 2007). An ambitious approach to explore and explain the 'functioning' of technological innovation systems has been developed (Hekkert et al. 2007) and the role of users, user organizations and patterns of 'demand articulation' in emerging technologies have been investigated (Boon et al. 2008). In winter 2008/09 a major book edition will be completed (2005-2008 PRIME funded): *'The Theory and Practice of Innovation Policy: An International Research Handbook'*, published by Edward Elgar. Edited by S. Kuhlmann (with Phil Shapira, Georgia Institute of Technology and Manchester University, and Ruud Smits, University of Utrecht) the book assembles some 20 chapters authored by internationally

[5] Kuhlmann, S. (2001): Governance of Innovation Policy in Europe – Three Scenarios, *Research Policy*, vol. 30, issue 6/2001, 953-976.

leading scholars, guided by the interest in the mutual interaction by innovation theory, practice, and policy.

Annual R&D Evaluation course

R&D evaluation is still a developing issue for Science and Innovation Policies. Organizations and their staff are constantly looking for expertise to improve their approaches. The STeHPS group organizes an R&D evaluation course annually, which has a long standing reputation as one of the few truly international courses on R&D evaluation. It brings together experts from leading institutes on R&D evaluation and participants from European and non-European countries.

The course offers 3,5 days of lectures by experts, study of case material in small groups and international exchange of experiences. It is an excellent opportunity to learn about international best practices and the development in methods and applications of R&D evaluation. We update the course regularly to include new developments and new R&D evaluation needs of participants and to implement suggestions from participants.

Over 200 staff members from R&D organizations, young professional evaluators and researchers involved in evaluation from more than 20 countries have successfully participated in the course. The value of the course for the participants is demonstrated by the fact that most new participants enter on recommendation from earlier participants or from other R&D evaluation professionals.

Societal contributions

Many of the studies on Science and Innovation Policies were done in close cooperation with organizations involved in policy making. The research on boundary work is a clear example. Staff members who are involved in the theme on science and evaluation studies are frequently asked to advise national and international science and innovation governance bodies, act as members of expert groups and present work to the professional community of science and innovation policy.

A specific line of research that directly contributes to the functioning of research includes the commissioned studies on instruments for science and innovation policies: foresight, funding and evaluation. Following up on research in the previous period, a number of studies were done on the impact of foresight and its use as a policy instrument. (Van der Meulen 2000, Van der Meulen and Lohnberg 2001, Van der Meulen et al. 2003). The ways in which foresight contributes to policy making through aggregation of interests of heterogeneous actors was analyzed. Its success depends less on the specific methodologies employed and more on the possibilities for such aggregation networks. Results have been used to advise policy bodies such as the Royal Netherlands Academy of Arts and Sciences (KNAW) and the European Science Foundation (ESF) on their foresight activities.

In the context of PRIME, a comparative framework was developed for analyzing the development of funding of research (Lepori et al. 2007a, 2007b) and used to analyze the development of research funding in the Netherlands (Versleijen et al. 2007). Both comparative work and especially the study on the Netherlands showed that, contrary to policy beliefs, the amount of competitive funding has not increased substantially in most countries. Rather, there has been an increase in funding instruments for competitive funding. In the Netherlands this finding is now increasingly referred to in policy documents.

Intermediary organizations and their research programme activities were evaluated in a series of evaluation studies. This includes an evaluation study of the Austrian research council FWF (Van der Meulen 2004, Arnold et al. 2004), the institutes of the Ludwig Boltzmann Gesellschaft (Van der Meulen 2005), of the Asthma Foundation research program (Van der Meulen, Bodewes and Stemerding 2005), the impacts of ESF programmes (Arnold, Zaman, Van der Meulen 2005) and an innovation programme in agriculture (Van der Meulen and Cuijpers 2007). An important result of this series of evaluation studies was the development of an evaluation approach for intermediary organizations that assesses the functioning of organizations and their ability to respond to contextual challenges.

Future plans

The STIS group is preparing extended research into the interface (congruence, tensions, change) of the growing internationalization / Europeanisation of research activities on the one hand and institutional set-up, particularly appropriate governance and policy measures (supportive, defensive, etc.), on the other. Is there a *'post-national' knowledge policy* agenda? Related STI research projects will be run in close interaction with national and international project partners, embedded in related networks (springing e.g. from the broad and intense collaboration with the PRIME Network of Excellence, 2004-2009).
In parallel, and partly overlapping with the above theme, the STIS group will conduct research into institutional, governance and policy changes in relation to varying *'knowledge dynamics'* (or 'search regimes' of 'new sciences' vs. classical science (see Bonaccorsi in Minerva, 2008) , linking up with related (partly older) research into the diversity of science dynamics. Relevant concepts include the work of Whitley (2000), suggesting that differences and changes in scientific knowledges can be understood in terms of differences and changes in the system of their production and evaluation, considered as types of work organisation termed intellectual fields. Another relevant source is the 1980s discussion on the 'finalisation of science' (Böhme et al. 1983, starting from Kuhnian paradigmatic thinking), investigating field-wise pre-paradigmatic phases (interfering with external goals), paradigmatic phases (just internal discourse) and post-paradigmatic phases (application referring to external goals).
Another strand of research will focus on identifying appropriate *policy responses* to the specific cognitive, organizational, economic and ethical conditions of *emerging science and technology*, linking-up with the STIS group's 2nd research theme, particularly the projects exploring nano-technology and genomics. The ambition is to develop the CTA concept into a policy and strategy oriented concept of "Technology Governance". The STIS group will study such processes where possible *in situ*, working in close interaction with related technically oriented science institutes such as the UT's Nano-Technology Institute MESA+ or

the Dutch Centre for Society and Genomics. Beyond this, it appears promising to exploit further the knowledge and methodological capabilities of the STIS group's 3rd research theme (History of Science, Technology and Society) in order to learn – in retrospect – more about the institutional conditions and policy needs of emerging science and technology.

Key publications

Hisschemöller, M., R. Hoppe, W.N. Dunn and J.R. Ravetz., eds. (2001) Knowledge, Power, and Participation in Environmental Policy Analysis. *Policy Studies Review Annual 12*. New Brunswick, NJ: Transaction Publishers.
This volume presents a theoretical analysis and a large number of cases of the practices of knowledge utilization, post-normal science and boundary work in environmental policy analysis, authored by an international cast of authors.

Halffman, W. and R. Hoppe (2005) Science/policy boundaries: a changing division of labour in Dutch scientific policy advice, in: P. Weingart and S. Maasen (eds.) *Democratization of Expertise? Exploring Novel Forms of Scientific Advice in Political Decision-Making*, Sociology of Sciences Yearbook XXIV , (135-152). Dordrecht: Springer.
In this article the authors find at least three major ways of organizing expertise for governance in the Netherlands: etatist/corporatist, market/neo-liberal, and deliberative patterns. The variety is much larger than the national-cultural or grand transition narratives suggest.

Meulen, van der, B. (2003) New Roles and Strategies of Research Councils: Intermediation of the Principal-Agent Relationship. *Science and Public Policy*: 323-336.
The article develops a theoretical framework for understanding different strategies of research councils and a methodology for empirical research on the intermediate position of research councils.

Rip, A. (2004) Strategic Research, Post-modern Universities and Research Training. *Higher Education Policy* 17**:** 153166.
This article discusses the consequences of the changes in research systems, especiall the emergence of a regime for strategic science, for universities as institutes for research and higher education.

Robinson, D.K.R., A. Rip and V. Mangematin (2007) Technological agglomeration and the emergence of clusters and networks in nano-technology. *Research Policy* 36: 871-879.
This article relates the work on emerging S&T and dynamics of science and innovation systems.

Hekkert, M.P., R.A.A. Suurs, S. Negro, S. Kuhlmann, R. Smits, R. (2007) Functions of Innovation Systems: A new approach for analysing technological change, in:: *Technological Forecasting & Social Change* (TFSC), vol. 74, Issue 4, 413-432. *The paper contributed relevant conceptual suggestions to an ongoing international debate on 'functions of innovation systems', it has been well received and cited by scholars, and it got the Elsevier Prize for the outstanding paper published in TFSC during 2007.*

Theme 2: Technology Dynamics and Assessment

Introduction

This research theme aims to increase understanding of the dynamics of processes of technological development and the ways in which socio-technological change can be assessed.

Understanding the dynamics of technological change is an intellectual challenge, but in modern society also of great relevance to societal actors and audiences, ranging from scientists and technologists to government agencies, business firms, non-profit organizations, and the general public. Therefore, the development of concepts and tools to assess and contribute to the development of technologies is an important part of the group's research agenda. In the period under review, the research in this theme was organized around three leading research questions.

1. How can transitions of technological regimes be understood and assessed? This part of the research programme continued research that was started during the previous review period and was directed toward increasing understanding of the dynamics of technological change by developing a *multi-level perspective (MLP)* on transitions. Equally important, this research aimed to develop the *Strategic Niche Management (SNM)* approach further as an important tool to assess technological change. Funding for this research was supported by research grants from NWO (NWO-NOVEM).
2. How can the dynamics of *user-technology relations* be understood? This research served as an important extension of the previous research programme because it widened the scope of research, that was largely oriented toward processes at the level of institutions and macro-developments, to include processes in the daily life of users and design practices of engineers. Funding for this research was awarded by the NWO, the EU sixth framework programme and three corporations (Philips, ECN and KPN).
3. How can new and emerging technologies be assessed? This research aimed to develop further the *Constructive Technology Assessment (CTA)* approach already developed in the department. A major new focus of this research was to extend CTA to include emerging technologies such as nano-technology and genomics. This research received major funding from funds for technical sciences (STW and BSIK, particularly NanoNed), the NWO and the EU sixth framework programme.

Contributions to theoretical and methodological developments in the field

1. Transition of technological regimes

This research aimed (1) to enhance understanding of the dynamics of the transition of technological regimes (also referred to as system innovations) and (2) to use these insights to contribute to governance strategies seeking to induce transitions toward sustainability in a variety of empirical domains (mobility, energy, agriculture, etc.). This work built further on two strands of research from the 1990s largely instigated by the predecessor of the STeHPS group, notably (1) the development of the MLP on transitions (Rip and Kemp 1998, Kemp Rip and Schot 2001, Geels 2002a) and the development of the SNM approach (Hoogma et al. 2002, 2005).

The MLP acknowledges the complexity of transitions as multi-actor, multi-factor and multi-level processes and builds upon insights from sociology of technology and innovation studies. While early sociology of technology studies often had a micro-focus on actors, the MLP adds structural contexts within which actors act. The perspective thus provides a framework to integrate and position several existing theories and insights.

In the MLP, the dynamic of transition processes is anlysed as the interplay between three levels. These levels are (1) technological niches where novelties are developed, (2) socio-technical regimes (basically the system of focus in the analysis) and (3) the socio-technical landscape, which is comprised of a range of exogenous developments that influence regimes and niches. The main argument is that system innovations result from linkages between processes at these multiple levels. This means that transitions or system innovations are not caused by a change in a single factor or 'driver', but are the result of the interplay of many processes and activities.

The MLP can be seen as an analytical device that allows zooming in and zooming out. Zooming in means that the focus is on shorter term dynamics in which the activities of individual actors come into play. Zooming out means looking at longer term developments in which structural factors are more important. To elaborate the MLP in the zooming in mode, various historical studies were carried out as an empirical basis for the identification of various shorter term processes in the interplay of the three levels. This led to the identification of various so-called patterns and mechanisms (Geels 2002b). To elaborate the zooming out mode, further historical studies were used to identify stages in a transition process (Geels 2004). In his Ph.D thesis, Geels elaborated the method in detail. (Geels 2002c; later published as a book: Geels 2005). Deuten's Ph.D thesis analysed the initial stages of transition processes, focusing on the role of technological knowledge. He showed that new knowledge cannot just be transferred from one context to another, but first has to be made 'trans-local' in

a process that he calls ‘cosmopolitanisation’. His thesis analysed the dynamics of this process. (Deuten 2003).

Further work on transitions involved the development of a new scenario method to explore future system innovations. This method can be used as a tool in the governance of transitions. In a strict sense, transitions cannot be steered, because of their complex nature, but it is possible to stimulate developments in more sustainable directions over a longer period of time. This requires a vision of which directions that might be; that is, which combination(s) of technologies and their societal embedding might contribute to a sustainable system. As existing scenario methods are not able to account for the complex dynamic of transition processes, a new scenario method - called “socio-technical scenarios” was developed. (Elzen, Hofman et al. 2004, Hofman et al. 2004) This built further on the patterns, mechanisms and transition pathways developed in the analytical work on MLP and used these as building blocks for scenarios. Socio-technical scenarios can be especially fruitful when used in combination with the SNM approach to identify which novelties merit support. This research was supported by two grants from a NWO-Novem funded collaborative programme.

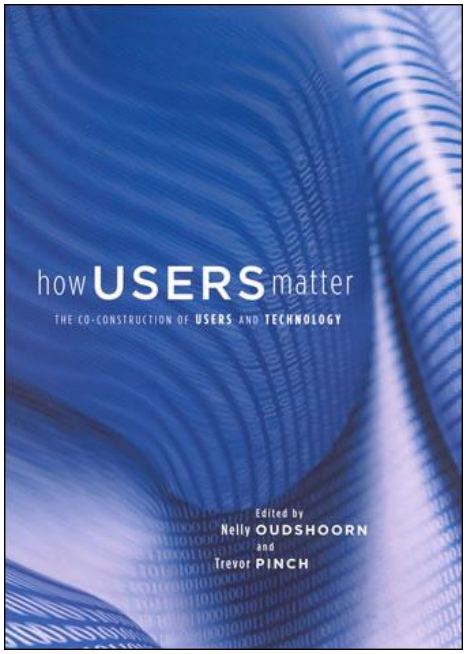
2. Dynamics of user-technology relations

This research aimed to enhance understanding of the dynamics of the interactions between users and technologies. Key research questions during the period under review were (1) how designers represent users during the development of technologies and (2) how users accept, modify or resist programs scripted in technology. The major aim of this research was to go beyond the almost exclusive attention to experts in STS (particularly the 'executive approach' that dominated actor network theory) and to intervene critically in dominant discourses (among engineers and policymakers) in which users are portrayed as passive recipients of technology. Instead, users were conceptualized as active participants in shaping and negotiating socio-technical change. This conceptualization informed several (NWO and industry-funded) PhD projects (Rommes 2002; Stienstra 2003; Ganzevles 2007), an EU-funded programme (Rommes, Slooten, Oost, Oudshoorn 2004) and a NWO-Novem funded collaborative programme (Jelsma and Elzen, forthcoming).

By analysing design cultures in information and communication technologies, Rommes and Stienstra showed how designers (predominantly men) often rely on the I-methodology: they take their own experiences and skills as representative for the user. These studies made visible how specific practices of configuring the user can lead to the exclusion of specific users, in these cases particularly women (Rommes 2002; Stienstra 2003; Oudshoorn, Rommes and Stienstra 2004). Theoretically, these studies have enriched the script approach introduced by Akrich and Latour by introducing and elaborating the concept of ‘gender script’ to capture all

the work involved in the inscription and de-inscription of representations of masculinities and femininities in technological artifacts (Oost 2003; Oudshoorn et al. 2002). For contraceptive technologies, Oudshoorn (2003) showed how radical innovations that conflict with hegemonic gender identities of users have a hard time coming into existence. By providing a multi-sited analysis, the book moved technology studies beyond its focus on social dynamics of innovation to include the cultural spaces in which technologies and user identities are co-constructed, stabilized or de-stabilized. In a similar vein, Schot and Bruheze (2003) drew attention to the mediation process between production and consumption, thus extending the STS research agenda to include the work of mediators such as consumer organizations ("the medication junction").

Whereas the studies discussed thus far demonstrated how users are configured in design practices, work on inscriptions of users and environmental policies in energy saving technologies showed that designers are configured as well (Ganzevles 2007). Another important insight of these studies is that issues that rely more heavily on spokespersons (e.g. the environment) are often overruled by other issues, thus destabilizing research agendas that aim to realize, for example, environmentally friendly policies (Jelsma 2003; Ganzevles 2007). Equally important, these studies critically intervened in policy discourses by arguing that governance of environmental problems should be oriented toward designing 'moralized' products rather than changing behavior of citizens (Jelsma and Swierstra 2006). Detailed case-studies of how designers can anticipate users' anti-programmes were done to develop tools for reflexive sustainable design (Jelsma 2003; Ganzevles 2007). Finally, in Oudshoorn and Pinch (2003), a number of studies were brought together and combined with contributions of international scholars. The scholarship presented in this book acknowledged the creative capacity of users to shape technological development in all phases of technological innovation. A major aim of this collection was to build bridges between the different approaches to users developed in technology studies, in feminist scholarship and in cultural and media studies.



Oudshoorn and Pinch, 2003

Recently, research has moved from studying design and use practices of individual users to user collectives in which innovation is conceptualized as distributed and performed in heterogeneous networks (Oudshoorn, Brouns and Oost 2005; Oost, Oudshoorn and Verhaegh 2008). Theoretically, these studies aim to bridge evolutionary economy-based innovation

studies with actor network analysis in STS (Oudshoorn and Pinch 2007; Oost, Oudshoorn and Verhaegh 2008) and technology studies with medical sociology (Oudshoorn 2007).

Future scenario: CO_2 consuming car
From: Alexander von Vegesack and Mateo Kries (eds.) *Automobility: Was uns bewegt*, Weil am Rhein: Vitra Design Museum (1999), p. 466.

3. CTA for new and emerging science and technology

The central question in this research was how to translate understanding of processes and patterns of *co-evolution* of science, technology and society into more reflexive practices of *governance* of science and technology in society. The focus was on finding ways in which actual and emerging processes and patterns of co-evolution can be modulated and changed as a contribution to more societally robust (responsible) forms of innovation, especially in regard to new and emerging science and technology. However, this aim crucially depends on more general insights in the dynamics and patterns of co-evolution shaping the development of science and technology in society. Questions that were studied in this research thus include (1) the dynamics of co-evolution and *patterns* that emerge in the development of science and technology in society, (2) the role and quality of multi-actor processes of *learning* in shaping the co-evolution of science, technology and society and (3) approaches and tools that can facilitate *anticipation* and *reflection* in learning about potential developments and impacts of new and emerging science and technology.

Patterns in the co-evolution of science, technology and society were studied in a number of ways. One research line that was already developed in the 1990's was the study of *promises and expectations* about new scientific and technological developments. Such promises and expectations have been shown to be fundamentally 'generative' in guiding the activities of

researchers, and thus play a central role in co-ordinating the activities of actors, mobilizing resources and shaping agendas and networks in processes of knowledge production. Based on this insight the articulation of promises and expectations, processes of agenda building and the creation of innovation networks were studied and conceptualized as *emerging irreversibities*, constituting patterns that both enable and constrain the activities of actors in emerging scientific and technological fields (Robinson, Ruivenkamp and Rip 2007; Robinson, Rip and Mangematin 2007; Maathuis and Smit 2003).

Emerging irreversibilities in the development of science and technology can also constitute more stable patterns that were conceptualized in a variety of studies as *socio-technical regimes studied with the MLP approach (see above)*, referring to complexes of shared knowledge and rules and to systems of corresponding interdependencies between actors. (Van der Ploeg et al. 2004; Stemerding and Nelis 2006; Hekkert et al. 2007; Moors et al. 2007 The interactions and tensions between new and emerging technological developments and existing socio-technical configurations in society have also been studied as involving multi-actor processes of *learning* in which new technological options, demand of potential users and notions of political and cultural acceptability have to be articulated and mutually attuned (Achterbergh et al. 2007; Stemerding and Van Berkel 2001). Processes of learning about the societal implications of new science and technology were more particularly studied and evaluated in terms of the perspectives and actors that are included or excluded in these processes (Kirejczyk et al. 2001; Van Berkel and Kirejczyk 2002; Kater and Kirejczyk 2005). An important question that was also addressed in this research is how these learning processes can be improved in the context of public debate and policy making about new science and technology (Kireczyk

30th Aniversary Congress CSSTS

On 29 November 2005 STeHPS held a congress to celebrate that one of its predecesors, the 'Centre for Studies of Science, Technology and Society', was established 30 years before. The main topic of the congres was the interaction between technical and societal development. After the opening of the congress by the Rector Magnificus, Prof.dr W.H.M. Zijm, four distinguished speakers gave a lecture on the topic from different angles. Among the speakers were Dr. H.A. Harwig, Chairman of the Board of Philips Research and Dr. H.H.F. Wijffels, then chairman of the SER, the Socio-Economic Council, the main advisory body on socio-economic issues to the Dutch government. In the afternoom, participants (160 in total) discussed the main topic in depth in smaller workshops addressing five specific areas of development, such nano technology and bio-medical technology. Although visions and perspectives varied widely the speakers as well as most of the participants agreed that technical development and societal development are closely intertwined and that innovation programmes in various concrete fields should address both sides. The implication for the university is that it can be to the advantange of technical disciplines as well as the social disciplines and humanities if they succeed in developing fruitful collaborative relationships in various concrete projects.

Volume with contributions from the speakers at the CSSTS 30th anniversary congress:
Boelie Elzen and Wim de Ridder (ed.) *Innovatie en Maatschappelijke Ontwikkeling: Omgaan met een haat-liefdeverhouding*, Den Haag: SMO (2005).

2005; Rip 2006). Another important point in earlier and present research is the observation that a conspicuous pattern is often found in these learning processes, showing a gap between promotion and control and an attendant division of labour between promoters of new technology and critical respondents. Thus, an interaction pattern is created, characterized by an asymmetry between developers, working as enactors of a new technology, and those dealing with technology in society, responding as selectors (Stemerding and Jelsma 2003; Stemerding and Van Berkel 2001).

From the 1990's CTA was developed as an approach aimed at bridging the gap between processes of technological innovation on the one hand and societal assessment on the other. In recent (and present) research this approach has been further elaborated as a tool for anticipating developments and reflecting on societal impacts of new and emerging science and technology (Rip 2007; Joly and Rip 2007). As part of a large national nano-technology research programme in the Netherlands (NanoNed), a comprehensive TA programme was established, headed by Arie Rip, former chair-holder in the STIS group. The aim of this research was to contribute to early assessments of and debates about potential societal impacts of nano-technology and to identify normative dilemmas (Rip 2006; Robinson, Ruivenkamp and Rip 2007; Swierstra and Rip 2007). More recently a similar line of research was developed by Dirk Stemerding, contributing to a research programme of the Dutch Centre for Society and Genomics, which was established as part of a national research initiative in genomics (Netherlands Genomics Initiative).

NATURE|Vol 450|8 November 2007

A timely harvest

The public should be consulted on contentious research and development earl opinions to influence the course of science and policy-making.

Pierre-Benoit Joly and Arie Rip

Public engagement in emerging science and technology is thriving, particularly in the United Kingdom. Recent initiatives such as 'Nanodialogues', organized by the think tank Demos, suggest that citizen juries, dialogue exercises and interactive public understanding projects can be fruitful for scientists and members of the public. Over two years, the Nanodialogues series allowed members of the public to join scientists in discussions on regulation, research funding, development and corporate innovation of nanotechnologies. Such enterprises may foster mutual understanding, but they can struggle to make a difference to research or to policy-making.

Governments and research institutions generally fail to respond to the outcomes of public engagement exercises, perhaps because the outcomes are often too late and too vague on concrete strategies for moving forward. We've learnt that it is better to engage the public 'mid-stream', at a point in the research process when it is possible to incorporate their opinions into research orientation and policy-making.

The French National Institute of Agronomic Research (INRA) used such an approach to focus on research into and field trials of genetically modified (GM) vines. In 2001, INRA had to decide whether to run field trials of a GM vine that is potentially resistant to a disease-causing virus. INRA's roles. Our goal was to produce a public report to be taken into account in decision-making at INRA.

Our working group comprised 14 people, including members of the public, wine growers and researchers. They had seven days of intensive discussions over a six-month period in 2002. The set of recommendations they produced was made freely available on the web. The INRA directorate prepared a public response explaining the decisions it

intended to take and how these would accommodate the group's

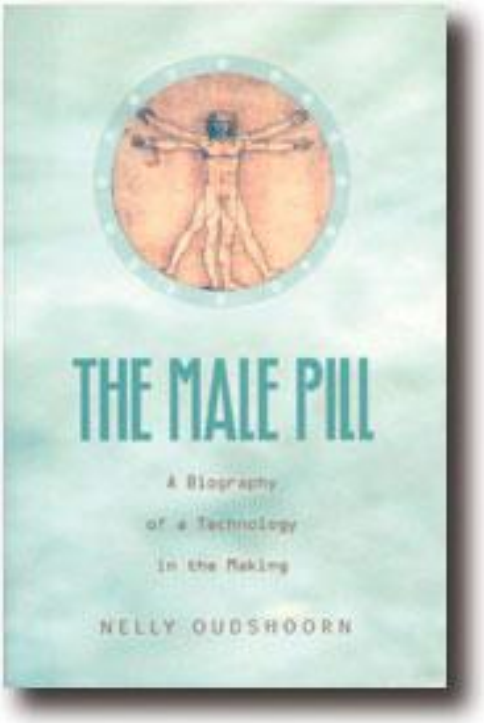
A. Rip (with P.-B. Joly) in *Nature*, November 2007

In this CTA-based research of developments in nano-technology and genomics, socio-technical scenario construction was used as a tool in creating bridging events between diverse groups of actors in assessments of new and emerging technologies (Rip 2007). The emerging irreversibilities that are visible in promises and expectations, processes of agenda building and network creation of actors who are mainly involved as enactors in developing new technologies were taken as a starting point in this process of scenario construction (Robinson,

Rip and Mangematin 2007; Stemerding and Swierstra 2006). On the basis of these insights, scenarios of potential future *innovation journeys* were constructed that can be used as a tool in learning processes about the future, also involving actors who represent the perspectives of societal selectors. Thus the aim was to enhance reflexivity in processes of technological innovation through anticipation, feedback and learning, modulating the co-evolution of science, technology and society (initial publications of this work have appeared and are forthcoming in 2008).

Societal contributions

Researchers who studied the transitions of technological regimes organized various international scientific meetings to discuss and elaborate analytical and governance approaches of transition processes that led to the publication of an edited volume (Elzen et al. 2004) and a special issue of a scientific journal (Elzen and Wieczorek 2005). Some of these meetings were also attended by representatives from Dutch ministries, which speaks to a growing interest by these ministries in the governance of transitions. Some ideas developed by the STIS group can be found in various subsequent policy programs and projects. Research on the dynamics of user-technology relations contributed to the realization of four patents, a rather unusual but very important type of valorization that reflects the mission of the programme to contribute to the technical disciplines at our university and elsewhere, in this case the R&D department at Philips. Valorization was also achieved through the development of tools that can assist designers to anticipate anti-programmes of users to realize sustainable design (Jelsma 2003; Ganzevles 2007) and through various public lectures on debates about the consequences of technology for users and normative questions concerning technology (Jelsma and Stemerding). In addition, the publication of the book *The Male Pill. A Biography of a Technology in the Making* (Oudshoorn 2003) received wide media attention, thus transferring insights into the co-construction of users and technology to a broader public.



Oudshoorn, 2003

Research into the ways in which learning about the societal implications of new science and technology can take place led to a number of policy relevant (and commissioned) reports (Rip and Smit 2002; Kirejczyk et al. 2003; Kirejczyk et al. 2001). The national research initiatives in the field of nano-technology and genomics have created important conditions for the valorisation of CTA inspired research of new and emerging technologies in these fields. In the context of these initiatives, insights from studies discussed here are being disseminated and discussed in interaction with various parties involved, including scientists and technologists, policy-makers and the broader public.

Plans for future research

Research on transitions of regimes will not be continued, partly because researchers interested in this research moved to other universities and continued their work on the dynamics of transitions there (e.g. Geels at TU-Eindhoven and Elzen at WUR), partly because insights of this research have been taken up by researchers working on CTA approaches of technology. Research into user-technology dynamics will be continued by including other technological domains, particularly telemonitoring technologies and social robots. CTA research of new and emerging technologies will be continued as well and will increase its focus on nano-technologies, genomics and stem cells.

Key contributions

Elzen, B., F.W. Geels and K. Green, eds. (2004) *System Innovation and the Transition to Sustainability*. Cheltenham: Edward Elgar Publishing Ltd.
This volume presents the first comprehensive overview of studies in the emerging field of transition research and presents insights into important problems related to sustainability.

Geels, F.W. (2005) *Technological Transitions and System Innovations: A co-evolutionary and socio-technical analysis.* Cheltenham: Edward Elgar Publishing Ltd.
This book discusses the roots of the multi-level perspective on technological change, elaborates the method and uses it to analyze and explain transition processes in various empirical cases.

Oudshoorn, N. and T. Pinch, eds. (2003) *How Users Matter. The Co-construction of Users and Technologies*. MIT Press.
The book, reprinted as a paperback in 2004, is widely used in teaching in Europe, the US and Asia and has inspired new PhD projects elsewhere. A revised, updated version of the introductory chapter was included in the Handbook of Science and Technology Studies (invited chapter).

Oudshoorn, N. (2003) *The Male Pill. A Biography of a Technology in the Making.* Duke University Press.
This book won the Rachel Carson Prize of the Society for Social Studies of Science in 2005.

Stemerding, D. and A. Nelis. (2006) Cancer genetics and its 'different faces of autonomy'. *New Genetics and Society*, 25: 1-19.
This publication shows how issues of agency and normativity may be adressed in an analysis of regimes as emerging patterns in the co-evolution of science, technology and society. (See: Hans Harbers (ed.) Inside the Politics of Technology. Agency and normativity in the co-production of technology and society, Amsterdam University Press, 2005).

Stemerding, D., and T.E. Swierstra (2006) How might scenario studies help us to think about the normative implications of genomics and predictive medicine? In: A. de Bouvet, P. Boitte and G. Aiguier (eds.) *Questions ethiques en medecine predictive.* (81-89). Paris: John Libbey Eurotext.
This publication presents a new direction in our research showing how an extended multi-level model of socio-technical change may be used to explore potential moral implications of emerging science and technology.

Theme 3: History of Science, Technology and Society

Introduction

This research theme is directed toward broadening and deepening insight in the long-term development of science, technology and society from the perspective of social, cultural, intellectual and institutional history. As such it provides an important background and context for the contemporary and future-oriented research carried out within the department and the faculty.

Research on this theme was strengthened during the period under review, as a result of a merger between the previously independent department of history (under the professorial leadership of H. Floris Cohen until his retirement in 2002), that focused on early modern history of science, and members of the Philosophy of Science and Technology Department who focused primarily on the history of 20th century technology.

Under the disciplinary banner of history, this theme is directed toward questions related to the long-term development of science and technology, as well as their historical relations with each other and the socio-cultural environment in which they develop. Prior to the merger (see above), research interests were divided along organizational lines; history of early modern science carried out by the history department and history of modern technology (largely twentieth century) was carried out within the department Philosophy of Science and Technology. The key question around which research was organized by this second group focused on an understanding of the co-evolution of technology and society, with particular attention to the Netherlands during the nineteenth and twentieth centuries. More recently, the focus of research has shifted from the history of technology in national (Dutch) context to an examination of the role played by technology in the 'becoming' of Europe during the nineteenth and twentieth centuries.

A second leading research question, introduced by former members of the department of history, centered on the challenge of interpreting the history of science as a cultural history in which science is seen as an integrated element of more general cultural development – one that both contributes to and reflects the culture in which it is pursued. Case studies in the history of chemistry, steam technology and gardens illustrated this claim. (Roberts 2004 and 2008; Fleischer 2005 and 2007) Toward the end of the period under review, this line received a great push by an NWO VIDI award (Netherlands Organization for Scientific Research award for innovational research) for a special research programme on the cultural history of mathematics during the Dutch Golden Age.

A third leading research question steps back from both these others to inquire into the history through which modern science and technology came to be seen as recognizable and

recognizably distinct realms of production. Funding for this line was awarded through an NWO Aspasia award (award for top female academic talent), with additional funding from KNAW, Huizinga Institute and NSF. The results of this line of research were published in a major volume of essays (Roberts et al 2007), to be followed by a forthcoming special issue of *History of Technology.* A fourth leading research question which began to emerge at the end of the period under review was directed toward the question of the place of science and technology in global history during the period 1770-1830 (a crucial historical period associated with the rise of the modern nation-state, imperialism, modern science and industrialisation), funding by an NWO Internationalization award, the NSF and the Spanish National Research Council.

Contributions to theoretical and methodological developments in the field

1. The historical relation between technology and society

The methodological claim undergirding this theme is that the historical relation between technology and society is one of co-evolution. This already stakes out an important position in current debates within the history and sociology of technology. (See, for example, J. Schot et al. *Techniek in Nederland in de Twintigste Eeuw* [*Technology in the Netherlands during the 20th Century*] (Zutphen Walburg Pers 2003). Research carried out during the period under review helped take the debate one step farther by arguing that co-evolution itself needs to be investigated and understood in terms of processes of mediation, with special attention to institutionalized forms of mediation. (See Schot and Albert de la Bruhèze 2003).

Of special interest is that research also contributed to the understanding of technology itself as the embodiment of mediation. This can be seen especially in work done within the international research project "Tensions of Europe" (taken up by the European Science Foundation's research programme "Inventing Europe") in which the claim is made that the history of Europe as an 'emergent outcome' of history owes much to the trans-national construction and use of technological infrastructure – technology that embodies the constructive mediation between regional and international collaboration and competition. (See e.g. Oldenziel, Albert de la Bruhèze and De Wit 2005), Nil Disco (2007).

Contributions have also been made to discussions in the history of technology related to centers of innovation (the city, the office), the history of consumption as an important focus, the process of modernization and understanding the history of technology in terms of 'regime changes' (see above).

Book presented to Queen

In recognition of the importance of raising public understanding of the role played by technology in the history of the Netherlands, the multi-volume *Techniek in Nederland in de twingtigste eeuw* was underwritten by the Ministry of Economic Affairs as well as grants by a number of private corporations. In November 2003, the final volume was formally presented to Queen Beatrix.

2. The cultural history of science

Also oriented toward the methodological stance of 'co-evolution' this research focus argues that science should not be defined as a body of knowledge so much as a culturally rooted set of practices whose activities and meaning simultaneously draw on and contribute to cultural resources (culture understood here as a broad category within which social, political, material and intellectual forms of life can be placed). Debates in this field are especially lively for the early modern period – in relation to what has traditionally been called the 'Scientific Revolution'. While historians have been increasingly willing to entertain the possibility and/or accept that activities related to patronage, collection, rhetoric, social organization and the like can be seen as cultural phenomena, the content and 'internal' development of the exact and mathematical sciences have tended to resist interpretation as cultural phenomena. (See, e.g. Roberts and Knoeff,, 2006).

A major thrust of research that has recently evolved is to construct a convincing cultural history of mathematics and show it to be an integrated facet of Dutch history during the long seventeenth century. (See e.g. Dijksterhuis 2007).

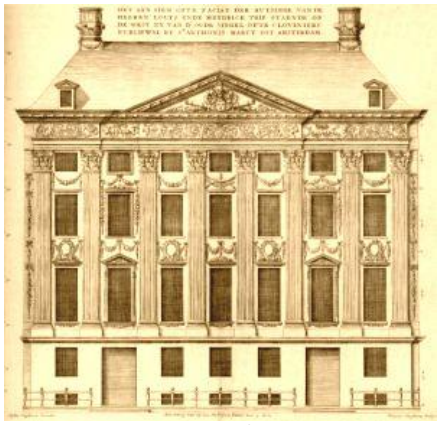
3. The history of science and technology replaced by the 'mindful hand'

It is a general tendency to distinguish between the history of knowledge production and the history of material production, associating the first with science and the second with technology. The classic question that is then posed is one of the relation between knowledge (often associated with theory, but more recently with the production of 'useful knowledge' pace Joel Mokyr) and material production (especially oriented around 'invention' and 'innovation'). By focussing on specific sites in which knowledge production and material

production were intimately collaborative processes, a two-fold claim was articulated in research done in this area: first, that the history of material and knowledge production can not simply be understood as the application of theory to practice nor of the application of technical innovation to theoretical development – the mind and the hand have historically worked as a collaborative team; second, at the very same time, socio-cultural contests have led to a rewriting of history such that reason (the reified work of the head) is separated from and claimed to have constructive priority over labor (skilled or otherwise). (See Roberts et al. 2007).

Public lecture

Historian of science Simon Schaffer and sociologist of science Steven Shapin were awarded the prestigious Erasmus Prize in 2005. As part of the celebrations surrounding this major cultural event, Lissa Roberts was asked to give a public lecture at the Royal Dutch Academy of Sciences and to edit a collection of Shapin and Schaffer's essays in a volume entitled *Wetenschap is cultuur* (Uitgeverij Balans, 2005).



Dutch Royal Academy of Sciences, KNAW, Trippenhuis, Amsterdam

4. Science, technology and global history

Following post-modern and post-colonial critiques of Euro-centric histories that responded to claims of the spread of progress with charges of domination and 'orientalism', ongoing research done in this field is meant to demonstrate that – however unbalanced the relations – the globally anchored production of knowledge and know-how since the early modern period has involved local, cross-cultural interactions which were generally mediated by locally present and actively engaged go-betweens and productively transformed through travel (the key term here is 'circulation'). Rather than give rise to comparative histories of 'the West and the Rest", the challenge presented here is to show how the history of science, since at least the fifteenth century, is a global history of interaction and circulation. Results of research done during the period under review, in the context of an international network of collaborators that was funded by NWO, NSF and the Spanish Research Council, will appear as an edited volume published and distributed cooperatively by the KNAW and University of Chicago Press in 2009.

Societal contributions

Researchers organized a variety of international workshops, including one sponsored by the Royal Netherlands Academy of Sciences, published a special issue of a journal (Roberts 2006) and an edited volume (Roberts et al. 2007), which is available electronically for free download thanks to the generosity of the KNAW. Johan Schot, senior researcher and professor in the department between 1991 and 2003, spearheaded the publication of the seven

volume series *Techniek in Nederland in the twintigste eeuw* (*Technology in the Netherlands in the twentieth century*), which was formally presented to Queen Beatrix in 2003. Written in Dutch, widely promoted and read, this series – a good portion of which was written and edited by Twente researchers – helped to integrate the history of technology into the more general history of the Netherlands and to demonstrate its importance to a broader public.
Professor H.F. Cohen (emeritus) published a popular history of science text entitled *De herschepping van de wereld* (*The re-creation of the world*) in 2007, which was subsequently awarded the Dutch Eureka Prize for greatest contribution to the popularization of science in the Netherlands.
Researchers also gave various public lectures and taught courses in which research into the history of science and technology has been shown as key to a broader understanding of the processes of modernity and modernisation. In addition members of the department were involved in the training of high school teachers and the writing of high school textbooks, thus transferring insights into the dynamics of science, technology and society, as well as good historical sense, to broad educational domains.

http://www.phys.uu.nl/~vgent/telescope/images/emblemata_1624.jpg

Plans for future research

Research related into technology in the Netherlands in the twentieth century, regime changes and 'the mindful hand' is winding down. Attention is currently being directed toward research into mediation and consumption of technology, with special emphasis on tourism; the cultural history of mathematics and chemistry; science, technology and global history and the history

of waterways as transnational commons through which the 'becoming of Europe' can be examined.

Key contributions

Roberts, L., S. Schaffer and P. Dear, eds. (2007) *The Mindful Hand: Inquiry and Invention from the late Renaissance to early Industrialization* Edita/University of Chicago Press.
This volume argues for a reconsideration of the history of science and technology.

Roberts, L. (2004) An Arcadian Apparatus: Steam engines and landscapes in the history of Dutch culture, in: *Technology and Culture.*
This article won the Abbott Payson Usher Prize of the Society for History of Technology in 2006.

Dijksterhuis, F.J. (2004) *Lenses and Waves. Christiaan Huygens and the Mathematical Science of Optics in the Seventeenth Century.* Dordrecht.
This book offers a new in-depth study of Christiaan Huygens and seventeenth-century optics.

Schot, J. and T. Misa, eds. (2005) *Inventing Europe,* special issue of *History and Technology* 21.
This issue developed the theme that was adopted by the European Science Foundation for one of its major research programmes.

4.
Programme members

Tenured staff in 2001/2007

Name	Position	Appointed on	Left on	Fte
Oudshoorn	professor	01-10-1995		0.84
Cohen	professor	01-05-1982	31-12-2000	1
		01-01-2001	01-08-2007	0 SUT-B
Hoppe	professor	01-09-1997		1
Rip	professor	01-09-1987	01-07-2006	1
		02-07-2006		0
Kuhlmann	professor	01-10-2006		1
Schot	professor	01-05-1991	01-09-2003	0.4
Ridder	professor			0 (PNUT-er)
Dijksterhuis	associate professor	01-11-1999	30-04-2004	1
		01-05-2004		0.84
Meulen van der	associate professor	01-08-1993		1
Oost van	associate professor	01-10-1982		0.84
Roberts	associate professor	01-09-2000		1
Smit	associate professor	01-02-1975	31-12-2000	1.0
		01-01-2001	01-12-2005	0.84 SUT-A
Albert de la Bruheze	assistant professor	01-08-1998		1
Disco	assistant professor	15-08-1988	31-06-2002	0.84
		01-07-2002		0.21 SUT-B
Jelsma	assistant professor	01-12-1982	31-03-2001	0.84
		01-04-2001	01-04-2007	0.21
Kireczyk	assistant professor	01-08-1988	30-11-2005	0.84
		01-12-2005		0.74
Stemerding	assistant professor	01-05-1980		0.84
Lauxterman	assistant professor	01-11-1982	01-04-2004	0.84

Externally funded and/or temporary post-doc staff in 2001/2007

Name	Position	Appointed on	Left on	Fte
Dubbeld	Post doc	01-04-2004	01-04-2006	1
		01-10-2005	01-12-2005	0.11
Roep	Post doc	01-12-2001	01-01-2002	0.42
		01-03-2002	01-09-2004	0.42
Kater	Post doc	01-10-2002	01-02-2005	0.84
Elzen	Post doc	01-02-1996	01-09-2006	???
		01-09-2001	28-02-2002	0.84
		01-03-2002	14-10-2002	1
		15-10-2002	28-02-2003	0.84
		01-03-2003	31-08-2003	0.21
		01-09-2003	29-02-2004	0.84
		01-03-2004	28-02-2005	0.11
		01-03-2005	31-12-2005	0.21
		01-01-2006	31-08-2006	0.84
		01-09-2006	14-04-2008	0 PNUT
Propp	Post doc	01-02-2004	01-07-2006	1
Amerom van	Post doc	01-12-2005	14-02-2007	1
		15-02-2007	28-02-2008	0.42
Melenhorst	Post doc	15-01-2006	01-04-2007	0.84
Halffman	Post doc	01-01-2002	01-01-2007	1.0
Rommes	Post doc	01-02-2003	01-02-2004	0.42
Heinze	Post doc	01-04-2007	01-04-2008	1.0
Maathuis.	Jr. researcher	01-10-2003	16-11-2006	1
		16-07-2007	01-09-2007	1
Rijswoud, van.	Jr. researcher	01-06-2005	01-06-2007	1
Cuypers	Jr. researcher	01-01-2007	01-07-2007	1
Berg-Schroer	Jr. researcher	15-12-2001	14-02-2002	0.74
		15-12-2002	15-04-2003	1
Bodewes	Jr. researcher	01-08-2004	01-09-2005	0.84
Franzen.	Jr. researcher	15-10-2003	01-03-2005	0.84

5.
Research input and funding of academic staff

Source of funding	Fte	2001	2002	2003*	2004	2005	2006	2007
University	Phd	n.a.	n.a.	3,40	3,93	1,96	0,72	0,68
	Other	n.a.	n.a.	4,28	4,88	5,71	5,46	3,76
Research Council	Phd	n.a.	n.a.	1,47	2,07	3,93	7,32	6,56
	Other	n.a.	n.a.	2,30	2,54	2,23	3,45	1,26
Other funding	Phd	n.a.	n.a.	1,06	1,60	1,47	0,8	1,17
	Other	n.a.	n.a.	0,58	0,76	1,13	0,4	1,00
Total		n.a.	n.a.	***13,09***	***15,78***	***16,43***	***18,15***	***14,43***

Main resources for externally funded research

- The Netherlands Organisation for Scientific Research (NWO): WOTRO, ASPASIA, MAG, NOVEM
- Technology Foundation STW- NanoNed, the Nano-Technology network in the Netherlands
- European Union (EU) -Specific target research project
- European Union (EU)-NEST
- European Union (EU)- IST
- Wageningen University
- KPN
- TNO
- The Centre for Society and Genomics (CSG), CSG
- Rathenau Institute
- Astmafonds
- The Energy research Centre of the Netherlands, ECN
- Dutch Organization for Health Research and Innovation (ZonMW)
- National Institute for Public Health and the Environment (RIVM)
- Advisory Council for Research on Spational Planning, Nature and the Environment (RMNO)
- Philips
- COS Netherlands
- Deutsche Forschungsgemeinschaft, DFG

6.

Composition of research input and source of funding of academic staff final year of evaluation period (2007)

Fte per funding source	University	Research Councils	Other funding	Total
Professor, HGL	1,10			1,10
Associate professor UHD	1,44			1,44
Other senior staff, UD	1,12			1,12
Post doc		0,93	0,60	1,53
PhD, junior staff	0,78	6,89	1,57	9,24
Total	4,44	7,82	2,17	14,43

NB:
1 fulltime PhD is equivalent to 0,8 fte research input
1 fulltime postdoc is equivalent to 0,8 fte research input

7.
Research output

Publications

		2000	2001	2002	2003	2004	2005	2006	2007	Total
A	**Academic publications**									
a	PhD theses[1]	2	2	3	3	1	5		2	**18**
b	Refereed articles, (foreign language) and peer-reviewed editing of books	5	8	15	14	7	3	11	10	**73**
c	Refereed articles, (Dutch)	1	2	10	1	1	3	2		**20**
d	Refereed chapters in books (foreign language)	19	20	11	13	2	11	13	9	**98**
e	Refereed chapters in books (Dutch)	10	2	9	8		2			**31**
f	Refereed books (foreign language)	2	1	2	2				1	**8**
g	Refereed books (Dutch)	2	1	1	3		1			**8**
h	Non-refereed articles (foreign)			1	1	2	3	1	1	**9**
i	Non-refereed articles (Dutch)		1	1		3	4	2	1	**12**
j	Non-refereed chapters in books (foreign)	6	5	2	1	13	5	3		**35**
k	Non-refereed chapters in books (Dutch)		3	2		2	2			**9**
l	Non-refereed books (foreign language)	2	2	7	1	7		3	2	**24**
m	Non-refereed books (Dutch)				3	2	1		6	**12**
n	other (inaugural speeches, patents: foreign)			4					1	**5**
o	other (inaugural speeches, patents: Dutch)	1		1						**2**
Total		**50**	**47**	**69**	**50**	**40**	**40**	**35**	**33**	**364**

B	**Main professional publications**									
	Foreign language									
a	Articles	2	1	3					1	**7**
b	Book chapters	4	1		5		1	1	2	**14**
c	Reports	3			2				1	**6**
	Dutch									
a	Articles	5	6	2	6	3		2		**24**
b	Book chapters	2			1		1			**4**
c	Reports	2	2	1			3	2		**10**
Total		**18**	**10**	**6**	**14**	**3**	**5**	**5**	**4**	**65**

See section 12 for the complete overview of publications

Participation in editorial boards, policy and other relevant networks and institutions, and consulting activities

Albert de la Bruheze, A.A.

- Member Advisory Group of the European History of Technology research network 'Tensions of Europe': http://www.tensionsofeurope.eu/ '
- Member of the ESF (EUROCORES) Research Programme *Inventing Europe. A Transnational History of European Integration:* http://www.esf.org/activities/eurocores/programmes/inventing-europe.html
- Member of the ESF Research Programme *European Ways of Life in "The American Century": Mediating Consumption and Technology in the Twentieth Century'* (EUWOL). EUWOL is a Collaborative Research Project (CRP) in the framework of the European Science Foundation's EUROCORES program *Inventing Europe*. http://www.esf.org/activities/eurocores/programmes/inventing-europe/projects/list-of-projects.html
- Editor of the Dutch Journal *Tijdschrift voor Sociaal Economische Geschiedenis (TSEG)*: http://www.tseg.nl/
- Member of the Monumentencommissie Hengelo **http://www.hengelo.nl/smartsite.dws?menu=11988&channel=INT&id=57121**

Disco, C.

- Project Leader ESF-supported Tensions of Europe Network "Eurocommons: Technology and Transnational Commons in Europe"

- Member joint Rijkswaterstaat – U.S. Army Corps of Engineers water history research group
- Member transition committee Tensions of Europe

Elzen, B.

- Member of KSI – Knowledge Network on System Innovation (Netherlands)

Halffman, W.

- Member of Sheila Jasanoff's Science and Democracy Network (SDN)
- Member of the Dutch research school "Science, Technology and Modern Culture"
- Occasional advisory in the Dutch scientific advisory sector, and to the European Commission, DG research (Science and Society, Environment)

Hoppe, R.

- Member of the Local Audit Chamber of the City Government of Enschede, 1998-2006
- Member of the Supervisory Board (now Advisory Board) of the Center for Society and Genomics (CSG), a Center of Excellence of the Dutch Genomics Initiative (NGI), 2004 - present
- Senior Fellow Netherlands Institute of Government (NIG/NOB)
- Fellow Institute for Science, Technology, and Modern Culture (WTMC)
- Particpant/member in the EU Network of Excellence "Policy for Research and Innovation for the Move to a European Research Area"(PRIME), program FP-6, "Citizens and Governance in a Knowledge-Based Economy"
- Member of the Advisory Board for the multi-year RIVM/VROM project *Climate Options For the Long Range* (COOL), (1999-2002)
- Expert/reviewer for EU Framework programmes (1999-present)
- *Member Dutch Political Science Association/Nederlandse Kring voor Wetenschap der Politiek* (NKWP)
- Member European *Association for Science, Society and Technology Studies* (EASST)
- Member Dutch Association for Public Administration/*Vereniging voor Bestuurskunde* (VB)
- Member of *Association for Policy Analysis and Management* (APPAM)
- Peer reviewer for a.o. *Acta Politica, Beleidswetenschap, Beleid & Maatschappij, Science & Public Policy, Policy Sciences, Public Administration Review, Administrative Theory & Praxis,, Science, Technology & Human Values, Poièsis & Praxis: International Journal of Technology Assessment and Ethics of Science, Journal of Critical Policy Analysis*

- Member of Editorial Board of *Policy Studies Journal*
- Editor-in-Chief of *Beleidswetenschap*, 2001-2006

Kuhlmann, S.

- Editor: „Research Policy - Policy and management studies of science, technology and innovation“, since 2005
- Editor: „Forschung. Politik - Strategie - Management“, since 2006
- Associate Editor: „International Journal of Foresight and Innovation Policy“,since 2003
- Editorial Advisory Board: „Evaluation – The International Journal of Theory, Research and Practice”, since 2000
- Member: Evaluation Board of the Alexander von Humboldt Foundation, Bonn, since 2006
- Member: COST High Level Expert Group on ‘Impact Assessment’, since 2008
- Member: Resource Group of the “ERiC-project - Evaluating Research in Context”, a task force of leading Dutch science organisations (KNAW, NWO, COS, QANU, VSNU), since 2006
- Member: Working Group on ‘Research and Science Policy in Europe’ of the German Science Council (Wissenschaftsrat), since 2008
- Member: Executive Committee European Network of Excellence PRIME (Policies for Research and Innovation on the Move towards the European Research Area), since 2004
- Member: International Advisory Board on Evaluation and Impact Analysis of VINNOVA, the Swedish Governmental Agency for Innovation Systems, since 2007
- Member: ERAWATCH Scientific Advisory Board, European Commission’s Institute for Prospective Technology Studies (IPTS), Seville, since 2006
- Member: European Commission’s Expert Group on the “Follow-up of the Research Aspects of the Lisbon Strategy”, since 2006
- Member: Scientific Advisory Committee of „Koordinierungsstelle EG der Wissenschaftsorganisationen (KOWI)“, Brussels/Bonn, since 1997
- Member: European Commission's High Level Expert Group on „Maximising the wider benefits of competitive basic research funding at European level“ (Directorate General Research), 2004-2005
- Member: Evaluation commission of the Commissie Overleg Sectorraden (COS), and Commissie Rabbinge (on behalf of the Dutch Minister of Education, Culture and Science, OCW), 2005
- Member of Steering Committee: „Six Countries Programme -The International Innovation Network“, 1993 – 2006
- Member: „European RTD Evaluation Network“ of then European Commission,

Directorate General Research, 1997 – 2006

- Member: European Techno-economic Policy Support Network (ETEPS network) of the European Commission's Institute for Prospective Technology Studies (IPTS), Seville, 2005 – 2006
- Member: Working Group „Politik und Technik" of the Deutsche Vereinigung für Politische Wissenschaft (DVPW), since 1988 (until 1991 Member of the board)
- Member: German Evaluation Association (DeGEval), 1997 – 2006 (until 2001 member of the board)

Meulen, B.J.R. van der

- Member of the PRIME network.
- Involved in setting up the Science System Assessment department of the Rathenau Institute, The Hague

Oudshoorn, N.E.J.

- Contributing editor Science, Technology & Human Values
- Editorial adviser Social Studies of Science
- Member of the Advisory Board of Medicine Studies. An International Journal for History, Philosophy, and Ethics of Medicine & Allies Sciences
- Member of the Advisory Board of the East Asian Science, Technology and Society: an International Journal
- Member of the Editorial Council of the Electronical Journal in Communication, Information and Innovation in Health
- Member of the International Editorial Board of the European Journal of Women's Studies
- Member of the Advisory Board of Tijdschrift voor Genderstudies
- Member Program committee of the research program Society and the Electronic Highway of the Dutch Research Council (NWO), 1999-2005
- Chair of the board of the Dutch Graduate School Science, Technology and Modern Culture, 2005-2011
- Chair of the Department of Science, Technology, Health and Policy Studies, University of Twente, 2005- present
- Co-founder and member of the board Centre of Information Technology and Society, University Twente, 2007-2010

Rip, A.

- South-Africa Netherlands Research Programme on Alternatives in Development (SANPAD), member of the Dutch National Committee, 2001- 2007

- Norwegian Research Council, Steering Committee, ELSA programme for bio-technology, nano-technology and cognitive sciences, Member, 2007-
- Raad voor Advies Wetenschappelijk Onderzoek ten behoeve van Ontwikkelingslanden (RAWOO), council member, 2003-2006. The Council was dissolved by the end of 2006
- Universität Bielefeld, Institut für Wissenschafts- und Technikforschung, Mitglied, Wissenschaftlicher Beirat, 1994- present
- Volkswagen Foundation, member advisory panel for the program on Innovation Studies, 2001-2006
- EU High-Level Expert Group on Foresighting the New Technology Wave, member, 2003-2004
- EU Network of Excellence PRIME (Policies for Research and Innovation in the Move towards the European Research Area), Executive Committee member, 2004- . Also leader, Working Group 2, New Multi-Actor Spaces, 2004-
- EU Network of Excellence Nano2Life, Ethics Board (now: ELSA Board), member, 2004-
- Universität Bremen, Wissenschaftliche Beirat des Forschungszentrums Nachhaltigkeit/artec, Mitglied, 2004 – 2007
- EU Expert Group Science and Governance, Member, 2005-2006
- Scientific advisory board, BMBF (German Federal Ministry of Research and Education) initiative on 'New Governance of Science – Research on the relationship between science, politics and society', Member, 2007-
- Member, Scientific Advisory Board, LichtenbergKolleg (Center for Advanced Study), University of Göttingen, 2007 –
- Consultant (with Wim Smit) to Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (Scientific Council for Government Policy), Perspectives on Environmental Risk, 2001
- Chairman of the Panel assisting the evaluation team, led by E. Arnold (Technopolis), evaluating the Research Council of Norway. 2001. [This included giving advice to the Minister of Education and Sciences.] E. Arnold, S. Kuhlmann, B. van der Meulen, A Singular Council. Evaluation of the Research Council of Norway. Brighton: Technopolis, December 2001.
- Expert review for the German BMBF programme *Politik, Wissenschaft und Gesellschaft*, 2002
- Président du Comité d'Évaluation, Expérience pilote sur les vignes transgéniques, INRA (Paris), 2002-2003
- Member, Evaluation Panel of Research Management in the Flemish Universities, commissioned by VLIR (Flemish InterUniversity Council), 2004
- Member, Evaluation Panel of FuturIS (project supported by the Association Nationale de la Recherche Technique, Paris), 2005

- Expert review for the German BMBF programme *Politik, Wissenschaft und Gesellschaft.* 2002.
- Président du Comité d'Évaluation, Expérience pilote sur les vignes transgéniques, INRA (Paris). 2002-2003. This included advice to the Director of INRA.
- *Challenges for Technology Foresight/Assessment and Governance.* Report for the STRATA Consolidating Workshop, Brussels, 22-23 April 2002. Published in EU Directorate-General for Research, *Science & Technology Policies in Europe: New Challenges and New Responses*, Brussels: March 2003 (EUR 20440), 39-85.
- *Co-Evolution of Science, Technology and Society*. Expert Review for the Bundesministerium Bildung and Forschung's Förderinitiative 'Politik, Wissenschaft und Gesellschaft' (Science Policy Studies), managed by the Berlin-Brandenburgische Akademie der Wissenschaften. Enschede: University of Twente, 7 June 2002.

Rip, A. and W. Smit

- Consultant to Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (Scientific Council for Government Policy), Perspectives on Environmental Risk. 2001. A. Rip and W.A. Smit, *Risico's: Observaties vanuit een wetenschapsfilosofisch en sociologisch perspectief*. Universiteit Twente. Essay written on behalf of the Scientific Council for Government Policy, Social anchoring of environmental norms project.

Roberts, L.L.

- Co-founder and co-chair with Prof. Dr. L.T.G. Theunissen, national research programme for history of science in the Netherlands, "Science and the circulation of knowledge: The Netherlands as a historical laboratory" (see www.gewina.nl)
- Member, editorial board, *British Journal for the History of Science*
- Member of organizing committee, Scientific Research Network: Circulating Knowledge in Early Modern Science (funded by Fonds voor Wetenschappelijk Onderzoek – Vlaanderen)
- Permanent member of review panel for NSF Science, Technology and Society Programme 2002-2005
- Member of steering committee for International Research Group "Science and Technology in the European Periphery"

Stemerding, D.

- Principal investigator of Centre for Society and Genomics
- Member of Health Council commission on Pre-conception care, 09-2005 to 03-2007, and Population screening, 06-2007 to 04-2008
- Member of EASST and 4S
- Member of Public Health Genomics European Network (PHGEN)
- Associate member of Centre for Prospective Regulation (University of York)

Smit, W.A.

- Participation in European Commission funded PRIME Network of Excellence, in particular the PRIME INNO-MIL project on "Re-Evaluating Defence R&D and Innovation Dynamics", 2005-2008. A number of workshops were organized that will result in a book publication. Organizing participants are: Andrew James, PREST, University of Manchester, Jordi Molas-Gallart, SPRU, University of Sussex, Philippe Larédo, LATTS, Ecole des Ponts, Paris, Wim A. Smit, STeHPS, University of Twente, Rikard Stankiewicz, European University Institute, Florence

8.

Other indicators of quality, reputation, and knowledge valorisation

Invited visiting professorships

Rip, A.

- Professor Extraordinary, University of Stellenbosch (South Africa), Department of Sociology, January 1998- present.
- Visiting Professor, École Nationale Supérieure de Cachan, France, (March 2004).
- Professor Extraordinary, University of Western Cape, Department of Education, March 2006 – March 2009**.**

Oudshoorn, N.E.J.

- Visiting professor Norwegian University of Science and Technology. Department of Interdisciplinary Studies of Culture. October 2000 – October 2005.
- Visiting professor University of Vienna. Department for Philosophy of Science and Social Studies of Science, May, 2005**.**

Research grants

Rip, A.

- "History of Technology in the Netherlands in the 20th Century," an internally and externally funded research programme of a consortium including the Universities of Eindhoven, Twente, Delft, and Limburg, supported by the Foundation for the History of Technology, (with H.W. Lintsen, J.W. Schot). Funding from NWO and various other sources., 1993 – 2003.
- Netherlands Research Council NWO: Hidden novelties in agriculture (with Jan-Douwe van der Ploeg, principal investigator), 1999 – 2005.
- 'Management Tools and a Management Framework for Assessing the Potential of Long-Term S&T Options to Become Embedded in Society', TSER Programme of the European Commission, 2002 - .
- Netherlands Ministry of Economic Affairs and STW, "Captain" of the Flagship 'TA & Societal Aspects of Nano-Technology', funded as part of the Nano-Impulse programme, 2003-2007. Now expanded as part of the larger NanoNed programme, funded through BSIK and STW, 2005 – 2010.

- EU, Sixth Framework Programme, NEST (New and Emerging Science and Technology): coordinator of ATBEST, Assessment Tools for Breakthrough and Emerging Science and Technology, 2004 – 2005.
- *Africa Prime, A Demonstrator Project.* Enschede: Africa PRIME project supported by the European Union Network of Excellence PRIME, 2006**.**
- EU, Sixth Framework Program, Science and Society Program (2005 Call, Risk, Governance and Ethics): one of the principal investigators in DEEPEN (Deepening Ethical Engagement and Participation in Emerging Nanotechnologies), 2006 – present.
- *Ruimte voor rechtvaardigheid. Reconstructie van de dynamiek in de processen van besluitvorming over toelating van vier medische interventies: IVF, maternale serumscreening, taxoïden en rivastigmine*. Project financed by Zorgonderzoek Nederland en Medische Wetenschappen NWO, 2003 – 2006. **(Rip and Kirejczyk)**

Oudshoorn, N.E.J.

- PhD project *Gender and the Design of Electronic Toys* financed by Philips, 1998 – 2003.
- *Strategies of Inclusion. Gender and the Information Society*. Two junior researchers financed by the EU, 6th framework programme, 2001-2004**.**
- *Dual Inscription of Energy saving and Comfort for Clients*, PhD project. Co-financed by ECN, 2002 – 2007. (**Oudshoorn and Jelsma)**
- *Privacy and the dynamics of telemedicine*. Postdoc project and three senior researchers financed by NWO, 2006 – 2008.
- *User-initiated innovation in network technologies*. PhD Project, financed by NWO, 2005 – 2009. **(Oudshoorn and Van Oost)**

Hoppe, R.

- Research Program "Rethinking Political Judgment and Science-Based Expertise: Boundary Work at the science/politics nexus by Dutch knowledge institutes" The program contains 6 separate projects, 2001 - .
- ISW-grant ("beurs") of the Royal Acedemy of Sciences for inviting foreign participants to the international mid-term conference of the Rethinking program, "Comparative Perspectives on Scientific Expertise for Public Policy", 17-18 December, Amsterdam, 2004.
- NWO "Shifts in Governance", on the project "The Governance of Problems", research leave grant, 2005 – 2006.

Dijksterhuis, F.J.

- 'The Uses of Mathematics in the Dutch Republic', VIDI project financed by NWO with 2 PhD students, 2007 – 2011.

Elzen, B.

- "Developing and testing a coherent theory-based methodological framework for tuning product design-in-progress to future use and societal embedding of PVSM (photovoltaic plus electric storage medium based energy supply) technology for indoor and outdoor use". Research program financed by NWO – SenterNovem, 2003 – 2008.
- "Socio-technical scenarios: development of a new tool to explore and stimulate transition to a sustainable electricity system". Financed by NWO – SenterNovem, 2003 – 2008.

Halffman

- Commissie Overleg Sectorraden: "Een Internationale Vergelijking van Grenzenwerk tussen Wetenschap en Beleid"(International comparison of Boundary work between science and policy).
- Netherlands Environmental Assessment Agency, "Uncertainty in policy advise and decision making" PhD position, 2003 – 2008. (**Halffman and Hoppe)**
- Co-operative Research on Environmental Problems in Europe (CREPE), EU Framework Programme, co-application, 2006 – 2008.

Roberts, L.L.

- NWO Aspasia Award, 2003 – 2008. Included funds for PhD research position.
- NSF award to support KNAW Akademie Colloquium, 2004.
- NWO award to support KNAW Akademie Colloquium, 2004.
- KNAW Akademie Colloquium Award, 2004**.**
- National Science Foundation (NSF) Independent Research Award, 2006.
- NWO Internationalisation Award, 2006.

Stemerding, D.

- Centre for Society and Genomics: Interactive scenario study of future developments in the field of community genetics, 01-06-2005 to 01-06-2007.
- NWO (not applicant, but participating researcher): Developing scenarios of moral controversies concerning new biomedical technologies, 01-09-2005 to 01-09-2006.

Kuhlmann, S.

- "Governance of the cooperation of heterogeneous partners across national research and innovation systems", project funded by Deutsche Forschungsgemeinschaft (DFG), 2007 – 2011.

- "Measurement and Analysis of Highly Creative Research in the US and Europe", project funded by National Science Foundation (NSF), USA; principal partner: Prof. Philip Shapira, Georgia Institute of Technology, 2007 – 2011.
- "ERA-Dynamics", a research project in context of the PRIME Network of Excellence (EU FP 6), 2007.

Academic Prizes

- 'Science for the 21st Century', prize-winning essay presented at the 'Sciences and Arts Debate', Haarlem, 16 February 2002, on the occasion of the 250th anniversary of the Hollandsche Maatschappij der Wetenschappen. [published as: A. Rip. 2002. Science for the 21st Century. In: P. Tindemans, A. Verrijn-Stuart and R. Visser (eds.) *The Future of the Sciences and Humanities. Four analytical essays and a critical debate on the future of scholastic endeavour*. Amsterdam: Amsterdam University Press. 99-148. **(Rip)**
- Rachel Carson prize 2005 by the Society for Social Studies of Science for N.E.J. Oudshoorn. 2003. *The Male Pill. A Biography of a Technology in the Making*. Durham and London: Duke University Press. **(Oudshoorn)**
- Abbott Payson Usher Prize, Society for History of Technology, 2006 for article: L.L. Roberts. 2004. An Arcadian apparatus: The introduction of the steamengine into the Dutch landscape. *Technology and Culture* 45: 251-276. **(Roberts)**
- Elsevier Prize for the outstanding paper published in TFSC during 2007: for M.P. Hekkert, R.A.A. Suurs, S. Negro, S. Kuhlmann and R.E.H.M. Smits, 2007, Functions of Innovation Systems: A new approach for analysing technological change. In: *Technological Forecasting & Social Change*, 74 (4): 413-432. **(Kuhlmann)**

Organisation of international conferences

2002

- Organistation of International Workshop "Transitions to Sustainability through System Innovations", University of Twente, 4-6 July 2002. A Selection of the papers were published as: B. Elzen, F.W. Geels and K. Green (eds.). 2004. *System Innovation and the Transition to Sustainability*. Cheltenham: Edward Elgar Publishing Ltd. **(Elzen)**

2004

- International workshop in the context of the NWO research programme "Rethinking Political Judgment And Science-Based Expertise: Boundary Work At The Science/Politics Nexus Of Dutch Knowledge Institutes.":
  Mid-term conference Rethinking, December 16-17 2004, at the Royal Academy of Science (KNAW), Amsterdam. **(Halffman)**

- Amsterdam, 16-17 December 2004, "Comparative Perspectives on Scientific Expertise for Public Policy", te Amsterdam, Rho Hotel, Mid-term conference for the Rethinking program. **(Hoppe)**
- Member of programme committee, International Conference Images of Science. New Interactions between Science and Society, Amsterdam, 6-7 December 2004 (on the occasion of the Dutch chairmanship of the European Union). Also keynote speaker. **(Rip)**
- "Inventive intersections: Sites, Artifacts and the Rise of Modern Science and Technology" Akademie Conference organized under auspices of the Royal Dutch Academy of Sciences in Amsterdam. September 2004. **(**Papers presented at this conference were revised for publication in a co-edited volume with Simon Schaffer (Cambridge University) and Peter Dear (Cornell University). **(Roberts)**

2005

- 30th Aniversary Congress CSSTS. On 29 November 2005 STeHPS held a congress with distinguished speakers celebrating the creation of one of its predecessors, the 'Centre for Studies of Science, Technology and Society', 30 years before. A volume with contributions was published: Boelie Elzen and Wim de Ridder (red.), Innovatie en Maatschappelijke Ontwikkeling: Omgaan met een haat-liefdeverhouding, Den Haag: SMO (2005).
- PRIME Workshop on Intermediaire Organisations and Processes, 6-7 October 2005, Enschede, The Netherlands. **(Van der Meulen)**
- Co-organizer, with Jörg Sydow and Arnold Windeler, Workshop 'Measuring Path Dependency – The Social-Constructivist Challenge', Berlin, Free University, 5-6 September 2005. **(Rip)**
- "Science: the Low Countries as a historical laboratory", May 2005**,** First national conference for historians of science in the Netherlands (and Belgium). Co-organized with Bert Theunnisen (Universiteit Utrecht) (with financial assistance of KNAW). Held in Woudschoten, Netherlands. **(Roberts)**

2006

- Changing identities and networks in a digital world. International conference organized to present the results of the sub-programme "Social and Cultural aspects of ICTs of the NWO-MES programme Society and the Electronic Highway." Amsterdam, September 15-16, 2006. **(Oudshoorn and Zoonen)**
- Material Narratives of Technology in Society. International workshop of the Department of Science, Technology, Health and Policy Studies. University of Twente, October 19-21, 2006. **(Oudshoorn, Rip and Tauritz)**
- "Go-betweens and imperial networks of knowledge", December 2006 International workshop held at Teylers Museum, with support from NWO, NSF and Teylers Museum. **(Roberts)**

2007

- Member of Programme Committee: Science Impact - Rethinking the Impact of Basic Research on Society and the Economy, Vienna (Austrian Science Fund; European Science Foundation), 10 – 11 May, 2007. **(Kuhlmann)**
- Organizer: PRIME Network of Excellence Workshop "Beyond the dichotomy of national vs. European science systems - Configurations of knowledge, institutions and policy in European research", Bonn, Germany, May 30, 2007. **(Kuhlmann)**
- Member of Programme Committee: PRIME Network of Excellence Workshop „Knowledge dynamics and the development of ERA: Institutional issues and actors strategies", Lisbon, Portugal, 9 November 2007. **(Kuhlmann)**
- Organizer: PRIME Network of Excellence Workshop „Knowledge dynamics and the development of ERA: Institutional issues and actors strategies", Lisbon, Portugal, 14 November 2007. **(Kuhlmann)**
- Changing Roles of Users in Information Technologies. International workshop of the Centre of Information Technology and Society. University of Twente. November 8, 2007. **(Oudshoorn)**
- "Global commerce, innovation and the circulation of knowledge", September 2007**,** Second national conference for historians of science in the Netherlands (and Belgium). Co-organized with Bert Theunnisen (Universiteit Utrecht) (with financial assistance of Huizinga Institute for Cultural History). Held in Woudschoten (Zeist), Netherlands. **(Roberts)**

Invited main lectures, keynote speeches

2001

- Science versus Commerce: Conflicting Views of Science and Normativity. Lecture Studium Generale. Free University, 14 November 2001. **(Oudshoorn)**
- Access to Information and Communication Technology: Debates on Design and Diversity (m/f). KIVI, Department of Philosophy and Technology, 7 March 2001. **(Oudshoorn)**
- 'Management of Technology in Society', keynote speech to the R&D Management Conference, Wellington, New Zealand, 7-9 February 2001. **(Rip)**

2002

- A future for participatory Technology Assessment in Europe? Participatory and interactive policymaking, representative democracy, and the quality of public debate, afsluitend keynote address EUROPTA/Rathenau congres, The Hague, september, 2002. **(Hoppe)**

- Designing Technology and Masculinity. A Biography of the Male Pill. Pennsylvania State University, April 5, 2002. **(Oudshoorn)**
- Diversity and Distributed Agency in the Design and Use of Medical Video-Communication Technologies Cornell University, April 8, 2002. **(Oudshoorn)**
- The Male Pill. Designing Technology and Masculinity. November 11, 2002. University of Michigan, USA. **(Oudshoorn)**
- The Role of Technology in Innovations. Summerschool Ministry of Health, Social Welfare and Sport, 2 July 2002. The Hague. **(Oudshoorn)**
- 'Postmodern Science and Technology Policy', invited lecture, International Symposium New Articulation of Science and Technology, Tokyo, February 28 and March 01, 2002. **(Rip)**
- 'Technological Innovation in Context', invited lecture, Sino-European International Symposium on Science, Technology and Society, Chinese Academy of Social Sciences, Beijing, 15-18 September 2002. **(Rip)**
- 'Technology Assessment and Reflexive Co-Evolution of Science, Technology and Society', keynote lecture, 4th Triple Helix Conference, Copenhagen, 6-9 November 2002. **(Rip)**

2003

- "Hidden Resources". Invited lecture for the ESF Exploratory Workshop Optics, Optical Instruments and Painting. The Hockney-Falco Thesis Revisited, Ghent: Ghent University, 12-15 November, 2003. **(Dijksterhuis)**
- Emancipatory ICT requires a lot of work. Meeting to launch the Yearbook ICT and Society, 3 March 2003. The Hague, Social and Cultural Planning Office of The Netherlands. **(Oudshoorn)**
- Configuring the User as Everybody. Gender and Design Cultures in ICTs. Conference on Gender, Science and Technology. May 18-20, NTNU, Trondheim, Norway. **(Oudshoorn)**
- Contested Hybridity: Patient Organizations and the Design of Health Web Sites, Patient Organizations Movements Symposium. June, 12-14. University of Goteborg. **(Oudshoorn)**
- What about the Male Pill? Lecture at the Institute of the International Archive for Women, Amsterdam,.18 June 2003. **(Oudshoorn)**
- Cultural aspects of technological innovation. The Case of the Male Pill. University of Eindhoven, 19 juni. **(Oudshoorn)**
- Reflections on the state of the art of gender and technology studies, Congres Gender en technologie Netwerk, 24 Oktober 2003. Vrije Universiteit, Amsterdam. **(Oudshoorn)**
- 'Tertiary Education Institutions and Changing Modes of Knowledge Production', keynote speech to the South African Academic Development Association (SAADA) Conference, Cape Town, SA, 3-5 December 2003. **(Rip)**

- "Toward a Cultural History of Technology" invited lecture at Simpson Humanities Center, University of Washington, 24 April 2003. **(Roberts)**
- "What makes a 'public' demonstration public?" invited lecture, Sciences & spectacle au temps des Lumières, Cité des Sciences et de l'Industrie, Paris. 19- 20 May 2003. **(Roberts)**

2004

- "Reading up on A Compleat System of Opticks (1738)". Invited lecture for the symposium The Legacy of Newton's Opticks, Cambridge: Dibner Institute, November 12-13, 2004. **(Dijksterhuis)**
- "Huygens and the light of the Seventeenth Century". Invited lecture for the Forschungsgruppe historische Lichtgefüge conference Rembrandt und Vermeer – Lichtgefüge des 17. Jahrhunderts, Wolfenbüttel: Herzog August Bibliothek, 4-6 October, 2004. **(Dijksterhuis)**
- "New Lights: seventeenth-century optics". Invited lecture for the KNAW Akademie Colloquium Inventive Intersections: Sites, Artifacts and the Rise of Modern Science and Technology. KNAW: Amsterdam, 22-24 September, 2004. **(Dijksterhuis)**
- *The planning bureau function: boundary work under uncertainty/De planbureaufunctie: grenzenwerk in onzekerheid,* Lecture at the opening of the Academy Series of the Environmental and Nature Assessment Agency, De Bilt, 29 januari, 2004. **(Hoppe)**
- *Redrawing the boundatries. A political perspective on participatory Technology Assessment*, PRIME Workshop on Interactive Technology Assessment, Universität Bielefeld, December 4-6, 2004. **(Hoppe)**
- Constructing the digital patient. Patient organizations and the development of health web sites. Invited lecture at the conference Medicine as Culture – Cultural Studies of Medicine organized by the Swiss Academy of Humanities and Social Sciences and the Swiss Academy of Medical Sciences. Zurich, 12-13 November 2004. **(Oudshoorn)**
- Difference or Equality? Theory and Strategy concerning Gender and Science. Lecture Network Women at the University of Twente, Enschede, 13 September 2004 **. (Oudshoorn)**
- Script approaches in technology studies. Or: how to take into account the diversity and agency of users. Lecture WTMC workshop Soeterbeek, February 5, 2004. **(Oudshoorn)**
- 'New and emerging governance arrangements for science', invited lecture, workshop "Shifting Boundaries between Science and Politics. New Research Perspectives in Science Studies', Wissenschaftszentrum Berlin, Berlin, 25-26 June 2004. **(Rip)**
- 'New Interactions Between Science and Society', invited keynote speech, International Conference 'Images of Science' (convened under the Netherlands Presidency of the European Union), Amsterdam, 6-7 December 2004. **(Rip)**
- "Solution to revolution: Dutch chemistry between science and industry" invited lecture,

Anglo-Dutch meeting on “Chemistry and Medicine in the 18th Century”Leiden, 23-24 April 2004. **(Roberts)**

- **“**Mediators and Knowledge Networks in Late-Eighteenth-Century Imperial Experience” plenary session participant, Four Societies for History of Science meeting Halifax, Canada 5-7 August 2004. **(Roberts)**
- "The Netherlands as a historical laboratory, a national research programme on the circulation of scientific knowledge and practice, 1600-2000". Inaugural presentation given at European Society for History of Science annual meeting, 5 November 2004. **(Roberts)**

2005

- *World images and styles of governance/Wereldbeelden en sturingsstijlen*, lecture for the Copernicus/RIVM symposium on the occasion of the publication of the *Milieubalans 2004*, Utrecht, 26 mei 2005. **(Hoppe)**
- *Good health governance: between system optimization and transformation*, lecture for the congress *Just Research? Issues of Justice in Medical Research,* iBMG/EUR (prof. Dr. M. Trappenburg), Rotterdam, 8 december 2005. **(Hoppe)**
- Diversity and Distributed Agency in the Design and Use of Medical Video-Communication Technologies. NTNU Trondheim, Norway, March 4, 2005. **(Oudshoorn)**
- The Cultural Construction of Technologies. The case of the male pill. University of Vienna, May 20, 2005. **(Oudshoorn)**
- What about the Male Pill? National Network for Female Professors April 15, Utrecht. **(Oudshoorn)**
- How Users matter. The Co-Construction of technologies and users. NTNU Trondheim, Norway, September 13, 2005. **(Oudshoorn)**
- Risks assessment of contraceptives technologies. NTNU Trondheim, Norway, September 22, 2005. **(Oudshoorn)**
- The Social and Cultural Construction of Technologies. The case of the male pill. Stanford University, US, October 24, 2005. **(Oudshoorn)**
- ‘ELSA and reflexive co-evolution of genomics and society’, invited lecture, Second CESAGEN International Conference Genomics and Society, London, 12-14 April 2005. **(Rip)**
- ‘Technology as Prospective Ontology’, invited lecture, Copenhagen Conference on the Philosophy of Technology, Carlsberg Academy, 13-15 October 2005. A revised version will be published in a special issue of *Synthese.* **(Rip)**
- “The circulation of knowledge: Promises and Challenges,” keynote lecture, Woudschoten Conference for History of Science “The Circulation of Knowledge and Practices: The Low Countries as an historical laboratory” 27-28 May 2005. **(Roberts)**

- "Guardians, judges, students and customers: towards a taxonomy of observation" invited lecture at symposium "Observation in the Enlightenment" to honor re-opening of University of Gottingen Library 13-15 October 2005. **(Roberts)**
- "Running in Place: Location and Identity in the History of Dutch Steam Engines" invited lecture, "Who needs Scientific Instruments" International Conference Leiden 20-22 October 2005. **(Roberts)**

2006

- *Heuristics in dealing with uncertainty inexpert policy advice/Heuristieken in de omgang met onzekerheid in beleidsadvisering*, keynote address for the conference "Omgaan met onzekerheid", organized by CPB, MNP en Rand Europe, 16-17 mei, 2006, Den Haag. **(Hoppe)**
- *Risk and uncertainty: politics and analysis*, keynoyte address voor de workshop on Science Policy Guidelines for Risk Analysis, Universität Bremen, 6-7 October, 2006. **(Hoppe)**
- Governance of Innovation - a Policy Research Perspective (invited lecture), 27th VIPE Conference „Governance of Innovation", Twente University, Enschede, November 10, 2006. **(Kuhlmann)**
- Analysing new configurations in research and policy in Europe (invited lecture), International PRIME Conference "Indicators on Science, Technology and Innovation", University of Lugano, Switzerland, November 17, 2006. **(Kuhlmann)**
- Assessment of R&D systems and policies based on a functions approach (invited commentary) (invited lecture), IPTS Workshop on the Assessment of R&D Systems and Policies Based on a Functions Approach, European Commission, Brussels, December 12, 2006. **(Kuhlmann)**
- Diversity and Distributed Agency in the Design and Use of Medical, Video-Communication Technologies. National University of Taiwan. January 18, 2006. **(Oudshoorn)**
- The Co-construction of Technologies and Users. National University of Taiwan. January 18, 2006. **(Oudshoorn)**
- Building trust and competences in cardiac telemonitoring technologies. Invited lecture 3rd E-Health SRO Lunch Meeting February 15, 2006, University of Twente. **(Oudshoorn)**
- E-health in 2020. Conference Zon-MW. Sharing Knowledge Better Veldhoven, April 2006. **(Oudshoorn)**
- From Victims to Heroes? Rethinking the Role of Users in Techno-science. **(Oudshoorn)**
- Rausing lecture 2006 at the Department of History and Philosophy of Science at Cambridge University, May 18 2006. **(Oudshoorn)**

- Exploring and Rethinking Invisibility in the Context of Telemedicine. Invited lecture Netherlands Summer School Graduate Research School Science, Technology and Modern Culture. September 5, 2006. **(Oudshoorn)**
- The Invisible Work of Users in Telemedicine. Invited lecture Book Launch Meeting at the Royal Society in London, October 25, 2006. **(Oudshoorn)**
- James Martin Institute World Forum on 'Tomorrow's People: The Challenges of Technologies for Life Extension and Enhancement', Oxford, 15-17 March 2006: Governing new and emerging science and technology (17 March 2006). **(Rip)**
- International Nano-technology Conference on Communication and Cooperation, Second Meeting, Arlington, VA, 16-18 May 2006: Addressing Societal Implications of Nano-technology (in Europe) [18 May 2006]. **(Rip)**
- Universitair Centrum Sint-Ignatius Antwerpen, Lectures and discussions on Nano Researchers facing choices, Antwerpen, 3-4 Oct 2006: Research Choices and Directions – in Changing Contexts. **(Rip)**
- University of Bielefeld, Zentrum für interdisziplinaire Forschung, Program 'Science in the Context of Application', Opening Conference on Transformations of Academic Research, 26-28 October 2006: Continuities and Transformations in Knowledge Production (opening lecture). **(Rip)**

2007

- Anchor teacher and invited lecture at 7th International Summer Academy on Technology Studies, "Transforming the Energy System: The Role of Institutions, Interests & Ideas", Deutschlandsberg, Austria, 27 – 31 August, 2007. **(Elzen)**
- *Expertise and the policy process: Boundary Workers' Perspectives,* paper presented for the panel Arguing Qualitative Methods of Policy Analysis, Conference on Interpretive Policy Aanalysis, Free University Amsterdam, May 30 – June 2, 2007, Amsterdam. **(Hoppe)**
- *Boundary Work and Agricultural Modeling for Policy*, keynote address for the workshop "*Policy oriented research for agricultural land management***",** Wageningen Universiteit/Research, July 6, 2007. **(Hoppe)**
- ERA Dynamics – New configurations of knowledge, institutions and policy in Europe? (invited lecture), Workshop on the impact of the 2000 ERA Initiative, European Commission, DG Research, Brussels, 13 February 2007. **(Kuhlmann)**
- Die außeruniversitäre Forschung unter Reformdruck - Aufbrechen der Versäulung oder Entdifferenzierung? (invited lecture), Conference „Neue Governance für die Forschung", Berlin, 14-15 March 2007. **(Kuhlmann)**
- Evaluation von Forschung und Technologie in Deutschland; Stand und Perspektiven invited lecture), Conference „Evaluation im deutschsprachigen Raum", University of

Basel, Switzerland, 15 – 16 March 2007. **(Kuhlmann)**

- The Impact of Science – Truisms, Insights, and Conclusions (invited lecture), Science Impact, International Conference, Vienna, 10-11 May, 2007. **(Kuhlmann)**
- A Dawn of "Post-national" Research and Innovation Policy in Europe? Speculations based on an empirical analysis of EU Member States' "National Reform Programmes" delivered within the "Lisbon Strategy", DVPW-Workshop "Innovation Policy for High Technology in a Comparative Perspective", Meersburg am Bodensee, Germany, 22/23 June 2007. **(Kuhlmann)**
- Conditions for Creative Research (invited lecture), Conference "Science and its Publics", Munich, June 24/25, 2007. **(Kuhlmann)**
- Evaluation Foresight Effectiveness (invited lecture), FOR LEARN Mutual Learning Workshop "Evaluation of Foresight", European Commission, Brussels, 19 September 2007. **(Kuhlmann)**
- Außeruniversitäre Forschung - unausgeschöpftes Kooperationspotential (invited lecture), „Allianzen – Cluster – Netzwerke. Neue Formen der Zusammenarbeit im Wissenschaftssystem" Tag des Wissenschaftsmanagements, Braunschweig, 22./23. October 2007. **(Kuhlmann)**
- Evaluation of productive interactions between science and society – Introduction (invited lecture), International Expert Meeting "Evaluation of productive interactions between science and society", KNAW, Amsterdam, 9 November 2007. **(Kuhlmann)**
- Analysing configurative processes of knowledge, institutions and policy in Europe (invited lecture) Institute for Prospective Technology Studies (IPTS), Sevilla, 13 November, 2007. **(Kuhlmann)**
- Rationales and evolution of public 'knowledge policies' in the context of their evaluation (invited lecture), Seminário Internacional CGEE "AVALIAÇÃO DE POLÍTICAS DE CIÊNCIA, TECNOLOGIA E INOVAÇÃO" - Diálogo entre Experiências Internacionais e Brasileiras, Rio de Janeiro, 3-5 December 2007. **(Kuhlmann)**
- The Co-construction of Technology and User Identities. The Case of the Male Pill. Centre Pompidou, Paris, January 18, 2007. **(Oudshoorn)**
- From Victims to Heroes? Rethinking the Role of Users in Technoscience. Invited lecture at the Deutsches Museum, Munich, April 23, 2007-12-20. **(Oudshoorn)**
- Exploring and Rethinking Invisibility in the Context of Telemedicine.Invited lecture at the European Computing and Philosophy Conference. University Twente, June 21, 2007. **(Oudshoorn)**
- The Co-construction of Gender and Technology. The Case of the Male Pill. Invited lecture at the department of Sociology at the McGill University, Montreal, October 9, 2007. **(Oudshoorn)**

- How users matter. Sociological approaches to user-technology relations. Invited lecture at the International conference Models of technology acceptance and use, University Twente, 12 December 2007. **(Oudshoorn)**
- Center for Nano-technology in Society, Arizona State University, Tempe, Arizona, 23 February 2007: Constructive Technology Assessment: Supporting Reflexive Co-evolution through Socio-technical Scenarios. **(Rip)**
- University of Basel, Program Wissenschaftsforschung, Public Evening Lecture, 3 May 2007: Addressing Societal Implications of Nano-technology – And Their Ambivalencies. **(Rip)**
- Center for Nano-technology in Society, UC Santa Barbara, CA, Public Lecture, 24 May 2007: Addressing Societal Implications of Nano-technology – and Their Ambivalencies. **(Rip)**
- BMBF (Federal Ministry of Education and Research), Conference on ResponsibleResearch in Europe – Public Images of Science, München, 24-25 June 2007: A changing social contract between science and society [24 June 2007]. **(Rip)**
- Swiss NanoConvention, Zürich, 28-29 June 2007: New Technologies and Society – the case of nanotechnologies [29 June 2007]. **(Rip)**
- Economic and Social Research Council, Science in Society Program, Closing Conference on Science in Society: Innovation culture or anti-science Britain? London, 16 Oct 2007: The state of Science in Society research (Concluding Keynote). **(Rip)**
- Stellenbosch, South Africa, Research Directors Forum, Invited Lecture, 26 November 2007. Integrity of Science. **(Rip)**
- "Putting Circulation in Global Context," keynote address at Woudschoten Conference for History of Science 28-29 September 2007. **(Roberts)**

9.

Dissertations

category 1: doctorate granted by the institution, prepared within the institution

category 2: doctorate granted by the institution, prepared at another institution

category 3: doctorate granted by another institution, prepared within the institution

Theme S: *Science and Innovation Policies*

Theme T: *Technology Dynamics and Assessment*

Theme H: *History of Science and Technology*

Theme M: *Miscellaneous*

2000	**category**	**theme**
Hoogma, R. (2000) Exploiting Technological Niches: Strategies for Experimental Introduction of Electric Vehicles, Enschede: University of Twente, 26 May 2000, promotor: Prof.dr. A. Rip, Enschede: Twente University Press, 408 pp. ISBN 9036514541.	1	T
Moors, Ellen (2000) *Metal Making in Motion. Technology Choices for Sustainable Metals Production.* Delft: Delft University Press, 355 pp., promotor Prof.dr. Philip Vergragt, 14 June 2000. ISBN : 90-407-2075-4.	3	T
2001	**category**	**theme**
Oosterhout, A.W.G. van (21-09-2001) *De precaire autonomie van de Nederlandse marinescheepsbouw.* (The precarious autonomy of Dutch marine shipbuilding) Universiteit Twente, 418 pp. (Enschede: private publication). ISBN 90-365-1650-1. ((Co-)promotor: Prof.dr. A. Rip).	1	T
Magalhaes E. de Sousa, A.M. (30-08-2001) *Higher Education Dilemmas and the Quest for Identity: Politics, Knowledge and Education in an Era of Transition.* Universiteit Twente, 415 pp. (Enschede: prive uitgave). ISBN 90-365-16-447. (Co-)promot.: Prof.dr. A. Rip and S. Stoer).	2	S
2002	**category**	**theme**
Geels, F.W. (Filosofie van wetenschap en techniek) (01-11-2002) *Understanding the Dynamics of Technological Transitions: A co-evolutionary and socio-technical analysis.* ut, 426 pp. (Enschede: Twente University Press). ISBN 9036517974. ((Co-)promot.: Prof.dr. J. W. Schot and Prof.dr. A. Rip).	1	T
Rommes, E.W.M. (Filosofie van wetenschap en techniek) (27-06-2002) *Gender scripts and the internet; The design and use of Amserdam's Digital City.* ut, 300 pp. (Enschede: Twente University Press). ISBN 9036517745. ((Co-)promot.: Prof.dr. N. E. J. Oudshoorn and Dr.ir. E. C. J. van Oost).	1	T
Kater, L. (Leerstoel Filosofie van Wetenschap en Techniek) (20-12-2002) *Disciplines met dadendrang. Gezondheidsethiek en gezondheidsrecht i nhet Nederlandse ethanasiedebat 1960 - 1094.* Universiteit Maastricht, 209 pp.((Co-)promot.: G. A. M. Widdershoven, C. Spreeuwenberg, R . H. Houtepen and K. Horstman).	3	T

2003	**category**	**theme**
Deuten, J.J. (20-06-2003) *Cosmopolitanising technologies. A study of four emerging technological regimes.* Universiteit Twente, 316 pp. (Enschede: Twente University Press). ISBN 90 365 1922 5. ((Co-)promot.: Prof.dr. A. Rip and Dr. C. Disco).	1	T
Hackmann, H. (19-06-2003) *National priority-setting and the governance of science.* Universiteit Twente, 437 pp. ((Co-)promot.: Prof.dr. A. Rip and Dr. B. J. R. van der Meulen).	1	S
Stienstra, M.A. (26-11-2003) *Is every kid having fun? A gender approach to interactive toy design.* Universiteit Twente, 234 pp. (Enschede: Twente University Press). ISBN 90-365-1972-1. ((Co-)promot.: Prof.dr. N. E. J. Oudshoorn).	1	T
2004	**category**	**theme**
Morris, N. (10-11-2004) *Scientists responding to Science Policy. A multi-level analysis of the situation of life scientists in the UK.* UT Universiteit Twente (pag.nummering ontbreekt pag.) (S.l.: s.n.) Prom./coprom.: Rip, Prof.dr. A. ISBN ISBN ontbreekt).	2	S
2005	**category**	**theme**
Aksnes, D.W. (31-03-2005) *Citations and their use as indicators in science policy. Studies of validity and applicability issues with a particular focus on highly cited papers.* UT Universiteit Twente (193 pag.) (S.l.: s.n.). Prom./coprom.: Prof.dr. A. Rip.	2	S
Stoop, S.G.C. (11-03-2005) *Alignment Syndromes. Using Constructive Technology Assessment to Diagnose C2 System Development.* UT Universiteit Twente (336 pag.) (Enschede: S.G.C. Stoop) ISBN 90-365-2170-X). Prom./coprom.: Prof.dr. A. Rip, and Dr. W.A. Smit ISBN 90-365-2170-X).	1	T
Tennekes, J. (10-06-2005) *Wat Donoren Zien in Good Governance. Discoursanalyse van het Ontwikkelingsbeleid van Nederland en Duitsland.* UT (392 pag.). ISBN 90-901-9363-4. Prom./Assist. Prom. Prof.dr. R.Hoppe and Dr. P.J. Klok.	1	M
Verbruggen, J.A. (27-04-2005) *The Correspondence of Jan Daniel Huichelbos van Liender with James Watt.* UT Universiteit Twente (486 pag.) (S.l.: J.A. Verbruggen) ISBN 90-9019267-0). Prom./coprom.: Prof.dr. A. Rip, and Dr. L.L. Roberts ISBN 90-9019267-0).	2	H
Vijver, M. (27-05-2005) *Protein Politics,* UT (138pag.). ISBN 90-365-2181-5. Prom./Assist. Prom. Prof.dr. R.Hoppe and Dr. P.J. Klok.	1	S
2006	**category**	**theme**
2007	**category**	**theme**
Ganzevles, J.H. (18-10-2007) *Technologie voor Mens en Milieu, een actor-netwerk analyse van de ontwikkeling van energietechnologie voor woningen.* (Technology for humans and the environment, an actor-network analysis of the development of domestic energy technology) UT Universiteit Twente (209 pp.) (Enschede: Print Partners Ipskamp). Prom./coprom.: Prof.dr. N.E.J. Oudshoorn and Dr. J. Jelsma.	1	T
Voss, J.P. (18-10-2007) *Designs on governance, Development of policy instruments and dynamics in governance.* UT Universiteit Twente (224 pag.) (Enschede: Universiteit Twente). Prom./coprom.: Prof.dr. A. Rip and dr. M.J. Arentsen.	2	S

10.

Publications

12a. Academic Publications (Foreign language)

Category b:	Refereed articles, (foreign language)
Category d:	Refereed chapters in books (foreign language)
Category f:	Refereed books (foreign language)
Category h:	Non-refereed articles (foreign language)
Category j:	Non-refereed chapters in books (foreign language)
Category l:	Non-refereed books (foreign language)
Category n:	Other (orations, inaugural speeches, patents)

Theme S: *Science and Innovation Policies*
Theme T: *Technology Dynamics and Assessment*
Theme H: *History of Science and Technology*
Theme M: *Miscellaneous*

2000	**category**	**theme**
Assouline, G, N.J. Oerlemans and J.S.C. Wiskerke (2000) 'Farmers' organisational strategies and sustainability in agriculture: building organisation for learning and learning on organisation, in T. Alföldi *et al.* (eds.) *IFOAM 2000: the world grows organic : proceedings 13th international IFOAM scientific conference, Convention Center Basel 28 to 31 August 2000*, Zürich [etc.] : vdf Hochschulverlag AG an der ETH [etc.], 501-501. ISBN 372812754X.	j	S
Deuten, J.J and Rip, A. (2000) The Narrative Shaping of a Product Creation Process, in N. Brown, B. Rappert and A. Webster (eds.) *Contested Futures: A Sociology of Prospective Techno-Science*, Burlington: Ashgate, 65-86. ISBN 0 7546 1263 5.	d	T
Deuten, J.J. and Arie Rip (2000) Narrative Infrastructure in Product Creation Processes, *Organization*, 7(1): 69-95. ISSN 1350-5084.	b	T
Elzen, B. and R. Hoogma (2000) EVs as a Stepping Stone Towards a Sustainable Transportation Regime: Stimulating Renewal by Means of Strategic Niche Management, in R. Cowan and S. Hultén (eds.) *Electric Vehicles: Socio-economic prospect and technological* challenges, Aldershot: Ashgate: 270-295. ISBN : 0 7546 1399 2.	d	T
Elzen, B. (2000) *Demonstrating Cleaner Vehicles - Guidelines for Success*, Final guidelines of EU-Project UTOPIA (Contract No. UR-97-SC-2076). Co-auteur met David Moon. **(**see http://utopia.jrc.it/).	l	T
Geels, F.W. (2000) Sociotechnical scenarios as a tool for reflexive technology policies: using evolutionary insights from technology studies, in: R. Williams (ed.) *Concepts, spaces and tools: Recent developments in social shaping research*, Edinburgh: Edinburgh University. Final Report , COST-A4 : Focused Study on The Social Shaping of Technology. COST-STY-98-4018, 255-288.	j	T
Geels, F.W. and W.A. Smit (2000) Failed technology futures: Pitfalls and lessons from a historical survey, *Futures*, 32 (9/6): 867-885. ISSN 8755-3317.	b	T
Geels, F.W. and W.A. Smit (2000) Potholes in the road to the future: Lessons and pitfalls from failed technology futures, in: N. Brown, B. Rappert, and A.Webster (eds.) *Contested Futures*: *A sociology of prospective techno-science,*	d	T

Ashgate Publishing Company: Burlington, Singapore, Sydney, 129-155. ISBN 0-7546-1263-5.		
Hackmann, H. and A.Rip (2000) *Priorities and quality incentives for university research. A brief international survey*, Den Haag: Sdu servicecentrum. Ministerie van Onderwijs, Cultuur en Wetenschappen, Beleidsgerichte studies Hoger onderwijs en Wetenschappelijk onderzoek 67.	j	S
Hoppe, R. and J. Grin (2000) Cultural Bias and Framing Wicked Problems, in: H. Wagenaar (ed.) *Government Institutions; Effects, Changes and Normative Foundations.* Dordrecht/Boston/London, Kluwer Academic Publishes, Vol.5, 179-199.	d	
Hoppe, R. and J. Grin (2000) Traffic Problems Go through the Technology Assessment Machine: A Culturalist ComparisonI, in: N. Vig and H. Paschen, *Parliaments and Technology Assessment in Europe*, Albany, SUNY Press, 273-324.	d	
Jelsma, J (2000) Design of behaviour steering technology, in: U. Pretterhofer (ed.) *Conference Proceedings of the International Summer Academy on Technology Studies,* Deutschlandsberg, July 9-15: 121-132.	j	T
Kirejczyk, M. (2000) Users, Values and Markets: The Shaping of Users through the Cultural and Legal Appropriation of In Vitro Fertilisation, in: A. Saetnan, N.E.J. Oudshoorn and M. Kirejczyk (eds.) *Bodies of Technologies. Women's Involvement with Reproductive Medicine*, Columbus: Ohio State University Press, 177-181. ISBN 0-8142-0846-0 (hc) and 0-8142-5050-5 (pbk).	d	T
Kirejczyk, M. (2000) Enculturation through script selection. Political discource and practice of in vitro fertilisation in the Netherlands', in: A. Saetnan, N.E.J. Oudshoorn and M. Kirejczyk (eds.) *Bodies of Technologies. Women's Involvement with Reproductive Medicine*, Columbus: Ohio State University Press, 183-206. ISBN 0-8142-0846-0 (hc) and 0-8142-5050-5 (pbk).	d	T
Larédo, Ph., E. Munoz and A. Rip (2000) *Interuniversity attraction poles (IAP). Conclusions and recommendations of the expert panel*, Brussels: Federal Office for Scientific, Technical and Cultural Affairs.	l	S
Meulen, B.J.R., and A. Rip (2000) Evaluation of societal quality of public sector research in the Netherlands, *Research Evaluation* 8(1), April 2000: 11-25. ISSN 0958-2029.	b	S
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Rip, A. (2006) Systemisches Lernen - ohne Systeme? In M. Miller (ed.) *Dissens. Zur Theorie diskursiven und systemischen Lernens* (321-334). Bielefeld: Transcript ISBN 3899424840.	d	S
Rip, A. (2006) The tension between fiction and precaution in nano-technology, in: E. Fischer, J. Jones, and R. von Schomberg (eds.) *Implementing the Precautionary Principle. Perspectives and Prospects* (423-448). Cheltenham: Edward Elgar ISBN 1-8454-2702-5.	d	T
Roberts, L. and R. Knoeff (eds.) (2006) *The Places of Chemistry in 18th Century England and The Netherlands* (special issue of *Ambix).*	f	H
Smit, W.A. (2006) Military Technologies and Politics, in: R.E. Goodin and C. Tilly (eds.) *The Oxford Handbook of Contextual Political Analysis* (The Oxford handbooks of political science) (722-744). Oxford: Oxford University Press ISBN 0-19-927043-0.	d	T
Stemerding, D. and A.P. Nelis (2006) Cancer genetics and its 'different faces of autonomy'. *New genetics and society, (*ISSN *1463-6778), 25*(1): 1-19.	b	T
Stemerding, D. and T.E. Swierstra (2006) How might scenario studies help us to think about the normative implications of genomics and predictive medicine? In A..de Bouvet, P. Boitte, and G. Aiguier (eds.) *Questions ethiques en medecine predictive* (81-89). Paris: John Libbey Eurotext ISBN 2-7420-0627-3.	d	T
Timmermans, A. and C. Moury. (2006) Coalition governance in Belgium and The Netherlands: Rising government stability against all electoral odds. *Acta politica, 41*: 389-407. ISSN 0001-6810.	b	S
Timmermans, A. (2006) Standing Apart and Sitting Together. Enforcing Coalition Agreements in Multiparty Systems. *European journal of political research 45*(2): 263-283. ISSN 0304-4130.	b	S
Timmermans, A. and P. Scholten (2006) The Political Flow of Wisdom. Science Institutions as Policy Venues. *Journal of European public policy, 13*(7): 1104-1118. ISSN 1350-1763.	b	S
Timmermans, A. (2006) Accommodation, Bureaucratic Politics, and	d	S

Supranational Leviathan: ART and GMO Policy-Making in the Nethelands, in: E. Montpetit, C. Rothmayr, and F. Varone (eds.) *The Politics of Biotechnology in North America and Europe: Policy Networks, Institutions, and Internationalization* (169-192). Lanham: Lexington Books ISBN 0-7391-1247-3.		
Veefkind, M.J., N.H. Reich, B. Elzen, S.Y. Kan, S. Silvester, V.Verwaal, A.E. Alsema, W.G.J.H.M. Sark and J. Jelsma (2006) The design of a solar powered consumer product, a case study, in: *Proceedings (CD-ROM) Going Green - CARE INNOVATION 2006, 13-16 November 2006, Vienna, Austria* .	j	T
2007	**category**	**theme**
Achterbergh, R., Ph. Lakeman, D. Stemerding, E.H.M. Moors and M.C. Cornel (2007) Implementation of preconceptional carrier screening for cystic fibrosis and haemoglobinopathies : A sociotechnical analysis. *Health policy, 83*: 277-286.	b	T
Dijksterhuis, F.J. (2007) Constructive Thinking. A Case for Dioptrics, in: L.L. Roberts, S. Schaffer and P.R. Dear (eds.) *The mindful hand: inquiry and invention from the late Renaissance to early industrialisation* (History of science and scholarship, 9). Chicago: Edita. University of Chicago. 59-81. ISBN 978-90-6984-506-7	d	H
Dijksterhuis, F.J. (2007) Clair & Distinct. Seventeenth-Century Conceptualizations of the Quality of Images, in: W. Lefèvre (ed.) *Inside the Camera Obscura - Optics and Art under the Spell of the Projected Image*. Berlin: Max-Planck-Institut für Wissenschaftsgeschichte. 105-114.	d	
Elzen, B. and P.S. Hofman (2007) *Transition paths towards a sustainable electricity system - An exploration using sociotechnical scenarios.* Den Haag: NWO / NovemSenter Energy Research Programme.	l	H
Fleischer, A. (2007) The Beemster Polder: conservative invention and Holland's great pleasure garden. *The mindful hand: inquiry and invention from the late Renaissance to early industrialisation*(History of science and scholarship, 9). Chicago: Edita. University of Chicago. 145-166. ISBN 978-90-6984-506-7		
Heinze, T. and S. Kuhlmann (2007) Analysis of heterogeneous collaboration in the German research system with a focus on nano-technology, in: D. Jansen (ed.) *New Forms of Governance in Research Organizations.Disciplinary Approaches, Interfaces and Integration*. Heidelberg: Springer. 190-209.	d	T
Heinze, T. and G. Bauer (2007) Characterizing Creative Scientists in Nano S&T: Productivity, Multidisciplinarity, and Network Brokerage in a Longitudinal Perspective, in: T. Braun and M. Martin (eds.) *The Mechanism of Research on Nanostructures. A Selection of Papers from the Journal Scientometrics.* Budapest: Akadémiai Kiadó. 273-292.	d	S
Heinze, T., P. Shapira, J. Senker and S. Kuhlmann (2007) Identifying Creative Research Accomplishments: Methodology and Results for Nano-technology and Human Genetics. *Scientometrics, 70*(1): 125-152.	b	S
Heinze, T. (2007) Science-based technologies and the coupling of science and economy. *Journal of sociology, 4*: 5-26.	b	S
Hekkert, M.P., R.A.A. Suurs, S. Negro, S. Kuhlmann and R.E.H.M. Smits (2007) Functions of Innovation Systems: A new approach for analysing technological change. *Technological forecasting and social change, 74*(4): 413-432.	b	S
Hoppe, R. (2007) Applied Cultural Theory: Tool for Policy Analysis, in: F. Fischer, G.J. Miller and M.S. Sidney (eds.) *Handbook of Public Policy Analysis, Theory, Politics and Methods*. Boca Raton, London New York: CRC Press Taylor and Frances Group. 289-308.	d	S
Joly, P.B. and A. Rip (2007) A timely harvest. *Nature, 450*(8): 1-1.	b	T
Kuhlmann, S. (2007) Book review "A New Deal for an Effective European Research Policy - The Design and Impacts of the 7th Framework Programme"	h	S

[Bespreking van het boek *A New Deal for an Effective European Research Policy - The Design and Impacts of the 7th Framework Programme*]. *Newsl. Plattform Forsch. Technologieeval. elektron., 30*(2007): 40-44.		
Kuhlmann, S. (2007) *Governance of innovation: Practice, policy and theory as dancing partners*. Delivered upon the acceptance of the Chair Foundations of Science, Technology and Society, Faculty Management and Governance, Univeristy of Twente. Enschede: IGS.	n	S
Lepori, B., P. van den Besselaar, M. Dinges, B. Potì, E. Reale, S. Slipersæter, J. Thèves and B.J.R. van der Meulen (2007) Comparing the evolution of national research policies: what patterns of change? *Science and public policy, 34*(6): 372-388.	b	S
Meulen, B.J.R. van der (2007) *Looking Beyond the Endless Frontier, ESF Forward Look Scheme: analysis and recommendations.* Strassbourg: The European Science Foundation (ESF).	l	S
Oudshoorn, N.E.J. (2007) 'Austronauts in the Sperm World': The renegotiation of masculine identities in discourses on male contraceptive technologies, in: R. Fouché (ed.) *Technology Studies* I. London: SAGE Publications.	d	T
Oudshoorn, N.E.J. and T. Pinch (2007) User-technology relationships: Some Recent Developments, in: E.J. Hackett, O. Amsterdamska, M. Lycnh and J. Wajcman (eds.) *Handbook for Social Studies of Science.* London, England: MIT Press. 541-567.	d	T
Rip, A. (2007) Die Verzahnung von Technologischen und sozialen Determinismen und die Ambivalenzen von Handlungsträgerschaft im "Constructive Technology Assesment", in: U. Dolata and R. Werle (eds.) *Gesellschaft und die Macht der Technik, Sozioökonomischer und institutioneller Wandel durch Technisierung.* Frankfurt / New York: Campus Verlag. 83-104.	d	T
Roberts, L.L., S. Schaffer and P. Dear (2007) *The Mindfull Hand. Inquiry and Invention from the Late Renaissance to Early Industrialisation* (History of science and scholarship in the Netherlands, 9). Chicago: Edita, University of Chicago Press. ISBN 978-90-6984-506-7.	f	H
Roberts, L.L. (2007) Mapping Steam engines and skill in 18th century Holland, in: L.L. Roberts, S. Schaffer and P.R. Dear (eds.) *The Mindful Hand. Inquiry and Invention from the Late Renaissance to Early Industrialisation* (History of science and scholarship in the Netherlands, 9). Chicago: Edita, University of Chicago Press. 197-218.	d	H
Roberts, L.L. (2007) The content of the form. *Technology and culture, 48*(4): 831-835.	b	H
Robinson, D.K.R., A. Rip and V. Mangematin (2007) Technological agglomeration and the emergence of clusters and networks in nano-technology. *Research policy, 36*: 871-879.	b	H
Robinson, D.K.R., M. Ruivenkamp and A. Rip (2007) Tracking the evolution of new and emerging S&T via statement-linkages: Vision assessment in molecular machines. *Scientometrics, 70*(3): 831-858.	b	H
Swierstra, T.E. and A. Rip (2007) Nano-ethics as NEST-ethics: Patterns of Moral Argumentation About New and Emerging Science and Technology. *Nanoethics* 1: 3-20.	b	T

12b. Academic Publications (Dutch)

Category c: Refereed articles, (Dutch)
Category e: Refereed chapters in books (Dutch)
Category g: Refereed books (Dutch)
Category i: Non-refereed articles (Dutch)
Category k: Non-refereed chapters in books (Dutch)
Category m: Non-refereed books (Dutch)
Category o: Other (orations, inaugural speeches, patents)

Theme S: *Science and Innovation Policies*
Theme T: *Technology Dynamics and Assessment*
Theme H: *History of Science and Technology*
Theme M: *Miscellaneous*

2000	**category**	**theme**
Albert de la Bruheze, A.A. (2000) Snacks, in: A.H. van Otterloo (ed.) *Voeding* (*Food*), in: J.W. Schot, H.W. Lintsen, A. Rip and A.A. Albert de la Bruheze (eds.) *Techniek in Nederland in de twintigste eeuw – Deel III* (*Technology in the Netherlands in the twentieth century – Part III*), Zutphen: Walburg Pers, 353-369. ISBN 90.5730.066.4.	e	H
Bogaard, A.A. van den (2000) Het Centraal Planbureau: wiskunde en praktijk in wording, in: N*ieuw Archief voor Wiskunde* (The Central Planning Bureau: mathematics and practice in development, in: *New Archive for Mathematics*) 2000 5(1) 3: 294-300. ISSN 0028-9825.	e	H
Disco, C. (2000) De natuur herboren – De ecologische wending in het Nederlands waterbeheer, *Tijdschrift voor waterstaatsgeschiedenis* ("Nature reborn – the ecological development of Dutch water management," *Journal for governmental water management history*) *9*(1): 1-18. ISSN 0927-3336.	e	H
Hartog, A.P. den and A.A. Albert de la Bruheze (2000) Verpakking ('Packaging'), in: A.H. van Otterloo (Ed)., *Voeding* (*Food*), in: J.W. Schot, H.W. Lintsen, A. Rip and A.A. Albert de la Bruheze (eds.) *Techniek in Nederland in de twintigste eeuw – Deel III (Technology in the Netherlands in the twentieth century – Part III*), Zutphen: Walburg Pers, 323-339. ISBN 90.5730.066.4.	e	H
Homburg, E., A. Rip and J.S. Small (2000) Chemici, hun kennis en de industrie ('Chemists, their knowledge and industry'), in: J.W. Schot, H.W. Lintsen, A. Rip, A.A. Albert de la Bruhèze (eds.) *Techniek in Nederland in de twintigste eeuw. II. Delfstoffen. Energie. Chemie* (*Technology in the Netherlands in the twentieth century. II. Minerals. Energy. Chemistry*) Eindhoven, Zutphen: Stichting Historie der Techniek, Walburg Pers, 299-316. ISBN 90.5730.064.8.	e	H
Homburg, E. and A. Rip (2000) De chemische industrie in de twintigste eeuw ('The chemical industry in the twentieth century'), in: Schot et al. *Techniek in Nederland in de twintigste eeuw - Deel II, Delfstoffen, energie, chemie*, (*Technology in the Netherlands in the twentieth century. II. Minerals. Energy. Chemistry*) Zutphen: Walburg Pers, 403-407. ISBN 0.57030.064.8.	e	H
Hoppe, R. and A. Peterse (2000) Na 'Enschede'. Wat moet beter in het veiligheidsbeleid("After 'Enschede': What needs to be improved in security policy"),in: *Openbaar Bestuur (Public Governance)*, 11: 23.	c	S
Kirejczyk, M. (2000) Beleidsculturen en menselijke embryo's: Een vergelijking van beleidsontwikkeling in Nederland en het Verenigd Koninkrijk, ('Policy cultures and human embryos: A comparison between Dutch and British policy development'), *Beleidswetenschap, kwartaalschrift voor beleidsonderzoek en* beleidspraktjk (*Policy Science: quarterly journal for policy research and policy*	e	S

practice), 14(3): 203-228. ISSN 0921 1934.		
Knecht, de – Van Eekelen, A. and A.A. Albert de la Bruheze (2000) De witte motor ('The white motor') in A.H. van Otterloo (ed.) *Voeding (Food)*, in: J.W. Schot, H.W. Lintsen, A. Rip and A.A. Albert de la Bruheze (Eds), *Techniek in Nederland in de twintigste eeuw – Deel III* (*Technology in the Netherlands in the twentieth century – Part III*),, Zutphen: Walburg Pers, 311-323. ISBN 90.5730.066.4.	e	H
Most, F.V. van der, J.W. Schot,, B.P.A. Gales (2000) Zout ('Salt'), in: J.W. Schot,. H.W. Lintsen, A. Rip, A.A. Albert de la Bruhèze (eds.) *Techniek in Nederland in de twintigste eeuw. II. Delfstoffen. Energie. Chemie* (*Technology in the Netherlands in the twentieth century – Part II. Minerals. Energy. Chemistry*). Eindhoven, Zutphen: Stichting Historie der Techniek, Walburg Pers, 90-101. ISBN 90.5730.064.8.	e	H
Most, F. van der, E. Homburg, P. Hooghoff, A. van Selm (2000) Nieuwe synthetische producten: plastics en wasmiddelen na de Tweede Wereldoorlog('New synthetic products: products and washpowder after the Second World War'), in J.W. Schot, H.W. Lintsen, A. Rip, A.A. Albert de la Bruhèze (eds.) *Techniek in Nederland in de twintigste eeuw. II. Delfstoffen. Energie. Chemie.* (*Technology in the Netherlands in the twentieth century – Part II. Minerals. Energy. Chemistry*). Eindhoven, Zutphen: Stichting Historie der Techniek, Walburg Pers, 358-375. ISBN 90.5730.064.8.	e	H
Schot, J.W., H.W. Lintsen, A.Rip and A.A. Albert de la Bruheze (eds.) (2000) *Techniek in Nederland in de twintigste eeuw - Deel II, Delfstoffen, energie, chemie* (*Technology in the Netherlands in the twentieth century – Part II. Minerals. Energy. Chemistry*). Zutphen: Walburg Pers, 488 pp. ISBN 90.57030.064.8.	g	H
Schot, J.W., H.W. Lintsen, A.Rip and A.A. Albert de la Bruheze (eds.) (2000) *Techniek in Nederland in de twintigste eeuw - Deel III, Landbouw, voeding* (*Technology in the Netherlands in the twentieth century – Part III. Agriculture, Food*). Zutphen: Walburg Pers, 442 pp. ISBN 90.5730.066.4.	g	H
Schot, J.W. (2000) De bouwput van techniek en maatschappij. Uitgangspunten van een nieuwe contextualistische techniekgeschiedenis ('The construction site of technology and society: Starting points for a new contextual history of technology'), inaugural address, 3 November 2000, Technical University of Eindhoven.	n	H
2001	**category**	**theme**
Hoppe, R. (2001) Stijlen in probleemdefniëring: Culturele theorie en probleemdefiniëring ("Styles in problem definition: Cultural theory and problem definition"), *Beleidswetenschap (Policy Science)* 15(2): 107-140.	c	S
Kirejczyk, M., D. van Berkel, and T.E. Swierstra (2001) *Nieuwe voortplanting: afscheid van de ooievaar. Sociaal-historische en normatief-politieke aspecten van de ontwikkeling van voortplantingstechnologie in Nederland. Rathenau Studie (New reproduction: farewell to the stork. Social historical and normative-political aspects of the development of reproduction technology in the Netherlands. Rathenau Study):* 44. Den Haag: Rathenau Instituut, 167 pp. ISBN 90-346-3952-5.	k	T
Oldenziel, R., M. Berendsen and A.A. Albert de la Bruhèze (2001) Het huishouden tussen droom en werkelijkheid: Oorlogseconomie in vredestijd, 1945-1963 ('The household between dream and reality: War economy in peacetime, 1945-1963'), in: Schot, J.W., Lintsen, H.W., Rip, A. and Albert de La Bruheze, A.A. (ed.) *Techniek in Nederland in de Twintigste Eeuw - Deel IV, Huishoudtechnologie en Medische Techniek (Technology in the Netherlands in the Twentieth Century – Part IV, Household technology and Medical Technology).* Zutphen: Walburg Pers. 103-131. ISBN 90.5730.067.2.	e	H

Oudshoorn, N.E.J. (2001) Reproductie, normativiteit en het verschil (m/v) ('Reproduction, normativity and the difference (m/f) '), in: Berg, M. and A. Mol (ed.) *Ingebouwde normen. Medische technieken doorgelicht.* (*Built-in norms. Mecial technology investigated).* Utrecht: Uitgeverij van der Wees. 113-131. ISBN 90-5805-044-0.	e	T
Oudshoorn, N.E.J. (2001) Technologie en zorg: het voorbeeld van anticonceptiemiddelen voor vrouwen en mannen. ('Technology and healthcare: the example of anti-conception remedies for women and men'), in: Everdingen, van J.J.E., O.P. Bleker, and H.W. Lunsen (eds.) *Pil over pil (Pill over pill).* Overveen/Alphen aan de Rijn: Belvedere/Medidact. 103-116.	k	T
Oudshoorn, N.E.J. (2001) Laqueur en Organon. Het universitaire laboratorium en de farmaceutische industrie in Nederland. ('Laqueur and Organon. The university laboratory and the pharmaceutical industry in the Netherlands'), in: Everdingen, van J.J.E., O.P. Bleker and H.W. Lunsen (eds.) *Pil over pil. (Pill over Pill).* Overveen/Alphen aan de Rijn: Belvedere/Medidact. 29-40.	k	T
Schot, J.W. (06-12-2001) *De Maakbaarheid van Nederland.* (*The 'engineerability' of the Netherlands*). Enschede: Universiteit Twente. pp 31.	o	T
Schot, J.W., H. Lintsen, A. Rip and A.A. Albert de la Bruhèze (2001) *Techniek in Nederland in de Twintigste Eeuw - Deel IV, Huishoudtechnologie en Medische Techniek. Techniek in Nederland in de Twintigste Eeuw (TIN-20) (Technology in the Netherlands in the Twentieth Century – Part IV, Household technology and Medical Technology). 4.* Zutphen: Walburg Pers, 349 pp. ISBN 90-5730-067-2.	g	H
Schot, J.W. (2001) De bouwput van techniek en maatschappij. Uitgangspunten van een nieuwe contextualistische techniekgeschiedenis. ('The construction site of technology and society: Starting points for a new contextual history of technology,') *Tijdschrift voor wetenschap, technologie en samenleving (Journal for science, technology and society), 9*(3). ISSN 1386-4289.	c	H
Schot, J.W. (2001) De bouwput van techniek en maatschappij. Uitgangspunten van een nieuwe contextualitische techniekgeschiedenis. Bewerking intreerede aan de TUE. ('The construction site of technology and society: Starting points for a new contextual history of technology,' Revision of inaugural address at TUE) *Ingenieur (Engineer), 113*(19). ISSN 0020-1146.	i	H
2002	**category**	**theme**
Albert de la Bruheze, A.A. and O. de Wit (2002) De productie van consumptie. De bemiddelde ontwikkeling van de Nederlandse consumptiesamenleving. Inleiding Themanummer. *Tijdschrift voor Sociale Geschiedenis* ('The production of consumption. The mediated development of the Dutch consumer society,' introduction for special issue. *Journal for social history), 28*(3): 139.	c	H
Albert de la Bruheze, A.A. and O. de Wit (2002) De productie van consumptie. De bemiddeling van productie en consumptie en de ontwikkeling van de consumptiesamenleving in Nederland in de twintigste eeuw. *Tijdschrift voor Sociale Geschiedenis,* ('The production of consumption. The mediated development of the Dutch consumer society,' *Journal for social history*), *28*(3): 257-272.	c	H
Berkel, D. van and M. Kirejczyk (2002) Jongleren met biologie bij technisch geassisteerde voortplanting. Culturele herinterpretatie van de relatie tussen afstamming en verwantschap in de tweede helft van de 20ste eeuw in Nederland. *Tijdschrift voor genderstudies* ('Juggling with biology through technically assisted reproduction. Cultural re-interpretation of the relation between descent and kinship.'*Journal for gender studies), 5*(4): 36-48. ISSN 1388-3186.	c	T
Dierikx, M.L.J., J.W. Schot and A. Vlot (2002) Van uithoek tot knooppunt: Schiphol. ('From remote corner to junction: Schiphol'), in: Schot, J.W., H.W. Lintsen, A. Rip and A.A. Albert de la Bruheze (eds.) *Techniek in Nederland in*	e	H

de Twintigste Eeuw. Deel V: Transport, Communicatie (Technology in the Netherlands in the Twentieth Century. Part V: Transport, Communication). Zutphen: Walburg Pers. 117-143.		
Elzen, B. (2002) Voorstudie onderzoeksprogramma "Transitie naar een Duurzame Brabantse Samenleving". (Preparatory study for the research programme “Transition to a sustainable Brabant Society”) Tilburg: Telos, 37 pp.	m	T
Hoppe, R. (2002) *Van flipperkast naar grensverkeer. Veranderende visies op de relatie tussen wetenschap en beleid. (From pinball machine to border traffic. Changing visions of the relation between science and policy)* AWT-Achtergrondstudies (no. 25). Den Haag: AWT, 62 pp.	e	S
Kater, L. (2002) Capita selecta. Enkele pioniers van het euthanasiedebat. *Tijdschrift voor geneeskunde en ethiek,* (‘Capita Selecta. Some pioneers of the euthanasia debate,”*Journal for medicine and ethics*) *12*(2): 43-48. ISSN 0925-2819.	c	T
Leenes, R.E. and L.A. Tauritz (2002) 'Klantgerichte dienstverlening in Enschede' over ICT en de modernisering van dienstverlening. *Bestuurskunde* (‘Customer oriented service in Enschede: on ICT and the modernization of service,’ *Governance Science), 11*(8) ISSN 0927-3387.	c	T
Mom, G.P.A., P.E. Staal and Schot (2002) De beschaving van het gemotoriseerde avontuur. ANWB en KNAC als wegbereiders bij de inburgering van de auto in Nederland. *Tijdschrift voor Sociale Geschiedenis* (‘The civilization of the motorized adventure. ANWB and KNAC as harbingers of the integration of automobiles in the Netherlands, *Journal for social history*) *28*(3): 323-346.	c	H
Mom, G.P.A., J.W. Schot and P.E. Staal (2002) Werken aan mobiliteit: de inburgering van de auto. (‘Working on mobility: the integration of the automobile’), in: Schot, J.W., H.W. Lintsen, A. Rip and A.A. Albert de la Bruheze (eds.) *Techniek in Nederland in de Twintigste Eeuw. Deel V: Transport, Communicatie. (Technology in the Netherlands in the twentieth century. Part V: Transport, Communication)*. Zutphen: Walburg Pers. 45-73.	e	H
Oost, E.C.J. van (2002) Book review: Ruth Oldenziel, "Making technology masculine. Men, women and modern machines in America, 1870-1945. *Tijdschrift voor genderstudies (Journal for gender studies), 5*(3): 68-70. ISSN 1388-3186.	c	T
Otterloo, van A.H. and A.A. Albert de la bruheze (2002) Nieuwe etenswaren, nieuwe eetplekken en veranderende eetgewoonten: snacks en fastfood in Nederland in de twintigste eeuw. (‘New foods, new places to eat and changing eating habits: snacks and fast food in the Netherlands during the twentieth century’), in: Jacobs, M. and P. Scholliers (eds.) *Buitenshuis eten in de Lage Landen sinds 1800.* (*Eating out in the Low Countries since 1800).* Brussel: VUB Press. 87-115. ISBN 90-5487-329-9	k	H
Rip, A. and W.A. Smit (2002) Het risicobegrip vanuit een wetenschapsfilosofisch en sociologisch perspectief. (‘The concept of risk from the perspective of philosophy of science and sociology’), in: Wissink, B. and J. Bouma (eds.) *Perspectieven op milieurisico's. (Perspectives on environmental risks)* (WRR Werkdocumenten, W128, 67-102). Den Haag: Wetenschappelijke Raad voor het Regeringsbeleid.	k	T
Rip, A. (2002) De ambivalente maatschappelijke rol en taak van wetenschapsstudies. (‘The ambivalent social role and task of science studies’). *Gewina 25*(1): 60-69. ISSN 0928-303X.	c	T
Rip, A. (2002) Finale. *Tijdschrift voor wetenschap, technologie en samenleving (Journal fo science, technology and society), 20*(5): 173-177. ISSN 1386-4289.	i	T
Schot, J.W. (2002) Begrensde mobiliteit? (‘Limited mobility?’), in: Schot, J.W., H.W. Lintsen, A.Rip and A.A. Albert de la Bruheze (ed.) *Techniek in Nederland*	e	H

in de Twintigste Eeuw. Deel V: Transport, Communicatie. (Technology in the Netherlands in the Twentieth Century. Part V: Transport, Communication). Zutphen: Walburg Pers. 145-149.		
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2005	**category**	**theme**
Elzen, B. (2005) Ultracentrifuge, in: C.A. Hempstead and W.E. Worthington (eds.) *Encyclopedia of 20th-century technology - Volume 2*: 867-868. New York: Routledge ISBN 1-57958-464-0.	b	T
2006	**category**	**theme**
Elzen, B. and W. Hafkamp (2006) Epilogue: a day in a life in 2049, in: P. Nieuwenhuis, P. Vergragt, and P. Wells (eds.) *The business of sustainable mobility. From vision to reality.* Sheffield, UK: Greenleaf Publishing. 231-240. ISBN 1-874719-80-2.	b	T
2007	**category**	**theme**
Jansen, D. and S. Kuhlmann (2007) *Rahmenbedingungen für eine leistungsfähige öffentlich finanzierte Forschung. Forschungspolitische Thesen der Forschergruppe "Governance der Forschung".* Berlin: Speyer (Deutsches Forschungsinstitut für öffentliche Verwaltung.	c	S

Kuhlmann, S. (2007) The European Research Area - an "Intra-European" task! *Forschungsbrief aus Brüssel, 8 KOWI*: 6-7.	a	S
Kuhlmann, S. and P. Larédo (2007) *Knowledge dynamics and ERA integration. Background paper for the Policy Workshop "Beyond the dichotomy of national vs. European science systems – Configurations of knowledge, institutions and policy in European research"*, Bonn, May 30, 2007	n	S
Leon, G., V. Bandini, S. Borras, M. Bucar, R. Kneucker, S. Kuhlmann, C. Nauwelaers and J. Romanainen (2007) *Interim Policy Options Paper of the Expert Group for the Follow-up of the Revised Lisbon Strategy - Governance issues and links with the Lisbon strategy*, in: European Commission, DG Research (ed.): The Future of Science and Technology in Europe, Discussion papers, Brussels (EU Commission, mimeo), 23-30 (download)	c	S
Leon, G., J.Romanainen, S. Inizan, R. Kneucker, S. Kuhlmann, C. Nauwelaers anv V. Timmerhuis (2007) *Open research and innovation policies for Europe - A leap forward!* A Report of the Lisbon Expert Group, Brussels (European Commission) (download)	c	S
Oudshoorn, N.E.J. (2007) Ernst Laqueur, in: W.F. Bynum and H. Bynum (eds.) *Dictionary of Medical Biography* I: 772-773. Westport/London: Greenwood Press.	b	T
Oudshoorn, N.E.J. (2007) Male contractive technologies, in: M. Flood, J.K. Gardiner, B. Pease and K. Pringle (eds.) *International Encyclopedia of Men and Masculinities* I. London/New York: Routledge.	b	T

12d. Main professional publications (Dutch)

Category a: Articles
Category b: Book chapters
Category c: Reports

Theme S: *Science and Innovation Policies*
Theme T: *Technology Dynamics and Assessment*
Theme H: *History of Science and Technology*
Theme M: *Miscellaneous*

2000	**category**	**theme**
Albert de la Bruheze. A.A. (2000) Fietsen en fietsbeleid in Nederland, *Openbaar Bestuur, tijdschrift voor beleid. Organisatie en politiek* ('Cycling and cycling policy in the Netherlands', *Public Governance, journal for policy, organisation and politics)* 10(2): 24-28.	a	H
Bogaard, A.A. van den (2000) Knooppunt van vele aders. Infrastructuur rond de luchthaven ('Intersection of many veins. Infrastructure around the airport') in: *Spiegel Historiael (Historical Mirror)* 35 (7/8): 308-311. ISSN 00387-487.	a	H
Bogaard, A.A. van den (2000) Book review, A. Kuijlaars *Het huis der getallen (The house of numbers)* in: *NEHA-bulletin* 14 (1): 245-247.	a	H
Brouns, M.L.M., E.C.J. van Oost and N.E.J.Oudshoorn (2000) Voorstudie ICT en maatschappij in verandering, in: Raad voor Maatschappelijke Ontwikkeling. *Ver weg én dichtbij. Over hoe ICT de samenleving kan verbeteren.* ('Preparatory study ICT and society in transition', in 'Council for societal development. *Far away and close by. Regarding how ICT can improve society) RMO advies 15*. Den Haag: Raad voor Maatschappelijke Ontwikkeling, 35-101. ISBN 90-1209063-6.	b	T
Disco, C. (2000) Voorvechter van 'cementijzer', *De Ingenieur* ('Advocate for	a	H

reinforced cement'. *The Engineer*) 112 (7): 17.		
Elzen, B. (2000) Een weg naar duurzame mobiliteit ('One way toward sustainable mobility'), in: M. Ham (ed.) *Chaos en Orde - GroenLinks en de Ruimtelijke Ordening (Chaos and order: GroenLinks [leftwing green political party] and Urban and Spatial Development),* Amsterdam: Wetenschappelijk Bureau GroenLinks.82-91. ISBN 90-72288-31-9.	b	T
Geels, F.W. and R. Kemp (2000) *Transities vanuit sociotechnisch perspectief*, Achtergrondrapport voor het Vierde Nationaal Milieubeleids Plan NMP-4 (*Transitions from a social-technical perspective*, Background report for the Fourth National Environmental Policy Plan NMP-4) , Ministerie van VROM, 63 pp.	c	T
Rip, A. (2000) Leid ons niet in verzoeking, Bespreking van KNAW, "Wetenschappelijk Onderzoek: Dilemma's en Verleiding", *Chemisch Weekblad* ('"Do not tempt us", Review of KNAW, "Scientific research: dilemmas and temptation," *Chemical weekly magazine)* 24, 16 december 2000, 19.	a	S
Rotmans, J., R. Kemp, M. van Asselt, F. Geels, G. Verbong and K. Molendijk (2000) *Transities and transitiemanagement: De casus van een emissiearme energievoorziening*, Rapport voor het Vierde Nationaal Milieubeleids Plan, NMP4-reeks (*Transitions and transition management: The case of a low emissions energy plant.* Report for the Fourth National Environmental Policy Plan NMP-4), Ministerie van VROM, 80 pp.	c	T
2001	**category**	**theme**
Kirejczyk, M. and D. van Berkel (2001) Experimentele techniek of gangbare behandeling: IVF is veel bekritiseerd maar snel ingevoerd. *Medisch contact* ('Experimental technology or valid treatment: IVF is much criticised by quickly implemented,' *Medical contact), 51/52*: 1886-1888. ISSN 0025-8245.	a	T
Merkx, F. and R.M. Struhkamp (2001) Oningevulde eigenheid: Promotie van Amade M'charek. *Nieuwsbrief Vereniging voor Gender en Technologie* ('Non-specified specificity: dissertation defence of Amade M'charek,' *Newsletter of the Organisation for Gender and Technology) , 19*: 3-4.	a	T
Notten, K.J.F.W. and E.W.M. Rommes (2001) *De logistieke processen simpeler maken; gebruikersonderzoek voor digitale dienstverlening (Simplifying logisticl processes; users-research for digital services).* Almelo: Equivalent.	c	T
Rip, A. (2001) Book review of Patricia Faasse, *Zuiver om de Wetenschap. De Akademie en haar levenswetenschappelijke Instituten* (*Purely for science. The Academy and its institutes for life sciences)* (1999). *Gewina, 24*(3): 178-180. ISSN 0928-303X.	a	H
Rip, A. (2001) Engagement is niet genoeg. *Tijdschrift voor wetenschap, technologie en samenleving,* ('Engagement is not enough,' *Journal for science, technology and society) 9*(3): 116-117. ISSN 1386-4289.	a	T
Rip, A. (2001) Bijdrage aan Arenadebat: Wetenschap en Samenleving Tussen Reflectie en Engagement. *Tijdschrift voor wetenschap, technologie en samenleving,*('Contribution to the Arena debate: Science and society between reflection and engagement,' *Journal for science, technology and society) 9*(3): 113-123. ISSN 1386-4289.	a	T
Rommes, E.W.M. (2001) *Participatief ontwerpen van het electronische dienstenknooppunt, rapportage voor Equivalent.* (*Collaborative design of the electronic services junction, report for Equivalent).* Enschede: Equivalent.	c	T
Veraart, F.C.A. and A.A. Albert de la Bruhèze (2001) Fietsen in de Nederlandse bergen. Achterblijvend fietsgebruik in het zuiden van Limburg in historisch perspectief. *Studies over de sociaal-economische geschiedenis van Limburg* ('Cycling in the Dutch mountains. Residual bicycle use in southern Limburg in historical perspective', *Studies of the socio-economic history of Limburg), XLVI02001*, 133-157. ISSN 0923-2842.	a	H
2002	**category**	**Theme**

Meulen, B.J.R. van der (2002) *Methodiek Verkenningen; Naar een ontwerpbenadering voor het opzetten van een verkenning (Method for foresighting; Toward an approach for designing the structure of a foresight study).* Enschede: Centrum voor Studies van Wetenschap, Technologie en Samenleving, 44 pp.	c	S
Oudshoorn, N.E.J. (2002) Waar blijft de mannenpil? over lastige hormonen, onwillige medici en 'De Nieuwe Man'. ('Where is the male pill? Regarding troublesome hormones, unwilling doctors and 'the new man'*') Lover 29*(4): 6-10. ISSN 0165-8042.	a	T
Rommes, E.W.M. (2002) 'Wat als ik op het verkeerde knopje druk?' Vrouwen, computers en genderscripts. ('What if I push the wrong button? Women, computers and gender scripts') *Lover* ISSN 0165-8042.	a	T
2003	**category**	**theme**
Hartog, A.P. den and A.A. Albert de la Bruhèze (2003) Goed verpakt is half verkocht. Verpakkingstechnologie, reclame en consument. *Spiegel Historiael* ('Well packaged is half-sold. Packaging technology, advertising and the consumer', *Historical Mirror), 38*(3/4): 156-163. ISSN 0038-7487.	a	H
Kater, L. (2003) Macht van medische professie doorbroken in euthanasiedebat ('Power of the medical profession broken through in the debate over euthanasia'). *Modern medicine,* 77-79. ISSN 0929-0141.	a	T
Lente, D. van and J.W. Schot (2003) Gordiaantje. Maatschappijgeschiedenis van de techniek. ('Social history of the technology') *Kleio,* 8-13. ISSN 0165-6449.	a	H
Otterloo, van A.H. and A.A. Albert de la Bruhèze (2003) Goedkoop maar vullend. Snacks, snackcultuur en binnenshuis eten in Nederland, 1920-1980. *Spiegel Historiael* ('Chea but filling. Snacks, snack culture and eating at home in the Netherlands, 1920-1980', *Historical Mirror*), *38*(3/4): 142-147. ISSN 0038-7487.	a	H
Rip, A. (2003) Chemie verandert - in context. ('Chemistry changes – in context') In -- (ed.) *100 jaar KNCV: eeuwig dansende moleculen (100 years KNCV: eternally dancing molecules).* (61). Den Haag: Ten Hagen and Stam.	b	H
Schot, J.W. (2003) Modernisering en techniek tussen 1890 en 1970. Het project van de maakbare samenleving. *Ingenieur* ('Modernising and technology between 1890 and 1970', *Engineer), 115*(20): 52-55. ISSN 0020-1146.	a	H
Timmermans, A. et al (2003) Kamer laat steken vallen bij onderzoek ('The House leaves out elements in research'). *Trouw,* 6 oktober 2003.	a	S
2004	**category**	**theme**
Jelsma, J. et al, (2004) Lessen uit een veldtest. *VV: verwarming en ventilatie* (Lessons from a field test. *VV: heating and ventilation), 2004(10):* 758-763. ISSN 0042-451x.	a	T
Jelsma, J. et al, (2004) Slimme internet-technologie voor gebouwbeheer ('Smart internet technology for building management'). *TVVL magazine, 2004(4):* 48-53. ISSN 1380-5428.	a	T
Kater, L. (2004) Bericht uit de kraamkamer van de vervangingsgeneeskunde: stamcellen in Nederland en Engeland ('Report from the delivery room of replacement medicine: stemcells in the Netherlands and in England'). *NVBe-nieuwsbrief) 11(4):* 6-8.	a	T
2005	**category**	**theme**
Elzen, B., W.J. de Ridder et al, (eds.) (2005) *Innovatie en Maatschappelijke Ontwikkeling: Omgaan met een haat-liefdeverhouding (Innovation and Societal Development: Getting on with a love-hate relation).* Den Haag: SMO (Stichting Maatschappij en Onderneming) ISBN 90-6962-222-x.	c	T
Hoppe, R., S. Hogewind and W.J. de Ridder (2005) *Zekerheden in de toekomst. Metamorfose van de accountant (Certainties in the future. Metamorphosis of the accountant).* Den Haag: SMO (Stichting Maatschappij en Onderneming) ISBN	c	S

90-6962-218-1.		
Meulen, B.J.R. van der, H. Bodewes and D. Stemerding (2005) *Succes heeft zijn prijs. Evaluatie Astma en COPD onderzoek en Advisering kennismanagement Nederlands Astma Fonds (Success has its price. Evaluation of asthma and COPD research and advice for knowledge management, the Netherlands Asthma Foundation).* STeHPS.	c	S
Rip, A. (2005) Om de kwaliteit van ervaringskennis ('On the quality of experience-based knowledge'), in: H. van Haaster and Y. Koster-Deese (eds.) *Ervaren en weten. Essays over de relatie tussen ervaringskennis en onderzoek (To experience and to know. Essays on the relation between experience-based knowledge and research)* (27-39). Utrecht: Uitgeverij Jan van Arkel. ISBN 90-6224-465-3.	b	S
2006	**category**	**theme**
Hoppe, R. and P.J. Klok (2006) *Onderzoeksprogrammering door de Enschedese Rekenkamercommissie: systematiek en methodiek (Research programming for the Budget Office Commission of Enschede: systematics and method)*, Universiteit Twente, Enschede, 27 pp.	c	S
Jongbloed, B.W.A. and B.J.R. van der Meulen (2006) *De follow-up van onderzoeksvisitaties (The follow-up of research evaluations)* in *Investeren in Dynamiek - Eindrapport Commissie Dynamisering Deel 2(Investing in Dynamics – final report of the Commission for Energisation).* Enschede: CHEPS. 112 pp.	c	S
Linden, C. van der and D. Stemerding (2006) Heeft niet-invasieve prenatale diagnostiek de toekomst? *Tijdschrift voor verloskundigen* ('Is non-invasive prenatal diagnosis the way of the future?' *Journal for Nursing), 31*(11): 23-27. ISSN 0378-1925.	a	T
Maathuis, I.H.J., L. Dubbeld and N.E.J. Oudshoorn (2006) Hartritmestoornissen diagnosticeren op afstand en de ervaringen van de patiënt ('Diagnosing irregular heart rhythms from a distance and patient experience'). *Patient care, 33*(4): 41-43. ISSN 0770-4224.	a	T
2007	**category**	**theme**

Appendix 1

The context of research programmes at the University of Twente

Documentation of the Research in the group Stehps

The Faculty of Management and Governance is organized into groups, or‘chairs’, each covering a coherent part in the broad field of Management and Governance. Under the supervision of each chair, one or more ‘Research Programmes’ are carried out. In Twente these programmes are carried out within the framework of multi-disciplinary research institutes at the university level (Institute for Nano-technology MESA+, Institute for Telematics and Telecommunication CTIT, and Institute for Governance Studies IGS) assembling chairs, or research programmes under chairs, from different disciplines to work under a mission statement with a strongly focused goal. These institutes are not being evaluated here, although their influence on research policy is evident. Research programmes of chairs participating in our research institutes fall under the formal responsibility of the Scientific Director of the Institute. This formal responsibility, of course, does not reduce the responsibilities of the chair holders for the research activities carried out under the chair’s responsibility.

Leadership and management

A matrix structure is used for the relation between departments and institutes. Formal responsibility toward the College van Bestuur (Executive Board) for research activities carried out under the responsibility of the institutes rests with the scientific directors. They are allocated the budget from the university using a transparent and detailed model. Much of this budget is based on output from chairs and is thus unconditionally channelled to these chairs. A ‘tax’ is levied to fund the infrastructure and support staff members who are employed within the department but who are not responsible to the chairs. Scientific directors are also allocated a strategic research incentive which they use to initiate innovative research. All staff is employed by the faculty, and chairs are responsible for education and research personnel within their groups.

Chair holders are responsible for the scientific direction of the research programmes carried out under the responsibility of their chairs. They report on this research to the scientific director of the institute under which the specific programme resides. Institutes such as MESA+, CTIT and IGS have internal and external advisory boards where programme choices

are discussed. The scientific directors are responsible for new research initiatives in fields that might span more than one chair. Funds allocated for this are under their control and a scientific director can, in consultation with the dean and chair-holders, provide a budget for new (temporary) appointments, investments, and/or existing staff members to engage in new activities. Directors as well as the dean have the right to propose new professorial positions to the executive board of the university. In all appointment committees of key research staff, the department as well as the directors of institutes are represented. The dean is represented on the management board of all relevant institutes. This structure provides a framework where the interests of individual groups, the department, and the university are balanced and decisions on choices can be made.

Within the department, monthly meetings take place between all chair-holders, the dean and chairman of the department to discuss current affairs affecting the faculty and advise the management team of the faculty when needed. Every year toward the summer, a management meeting takes place between the management team of the faculty and each individual chair-holder to discuss and report on the situation of the chair with regard to education, research, personnel management and finances. Chair-holders carry formal responsibilities in these areas and in these meetings the chair-holders are interviewed on that accountability. These meetings can lead to decisions regarding the future of the chairs on any of these issues.

Chair-holders are responsible for motivating their staff. They conduct personnel assessments and job satisfaction meetings and propose staff development steps when needed. All financial aspects regarding personnel management rest with the dean. Changes of profile or research orientation take place under the dean's leadership, in consultation with scientific directors. The general management style is participatory, both within the groups and at the departmental level, but responsibilities are defined clearly so decisions can be made. In this framework, where scientific directors can initiate new activities, care must be taken to deal with the counter side: re-directing or terminating existing activities. For the most part, this happens automatically: science develops and so do staff members. Occasionally, activities have to be re-directed and the management has to direct these changes. Deans and directors have a mutual responsibility here, and the fact that all personnel is appointed in the faculty is merely an administrative arrangement.

Research Strategy and policy

Research strategy is the domain of the research institutes at the University of Twente. Each of the six institutes focuses on a multi-disciplinairy area. Within this area, so called 'strategic research orientations' (SRO) are defined. SROs provide focal points for a 3-5 year time

period to achieve an institute's mission. An SRO is a large scientific programme in the order of 30-35 full-time researchers, which satisfies the following criteria:

- Combining high-quality research of at least five groups within the institute into a genuine multidisciplinary programme
- Providing excellent opportunities for international top-level research
- Attractive for external funding (which is a quality indicator in its own right)

A program director is responsible for the scientific coordination of each SRO. The program directors are directly responsible to the scientific director of the institute. The STeHPS research group participates in the three following research institutes.

MESA+

The mission of MESA+ is to excel in its field: nano-technology, materials, technologies and systems for information and communication technology. MESA+ is one of the largest nano-technology research institutes in the world, delivering competitive and successful high quality research. It uses a unique structure that unites scientific disciplines and builds fruitful international cooperation to excel in science and education. MESA+ has created a perfect habitat for start-ups in the micro- and nano-industry to establish and to mature. MESA+ is also a 'Research School' with KNAW recognition and has its own laboratories.

CTIT

The mission of CTIT is to excel in the design and implementation of advanced telematics and information technology systems and their integration in user environments. The research programme is based on the view that to address the complex issues raised by ICT and its role in society a multidisciplinary approach is needed. To be effective, issues need to be looked at from different and complementary perspectives. Integration of technology-based ICT research and its application in specific domains is a clear focus of CTIT. To that end, CTIT aims at combining a range of disciplines from the technical and social sciences into coherent SROs.

IGS

The Institute for Governance Studies is one of the priority research institutes of the University of Twente and performs multi-disciplinary research and postgraduate research training in the field of the governance and management of technological and social innovation. In this, issues of co-ordination, steering and the operation of (networks of) institutions in both public and private sectors are core research foci, based on a multi-level, multi-actor perspective. IGS strives to combine scientific excellence with relevance for stakeholders in the public and private sector.

The research institutes have played a major role in defining the national research agenda over the last years, e.g. the socalled BSIK programs, and members of the staff are active in the management board.

Researchers and other personnel

All personnel are employed within the faculty (and thus department); university institutes only employ a scientific director, a managing/ executive director and a minimum of secretarial staff. It is the policy that all permanent academic staff have a dual assignment: education and research. This is also true for part time professors, commonly appointed on positions provided for by industry. To this is added a small volume of managerial activities. Part time academic staff (like PhD 'students', post docs) usually have a single assignment in research. The actual tasks of permanent academic staff are decided by the chair holder; and depending on work load and competencies, some staff are more inclined towards research and some toward education. These inclinations also change in time. There is an active policy on study and sabbatical leave to support the dynamics in focus of research. Budget limitations and cuts have minimised the possibilities for expanding the staff size. Human resource management takes place through semi-annual meetings between a staff member and the chair holder. In one meeting, an open discussion takes place on all factors influencing the productivity and well-being of the staff member. Steps can be agreed on by both parties to enhance the cooperation. The other meeting is an assessment of achieved results, normally based on agreed targets from the year before. This assessment is archived in the personnel file. Recently, this system has changed to a once yearly meeting combining both aspects.

The appointment of professors can be divided into several categories. A chair holder generally has a full time full professorship. Recruitment is by rule done internationally, outside the university. A description of the field of activity is made by the faculty where, also relevant, scientific directors provide input. These descriptions are kept short since it is important to attract young, eminent scientists and give them some freedom to further profile their field. Part time professors are appointed if there is a faculty/institutional interest in providing seniority for a specific sub-field for which collaboration with an external partner(s) is fruitful. These appointments are normally financed by third parties and made for a period of 3 years. There is also a category of 'personal' professorships awarded to existing permanent personnel in sub-fields of substantial width and size within chairs. Candidates must be outstanding in their field, but the field itself should not warrant a separate chair.

Profile of IGS

The Institute for Governance Studies is one of the priority research institutes of the University of Twente and performs multi-disciplinary research and postgraduate research training in the field of the governance and management of technological and social innovation. In this, issues of co-ordination, steering and the operation of (networks of) institutions in both public and private sectors are core research foci, based on a multi-level, multi-actor perspective. IGS strives to combine scientific excellence with relevance for our stakeholders in the public and private sector.

IGS is a multidisciplinary social scientific research institute that in its projects combines theoretical perspectives from disciplines such as economics, sociology, law and political science, as well as multidisciplinary fields such as business and public administration. The technical institutes focus on the processes of technological innovation themselves (e.g. on fields such as biomedical technology and nano-technology), while IGS emphasizes research on the social conditions and consequences of these processes of technological innovation. This does not imply that IGS will only do research explicitly related to technological innovation. IGS research also comprises projects regarding the social processes of societal change, processes that are fundamental to the knowledge society. These processes are the major underpinning of all efforts to stimulate innovation within society in general and the economy in particular.

The IGS Institute Plan (2007 – 2012) focuses on two different themes within innovation. First of all, the institute will focus on governance and managerial aspects related to the development of emerging technologies (such as nano-technology and bio-medical technology). In this case the contribution of the IGS is in the non-technological aspects of the development of innovations based on emerging technologies. This theme will be executed in relationship with two other UT research institutes, i.e. MESA+ and BMTi. The second innovation theme focuses on the innovation aspects of existing technologies. In this theme the contribution of the institute is rather in the development of new insights in the field of governance and management which in the recent past have often been related to the implementation of existing technologies, such as information and communication technology and geo-sensing technology. In this case the contribution consists of innovations that facilitate the implementation of already developed technologies.

The two themes within the institute carry 7 strategic research orientations:

Theme one:	*Theme two:*
SRO 1: Innovation and University	SRO3: Management of Innovation and Enterpreneurship
SRO 2: Health	SRO 4: Public Management and e-governance
	SRO 6: Twente Water Centre
	SRO 5: Innovation of Governance
	SRO 7: Sustainable Innovation

IGS between 2002 and 2007

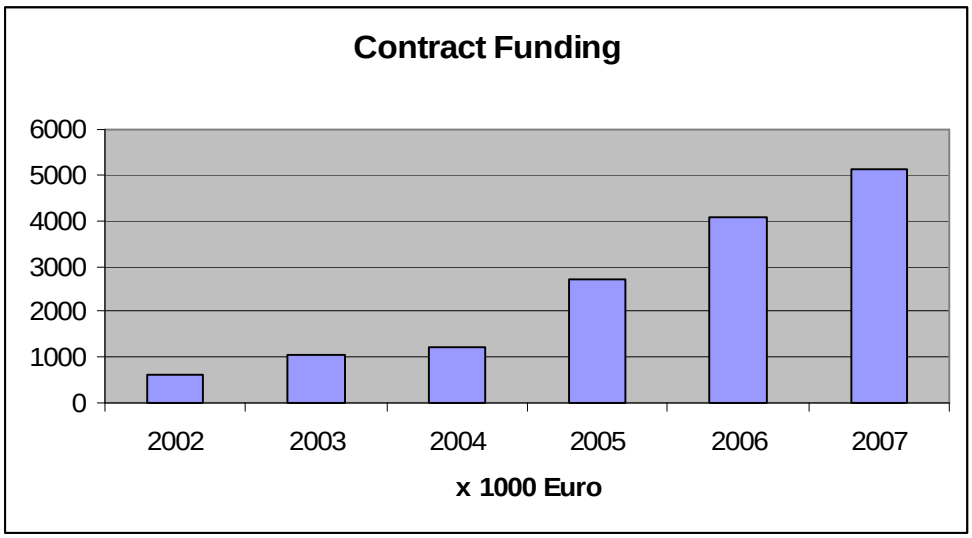
In 2000, the Board of Directors of the University of Twente decided to improve the quality of scientific research by strengthening established research and by stimulating clusters of promising research. Research spearheads and potentials were found and defined. Around these spearheads and potentials 6 spearhead institutes where formed. In the social sciences domain, the spearhead programme "Institutional Change" and the potential "Governance in a Complex Society" became the selected research themes. Both programmes started in the end 2001. These two programmes formed an umbrella for the scientific activities of a number of research groups within the faculty of public administration. To enhance the impact of the programmes in the long term and to improve the organizational framework needed for a successful programme execution, it was decided to establish a new structure that would incorporate the core scientific activities. To serve these purposes, the Institute for Governance Studies (IGS) was set up in 2002.

	2002	**2003**	**2004**	**2005**	**2006**	**2007**
Spearhead Research	642	703	747	1066	553	910
Potential Research	140	202	181	188	67	0
Additional Investments	782	905	982	1254	620	1450

Table 1: additional IGS investments in spearhead and potential research (x 1000 euros)

The years 2002 and 2003 were primarily directed at building up the spearhead research and potential research programme. Basic infrastructure was set up and staff members were contracted. In 2003, the major effort was put into the expansion of the research carried out under the auspices of the IGS. This resulted in 2004 in a rather broadly defined research institute comprising research groups with different backgrounds. Although at the beginning the attention was mainly focused on social scientific research regarding institutional change from a multi-actor/multi-level perspective, this focus failed to provide a sufficient frame of reference for effective actions within a larger institute. In 2005 the attention was directed more toward the topics of innovation and governance.

Results over the period 2002 - 2007



Another extremely important outcome of the IGS efforts can be found in the establishment of a professional support structure and creation of stimuli for researchers to improve their capacity to generate extra income. These measures proved very effective from the beginning. Income based on Scientific Council funding and on contract funding considerably increased.