

CENTRE FOR ADVANCED STUDY
SENTER FOR GRUNNFORSKNING

ANNUAL REPORT 2009



Centre for Advanced Study at the Norwegian Academy of Science and Letters

The Centre for Advanced Study (CAS) is a private foundation. It was established by the Norwegian Academy of Science and Letters in 1989, and its activities commenced in full from the autumn of 1992. Its purpose is to raise the calibre of Norwegian basic research and interdisciplinary theoretical work up to the highest international level in the humanities/theology, social sciences/law, natural sciences/medicine and mathematics. The Centre rents premises from the Norwegian Academy of Science and Letters at Drammensveien 78, NO-0271 Oslo.

Outstanding researchers from Norway and abroad are nominated for one-year stays in the Centre. The activities are organized in three groups – one in the humanities, one in the social sciences and one in the natural sciences – each with from six to ten members whose affiliation is long-term. In addition, numerous researchers spend shorter periods conducting research, altogether some 40–45 researchers of 10 to 15 nationalities a year. Each group is planned and organized around a unifying theme and headed by one or more outstanding researchers. The groups have no other obligations than their own research. They receive administrative and financial support from the Centre in formalized cooperation with seven Norwegian universities and two high-level research colleges, i.e. the University of Oslo, the University of Stavanger, the University of Bergen, the University of Tromsø, the Norwegian University of Science and Technology in Trondheim, the Norwegian University of Life Sciences in Ås, the University of Agder, the Norwegian School of Economics and Business Administration in Bergen and BI Norwegian School of Management.

The Centre has a Board appointed by the Norwegian Academy of Science and Letters, the Norwegian Association of Higher Education Institutions and the Research Council of Norway.



Abbreviations used in the Annual Report

CAS	Centre for Advanced Study
NASL	Norwegian Academy of Science and Letters
NetIAS	European Network of Institutes of Advanced Study
NTNU	The Norwegian University of Science and Technology
RCN	The Research Council of Norway
UHR	The Norwegian Association of Higher Education Institutions
UiB	University of Bergen
UiO	University of Oslo
UiS	University of Stavanger
UiT	University of Tromsø
USIT	University of Oslo's Center for Information Technology

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The Board



Aanund Hylland
Professor
University of Oslo
(Chair) - NASL



Gerd Bjørhovde
Professor
University of Tromsø
(Deputy Chair) –
UHR



Liv Bliksrud
Professor
University of Oslo –
NASL



Leif Arne Heløe
Professor
Norwegian Institute
for Urban and Regional
Research – RCN



Kenneth Hugdahl
Professor
University of Bergen
– NASL



Ivar Langen
Professor
University of
Stavanger – UHR



Reidun Sirevåg
Professor
Secretary General
The Norwegian Academy of
Science and Letters (Observer for
NASL)

Alternates



Sigmund Grønmo
Professor
Alternate (for Bjørhovde), University of Bergen – UHR



Marit Halvorsen
Professor
Alternate (for Heløe), University of Oslo - RCN



Egil Leer
Professor
Alternate (for Huggdahl), University of Oslo – NASL



Astrid Læg Reid
Professor
Alternate (for Langen), Norwegian University of Science and Technology – UHR



Ivar B. Ramberg
Professor
Alternate (for Hylland), Ramberg Consulting AS – NASL



Lars Walløe
Professor
Alternate (for Blikrud), University of Oslo - NASL

The administration



Willy Østreg
Professor
Scientific Director
until 1 August 2009



Gro Steinsland
Professor
Scientific Director
from 1 August 2009



Maria M. L. Sætre
Office Manager



Trude Gran Peters
Higher Executive Officer



Marit Finnemyhr Strøm
Executive Officer

Research groups 2008/2009 – Participants spring 2009

Nonlinear partial differential equations



Helge Holden
(Group Leader)
Professor
NTNU, Norway



Kenneth H. Karlsen
(Group leader)
Professor
UiO, Norway



Nils Henrik Risebro
Professor
UiO, Norway



Christian Rohde
Professor
University of
Stuttgart, Germany



Debora Amadori
Assistant Professor
University of
L'Aquila, Italy



Denis Serre
Professor
ENS-Lyon, France



Eitan Tadmor
Professor
University of Mary-
land, USA



Espen R. Jakobsen
Associate Professor
NTNU, Norway



Fritz Gesztesy
Professor
University of Mis-
souri, USA



Gerald Teschl
Professor
University of Vienna,
Austria



Giuseppe Maria Coclite
Professor
University of Bari,
Italy



Gui-Qiang Chen
Professor
Northwestern Univer-
sity, USA



Harald Hanche-Olsen
Associate professor
NTNU, Norway



Hermano Frid
Professor
IMPA, Brazil



Hilde Sande
Research Fellow
NTNU, Norway



John D. Towers
Professor
MiraCosta College,
USA



Kristian Jenssen
Associate Professor
Penn State University,
USA



Philippe G. LeFloch
Professor
Pierre and Marie
Curie University,
France



Trygve Karper
Research Fellow
UiO, Norway



Xavier Raynaud
Postdoctoral Fellow
NTNU, Norway

Research groups 2008/2009 – Participants spring 2009

Early networking in Northern Fennoscandia



Charlotte Damm
(Group Leader)
Professor
UiT, Norway



Lars Forsberg
Professor
UiB, Norway



Lars Ivar Hansen
Professor
UiT, Norway



Lars-Gunnar Larsson
Professor
University of
Uppsala, Sweden



Mika Lavento
Professor
University of
Helsinki, Finland



Peter Jordan
Senior lecturer
University of
Aberdeen, UK



Janne Saarikivi
Researcher
University of
Helsinki, Finland



Anja Roth Niemi
Research Fellow
UiT, Norway



Fredrik Hallgren
Post doctoral fellow
University of Upp-
sala, Sweden



Marianne Skandfer
Post doctoral fellow
UiT, Norway

Understanding the role of water in history and development



Terje Tvedt
(Group Leader)
Professor
UiB, Norway



Richard Coopey
Senior Lecturer
Aberystwyth Univer-
sity, UK



Graham Chapman
Professor
Lancaster University,
UK



Roar Hagen
Professor
UiT, Norway



Armando J. Lamadrid
Assistant Research
Fellow
UiB, Norway



Karen Syse
Research Fellow
UiO, Norway



Eva Jakobsson
Postdoctoral Fellow
UiS, Norway

Research groups 2009/2010 – Participants autumn 2009

Coevolutionary interactions and adaptations in a metapopulation context



Eivin Røskft
(Group leader)
Professor
NTNU, Norway



Anton Antonov
Research Fellow
NTNU, Norway



Frode Fossøy
Post Doctoral Fellow
NTNU, Norway



Jacqui Shykoff
Senior Researcher
Université Paris-Sud
Bâtiment, France



Arne Moksnes
Professor
NTNU, Norway



**Anders Pape
Møller**
Professor
Université Pierre et
Marie Curie, France



Manuel Soler
Professor
University of
Granada, Spain



Bård Stokke
Researcher
NTNU, Norway



Fugo Takasu
Professor
Nara Women's Uni-
versity, Japan



John N. Thompson
Professor
University of California
Santa Cruz, USA

Research groups 2009/2010 – Participants autumn 2009

Ethics in Antiquity: The quest for the good life



Øivind Andersen
(Group leader)
Professor
UiO, Norway



**Eyjólfur Kjalar
Emilsson**
(Group leader)
Professor
UiO, Norway



Julia Annas
Professor
University of Arizona,
USA



Panagiotis Dimas
Professor
UiO, Norway



Hallvard Fossheim
Post Doctoral Fellow
UiO, Norway



**Gabriel
Richardson Lear**
Professor
University of
Chicago, USA



Jonathan Lear
Professor
University of
Chicago, USA



**Fritz-Heiner
Mutschler**
Professor
TU Dresden,
Germany



Øyvind Rabbås
Professor
UiO, Norway



Pauliina Remes
Lecturer
Uppsala University,
Sweden



**Svavar Hrafn
Svavarsson**
Senior Lecturer
University of Iceland,
Iceland



Miira Tuominen
Researcher
University of
Helsinki, Finland

Research groups 2009/2010 – Participants autumn 2009

Should states ratify human rights conventions?



Andreas Føllesdal
(Group leader)
Professor
UiO, Norway



Geir Ulfstein
(Group leader)
Professor
UiO, Norway



Mads Andenæs
Professor
UiO, Norway



Basak Cali
Lecturer
University College
London, UK



Lynn Dobson
Senior Lecturer
University of
Edinburgh, UK



Ole Kristian Fauchald
Professor
UiO, Norway



Huawen Liu
Professor
Chinese Academy of
Social Sciences, China



Anne Julie Semb
Associate professor
UiO, Norway



Beth Simmons
Professor
Harvard University,
USA



Hege Skjeie
Professor
UiO, Norway



Eivind Smith
Professor
UiO, Norway



Henriette Sinding Aasen
Professor
UiB, Norway

CENTRE FOR ADVANCED STUDY

SENTER FOR GRUNNFORSKNING

ANNUAL REPORT 2009

The Centre for Advanced Study (CAS) is a foundation established by the Norwegian Academy of Science and Letters in 1989, its activities commenced in full from autumn 1992. The Centre leases premises in the Norwegian Academy of Science and Letters' building at Drammensveien 78 in Oslo.

Each academic year, the Centre hosts three international research groups, representing the humanities, the social sciences and the natural sciences, respectively, and addressing issues of basic research. In response to nominations, the groups are selected by the Board of CAS once the group leaders, proposed international partners and projects have been vetted through a comprehensive international evaluation process.



1. The objectives of the Centre

The purpose of CAS is to raise the calibre of Norwegian basic research to the highest international standards in the humanities/theology, the social sciences/law and the natural sciences/medicine/mathematics.

The Centre is to serve as a national institution and ensure close cooperation between Norwegian and foreign researchers. In addition to giving leading Norwegian scholars the best possible working conditions, the aim is to facilitate cooperation between Norwegian and international research communities, raising the quality of basic research in Norway through added internationalisation.

2. The Board of CAS

The Centre is governed by a Board of Directors consisting of six members and their alternates. The Board is the organisation's supreme governing body. The Board of Directors is regulated by §4 of the Articles of Association and is appointed by the Norwegian Academy of Science and Letters (NASL), the Norwegian Association of Higher Education Institutions (UHR) and the Norwegian State, as represented by the Research Council of Norway (RCN).

In 2009, the Board was composed of the following members

Professor Aanund Hylland, University of Oslo (Chair) – NASL

Professor Gerd Bjørhovde, University of Tromsø (Deputy Chair) – UHR

Professor Liv Blikrud, University of Oslo – NASL

Professor Leif Arne Heløe, Norwegian Institute for Urban and Regional Research – RCN

Professor Kenneth Hugdahl, University of Bergen – NASL

Professor Ivar Langen, University of Stavanger – UHR

Secretary General Professor Reidun Sirevåg, observer for NASL

Alternates

Professor Sigmund Grønmo, University of Bergen – UHR (for Bjørhovde)

Professor Marit Halvorsen, University of Oslo – RCN (for Heløe)

Professor Egil Leer, University of Oslo – NASL (for Hugdahl)

Professor Astrid Lægveid, Norwegian University of Science and Technology – UHR (for Langen)

Professor Ivar B. Ramberg, Ramberg Consulting AS – NASL (for Hylland)

Professor Lars Walløe, University of Oslo – NASL (for Blikrud)

The Board of Directors met four times in 2009. The Board dealt with the following main items of business:

- Selection of research groups for 2011/2012
- Financial statements for 2008 – Directors' Report for 2008
- Budget 2009 – half-yearly accounts 2009
- Application for funding from the Ministry of Education and Research for 2010
- Hiring of a new scientific director from 1 Aug. 2009
- Evaluation of the appointment process for the research groups 2011/2012
- Process of finding candidates for 2012/2013
- The Centre's publications – the newsletter (*Glimt/Impressions*) and the *Annual Report*
- CAS's partners, i.e. renewal of the agreements with the Norwegian University of Life Sciences and the Norwegian School of Economics and Business Administration, and entering into an agreement with the University of Agder
- The research groups' progress in 2008/2009 and 2009/2010
- Various maintenance projects

The following Board members/alternates completed their term of office at 31 December 2009:

Professor Aanund Hylland (Chair of the board)

Professor Ivar B. Ramberg (alternate for Hylland)

Secretary General Professor Reidun Sirevåg (observer for NASL)

The following new Board members/deputies were elected as from 1 January 2010:

Professor Asbjørn Kjønstad, University of Oslo (Chair of the Board)

Professor Odd Stokke Gabrielsen, University of Oslo (alternate for Kjønstad)

Vice President Professor Øyvind Østerud will be attending as a regular observer for NASL in 2010.

3. The partners of the Centre

At the end of 2009, CAS had nine partners:

University of Oslo (UiO)

University of Bergen (UiB)

University of Tromsø (UiT)

Norwegian University of Science and Technology, Trondheim (NTNU)

University of Stavanger (UiS)

Norwegian University of Life Sciences, Ås (UMB)

University of Agder (UiA)

Norwegian School of Economics and Business Administration (NHH)

Norwegian School of Management BI, Oslo

Cooperation agreements have been concluded with each of these institutions. The agreements imply a significant contribution to CAS' economy since employees of partner institutions retain their salaries while at CAS, and working at CAS is counted as an extraordinary sabbatical.

The cooperation agreements with the University of Life Sciences and the Norwegian School of Economics and Business Administration were renewed in 2009. An agreement was signed with the University of Agder on 1 August 2009.

Each partner has set up a special Contact Committee which is usually identical with the Research Committee at the institution in question. CAS and the Contact Committees liaise on an ongoing basis.

In autumn 2009, the scientific director and office manager visited the Contact Committees at the University of Bergen, the Norwegian School of Economics and Business Administration and the University of Tromsø. Visits are planned to other Contact Committees in spring 2010.

4. Administration and management

The scientific director is the academic leader of the Centre and there is also a research component to his/her duties. The administration prepares items of business for the Board and sees to it that the Board's decisions are implemented. The administration handles day-to-day operations at CAS.

4.1 Staff

The Centre's administration consisted of four employees.

Scientific Director Willy Østreng, until 1 August 2009

Scientific Director Gro Steinsland, from 1 August 2009

Office Manager Maria M. L. Sætre

Higher Executive Officer Trude Gran Peters

Executive Officer Marit Finnemyhr Strøm

The administrative staff has weekly meetings at which they discuss and plan all matters of importance for day-to-day operations.

4.2 IT services

Dag Christian Bjørnsen of the University of Oslo's Centre for Information Technology (USIT) was responsible for the operation of the computer systems and for providing IT support for the researchers 1.5 days a week, as well as full-time in August.

4.3 Working environment

The physical working environment is generally satisfactory, with the exception of office conditions for USIT's IT consultant, but efforts are currently being made to resolve that problem. CAS has limited office space, and available working space is at a premium. CAS helps provide medical assistance for visiting foreign researchers in the event of illness or injury. In autumn 2009, the Centre has addressed fire prevention measures, conducting fire drills and providing information.

The Centre has a *very* small administration compared with comparable foreign centres. It is a challenge to accommodate the profusion of duties. The rate of absence due to illness is low. The percentage of women in the administration was 100 per cent at year-end 2009, while women accounted for 33 per cent of the seats on the Board.

Temporary office help was hired on an hourly basis as needed to lighten the workload.

4.4 Environmental reporting

The Centre's activities do not pollute the outdoor environment.

4.5 Social initiatives

Combining academic activities with social initiatives is one of the advantages offered by CAS. Organising research activities by groups entails that all visiting scholars are immediately channelled into a close-knit circle of specialists. Sharing lunch in the Turret Room helps facilitate a good psychosocial atmosphere and fosters contact across the disciplines. A banquet for the scholars marks the beginning of the research year in September, and festive events are organised at Christmas and to mark the end of the academic year. A day trip is organised once or twice a year for the fellows of the Centre. The administration also handles school placements, facilitates contact with medical services, etc.

5. Research groups and academic activities

The three groups that started their work in autumn 2008 and continued in spring 2009, worked on the following topics:

- **Nonlinear partial differential equations**
headed by professors Helge Holden, NTNU, and Kenneth H. Karlsen, UiO
- **Understanding the role of water in history and development**
headed by Professor Terje Tvedt, UiB
- **Early networking in Northern Fennoscandia**
headed by Professor Charlotte Damm, UiT

For a presentation of the projects, academic activities, seminars and conferences, as well as preliminary results/publications, see the groups' reports in this Annual Report.

The 2009/2010 research groups commenced working in August 2009. The research topics for these groups are:

- **Coevolutionary interactions and adaptations in a metapopulation context**
headed by Professor Eivin Røskaft, NTNU
- **Ethics in Antiquity: The quest for the good life**
headed by professors Eyjólfur Kjalar Emilsson and Øivind Andersen, UiO (the latter until 1 January 2010)
- **Should states ratify human rights conventions?**
headed by professors Andreas Føllesdal and Geir Ulfstein, UiO

The newsletter *Glimt/Impressions* No. 1, 2009, presents the research topics for the 2008/2009 groups. *Glimt/Impressions* No. 2, 2009, describes the 2009/2010 groups' activities.

CAS' newsletters are available in English and Norwegian versions and are posted on the Centre's website at: www.cas.uio.no.

Journalist Bjarne Røsjø of *Bjarne Røsjø Media A/S* has been co-editor of and a writer for CAS' publications.

In June 2009, the Board made its final decision on the nominations for the groups to work at the Centre in 2011/2012. The Centre received 22 nominations, an increase of seven from the year before. After two rounds of discussions, the Board forwarded eight proposals for an international peer review in spring 2009.

A total of 51 evaluation reports were collected from prominent international scholars. Based on this, the Board decided to invite the following research groups to the CAS in 2011/2012:

- **Complex matter science**
headed by Professor Tom Henning Johansen, UiO
- **Time is space: Unconscious models and conscious acts**
headed by professors Laura A. Janda and Tore Nessel, UiT
- **Cognition in aging – contributions of cognitive neuroscience and cognitive neurogenetics**
headed by Professor Ivar Reinvang, UiO

The selection process for 2012/2013 was initiated in autumn 2009. The Centre received a total of 18 nominations, 13 of which were passed on to the second round.

6. Financial affairs

6.1 The Centre for Advanced Study

State allocations to the Centre for 2009 totalled MNOK 16.08, an increase from the previous year of NOK 680 000, or 4.42 per cent. The increase compensated somewhat for inflation and wage adjustments, but the total allocation is still below the level the Bjørge Committee recommended for CAS in the evaluation report from 1999 that compared CAS with its foreign sister organisations.

The Centre has made MNOK 3.3 available to each of the three research groups. The amount is intended to cover general project costs, grants and buying foreign researchers out of their duties, as well as accommodation, travel, conference and seminar expenses. Inasmuch as the common overheads for operations, maintenance, rental for researcher flats and social initiatives are on the rise, the allocations need to be raised in order to maintain the subsidies for each group at the current level.

The available resources have been too limited for a larger number of leading international researchers to be brought to Norway, which is one explicit goal. To enable the Centre to buy out the services of highly sought-after researchers from abroad for long-term research stays, each project group would require about NOK 700 000 more than the current allocation. In other words, in the long term, each group should have a budget of about MNOK 4.

As in previous years, the university agreements represent considerable additional funding, since visiting researchers from the Norwegian universities, the Norwegian School of Economics and Business Administration, and the Norwegian School of Management BI are paid by their respective home institutions while at CAS. In 2009, this supplementary funding represented about 8.6 full-time equivalents (FTEs), an increase of 2.2 FTEs from last year. Working at CAS is considered an extraordinary sabbatical for the individual researcher.

The Centre's Income Statement for 2009 shows an operating deficit of NOK -122 403. The budget for 2009 was set up with a budget deficit of NOK -540 000.

The Balance Sheet shows a balance of NOK 2 657 742. Of this amount, NOK 2 216 655 is short-term debt. In 2009, NOK 300 000 was transferred from the Operating Fund at the Centre for Advanced Study to the Centre for Advanced Study.

The accounts for 2009 have been prepared on the going concern assumption. In the view of the Board, the annual financial statements presented give a fair indication of the development and results of the activities at the Centre for Advanced Study as at 31 December 2009. The accounts have been audited by the auditing company Nitschke A/S.

6.2 The Operating Fund at the Centre for Advanced Study

In response to a request from the Ministry, in 1993 an Operating Fund was established to ensure the long-term operation of the Centre. CAS signs binding agreements for periods of up to three

years, and the Operating Fund was established as a kind of insurance to complement these long-term commitments. The fund is administrated by the Board of the Centre.

The Operating Fund consists of basic capital, which is inviolable, and disposable funds. In 2009, NOK 300 000 was transferred from the Operating Fund to the Centre for Advanced Study. Net interest income came to NOK 531 425, and the difference was added to the Fund, bringing the Operating Fund's aggregate capital at year end to NOK 17 866 056.

The internal accounts for 2009 have been prepared on the basis of the going concern assumption. In the view of the Board, the annual financial statements submitted give a fair indication of the development and results of the activities of the Operating Fund at the Centre for Advanced Study at 31 December 2009. The accounts have been audited by the auditing company Nitschke A/S.

The Operating Fund has no employees. The activities do not pollute the outdoor environment.

7. Results

7.1 Research activities

Research activities at the Centre were highly satisfactory during the year under review. The groups have taken maximal advantage of the available resources and given very favourable feedback on their stay and working opportunities at CAS.

In 2009, 71 scholars worked on the Centre's six projects. Of that number, 37 had longer stays at the Centre. There has been a significant international element. Altogether, 29 research institutions from 13 countries (Sweden, Finland, Great Britain, Germany, Italy, France, the USA, Austria, Brazil, Spain, Japan, Iceland and China) have been involved in the research projects at CAS. The Centre was the working place for 11 PhD students and post-doc fellows. What is more, a large number of outside scholars participated in conferences and seminars.

Conferences/workshops with broad national and international participation are a natural part of the academic activities of all groups. In 2009, the Centre organised 11 conferences/workshops of this type. Weekly in-house working seminars, often featuring invited guests, have also been part of the groups' routine activities. Several of the groups have also planned follow-up seminars after they have left CAS.

A series of luncheon seminars with topics of interest for all the projects has been arranged in collaboration with the group leaders.

Conferences and the seminars are announced on the Centre's website.

7.2 The publication of research results

The external communication of research results takes place through the national and international publication channels that are relevant for each of the groups. Publication activity is generally high, reflecting the general international level of activity that CAS aspires to achieve.

The 2008/09 academic year has already resulted in a series of peer-reviewed publications in the form of international articles in journals and books. Owing to the long lead time for the printing process, it is not possible at present to provide a complete survey of the results of the work done in 2009. The reports from the three research groups in 2008/2009 indicate that the preliminary number of publications and/or works currently in process has already reached 206, including several books.

The day-to-day cooperation between Norwegian and foreign researchers, as well as the lectures delivered by the foreign guests at Norwegian universities and other academic fora, contribute to the internationalisation of Norwegian research and have a significant impact in themselves, as detailed in the group reports in this Annual Report.

All in all, it can be confirmed that activities at CAS during the year have made a significant contribution to the organisation's objectives, i.e. to raise the calibre of basic research in Norway and to contribute to the internationalisation of Norwegian research.

The scientific director(s) delivered a variety of lectures and published the results of their own research through appropriate channels.

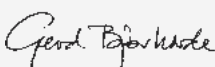
8. Objectives for 2010

- Primary objective: Work continuously to achieve an optimal working environment for the researchers affiliated with CAS
- Strive for a larger extent of long-term stays for foreign researchers
- Adapt the Centre's publication activities to the specified financial parameters:
 - The Newsletter *Glimt/Impressions* is published annually, in the autumn semester, in Norwegian and English, with print-runs of 14 500/700, respectively
 - The *Annual Report* is published in the spring semester, in English, with a print-run of 400
 - To reduce publication costs for both publications is an obvious goal for the near future
- Use CAS' website more effectively for conveying information about activities, research and communications, as well as for the publication of technical material/articles
- Set up a mirror website in Norwegian
- Devise a better system for raising the visibility of the groups' publications after they complete their stay at CAS
- Expand the Centre's IT services
- The Centre has a very small administration. Evaluate and streamline the administration's duties continuously to free up time to devote to working with the researchers on a daily basis
- Intensify contact with CAS' partners among the universities and university colleges; stay in contact with the Ministry of Education and Research and fora for science policy; be a liaison body for international sister organisations

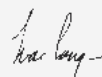
The Centre for Advanced Study,
23 February 2010



Asbjørn Kjønstad,
Chair of the Board



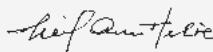
Gerd Bjørhovde,
Deputy Chair



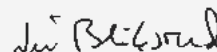
Ivar Langen



Kenneth Hugdahl



Leif Arne Heløe



Liv Blikrud

To the Board of the Foundation
Centre for Advanced Study at the Norwegian Academy of Science and Letters

AUDITORS' REPORT FOR 2009

We have audited the Annual Accounts of the Centre for Advanced Study at the Norwegian Academy of Science and Letters for 2009, which show a deficit of NOK 76 419. We have also audited the information in the Annual Report concerning the Annual Accounts, and the assumption of continued operation and the proposal for covering the deficit. The Annual Accounts comprise the profit and loss account, balance sheet and notes. The Accounts have been prepared in conformity with the Accounting Act and good auditing practice. The Annual Accounts and the Annual Report have been submitted by the Board of the Foundation. Our responsibility is to express an opinion on the annual accounts and other matters in accordance with the requirements of the Auditors Act.

We have performed our audit in conformity with the law, regulations and good auditing practice in Norway and auditing standards adopted by the Norwegian Institute of Public Accountants. The auditing standards require that we plan and conduct the audit in order to achieve a satisfactory level of certainty that the annual accounts do not contain any significantly incorrect information. The audit comprises an examination of selected parts of the evidence in support of the information in the annual accounts, an assessment of the accounting principles applied and of important accounting estimates, and an evaluation of the content and presentation of the annual accounts. To the extent required by generally accepted standards of good auditing, the audit also includes an examination of the Foundation's asset management and of its accounting and internal control systems. We believe that our audit provides a satisfactory basis for our statement.

We are of the opinion that

- the annual accounts have been presented in conformity with statute law and regulations and reflect the Foundation's financial situation on 31 December 2009 and its result for the financial year in accordance with good auditing practice in Norway.
- the administration has fulfilled its duty to ensure orderly and clear registration and documentation of information relating to the accounts in conformity with statute law and good accounting practice in Norway.
- the information in the Annual Report concerning the assumption that operations would continue is consistent with the annual accounts and is in conformity with statute law and regulations.
- the Foundation has been administrated and its allocations have been made in compliance with the law, the Foundation's objects clause and the rest of its Articles of Association.

Stabekk, 23 February 2010
NITSCHKE AS
Morten Hurum
State-authorized auditor


9. Accounts

9.1 The Centre for Advanced Study

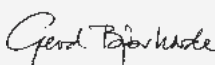
Balance at 31 december		2009	2008
ASSETS			
Cash			
Cash, bank deposits etc.	(Note 4)	2 657 742	2 188 824
Total cash		2 657 742	2 188 824
Total assets		2 657 742	2 188 824
LIABILITIES AND CAPITAL AND RESERVES			
Capital and reserves			
Basic capital	(Note 5)	120 800	119 600
Capital account		320 287	397 906
Total capital and reserves		441 087	517 506
Short-term liabilities			
Payable to the Norwegian Academy of Science and Letters		100 000	100 000
Payable tax deductions, National Insurance contributions, holiday pay etc.		511 979	446 785
Other short-term liabilities	(Note 6)	1 604 676	1 124 533
Total short-term liabilities		2 216 655	1 671 318
Total liabilities and capital and reserves		2 657 742	2 188 824

Oslo 23 February 2010

Board of the Centre for Advanced Study



Asbjørn Kjønstad,
Chair of the Board



Gerd Bjørhovde,
Deputy Chair




Ivar Langen



Kenneth Hugdahl



Leif Arne Heløe



Liv Blikrud

9.1 The Centre for Advanced Study

PROFIT AND LOSS ACCOUNT	2009	2008
Income from operations		
State grant from Ministry of Education and Research	16 080 000	15 400 000
Grant from the Operating Fund	300 000	0
Total income from operations	16 380 000	15 400 000
Operating expenses		
Expenses relating to research fellows (Note 1)	9 432 199	10 244 654
Salaries, fees etc. (Note 2)	2 944 956	2 959 122
Office furniture, furnishings, computer equipment	187 243	348 747
Other operating expenses (Note 3)	3 938 005	3 763 856
Total operating expenses	16 502 403	17 316 379
Operating result	-122 403	-1 916 379

FINANCIAL INCOME AND FINANCIAL EXPENDITURE

Income from interest	67 522	240 658
Bank charges	21 539	24 188
Net financial income	45 983	216 470
Annual balance	-76 419	-1 699 909
which is to be allocated as follows:		
To the Basic capital	1 200	1 200
To/(from) the Capital account	-77 619	-1 701 109

9.1 The Centre for Advanced Study

Accounting principles

The Accounts have been set out in conformity with the Accounting Act and good accounting practice. Cash and short-term liabilities normally include items falling due within one year. Pension premiums are linked to the employer's share of the premium payable to the Public Service Pension Fund. The enterprise is required to have a service pension scheme under the Act relating to Obligatory Company Pensions; the enterprise has a pension plan that meets the requirements of this Act.

Notes on the Accounts	2009	2008
Note 1 Expenses relating to research fellows		
Fellowships etc., researchers	3 376 502	5 041 122
Rent for researchers' flats	2 449 422	2 210 564
Travel expenses	704 727	666 681
Publications, printing, equipment	765 655	495 510
Seminars/Workshops	1 849 560	1 673 187
Miscellaneous expenses research groups	286 334	157 590
Total	9 432 199	10 244 654
Note 2 Salaries/fees		
Salaries/holiday pay	2 262 259	2 136 011
Pension premiums	255 570	242 853
National Insurance Contributions	355 378	335 773
Manpower services	0	191 911
Auditors' fees	58 125	38 125
Social expenditure	13 624	14 450
Total	2 944 956	2 959 122

The Centre's administration constitutes four full-time equivalents

The Centre for Advanced Study has a pension scheme that satisfies the requirements for mandatory service pension insurance

The directors were paid a salary of NOK 836.457

The sum of NOK 40.000 was paid out as remuneration to the Chairman of the Board

Auditing expenses cover in their entirety auditing services

9.1 The Centre for Advanced Study

Notes on the Accounts cont.	2009	2008
Note 3 Other operating expenses		
Lighting, heating, cleaning, rent, insurance, security	1 033 383	989 533
Telephone, fax, postage	137 393	216 660
Equipment, copying, computing	782 378	603 161
Books, library service, printing	824 695	904 613
Operating equipment, maintenance	87 182	94 822
Running the canteen, social measures and representation	585 446	529 893
Travel expenses	65 089	75 093
Miscellaneous expenditure	422 439	350 082
Total	3 938 005	3 763 856

Note 4 Bank deposits

Of the bank deposits entered in the books, the sum of NOK 252 940 represents withheld tax deductions

Specification of bank deposits on 31.12.:

DnB NOR, account 8200.01.17044	NOK	252 940	246 529
DnB NOR, account 1607.83.68385	NOK	2 373 958	1 917 401
DnB NOR, account 1644.14.60264	NOK	5 070	4 968
DnB NOR, account 8210.04.35809	NOK	1 386	1 676
Total bank deposits	NOK	2 633 355	2 170 574
Cash balance 31.12.	NOK	24 387	18 250
Total cash, bank etc.	NOK	2 657 742	2 188 824

Note 5 Basic Capital

10% of a calculated yield on the Basic capital throughout the year is allocated to the Basic capital.

Note 6 Other short-term liabilities

This entry consists of items with a time limit at the end of the year.

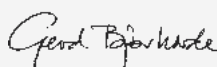
9.2 The Operating Fund at the Centre for Advanced Study

Balance at 31 December	2009	2008
ASSETS		
Cash		
Short-term claim	0	279 595
Bank deposit (Note 1)	17 866 056	17 355 036
Total cash	17 866 056	17 634 631
Total assets	17 866 056	17 634 631
 LIABILITIES AND CAPITAL AND RESERVES		
Capital and reserves		
Basic capital (Note 2)	1 528 010	1 474 810
Disposable funds	16 338 046	16 159 821
Total capital and reserves	17 866 056	17 634 631
Total liabilities and capital and reserves	17 866 056	17 634 631

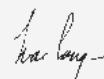
Oslo 23 February 2010
Board of the Centre for Advanced Study



Asbjørn Kjønstad,
Chair of the Board



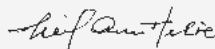
Gerd Bjørhovde,
Deputy Chair



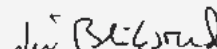
Ivar Langen



Kenneth Hugdahl



Leif Arne Heløe



Liv Blikrud

9.2 The Operating Fund at the Centre for Advanced Study

PROFIT AND LOSS ACCOUNT	2009	2008
Income		
Income from interest	531 425	1 031 679
Expenses		
Allocation	-300 000	
Annual balance	231 425	1 031 679
which it is proposed to allocate as follows:		
To the basic capital	53 200	103 200
To disposable funds	178 225	928 479
	231 425	1 031 679

Notes on the Accounts for the period ending 31 December 2009

The accounts have been prepared in compliance with the Norwegian Accounting Act and generally accepted Norwegian accounting practices for small businesses. The enterprise is not required to have a service pension scheme under the Act relating to Obligatory Company Pensions since it has no employees.

Note 1 Bank deposit

Specification of bank deposit for the period ending 31 December 2009:

DnBNOR, account 5076.09.13577	0	17 123 751
DnBNOR, account 8200.06.22903, balance	17 866 056	231 285
Total	17 866 056	17 355 036

Note 2 Basic capital

The Basic capital has increased by 10 per cent of the annual yield.

To the Board of the Operating Fund
Centre for Advanced Study

AUDITORS' REPORT FOR 2009

We have audited the Annual Accounts of the Operating Fund of the Centre for Advanced Study for 2009, which show a surplus of NOK 231 425. We have also audited the information in the Annual Report concerning the Annual Accounts, and the assumption of continued operation. The Annual Accounts comprise the profit and loss account, balance sheet and notes. The Accounts have been prepared in conformity with the Accounting Act and good auditing practice. The Annual Accounts and the Annual Report have been submitted by the Board of Operating Fund. Our responsibility is to express an opinion on the annual accounts and other matters in accordance with the requirements of the Auditors Act.

We have performed our audit in conformity with the law, regulations and good auditing practice in Norway and auditing standards adopted by the Norwegian Institute of Public Accountants. The auditing standards require that we plan and conduct the audit in order to achieve a satisfactory level of certainty that the annual accounts do not contain any significantly incorrect information. The audit comprises an examination of selected parts of the evidence in support of the information in the annual accounts, an assessment of the accounting principles applied and of important accounting estimates, and an evaluation of the content and presentation of the annual accounts. To the extent required by generally accepted standards of good auditing, the audit also includes an examination of the Operating Fund's asset management and of its accounting and internal control systems. We believe that our audit provides a satisfactory basis for our statement.

We are of the opinion that

- the annual accounts have been presented in conformity with statute law and regulations and reflect the Operating Fund's financial situation on 31 December 2009 and its result for the financial year in accordance with good auditing practice in Norway.
- the administration has fulfilled its duty to ensure orderly and clear registration and documentation of information relating to the accounts in conformity with statute law and good accounting practice in Norway.
- the information in the Annual Report concerning the assumption that operations would continue is consistent with the annual accounts and is in conformity with statute law and regulations.
- the Foundation has been administrated and its allocations have been made in compliance with the law, the Foundation's objects clause and the rest of its Articles of Association

Stabekk, 23 February 2010
NITSCHKE AS
Morten Hurum
State-authorized auditor

Opening Ceremony 2009

September 1st the opening of the 18th academic year of the Centre for Advanced Study took place on the premises of the Norwegian Academy of Science and Letters, Drammensveien 78. The same evening the Centre hosted a welcoming dinner for this year's fellows at CAS.



1

1. Professor Eivin Røskaft, NTNU Trondheim held the lecture: "Coevolutionary Interactions and Adaptations in a Metapopulation Context"





3. Group leaders 2009/2010:
From left: Professors Geir Ulfstein, Øivind
Andersen, Eyjólfur Kjalar Emilsson, Eivin
Røskaft and Andreas Føllesdal



2 Reception in the Academy's Tapestry Room

Day-trip to the Mjøsa region, June 2009



Left: CAS research fellows of 2008/2009 on a guided tour of Maihaugen at Lillehammer

Below: Trip with the paddle steamer Skibladner from Lillehammer to Gjøvik. Here with Professor Helge Holden (NTNU) at the helm

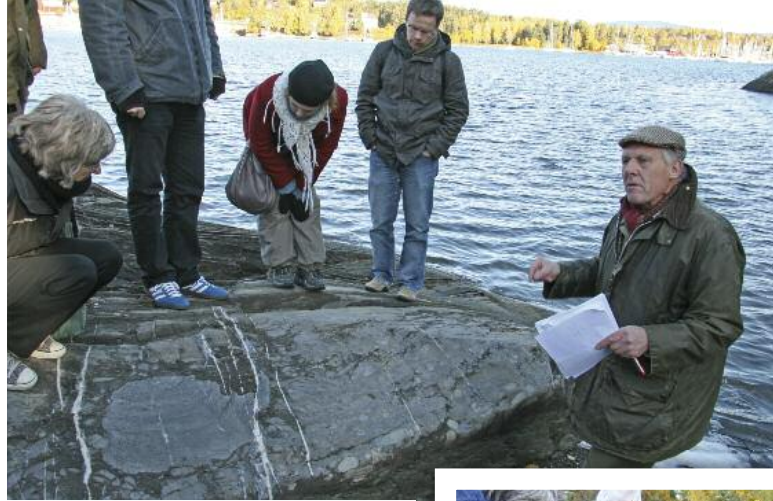


Traditional Japanese Tea Ceremony



A traditional Japanese tea ceremony was performed by Chiho Kaito, a Master student from Nara Women's University in Japan, visiting the CAS biology research group 2009/2010

Geological excursion, October 2009



Professor emeritus David L. Bruton gave an introduction to the geology of the Oslo area. Here describing the fossiliferous deposits at Kalvøya

CAS research fellows of 2009/2010 searching for fossils



The Rugosa (horn corals) were an important group of Paleozoic organisms

10. Nonlinear partial differential equations

Report by Helge Holden & Kenneth H. Karlsen
Group Leaders 2008/2009
September 1 2009

10.1 General description

Differential equations have their origin in the quest to describe nature by mathematics, and these equations are perfect tools to describe physical phenomena that vary in space and time. In fact, all the fundamental laws of nature are given by differential equations (Newton's law describes gravitation, Maxwell's equations describe electromagnetism, Navier–Stokes' equations describe fluid flow, etc). Thus they model a wide variety of phenomena, and have been extensively studied by mathematicians, physicists, engineers, and others. Differential equations constitute a core mathematical discipline, cf. the Abel Prize 2005. However, several key questions have not been answered, or only been partly answered. Central issues are:

- Do the equations have a solution? It is still not known if the equations that describe the flow of air around an airplane have a solution.
- Given that the equation has a solution, is it unique? For flow of oil in petroleum reservoirs the equations give several possible distinct values for the saturation at the same point in space.
- Is the solution stable? Will a small change in one place in space have dramatic consequences in a completely different location (“the butterfly effect”).
- If the equation has a unique and stable solution, how can one determine the solution? Given the measured weather data for today, how can one predict the weather for tomorrow?

Variations of these questions for carefully selected nonlinear partial differential equations constituted the focus for the research program, in particular the interplay between theoretical results (mathematical properties of the solution) and numerical computations (how to compute the solution). Differential equations have been an intensive research area in mathematics in Norway the last two decades, and there are now strong research groups in Oslo, Trondheim, and Bergen. The research program further reinforced the strong national activities.

During the program two workshops have been organized; one in August 2008 focusing on analytic results, and the second one in May 2009 with emphasis on numerical methods. In addition there will be a high level international conference organized in the form of an Abel Symposium in September-October 2010. This will in part serve as a follow-up event of the present program. Details about all these events are described below.

10.2 Participants

1. Debora Amadori [Università degli Studi dell'Aquila, Italy]
2. Boris Andreianov [Universite de Franche-Comte, France]
3. Yann Brenier [Universite de Nice-Sophia-Antipolis, France]
4. Alberto Bressan [Penn State University, US]
5. José A. Carrillo [Universitat Autònoma de Barcelona, Spain]
6. Gui-Qiang Chen [Northwestern University, US]
7. Giuseppe Maria Coclite [Università degli Studi di Bari, Italy]
8. Qian Ding [Northwestern University, US]
9. Nadine Even [Universität Würzburg, Germany]
10. Eduard Feireisl [Academy of Sciences of the Czech Republic]
11. Hermano Frid [IMPA, Brasil]
12. Shu Gao [Northwestern University, US]
13. Fritz Gesztesy [University of Missouri, US]
14. Harald Hanche-Olsen [NTNU]
15. Helge Holden [Group Leader, NTNU]
16. Espen R. Jakobsen [NTNU]
17. Kristian Jenssen [Penn State University, US]
18. Henrik Kalisch [University of Bergen]
19. Kenneth H. Karlsen [Group Leader, UiO]
20. Trygve Karper [UiO]
21. Sergiu Klainerman [Princeton University, US]
22. Young-Sam Kwon [University of Maryland, US]
23. Philippe G. LeFloch [Université Pierre et Marie Curie, France]
24. Peter Lindqvist [NTNU]
25. Hailiang Liu [Iowa State University, US]
26. Evgenii Yu. Panov [Novgorod State University, Russia]
27. Xavier Raynaud [NTNU]
28. Nils Henrik Risebro [UiO]
29. Christian Rohde [Universität Stuttgart, Germany]
30. Hilde Sande [NTNU]
31. Sigmund Selberg [NTNU]
32. Denis Serre [Ecole Normale Supérieure de Lyon, France]
33. Wen Shen [Penn State University, US]
34. Shaowei Su [Northwestern University, US]
35. Eitan Tadmor [University of Maryland, US]
36. Gerald Teschl [University of Vienna, Austria]

37. John Towers [MiraCosta College – San Diego, US]
38. Konstantina Trivisa [University of Maryland, US]
39. Zhaoyang Yin [Zhongshan University, China]

10.3 Symposia, conferences

August 20 – 22, 2008: Workshop on Nonlinear Waves and Hyperbolic Equations

Understanding properties of nonlinear partial differential equations modeling nonlinear wave phenomena is a fundamental challenge in pure and applied mathematics. In recent years the field has seen many advances in theory, numerics and applications. Long-established open problems have been successfully handled with new techniques, and new phenomena and models have been discovered. The workshop brought together leading experts in an informal setting presenting current trends in the field, relevant to the CAS program. Themes included hyperbolic conservation laws, free boundary problems, transport equations, wave equations, Camassa-Holm and related equations, and compressible fluid flow.

Speakers: • François Bouchut (Paris) • Alberto Bressan (State College) • Gui-Qiang Chen (Evanston) • Constantine M. Dafermos (Providence) • Maria J. Esteban (Paris) • Camillo De Lellis (Zürich) • Mikhail Feldman (Wisconsin) • Sergiu Klainerman (Princeton) • Peter Lindqvist (Trondheim) • Tai-Ping Liu (Stanford) • Benoit Perthame (Paris) • Wen Shen (State College) • Monica Torres (West Lafayette) • Ragnar Winther (Oslo)

The workshop was in part supported by the Center of Mathematics for Applications of the University of Oslo.

May 26 – 27, 2009: Workshop on Numerical Aspects of Nonlinear PDEs of Hyperbolic Type

Nonlinear partial differential equations (PDEs) of hyperbolic type are of fundamental importance in science and engineering, including fluid dynamics, acoustics, elastodynamics, geophysics, astrophysics, and many other disciplines. Closed form solutions are not available and numerical methods (finite difference, finite volume, finite element, etc.) have to be applied. The field of analysis and justification of numerical methods (stability, compactness and convergence, a priori or a posteriori error estimates, etc.), which often requires the use of sophisticated mathematics, has seen many advances in recent years. Besides providing a rigorous foundation, at least in the context of simplified model PDEs, the involved mathematical analysis tends to suggest design principles for constructing

stable and powerful computational techniques for complex problems arising in realistic applications, for which rigorous analysis is out of reach. The workshop brought together experts and junior researchers discussing new trends and activities in numerical analysis, algorithms and applications of hyperbolic and related PDEs, all of which were highly relevant to the CAS program.

Speakers: • Frédéric Coquel (Paris) • Bruno Despres (Paris) • Volker Elling (Michigan) • James Glimm (Stony Brook) • Espen Jakobsen (Trondheim) • Dietmar Kröner (Freiburg) • Peter A. Markowich (Cambridge) • Roberto Natalini (Rome) • Andreas Prohl (Tübingen) • Anders Szepessy (Stockholm) • Eitan Tadmor (Maryland) • Manuel Torrilhon (Zürich) • Gerald Warnecke (Magdeburg)

The workshop was in part supported by the Center of Mathematics for Applications of the University of Oslo.

September 28–October 1 2010: THE ABEL SYMPOSIUM 2010 on Nonlinear PDE

The scientific program will center around mathematical and numerical aspects of various classes of nonlinear partial differential equations (PDE). The symposium will bring together leading experts to learn about current trends in the field. Relevant topics include (i) nonlinear hyperbolic equations arising in fluid mechanics and general relativity, including questions of existence, uniqueness, regularity, formation of singularities, and asymptotic behaviour of solutions; (ii) nonlinear elliptic equations and variational methods with applications to mathematical physics, relativistic quantum mechanics, and quantum chemistry; (iii) construction and analysis of numerical methods for nonlinear PDE.

The organizing committee consists of Helge Holden (NTNU) and Kenneth H. Karlsen (UiO). The scientific committee consists of the following members: Alberto Bressan (Penn State University), Maria J. Esteban (Université Paris Dauphine), Sergiu Klainerman (Princeton University), Eitan Tadmor (University of Maryland).

Speakers: Luigi Ambrosio (Scuola Normale Superiore of Pisa) • Jean Bourgain (Institute for Advanced Study, Princeton, TBC) • Alberto Bressan (Penn State University) • Luis A. Caffarelli (University of Texas at Austin) • Gui-Qiang Chen (Northwestern University & University of Oxford) • Camillo De Lellis (University of Zürich) • Maria J. Esteban (Université Paris Dauphine) • Craig Evans (University of California, Berkeley) • Gerhard Huisken (Max-Planck-Institut für Gravitationsphysik, Albert-Einstein-Institut) • Carlos Kenig (University of Chicago) • Alex Kiselev (University of Wisconsin, Madison) • Sergiu Klainerman (Princeton University) • Pierre-Louis Lions (College de France) • Andrew J. Majda (Courant Institute of Mathematical Sciences) • Igor

Rodnianski (Princeton University) • Laure Saint-Raymond (École Normale Supérieure de Paris)
• Eitan Tadmor (University of Maryland) • Juan Luis Vazquez (Universidad Autónoma de Madrid)
• Cédric Villani (École Normale Supérieure de Lyon)

The Abel Symposium is organized under the auspices of the Norwegian Mathematical Society, and in part supported by the Niels Henrik Abel Memorial Fund.

10.4 Achievements and evaluation

The program at CAS has given the participants a unique opportunity to work focused and uninterrupted on difficult problems, and to strengthen collaboration with foreign colleagues and commence new partnership for joint work in the future.

Progress has been obtained along the following lines: First of all the program has provided a stimulating atmosphere to complete or considerably advance projects already initiated before the program at CAS. Examples of this include work by Jenssen and Karper on one-dimensional flow with temperature dependent transport coefficients, and the completion of the monograph by Feireisl. Another example is the work by Coclite, Karlsen, and Kwon on the Degasperis-Procesi equation. Let us also mention the work by Andreianov, Bendahmane, Karlsen, and Ouaro on well-posedness results for nonlinear degenerate parabolic equations and convergence of finite volume schemes.

Secondly, the program has given a singular opportunity to commence new projects with new collaborators. Some of the problems surfaced during the program, while some had been discussed prior to the program. Here we can mention the work of Bressan with Holden and Raynaud regarding the Lipschitz metric for the Hunter–Saxton equation. We also mention the work by Andreianov, Karlsen, and Risebro on the development of a new general theory for scalar conservation laws with discontinuous flux, and the work by Carrillo, Karper, and Trivisa on the dynamics of a fluid-particle interaction model in the bubbling regime and Chen, Ding, and Karlsen's results on multidimensional stochastic scalar conservation laws and degenerate parabolic equations.

Rather unexpected there has been interdisciplinary research completed between Chapman from group of Tvedt and Risebro of this group regarding cooperation, alliances, and competition, see references [25-27].

Finally we mention that Raynaud received a prize for young researchers from the Royal Norwegian Society for Sciences and Letters while at CAS.

The program has served as a seed for future research and collaborations that without doubt will prove to be highly fruitful in the years to come.

10.5 Publications in refereed journals and proceedings

– published, accepted for publication, submitted, and in preparation

- [1] D. Amadori and A. Corli. Global existence of BV solutions and relaxation limit for a model of multiphase reactive flow. Submitted.
- [2] D. Amadori and W. Shen. An integro-differential conservation law arising in a model of granular flow. In preparation.
- [3] D. Amadori and W. Shen. A hyperbolic model of granular flow. In H. Holden and K. H. Karlsen, editors, *Nonlinear Partial Differential Equations*, Contemp. Math. Amer. Math. Soc., to appear.
- [4] B. Andreianov, M. Bendahmane, K. Karlsen, and C. Pierre. Finite volume schemes for the macroscopic bidomain model of the heart electric activity. In H. Holden and K. H. Karlsen, editors, *Nonlinear Partial Differential Equations*, Contemp. Math. Amer. Math. Soc., to appear.
- [5] B. Andreianov, M. Bendahmane, and K. H. Karlsen. Discrete duality finite volume schemes for doubly nonlinear degenerate hyperbolic-parabolic equations. *J. Hyperbolic Differ. Equ.*, to appear.
- [6] B. Andreianov, M. Bendahmane, K. H. Karlsen, and S. Ouaro. Well-posedness results for triply nonlinear degenerate parabolic equations. *J. Differential Equations*, 247(1):277–302, 2009.
- [7] B. Andreianov, P. Goatin, and N. Seguin. Finite volume schemes for locally constrained conservation laws. Submitted.
- [8] B. Andreianov, K. H. Karlsen, and N. H. Risebro. On vanishing viscosity approximation of conservation laws with discontinuous flux. Submitted.
- [9] B. Andreianov, K. H. Karlsen, and N. H. Risebro. A theory of ϵ -dissipative solvers for scalar conservation laws with discontinuous flux. I. In preparation.
- [10] B. Andreianov, K. H. Karlsen, and N. H. Risebro. A theory of ϵ -dissipative solvers for scalar conservation laws with discontinuous flux. II. In preparation.
- [11] B. Andreianov, F. Lagoutiere, N. Seguin, and T. Takahashi. A 1D model of fluid-particle interaction. Theory and numerical analysis. I. In preparation.
- [12] B. Andreianov, F. Lagoutiere, N. Seguin, and T. Takahashi. A 1D model of fluid-particle interaction. Theory and numerical analysis. II. In preparation.
- [13] P. Athavale and E. Tadmor. Multiscale image representation using integro-differential equations. *Inverse Problems and Imaging*, to appear.

- [14] I. H. Biswas, E. R. Jakobsen, and K. H. Karlsen. Difference-quadrature schemes for non-linear degenerate parabolic integro-PDE. Submitted, 2009.
- [15] M. Bjørkavåg and H. Kalisch. Radius of analyticity and spectral convergence for the generalized KdV equation. *Communications in Nonlinear Science and Numerical Simulation*, to appear.
- [16] Y. Brenier. Hilbertian approaches to some non-linear conservation laws. In H. Holden, editor, *Nonlinear Partial Differential Equations*, Contemp. Math. Amer. Math. Soc., to appear.
- [17] A. Bressan. From optimal control to non-cooperative differential games: a homotopy approach. Submitted, 2008.
- [18] A. Bressan. Non-cooperative differential games. In W. Østrem, editor, *CAS Interdisciplinary Communications*, to appear.
- [19] A. Bressan, H. Holden, and X. Raynaud. Lipschitz metric for the Hunter–Saxton equation. Submitted, 2009.
- [20] A. Bressan and W. Shen. Measured valued solutions to a harvesting game with several players. *Annals of the International Society of Dynamic Games*, 2009.
- [21] A. Bressan and T. Wang. The minimum speed for a blocking problem on the half plane. *J. Math. Anal. Appl.*, 356:133–144, 2009.
- [22] R. Bürger, K. H. Karlsen, and J. D. Towers. On some difference schemes and entropy conditions for a class of multi-species kinematic flow models with discontinuous flux. Submitted, 2009.
- [23] R. Bürger, K. H. Karlsen, and J. D. Towers. A conservation law with discontinuous flux modelling traffic flow with abruptly changing road surface conditions. In 12th International Conference on Hyperbolic Problems: Theory, Numerics, Applications (Maryland 2008). Amer. Math. Soc., to appear.
- [24] J. A. Carrillo, T. Karper, and K. Trivisa. On the dynamics of a fluid–particle interaction model: The bubbling regime. In preparation.
- [25] J. A. Carrillo and S. Lisini. On the asymptotic behavior of the gradient flow of a polyconvex functional. In H. Holden and K. H. Karlsen, editors, *Nonlinear Partial Differential Equations*, Contemp. Math. Amer. Math. Soc., to appear.
- [26] G. Chapman and N. H. Risebro. The mathematical consequences of being the friend of your friend’s enemy. In W. Østrem, editor, *CAS Interdisciplinary Communications*, to appear.
- [27] G. Chapman and N. H. Risebro. The partitioning of networks under simultaneous cooperation and competition. In W. Østrem, editor, *CAS Interdisciplinary Communications*, to appear.
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Selected contributions described above will be published in H. Holden and K. H. Karlsen, editors, *Nonlinear Partial Differential Equations*, Contemporary Mathematics, American Mathematical Society, to appear. In addition, proceedings of the Abel Symposium 2010 will be published by Springer-Verlag.

10.6 Seminars, lectures

CAS Guest Lectures:

Fall 2008

Young-Sam Kwon: "Strong trace for conservation laws and related equations"

Yann Brennier: "L2 formulation and optimal transport tools for hyperbolic conservation laws: Part 1"

Yann Brennier: "L2 formulation and optimal transport tools for hyperbolic conservation laws: Part 2"

Konstantina Trivisa: "On the dynamics of gaseous stars"

Henrik Kalisch: "Dispersive PDE in Spaces of Analytic Functions: Theory and Applications"

Evgueni Panov: "On the strong pre-compactness property for approximate solutions of ultra-parabolic equations"

Boris Andreianov: "Auto-rheological fluids, stability of solutions of the $p(x)$ -Laplacian and numerical approximation"

Peter Lindqvist: "Sharp decay for the solutions to a quasilinear parabolic equation"

Yin Zhaoyang: "Well-posedness, blow-up phenomena, and global solutions for the b-equation"

Hailiang Liu: "Critical thresholds in Fokker-Planck equations for Polymers"

Spring 2009

John Towers: "Finite difference methods for approximating delta functions and other singularities"

Hermano Frid: "Homogenization in Ergodic Algebras with Applications to Nonlinear PDEs"

Kris Jenssen: "Conservative Systems with Given Geometry"

Hilde Sande: "The Cauchy problem for an immiscible gas flow with large data"

Christian Rohde: "Sharp and Diffuse Interface Models for Compressible Flow with Phase Transition"

Debora Amadori: "A hyperbolic model of granular flow"

Giuseppe Maria Coclite: "The initial-boundary value problem for the Degasperis-Procesi equation"

Kris Jenssen: "Multi-dimensional Symmetric Waves for Conservation Laws"

Espen Jakobsen:

Talk 1: "Convex fully-nonlinear 2nd order PDEs – error estimates for monotone schemes"

Talk 2: "Semi Lagrangian schemes for linear and fully nonlinear diffusion equations"

Harald Hanche-Olsen: "Vacuum on the highway"

Gerald Teschl: "Nonlinear steepest descent on one foot"

CAS Lecture Series:

Fall 2008

Alberto Bressan: "A New Class of Variational Problems Related to the Confinement of Wild Fires"

José A. Carrillo: "On aggregation equations in mathematical biology"

Eduard Feireisl: "Singular limits in thermodynamics of viscous fluids"

Spring 2009

Philippe G. LeFloch: "Small-scale dependent shock waves. Theory, approximation, and applications"

Gui-Qiang Chen: "Compressible Vortex Sheets/Entropy Waves and Free Boundary Problems"

Denis Serre: "Mathematics of the Chaplygin gas – Multidimensional shock waves and Riemann problems"

Eitan Tadmor:

Talk 1: "Critical Thresholds in Eulerian Dynamics"

Talk 2: "Kinetic Formulations and Regularizing Effects in Quasi-Linear PDEs"

Talk 3: "Separation and Decomposition of Scales in Signals and Images"

Talk 4: "From Particle to Kinetic and Hydrodynamic Descriptions of Flocking"

Gui-Qiang Chen:

Part I: "Degenerate Partial Differential Equations and Related Nonlinear Problems"

Part II: "Divergence-Measure Vector Fields and Entropy Solutions without Bounded Variation for Nonlinear Conservation Laws"

Fritz Gesztesy:

"Spectral theory and Weyl-type asymptotics for perturbed Krein Laplacians"

"Fredholm indices, the spectral shift function, and relative trace class perturbations"

11. Understanding the role of water in history and development

Report by Terje Tvedt
Group Leader 2008/2009
September 1 2009

11.1 General Description

On the conceptual and theoretical level the project should address the fact that the water factor has been absent both from most modern theories of development and from dominant historical explanations in general, although all societies have a hydraulic dimension. As all societies at all times and in all places have been forced to relate to water in one way or another, water is, compared to other elements in nature, a truly universal resource, at the same time as it has a unique physical character; it is always changing, varying over time from place to place and at each individual locality. This project aimed at bringing scholars from different countries and disciplines together to reflect upon, discuss and research on how this embodiment of the universal and the particular in a unique way makes freshwater availability and human control of it an important empirical aspect of all types of development processes. The project should create opportunities for conceptual and theoretical innovations of relevance to social science in general. The theoretical ambitions of the project reflected the fact that there is an extensive literature on the relationship between nature on the one hand and culture and society on the other hand, but few works on the more specific but at the same time universal relationship between water and culture or water and society.

11.2 Achievements

This project succeeded in bringing scholars from different countries and disciplines together, to reflect upon, discuss and research on the relationship between water and society and how this relationship should be analysed. This project has both helped to develop relevant concepts and theoretical models (see list of literature) and it has also produced new and important empirical explanations and studies of why some societies develop differently from other societies, analysed in a water system perspective. Through intensive interdisciplinary work, collection of data and literature, debates about concepts, theories and methods and the organisation of a number of international workshops with altogether around 70 participants from more than 20 different countries, the members of the group have been able to deepen their understanding of essential central issues related to how water and the struggle to control and use water have influenced societies.

11.3 Participants and research activities

Almost 70 researchers have participated in the project but the list below mentions only those who were based at CAS:

Professor Terje Tvedt, University of Bergen

Professor Graham Chapman, University of Lancaster

Professor Richard Coopey, University of Aberystwyth

Professor Roar Hagen, University of Tromsø

Professor Nina Witoszek, University of Oslo

Post.doc Eva Jakobsson, University of Stavanger

PhD student Karen Lykke Syse, University of Oslo

Post.doc Terje Østigård, University of Bergen

Research Assistant Armando Lamadrid, University of Bergen

Terje Tvedt (group leader), a historian and professor in Political Science and Geography, was at CAS for the entire academic year. His research focused on two main areas: 1. Conceptual and methodological issues related to the studying of nature/society relations, deconstructing the notion of “nature” as one thing, and instead employing what is called a “water system approach”, or more precise “open and multifunctional water systems”. 2. Global history has for a long time been concerned with comparing economic successes and failures of different parts of the world – most often European versus Asian regions. There is a general agreement that in the latter part of the 18th century the balance changed; Europe underwent a transformation that later enabled the Western world to become the dominant world power. But there is still a big debate on why not Eurasia, but Europe and England industrialized first. The project collected a huge amount of empirical data and literature about these issues.

Publications:

Tvedt, Terje, About the importance of Studying the Modern History of the Countries of the Nile Basin in a Nile perspective, 1-13, in Tvedt, Terje (ed), *The River Nile in the Post-colonial Age: Conflict and Cooperation in the Nile Basin Countries*, London/New York: IB Tauris, 2009.

Tvedt, Terje, Some Conceptual issues Regarding the Study of Inter-state Relationships in River Basins, 237-247, in Tvedt, Terje (ed), *The River Nile in the Post-colonial Age: Conflict and Cooperation in the Nile Basin Countries*, London/New York: IB Tauris, 2009.

Tvedt, Terje (ed), *The River Nile in the Post-colonial Age: Conflict and Cooperation in the Nile Basin Countries*, London/New York: IB Tauris, 2009.

Tvedt, Terje, Why England and not China and India? Water systems and the history of the Industrial Revolution, *Journal of Global History*, 5, 2009.

Tvedt, Terje, Water systems, environmental history and the deconstruction of nature, *Environmental History*, 2009 (in press).

- Tvedt, Terje, Bridging the gap: A Water System Approach, in Østremg, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.
- Tvedt, Terje, Geography and British Water Imperialism, in Tvedt, Terje, Chapman, Graham and Hagen, Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.
- Tvedt, Terje, *Why India and China failed and Europe succeeded. A new interpretation of global history* (book forthcoming 2011).
- Hagen, Roar, Chapman, Graham and Tvedt, Terje, Geopolitics, collective power and economic man: Water and the new world order, in Tvedt, Terje, Chapman, Graham and Hagen, Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.
- Tiki, Waktole, Oba, Gufu, and Tvedt, Terje, Reconstructing the impacts of disasters on *Tula Wells* cultural landscapes in Southern Ethiopia: ca. 1700-1960 (submitted to *Environmental History*).
- Tvedt, Terje, Chapman, Graham and Hagen, Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.
- Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.
- Tvedt, Terje and Coopey, Richard, "The 'water system'-perspective and historical explanations, in Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.
- Tvedt, Terje and Oestigaard, Terje (eds), *Ideas of Water: From Ancient Societies to the Modern World, History of Water Series II, Volume 1*, IB Tauris, New York/London 2009.
- Tvedt, Terje and Oestigaard, Terje, Nature deconstructed – a History of the Ideas of Water, in Tvedt, Terje and Oestigaard, Terje, *Ideas of Water: From Ancient Societies to the Modern World, History of Water Series II, Volume 1*, IB Tauris, New York/London 2009.

Lectures:

- Terje Tvedt: Opening address, Centre for Advanced Studies Academic Year 2008: "The way the rivers run: A 'water system' perspective on global history with a special focus on the Industrial Revolution", 3.9.2008.
- Terje Tvedt: The future of water and European Water Research, European Science Foundation, Complex Systems and Changes: Water and Life – A "Frontiers of Science", 30.10.09, A joint ESF-COST event, Taormina, Sicily, Italy, 29–31 October 2008.
- Terje Tvedt: Some theoretical perspectives on nature-society relations, 17.11.2008: The Way the Rivers Run, CAS.

- Terje Tvedt, 28.1.09: “Perspectives on the River Nile”, CAS, Luncheon Seminars.
- Terje Tvedt: The water system concept and the theoretical tradition, 30.3. 2009: “The Way the Rivers Run, River Control, Technological Development and Economic Change 1750–1900”, CAS.
- Terje Tvedt: Theoretical introduction: Geopolitics and water systems, 20.4. 2009: The Currents of Power. Water and the New World Order, Bergen.
- Terje Tvedt, 29.4.09: “The Concept of ‘Water Systems’. The Need to Bridge two Scientific Cultures” CAS, Luncheon Seminars.
- Terje Tvedt: Et vannsystemperspektiv og Skandinavisk historie, 18.5.2009, Det vannrike Norden, CAS.

Graham Chapman was at CAS for the whole year and took actively part in all the group’s activities. Chapman’s main focus of work was on the history of water in the development of South Asia. This involved library research from CAS and also one field trip to India in February 2009. The outputs from this are listed below. Additionally, within CAS Chapman cooperated with the mathematician, Professor Nils Henrik Risebro, on the mathematics of alliances, something Chapman had started while working on South Asian Geopolitics, and with the linguist Professor Lars-Gunnar Larsson using combinatorial statistical analysis to open new approaches in dialectology.

Publications:

- Chapman, Graham, *The Geopolitics of South Asia*, 3rd Edition, Ashgate, UK 2009 (final proof reading of, and construction of the index for, was undertaken in CAS. Publication occurred in March 2009 with CAS as affiliation, plus acknowledgment as Emeritus Professor at Lancaster University).
- Chapman, Graham, “Popular perception and climate change: mapping the varying experience of precipitation”, in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.
- Chapman, Graham, “Water and the British take-over of India”, in Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.
- Chapman, Graham, “The Brahmaputra and the northeast of South Asia”, in Tvedt, Terje, Chapman, Graham and Hagen Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.
- Chapman, Graham and Larsson, Lars-Gunnar, “Borderlines, chains and networks: describing Saami language variation”, in Damm, Charlotte and Jordan, Peter (eds.). In prep.

- Chapman, Graham and Risebro, Nils, "The partitioning of networks under simultaneous cooperation and competition", in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.
- Chapman, Graham and Risebro, Nils, "The Structural Evolution of Alliances", in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.
- Chapman, Graham and Risebro, Nils, "The mathematical consequences of being the friend of your friend's enemy" (in the process of submitting).
- Hagen, Roar, Chapman, Graham and Tvedt, Terje, "Geopolitics, collective power and economic man: Water and the new world order", in Tvedt, Terje, Chapman, Graham and Hagen, Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.
- Tvedt, Terje, Chapman, Graham and Hagen, Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.

Lectures:

- Graham Chapman, 17.9.08: "Coopertition: Or the simultaneous Operation of Cooperation and Competition and the Emergence of Hierarchy", CAS, Luncheon Seminars.
- Graham Chapman: "On another planet? Indian and Western perceptions of environmental change" Workshop –Politics of Adaptation to Environmental Challenges in South Asia in the 21st Century, University of Oslo, Hotel Soria Moria, November 8 2008.
- Graham Chapman, 12.11.08: "Global Variation in our normal Expectation of unusual Precipitation", CAS, Luncheon Seminars.
- Graham Chapman, 11.3.09: "The City of Victory", CAS, Luncheon Seminars.
- Graham Chapman: "Water in the development of South Asia": National Academy of Sciences, Allahabad, India. February 2009.
- Graham Chapman: "Foodprints: from the Local to the Global" University of Bergen, March 29.3.09.
- Graham Chapman: "Water as Foe, Water as Friend: Lessons from Bengal's Millennium Flood" to the South Asian Research Seminar, UIO, June 2009.
- Graham Chapman with Nils Risebro: "The Structural Evolution of Alliances" to the Norwegian Defence Research Institute, May 2009-05-14.
- Graham Chapman: "Vijayanagar: City of Victory", South Asian Research Seminar, University of Oslo.

Richard Coopey is Senior Lecturer in History at Aberystwyth University and Senior research Fellow at the London School of Economics. He has written on a wide range of topics in economic,

social and technological history. Coopey, who stayed at CAS from August to November 2008, and from February to June 2009, undertook research and writing relating to a number of projects, including the development and rationalisation of the River Severn navigation between 1780 and 1900. He also continued work on the relationship between water engineers and wider society, politics and culture. This research enhanced his work on the Birmingham water scheme of the late 19th century. In addition he worked quite closely with other colleagues in the water group at CAS, in developing new lines of research, seminar and publication, relating to the synergies between art and engineering, sparked a very useful line of research, which he is continuing to develop. Coopey played a part in organising the two conferences held by the water group, in November 2008, and in March 2009, and devoted considerable time to the organisation of papers from these conferences for the I. B. Tauris volume, which he will continue to edit.

Publications:

Coopey, Richard, "The Art of Engineering", in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.

Coopey, Richard, "The River Severn 1750–1850: Nature, Power and Rationalisation" in Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.

Coopey, Richard, "Birmingham's New river: Angling Along the River Severn, 1890–1950", in Syse, Karen and Oestigaard, Terje (eds), *Perceptions of water in the age of industrialisation*. BRIC Press, Bergen (in press).

Coopey, Richard, "Engineering Purity: Technology, Politics, Landscape and Culture in Construction of 19th Century British Water Systems" (to be submitted to *Technology and Culture*, 2010).

Coopey, Richard, "Landscape and Engineering, Art and Culture" (to be submitted, 2010. Journal undecided as yet since this is an interdisciplinary paper).

Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.

Tvedt, Terje and Coopey, Richard, "Water Systems in History: The Force of Nature", in Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.

Lectures:

Richard Coopey, "Angling and Nature: Environment, Leisure, Class and Culture in Britain 1750–1975" (with Tim Shakesheff), EHESS International Conference, Paris, September 2008.

Richard Coopey, "The Art of Engineering", CAS lunchtime seminar series, October 2008.

Richard Coopey, "Britain's River: The Economic and Cultural Impact of the Severn, 1750–1850".

Conference Paper; The Way Rivers Run: World History and Changes in the Water Landscape, CAS, November 2008.

Richard Coopey, “Modernising Aristocracy: Landed Interests and Industrial development on the River severn 1750–1900”, Conference Paper, The Way Rivers Run: Control, Technological Development and Economic change 1750, CAS, March 2009.

Roar Hagen was at CAS the whole year and took actively part in the group’s activities. Roar Hagen’s research topic was on the relation between collective power and water. The approach was mainly theoretical dealing with the question of how a concept of collective power may contribute to understanding the role of water in society, and vice versa how the study of water in history and social development might enlighten the concept of collective power and contribute to a general theory of the rational aspects of collective action. The project continues and the main publications on the concept of collective power and collective action are yet to come. Hagen took part in the preparations for the conference “The Currents of Power. Water and the New World Order” organized by the water group together with the Nile Basin research Program, University of Bergen March 2009. Considerable time is used co-editing papers from this conference for the I. B. Tauris volume *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010

Publications:

Hagen, Roar, “Collective power: Reception and prospect of a scientific concept”, in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.

Hagen, Roar, “Luhmann on collective power: What does it mean – collectively binding?” To be published in a Nordic anthology.

Hagen, Roar, Chapman, Graham and Tvedt, Terje, “Water and the new world order. Geopolitics, collective power and economic man”, in Tvedt, Terje, Chapman, Graham and Hagen, Roar (eds), *History of Water Series II, Volume 3: Water and Geopolitics in the New World Order*, IB Tauris, New York/London 2010.

Co-editor *Geopolitics, Water and the New World Order*, vol. VI, in *A History of Water*, London/New York: IB Tauris.

Lectures:

Roar Hagen, 15.10.08: “May Power be a good Thing? Collective Power: Scientific Reception and Prospects of a Concept”, CAS Luncheon Seminars.

Roar Hagen, “Luhmann on collective power: What does it mean – collectively binding?” Plenary lecture at the Nordic conference: Luhmann og makt: samfunn, organisasjon og interaksjon.

1. desember 2008, Universitetet i Bergen, Gruppe for sosialfilosofi og politisk teori ved Institutt for filosofi og førstesemesterstudiet (FOF).

Roar Hagen, “Water and the new world order. Geopolitics, collective power and economic man”, Plenary lecture, *The Currents of Power: Water and the New World Order*. Bergen 20.–21.04.2009.

Eva Jakobsson was at CAS the spring semester 2009. She worked on her project ”A Swedish Water History 1200–1900” (working title) – on the water politics in Sweden 1200–1900. During her stay at CAS she concentrated on the chapters on mediaeval and early modern water history, as well as on a chapter on the regulatory system for drainage 1200–1800. Jakobsson organized together with Tvedt the CAS workshop “Det vannrike Norden” in May 2009. The workshop papers are at the moment revised to be published at a later stage (2010).

Publications:

Jakobsson, Eva, “The History of Flowing Water policy in Sweden: From Natural Flow to Industrialised Rivers”, in Tvedt, Terje and Coopey, Richard (eds), *History of Water Series II, Volume 2, Rivers and Society: From the Birth of Agriculture to Modern Times*, IB Tauris, New York/London 2010.

Jakobsson, Eva, ”Understanding Lake Vänern. Science history perspectives on Sweden’s largest lake, 1600–1900”, in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.

Jakobsson, Eva, “Industrializing a drainage basin. The Swedish-Norwegian Vänern drainage basin” (in press, 2010).

Jakobsson, Eva, “Dikning i ett vattensystemperspektiv” (eng. “Drainage in a water system perspective”) in Jakobsson, Eva and Tvedt, Terje (eds), *Det vannrike Norden* (to be published 2010).

Lectures:

Eva Jakobsson, “The History of Flowing Water policy in Sweden: From Natural Flow to Industrialised Rivers”, *The Way the Rivers Run*, CAS, Oslo, 30.3.2009.

Eva Jakobsson, “Industrialisering av elver”, Seminar; *Å skrive naturens historie: Teknologihistorie versus vitenskapshistorie*, Senter for teknologi, innovasjon og kultur (TIK), Oslo University, 16.4.2009.

Eva Jakobsson, “Vann og miljøhistorie”, Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Trondheim, 6.5.2009.

Eva Jakobsson, “Drainage in a water system perspective”, CAS Workshop *Det vannrike Norden*. 18–19.5.2009.

Eva Jakobsson, 27.5.09: “Understanding Lake Vänern. Science History Perspectives on Europe’s third largest Lake”, CAS, Luncheon Seminars.

Eva Jakobsson, “Narratives about the river and the dam”, *Towards an Environmental History of Rivers: Narratives and Concepts*. First World Congress of Environmental History. Copenhagen, 4–8.8.2009.

Eva Jakobsson, “Industrializing a drainage basin. The Swedish-Norwegian Vänern drainage basin”, *International Conference on the Industrialization of Rivers*, Montreal/Trois Rivieres, Canada, 23–26.9.2009.

Armando Lamadrid worked at CAS for the whole year as a Research Assistant for the group and the group leader. He took active part in all of the group’s activities. His main responsibility was to assist the group leader in collecting literature and data. Lamadrid also contributed to the group’s research activity by presenting papers and lectures.

Publications:

Armando Lamadrid, “High Mountain Melt-down? Global Climate Change and Local Perceptions in Mustang, Nepal”, in Østreng, Willy (ed), *Transference. Interdisciplinary Communications*, Oslo: Centre for Advanced Studies, 2010. Web publication.

Lectures:

Armando Lamadrid, 17.06.09: “High Mountain Melt-down? Global Climate Change and Local Perceptions in Mustang, Nepal”, Seminar, Centre for Advanced Study, Oslo.

Armando Lamadrid, 27.06.09: “Irrigation in Medieval Valencia”, Fluid Approaches to History workshop, January 26–27, 2009, Centre for Advanced Study, Oslo.

Karen Syse stayed at CAS 50 % of her time from August 2008 to June 2009. The focus of Syse’s research in the period has been exploring how people’s perceptions of water have changed through the ages, from the perspective of the pre-industrial history of ideas. Digitalisation of books has made it possible for Syse to get a rapid overview of large bodies of text. Syse also organized a CAS workshop with the title “*Fluid approaches to history*”. The papers given in this workshop will be published as a book: Syse, K. & Oestigaard, T. (eds.). *Perceptions of water in the age of industrialisation*. BRIC Press. Bergen. Syse’s contribution is co-editing the book, a chapter in this book and writing the introduction.

Syse also defended her doctoral thesis while associated with CAS. The title of her thesis is *FROM LAND USE TO LANDSCAPE: A cultural history of conflict and consensus in Argyll 1945 – 2005*. Unipub 2009, Oslo.

Publications:

- Syse, Karen V. Lykke (2008), "Heather in Hordaland. Landscapes, Identities and Development", 2008-09-01 – 2008-09-05.
- Syse, Karen V. Lykke (2009), *From land use to landscape: A cultural history of conflict and consensus in Argyll*. Unipub forlag 2009, 277 s. Acta Humaniora (402).
- Syse, Karen V. Lykke (in press), "The river as an arena for leisure and pleasure in Early Modern England". In Syse, K. & Oestigaard, T. (eds). *Perceptions of water in the age of industrialisation*. BRIC Press. Bergen.
- Syse, K. & Oestigaard, T. (eds.). (forthcoming), *Perceptions of water in the age of industrialisation*. BRIC Press. Bergen.

Lectures:

- Syse, Karen V. Lykke. "Fluid approaches to History: The river as an arena for leisure and pleasure in Early Modern England". CAS Workshop; 2009-01-26 – 2009-01-27.
- Syse, Karen V Lykke. "The river as an arena for leisure and pleasure in Early Modern England". CAS Seminar; 2009-02-04
- Syse, Karen V. Lykke. "Botanikk, retorikk og romantikk: Landskapet som arena for konflikt og konsensus". NINA-dagan; 2009-02-10 – 2009-02-11.
- Syse, Karen V Lykke; Bjørkdahl, Kristian. "Making Meat a Mystery". The second workshop of the Nordforsk Network on Agrifood; 2009-05-07 – 2009-05-08
- Syse, Karen V. Lykke. "Methodological and theoretical challenges in the investigation of animals in cultural history". Prøveforelesning; 2009-06-18.

Nina Witoszek has been an associated scholar at CAS, working on a chapter exploring the Renaissance view of nature and humanity and its relevance for modern environmental agenda. In particular, she has focused on a case study of Leonardo da Vinci, his "hydraulic genius" and his obsession with water manifest in his art, cosmology and his work as an inventor.

Publications:

- Witoszek, Nina, "Leonardo da Vinci's heretiske kode." *Minerva*, desember 2009.
- Witoszek, Nina, "Rivers and Humans: The Civilizing Project of Leonardo da Vinci and Niccoló Machiavelli", *Journal for the Study of Religion, Nature and Culture*, spring 2010.

Lectures:

- Nina Witoszek, 3.6.09: "Leonardo da Vinci as our *Hydraulic Contemporary*: Can we learn anything from the Renaissance Ideas of Nature?" CAS, Luncheon Seminars.

Nina Witoszek: “Leonardo da Vinci Our Contemporary? The ‘Other’ Renaissance and Its Views on Religion and Progress”, Key address, at the conference “Religion, Nature and Progress” organized by the International Association for the Study of Nature, Culture and Religion, 23–26 July 2009, Amsterdam, The Netherlands.

Terje Østigård was at CAS the autumn semester 2008 and took actively part in the group’s activities, and helped to co-organize two of the group’s workshops. His research focused on the sub-project “Holy water after the reformation: The works of God or the Devil?” It focused on religious perceptions, beliefs and uses of holy water in England after the Reformation during the period ca. 1500-1800. The Reformation emphasised justification by faith alone. As opposed to the Catholic Church, water was stripped for any holiness, which involved both the water used in baptism and the water in holy wells. If these waters had any spiritual or healing qualities and powers, it became evidence of diabolic presence and the works of the Devil. Consequently, after the Reformation the church combated all kinds of magical superstition, which often was materialised in water. The beliefs in the power of holy water among the laity was an important theological battleground for the Protestant church because only God could make miracles, not idolatrous substances such as water or other ‘holy’ means, which was seen as a diabolic temptation aiming to distract the pious believer from the righteous path.

Publications:

- Oestigaard, T. 2008. The Sisters Kali and Ganga: Waters of Life and Death. In Håland, E. (ed.). *Women, Pain and Death: Rituals and Everyday Life on the Margins of Europe and Beyond*: 203–221. Cambridge Scholars Publishing, Newcastle upon Tyne.
- Oestigaard, T. 2008. Water and World Historical Processes. *The Forum on Religion and Ecology Newsletter* 2.11 (November 2008).
- Oestigaard, T. 2008. From Death to Life – The Hydrological Circle of Cosmos and Copulation. *Dhaulagiri Journal of Sociology and Anthropology* Vol.2: 121–144.
- Oestigaard, T. 2009. The Materiality of Hell. *Material Religion*.
- Oestigaard, T. 2009. The Materiality of Hell: The Christian Hell in a world Religion Context. *Material Religion*, Vol. 5, No. 3: 312–331.
- Oestigaard, T. 2009. Water. In Jenkins, W. (ed.). *Berkshire Encyclopedia of Sustainability Vol. 1: The Spirit of Sustainability*. Berkshire Oublishing LLC. Great Barrington, Massachusetts.
- Oestigaard, T. In press. The topography of holy water in England after the Reformation. In Syse, K. & Oestigaard, T. (eds). *Perceptions of water in the age of industrialisation*. BRIC Press. Bergen.
- Oestigaard, T. in prep (manus). *Holy water after the reformation: The works of God or the Devil?*
- Syse, K. & Oestigaard, T. (eds.). *Perceptions of water in the age of industrialisation*. BRIC Press. Bergen (forthcoming).

Lectures:

Terje Oestigaard, 31.10.08: “Dødens mester: krematøren og smeden i jernalderen”, (“Master of death: the cremator and the smith in the Iron Age”), Department of Archaeology, Conservation and History, University of Oslo.

Terje Oestigaard, 5.11.08: “The Rise of the Egyptian Civilization – The Pyramids and the Sun Cult in a Water Perspective”, CAS, Luncheon Seminars.

11.4 Seminars

20.3.2009: Professor **Michael Chisholm**: “The significance of navigation in the new drainage systems of the English Fens”.

23.4.2009: Professor **Erik Reinert**: “Water as Infrastructure and Factor of Production: An Approach from the History of Economic Thought and Policy”.

11.5 Excursions

19.11.2008: Rjukan/Vemork: Norwegian water power history (After Oslo Conference I).

30.3.2009: Akerselva: Guided tours along Akerselva in Oslo. Norwegian water history and industrial history (During Oslo Conference II).

1.4.2009: (During Oslo Conference III):

Boat trip on the Oslofjord with a guide from Norwegian Institute of Water Research .

22.4.2009: (after Bergen Conference):

Norway in a nutshell: The particular Norwegian interface between fresh water and salt water; rivers, glaciers and fiords.

11.6 Workshops

17–18.11.2008: **The Way the Rivers Run**

CAS/Norwegian Academy of Science and Letters.

Speakers:

Terje Tvedt: The way the Rivers Run. Some theoretical perspectives on nature-society relations.

Harvey Weiss: The development of the Euphrates/Tigris system and the Sumerian civilization; a water historical perspective.

Gregory L. Possehl: The Indus-civilization and Riverine History in Northwestern India and Pakistan.

Judith Bunbury: The development of the River Nile and the Egyptian civilization: a water historical perspective with focus on the First Intermediate Period.

Dan Penny: The Mekong river system and the end of the Angkor civilization; a water historical perspective.

Richardson B. Gil: The Great Maya Droughts.

Richard C. Hoffmann: Elemental Resources and Aquatic Ecosystems: Medieval Europeans and their Rivers.

Qiang Zhang: The history of the Yellow River and the development of China up to the 19th Century.

Fred H. Lawson: History of Nile flows and the development of Egypt up to the 19th century, from the coming of the Ottomans (1517) to the arrival of the British (1882).

Toon Bosch: History of Rhine flows and the development of the Netherlands and Germany in the 18th and early 19th centuries.

Richard Coopey: Britain's River: The Economic and Cultural Impact of the Severn, 1750–1850.

Graham Chapman: The Ganges and Indus and the development of India up to the 20th century.

26–27.1.2009: Fluid Approaches to History

The Norwegian Academy of Science and Letters.

Speakers:

Morten Stenak, senior advisor with the Heritage Agency of Denmark: Challenges in cultural heritage.

Justin Carter, an artist and lecturer in Environmental Art at Glasgow School of Art: The Molendinar Project.

Terje Østigård: The topography of holy water in England after the Reformation.

Karen Syse: From use and abuse to pleasure and leisure: Rivers in early modern England.

Jill Payne, Assistant Professor and Lecturer in Environmental History, the University of Amherst, USA: Water and 'Wilderness': the British Construction of Scotland's Wild Land before 1850.

Armando Lamadrid, Research Fellow, Water Project, CAS: Controlling the waters: The irrigation system of the Valencian Huerta.

30–31.3. 2009: The Way the Rivers Run, River Control, Technological Development and Economic Change 1750–1900

Norwegian Academy of Science and Letters. Organized in cooperation with the Nile Basin research Program, University of Bergen.

Speakers:

Terje Tvedt: The water system concept and the theoretical tradition.

Alexei Kraikovski: The rivers in the Russian history: economy, environment and culture. A case study of the Neva River.

Jose Augusto Padua: The role of the Amazon River in the 18th and 19th centuries.

Martin Reuss: Exploitation and Innovation along the Lower Mississippi, 1750–1900.

Rod Wilson: Changing river regimes: flood control and river transport in the Kanto region, Japan, 1750–1930.

Miklos Domokos: The Danube catchment and regional developments 1750–1900.

Richard Coopey: Modernising aristocracy: Landed interests and industrial development on the River Severn 1750–1900.

Jacobus De Vries: River management as a reflection of political-economic conditions in the Netherlands 1750–1900.

Christoph Bernhardt: German rivers in the 19th century – hydraulic projects and the methodological challenges of river biographies.

Michele Merger: French rivers and industrialization in the 19th century.

Leandro del Moral Ituarte: The hydraulic paradigm and the production of a new geography in Spain between the 18th and 21st centuries.

Salvatore Ciriaco: Venetian rivers after the fall of the republic. Tradition and the proof of French and Austrian hydrology.

20–21.4. 2009: The Currents of Power. Water and the New World Order

Hotel Admiral Bergen. Organized together with the Nile Basin research programme, University of Bergen.

Speakers:

Terje Tvedt: Theoretical introduction: Geopolitics and water systems.

Roar Hagen: Geopolitics, Collective power and Economic Man.

John Watebury: Is Our Conventional Theoretical Wisdom not up to the Task?

Øyvind Østerud: Geopolitics and Water: an Overview.

Mark Zeitoun: The Concepts of Hydropower and Hydrohegemony.

Rohan D'Souza: From Damming Rivers to Linking Waters: Beginning of the End of Supply-side Hydrology in India.

Graham Chapman: The Brahmaputra and the Geo-politics of India's Northeast.

Daanish Mustafa: The International and Sub-national Scales of Hydropolitics in the Indus Basin.

Jianchu Xu: Caring for Himalayan Rivers and Sharing Benefits.

Zayniddin Qaraev: Water and Power in Central Asia.

Frank Quinn: The Issue of Freshwater in Canada – US Relations.

Tadesse Kassa: The Growing Influence of the Rules of International Law on Juridical Discourses in the Nile Basin.

Todd W. Jarvis: Challenges in the Geopolitics of Groundwater: Fuzzy Boundaries, Multiple Dimensions and Scalability.

18–19.5.2009: Det vannrike Norden

CAS, Oslo

Speakers:

Terje Tvedt: Et vannsystemperspektiv og Skandinavisk historie.

Jon Nygaard, Universitetet i Oslo: “Jeg er ikke for ingenting født i fossedurens by” - Henrik Ibsen og vannveiene i Telemark.

Erland Mårald, Umeå universitet: Döda fallet och den fortsatta drömmen om en passage till Storsjön.

Brynjolv Gjerdåker, Høgskolen i Volda: Vassdragsregulering Lesja- og Siemsvatna i Lesja kommune, Nord-Gudbrandsdal, 1857–1984 – Eit utviklingsprosjekt i to etappar i norsk eitt hundreårs agrarhistorie.

Eva Jakobsson, Universitetet i Stavanger/CAS: Dikningar i ett vattensystemperspektiv.

Jörgen Lennqvist, Örebro universitet: Dikningarnas långa historia.

Kenneth Persson, Lunds Tekniska Högskola: Om drivkrafter bakom några sjösänkningar i Sverige – exempel från Näsbyholmssjön (Skåne) och Hjälmarén (Närke-Södermanland-Västmanland).

12. Early networking in Northern Fennoscandia

Report by Charlotte Brysting Damm
Group leader 2008/2009
September 1 2009

12.1 Aims and perspectives

The North has traditionally been viewed as a marginal zone whose hunting and gathering populations are often portrayed as the passive recipients of technological developments dispersing from the South via local adoption and/or population migrations.

More recently, many northern regions have been drawn into modern political states, with the result that scholarly debate has tended to reflect national research traditions which focus on the emergence of ethnic groups and identities. As a result, the present day cultural diversity of the North is understood from a categorical perspective.

Together, the shared emphasis on northern marginality and crisp group-based identities has increasingly come to obscure our understanding of the active roles played by northern communities in long-term historical transformations.

12.1.1 The Fennoscandian example

This general picture also holds true for northern Fennoscandia. Through time the northern communities here interacted with a wide variety of societies. These multicultural contacts are central to interpretations within many disciplines in the humanities and the social sciences. Nevertheless the substance, development and organisation of the networks is poorly understood, which is all the more unfortunate, as they eventually gave rise to the present, multi-cultural situation in the region. Through a number of interdisciplinary case studies the project has sought to provide an in-depth study of the processes involved in the emergence, development and changes in pre-historic and early historic networks across northern Fennoscandia.

The main emphasis has been on the period 6000 BC to 1600 AD, covering the initial contact between distinct regional groups up to the transition to reindeer herding. Some more recent linguistic data has also been employed in order to shed light on the development of linguistic diversification. Thus the focus is on the northern hunter-gatherer-fisher societies, their interaction with each other and later with neighbouring agricultural groups, which gradually developed into state societies. The main point of interest is the investigation of the dynamics of the resident groups and of the constituting processes and consequences of their active and strategic involvement in regional and interregional networks.

While more traditional studies have focused on cultural and linguistic entities, our starting point is the material and linguistic variability on different scales. By breaking down supposed entities into any number of separate connections documented in available data, we seek more detailed and nuanced insight into the substances of regional and interregional networks in order to be able to explore the motivation, processes and socio-cultural consequences of these contacts. The trajectory investigated in the project provides the background for an understanding of the modern ethnic, cultural and linguistic diversity in northern Fennoscandia.

The group members have been working on a number of different case studies, based on different types of data, but also employing a variety of theoretical and methodological approaches in order to examine networking, interaction and cultural diversity. In particular the project has explored the potentials of actor-network-theory and cultural transmission theory for analyses of constituting processes and organization of early Fennoscandian networks.

12.1.2 Interdisciplinary collaboration

The project has attempted to incorporate as many aspects of human societies as possible, rather than focus on a few selected aspects. Similarly we wanted to move beyond national boundaries and research traditions. It has therefore been necessary to gather, coordinate and analyze archaeological, historical, anthropological and linguistic data from across northern Fennoscandia, as well as comparative ethnoarchaeological and ethnohistorical data in order to implement a more truly interdisciplinary and international approach.

This interdisciplinary approach has been very successful. Several chapters in the resulting volumes will be co-authored, presenting interdisciplinary interpretations. Even more important, however, is the increased understanding of data, methods and theories in neighboring disciplines that has developed through the year. This way the project has initiated innovative research that we believe will develop in the future. As such the project has created a promising academic network, which will reach beyond the group participants.

12.2 Participants

Professor **Charlotte Damm**, Dpt. of Archaeology, University of Tromsø, Norway (group leader).
At CAS for the entire year.

Professor **Lars Forsberg**, Dpt. of Archaeology, University of Bergen, Norway. At CAS for the entire year.

Professor **Lars Ivar Hansen**, Dpt. of History, University of Tromsø, Norway. At CAS for the entire year.

Professor **Lars-Gunnar Larsson**, Dpt. of Finno-Ugric languages, University of Uppsala, Sweden. At CAS for the entire year.

Professor **Mika Lavento**, Dpt. of Archaeology, University of Helsinki, Finland. At CAS from the beginning of September to the end of May (9 months).

Senior lecturer Dr. **Peter Jordan**, Dpt. of Archaeology, University of Aberdeen, UK. At CAS from the beginning of September to the end of June (10 months).

Researcher Dr. **Janne Saarikivi**, Dpt. of Finno-Ugrian Studies, University of Helsinki, Finland. At CAS from the beginning of August to the end of January (6 months).

Ph.D.student **Anja Roth Niemi**, Dpt. of Archaeology, University of Tromsø, Norway. At CAS from the end of January to the end of May (4 months).

Dr. **Marianne Skandfer**, Dpt. of Archaeology, University of Tromsø, Norway. At CAS for April and May (2 months).

Dr. **Fredrik Hallgren**, Dpt. of Archaeology and Ancient History, University of Uppsala, Sweden. At CAS from the beginning of January to the end of March and again from the middle of May to the end of June (4 ½ months).

12.3 Academic activities

12.3.1 Pre-project workshops

Funding was obtained from the Norwegian Research Council (Samisk forskning and 'Smådriftsmidler') and the University of Tromsø (Centre for Sámi Studies and Dpt. of Archaeology) to organize three workshops during the two year period in advance of the actual CAS-year. Eight group participants (unfortunately Skandfer and Hallgren were not part of the group at this time) were able to meet once in 2006 (in Oslo) and twice in 2007 (in Tromsø and Oslo).

These workshops served as a venue for the group to get acquainted with each other, but in particular as a forum for discussing the broader theoretical and methodological issues involved in the project. Based on these discussions each participant presented ideas for case studies to be investigated. There is general consensus in the group that these workshops were extremely valuable in creating a coherent and collaborative project.

12.3.2 Kick-off seminar

An initial group seminar was held in Kirkenes, Finnmark early in September 2008. The purpose of the seminar was to present an update on available and selected data to the group members. In addition a one-day excursion to central sites in the Varanger area was organized.

12.3.3 Workshops

During the CAS-year three three-day workshops were organized. They were all located to Sem Gjestegård in Asker. For the first two workshops we purposely invited researchers whose primary fields of study lie beyond Northern Fennoscandia, as we wished to discuss the thematic issues on a more general level. In addition we hoped to extract critical, but constructive external comments on the project's central case studies. In addition to invited speakers all CAS-group members presented papers at all workshops.

Materiality, language and identities

The first seminar was held in October 2008. Invited speakers were

Dr. **John Edward Terrell**, Regenstein Curator of Pacific Anthropology, Field Museum of Natural History, Chicago, USA

Dr. **Olivier Gosselain**, Centre d'Anthropologie Culturelle, Institut de Sociologie de l'ULB, Bruxelles, Belgium

Dr. **Ilona Bausch**, Dpt. of Archaeology, University of Leiden, Netherlands

Dr. **Petri Kallio**, Department of Finno-Ugrian Studies, University of Helsinki, Finland

Interaction and networking: Theoretical and comparative perspectives

The second was held in January 2009. Invited speakers were:

Dr. **Max Friesen**, Dpt. of Anthropology, University of Toronto, Canada

Prof. **Aubrey Cannon**, Dpt. of Anthropology, McMaster University, Hamilton, Canada

Dr. **Junko Habu**, Anthropology Department, University of California, Berkeley, USA

Prof. **Thomas Widlok**, Cultural Anthropology and development studies, Radboud University Nijmegen, Netherlands

Prof. **Sarah Thomason**, Dpt. of Linguistics, University of Michigan, Ann Arbor, USA

Prof. **Juha Janhunen**, Institute for Asian and African Studies, University of Helsinki, Finland

Regional specialists

At the third workshop in April 2009 only CAS-group member presented papers. The intention was to present preliminary results to renowned colleagues, who were familiar with the data and problems at hand, in order to get an early 'peer-review' of the project. Invited discussants were:

Prof. **Hugh Beach**, Dpt. of Cultural Anthropology and Ethnology, University of Uppsala, Sweden

Prof. **Kjel Knutsson**, Dpt. of Archaeology and Ancient History, University of Uppsala, Sweden

Prof. **Håkan Rydving**, Dpt. of Archaeology, History, Cultural studies and Religion, University of Bergen, Norway

Prof. **Pekka Sammallahti**, Giellagas Institute, University of Oulu, Finland

12.3.4 International conference

An international conference '*Networks, Interaction and Emerging Identities in Fennoscandia and Beyond*' will be held in Tromsø, Norway October 13th–16th 2009. This meeting will bring together leading archaeologists, historians, ethnohistorians, antropologists, religious scientists and linguists who seek to understand the long-term history of the North from a networking perspective, focusing not on the archaeological or historical reconstruction of nominal groups and cultural boundaries, but on the changing characteristics of form, content and long-term interaction and exchange within and between northern communities.

The conference will showcase the results and approaches developed by the CAS project, but it also aims to provide scope for discussing how similar approaches might be applied to the study of hunter-gatherer communities in other geographic settings and historical contexts.

Additional funding for the conference has been granted from the University of Tromsø, the Norwegian Research Council, Kungl. Humanistiska Vetenskaps-Samfundet i Uppsala, Kungl. Vitterhets Historie och Antikvitets Akademien, Kungl. Gustav Adolfs Akademien för svensk folkkultur and Letterstedtska föreningen.

In addition to the CAS-scholars 20 researchers will present papers at the conference. The presenters come from 11 different countries and 8 different disciplines.

12.4 Publications

One outcome of the project is the initiative to launch a new book series 'Archaeology of the North'. Negotiations and peer-reviewing with Cambridge University Press is underway. This series will extend the intellectual legacy of the CAS project and its focus on northern societies. It will hopefully also serve to develop and maintain links between the many institutions working in the circumpolar north.

12.4.1 Collective volumes

The academic results of the project will be published in two collective volumes. The first will focus on the theoretical and methodological perspectives of the project and will direct itself towards a wider academic audience. Although examples will be derived from Northern Fennoscandia this volume is not predominantly meant to present the Fennoscandian material and (pre-)history.

The second volume will be in-depth presentations of the individual case studies, thus providing a trajectory of the development in networking and interaction in Fennoscandia. This volume is directed towards academics with a particular interest in the region

Volume one: (Title not decided)

Jordan & Damm (Eds)

Introduction: Networking Perspectives on Northern Hunter-Gatherers and Cultural Diversity

Charlotte Damm & Peter Jordan

Northern Hunter-Gatherer variability and culture-change

Peter Jordan

Regional Interactions among northern prehistoric hunter-fisher-gatherers

Charlotte Damm & Anja Niemi

Interacting Foragers, Farmers and 'differently organised Others': tracking the rise, causes and consequences of new forms of multi-cultural networking

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Local perspectives on innovation and dispersal of new technologies in northern foraging societies: ceramics and early metallurgy

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Reconstructing the Life-ways of Inari Sami through integration of archaeology and linguistics

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The Sami, State Subjugation and Strategic Interaction: from domination and resistance to mutual accommodation

Lars Ivar Hansen

Borderlines, chains and networks: describing Saami language variation

Lars-Gunnar Larson & Graham Chapman

Volume two: (Title not decided)

Charlotte Damm (Ed)

Introduction

Charlotte Damm

The foundations for interregional contacts 7000–3000

Charlotte Damm & Anja Niemi

The relations between hunter-gatherer societies and incipient farmers 4000–3000 BC

Fredrik Hallgren

The introduction of new technologies and their role in local transformations 2500–0.

Lars Forsberg

Emergence of Sámi identity 500 BC–300 AD

Marianne Skandfer

Identity and interaction at Inari

Mika Lavento & Janne Saarikivi

Exchange networks, demography and economy of five Sámi siidas in Torne and Kemi lappmark in the 1500's

Lars Ivar Hansen

The development and diversification of Ume Sámi

Lars-Gunnar Larsson – with contribution from Lars Forsberg

Conclusion and synthesis: the long trajectory

Charlotte Damm

12.4.2 Conference anthology

The papers from the conference '*Networks, Interaction and Emerging Identities in Fennoscandia and Beyond*' will be published in *Mémoires de la Société Finno-Ougrienne* (MSFOu) from the Finno-Ugrian Society. The volume will be edited by Charlotte Damm and Janne Saarikivi.

12.4.3 Other publications

Charlotte Damm

- Damm, C. (submitted) Approaching a complex past: entangled collective identities. In Anfinset, N., Nistad, D. and Wrigglesworth, M. (Eds.) *Regions on the Periphery of Bronze Age Northern Europe*. London, Equinox.
- Damm, C. (submitted) From entities to interaction. Replacing pots and people with networks of transmission. In Grünthal, R. (Ed.) *Proceedings from the Linguistic map of prehistoric northern Europe symposium, Rakvere Estonia*. Helsinki, Mémoires de la Société Finno-Ougrienne.
- Damm, C. (submitted) From cultural dualism to a multicultural past: perspectives on interaction and identity in Fennoscandian archaeology. In Østreg, W. (Ed.), *Transference. Interdisciplinary Communications 2008/2009*. Oslo: Centre for Advanced Study, web publication.
- Damm, C. & Forsberg, L. Fennoscandian forager-farmer contacts in prehistory. In Cummings, V., Jordan, P. and Zvelebil, M. (Eds.) *Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*. Oxford University Press. Work in progress.

Lars Forsberg

- Forsberg, L. (submitted) A consideration of the role of bifacial lithic technology in Northern Scandinavia. In Barndon, R., Engevik, A. and Øye, I. (Eds.) *Technology and Regions in a Long Time Perspective*. Mellen Press. UK.
- Forsberg, L. (submitted) The spread of new technologies in Early Fennoscandia - a view without borders. In Østreg, W. (Ed.) *Transference. Interdisciplinary Communications 2008/2009*. Oslo: Centre for Advanced Study, web publication.
- Forsberg, L. (submitted) Delving into the unknown. Ritual landscape and changing hunter-fisher lifeways in Central Norrland during the Epineolithic and Early Metal Age. In Sættersdal, E. (Ed.) *Cognition and Signification in Northern Landscapes*. UBAS International 2.
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- Hansen, L.I. "Tax, trade and diversification among the Northern Sami during the 16th century", in Østreng, W. (Ed.) *Transference. Interdisciplinary Communications 2008/2009*. Oslo: Centre for Advanced Study, web publication (7 p.). Submitted.
- Hansen, L.I. "The Arctic Dimension of 'Norgesveldet' ", (forthcoming, to be published in anthology edited by prof. Steinar Imsen, Department of History and Classical studies, Norwegian University of Science and Technology, Trondheim (23 p.).
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