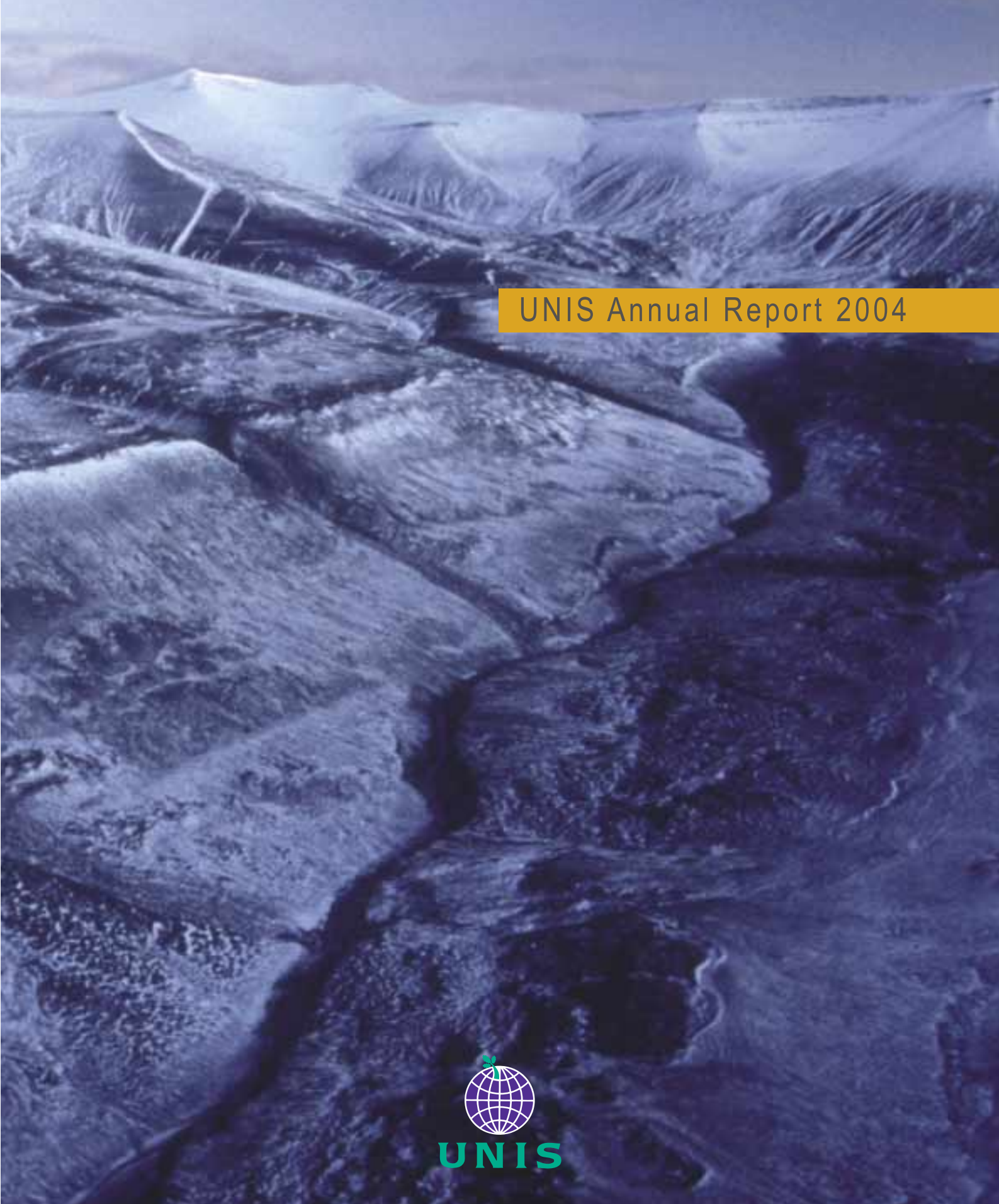
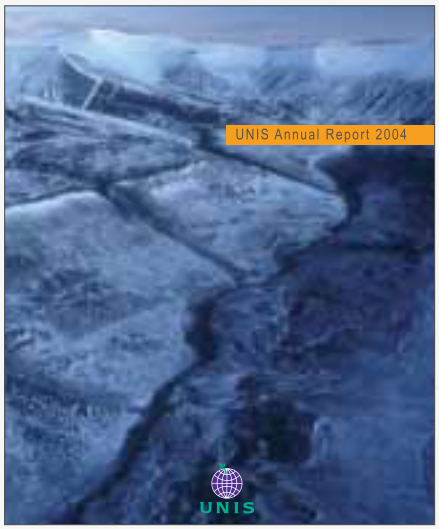


UNIS Annual Report 2004

UNIS



Magnificent autumn light after the first snowfall in Berzeliusdalen, Western Svalbard. Photo: Marta Slubowska

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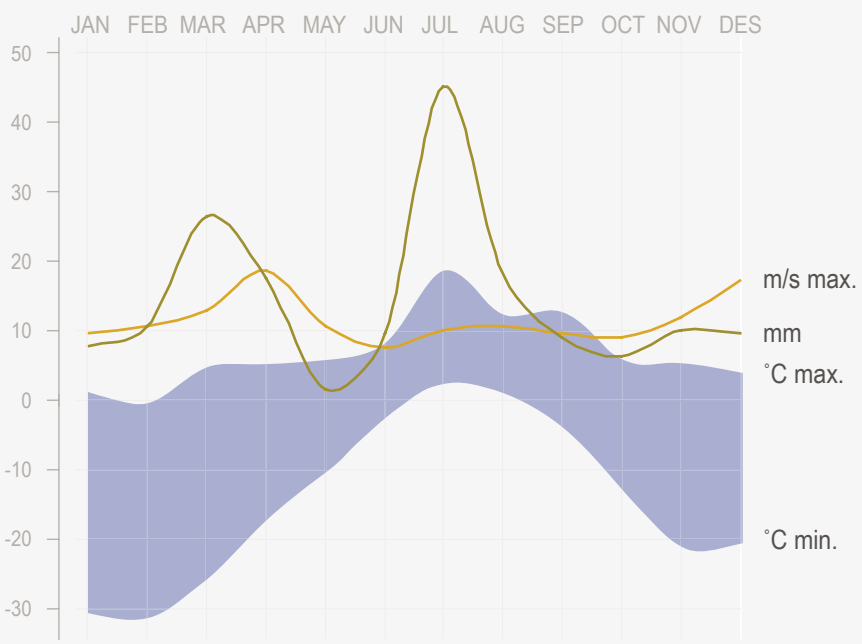
Wind, precipitation and temerature in Longyearbyen in 2004
Vind, nedbør og temperatur i Longyearbyen i 2004



A year of major challenges

Few institutions of research and higher education in Norway – or indeed anywhere else for that matter – can boast a more fairytale expansion than the University Centre in Svalbard (UNIS). Probably nobody imagined, back at the beginning in 1993, that anything like this was achievable at the North Pole. UNIS has beaten all records in proving itself an important player in its fields and is well recognised at home and also abroad. The interest from partner institutions is great and many interesting research projects are in train. The results are seen too, in the scientific production in 2004, when the numbers of articles in refereed scientific journals increased by 30 per cent.

Research at UNIS is highly diverse and great dedication is shown by researchers and supporting staff alike. In 2004 no less than 91 articles were published and many interesting discoveries were made. A team of biologists discovered mussels in Isfjorden, which may suggest a warmer climate in the water masses around Svalbard. Also, a team of geologists has discovered changes in siliceous algal communities and sediment geochemistry in several lakes on western Spitsbergen. These shifts are consistent with the predicted responses of lake ecosystems towards increased anthropogenic nitrogen deposition coupled with climate warming in recent decades. How these additive stressors may impact fragile arctic food chains will be a central issue in the future. One of our professor IIs, formerly a full-time staffer at UNIS, was rewarded in 2004 with the highly-prized ”Up-and-Coming Young Researcher of the Year” (YFF).

Students continue to stream into UNIS, and 2004 was again a record year with 299 students doing 126 years of study. A total of 24 nationalities were represented with the proportion of Norwegians at about 40 per cent. The main body of students do come from Norway and the EU, however. This is a very gratifying development and our work to increase the interest among home students will be intensified in the years ahead. Following the instigation of the national quality reform, as it was known, throughout Norway, UNIS was faced with another stern test, to adjust to the new national structure.

During Easter 2004, three of our students and another friend were reported missing on a private expedition. Despite terrible weather, they succeeded in releasing an emergency homing beacon. In the ensuing days this incident received so much attention from the media that UNIS was under virtual siege by reporters and TV crews for several days and nights. This was a new experience for us and I want to take this opportunity to praise all the staff and students who were involved in those hectic days. The incident had a happy outcome, but the experiences learned will be taken onboard in our future safety training at UNIS.

The Student Welfare organisation in Tromsø and UNIS have always worked well together and in 2004 it was decided to build a new hall of residence for students. This was wonderful news and enables us to reach our goal of 150 student years by 2008. The dormitory will be finished by autumn 2005.

The year 2004 was a very tight time for the Institution economically due to the significant deficit in 2003. A total of four courses had to be cancelled, but by year’s end the accounts were again almost 2.3 million kroner into the black.

Let me take this opportunity to thank all staff for their excellent efforts in the year now passed. Without our energetic staffers at all levels in the organisation UNIS would not be where we are today. It was my privilege to take the chair after Audhild Schanche in April, and I will extend my heartfelt thanks to her for the magnificent contribution she has made for UNIS. Taking the helm of an organisation that is already up and running is a highly pleasurable experience.

In the year ahead we must continue to shine a sharp focus on the quality of our research and education, and also begin reaping the rewards of the Svalbard Science Centre. The refurbishment of the old building and general heavy activity will present us with severe demands for flexibility and our capacity to devise solutions that will keep the wheels turning. UNIS is also all set to play a key role in the International Polar Year scheduled for 2007 and 2008.

Et år med store utfordringer

Få institusjoner innen forskning og høyere utdanning i Norge, eller noe annet sted for den saks skyld, kan vise til en mer eventyrlig utvikling enn Universitetssenteret på Svalbard (UNIS). Ingen hadde vel trodd tilbake ved oppstarten i 1993 at noe slikt var mulig å få til på Nordpolen. UNIS har i rekordfart markert seg som en viktig aktør innenfor sine fagområder og er godt kjent både nasjonalt og internasjonalt. Pågangen fra samarbeidende institusjoner er stor og mange interessante forskningsprosjekter er på gang. Dette vises også i den vitenskapelige produksjonen for 2004 hvor antall artikler i vitenskapelige tidsskrift med referee-ordning økte med 30 %.

Forskningen ved UNIS er svært mangfoldig og det legges ned en stor innsats fra forskere og støtteapparatet. I 2004 ble det publisert i alt 91 artikler og mange interessante funn ble gjort. Et team av biologer oppdaget blåskjell i Isfjorden som kan indikere et varmere klima i vannmassene rundt Svalbard. Videre har et team av geologer oppdaget endringer i sammensetningen av kiselalger og geokjemisk sammensetning i sedimenter i flere innsjøer på Vest-Spitsbergen. Slike endringer er i overensstemmelse med hvordan økosystemer i innsjøer reagerer på endringer i antropogent nitrogenopptak kombinert med klimaendringer. Hvordan dette kan påvirke den skjøre arktiske næringskjeden vil være en sentral problemstilling fremover. En av våre professor-II, som tidligere har vært ansatt i full stilling ved UNIS, fikk i 2004 en svært viktig status – "Yngere fremragende forsker - YFF".

Studentene fortsetter å strømme til UNIS og 2004 var nok et rekordår med 299 studenter tilsvarende 126 årsverk. I alt 24 nasjoner var representert og andelen av norske studenter var ca.40 %. Hovedvekten av studenter stammer imidlertid fra

Most of the construction work on the Science Centre was finished during the summer of 2004. Photo: Ketil Rønning

Norge og land innen EU. Dette er en svært gledelig utvikling og vårt arbeid med å øke den norske andelen skal forsterkes i årene som kommer. Etter at den såkalte kvalitetsreformen ble gjennomført nasjonalt har dette satt UNIS overfor nye utfordringer med tilpassing til ny nasjonal struktur.
Påsken 2004 ble tre UNIS studenter meldt savnet etter en privat tur og sammen med en kamerat utløste de en nødpeilesender i et forrykende uvær. I dagene som fulgte fikk denne saken mye oppmerksomhet i media og UNIS ble nærmest beleiret i flere døgn av journalister og TV-team. Dette var en ny erfaring for oss og jeg vil benytte anledningen til å rose alle ansatte og studenter som var involvert i disse hektiske dagene. Hendelsen fikk et lykkelig utfall, men erfaringene vil vi dra nytte av i den videre sikkerhetsopplæringen ved UNIS.

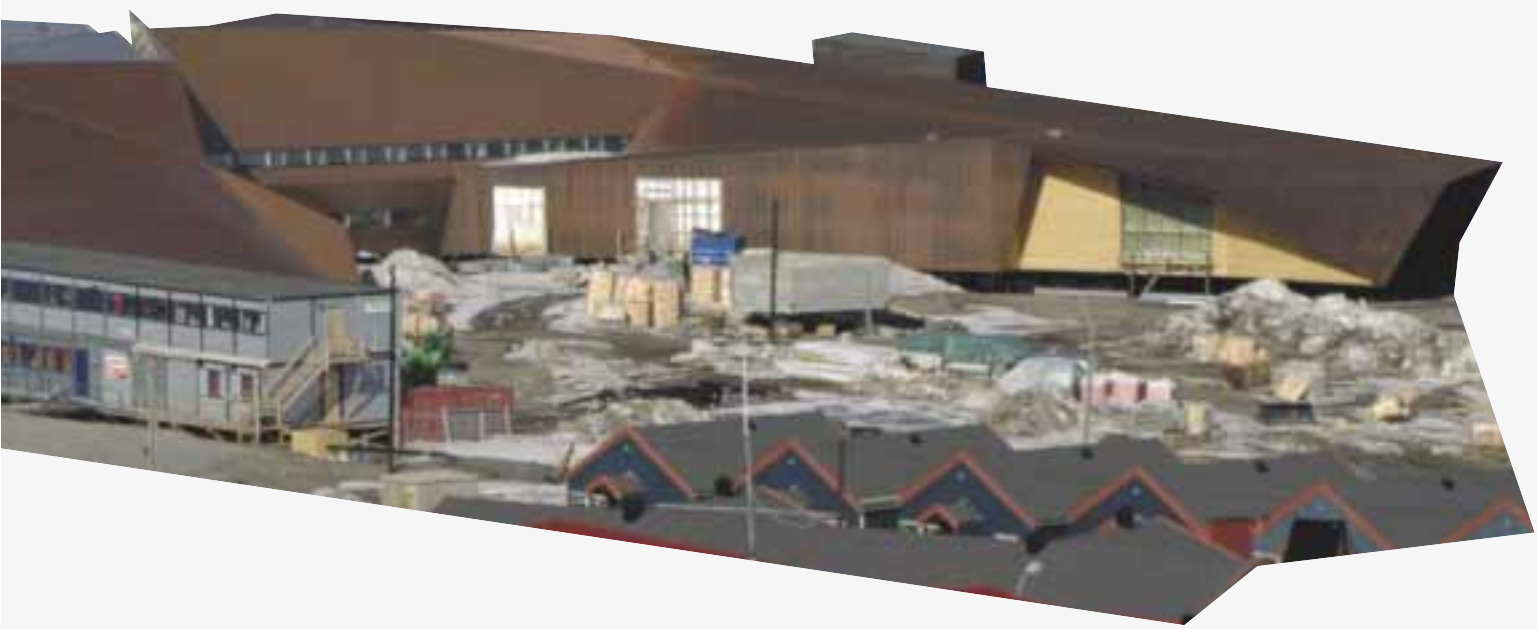
Studentsamskipnaden i Tromsø og UNIS har alltid hatt et nært samarbeid og i 2004 ble det besluttet å bygge et nytt hybelbygg for studentene. Dette er svært gledelig og gjør oss i stand til å nå målet med 150 studentårsverk i 2008. Bygningen skal stå ferdig høsten 2005.

I 2004 ble et meget stramt år økonomisk for institusjonen på grunn av et stort underskudd i 2003. I alt fire kurs ble avlyst, men ved årets utgang viste regnskapet et overskudd på nærmere 2,3 mill.kr.

Jeg vil med dette rette en takk til alle ansatte for en stor arbeidsinnsats i året som gikk. Uten energiske ansatte på alle nivå i organisasjonen kunne UNIS ikke vært der vi er i dag. Jeg overtok stolen etter Audhild Skancke i april og vil rette en stor takk til henne for det betydelige arbeidet hun har utrettet for UNIS. Det å overta en organisasjon som er på skinner er veldig bekvemt.

I året som kommer vil vi fortsatt ha stort fokus på kvalitet i forskning og utdanning samt på å ta Svalbard Forskningspark i bruk. Ombygging i "gammelbygget" og stor aktivitet generelt vil stille store krav til fleksibilitet og evne til å finne løsninger for å få hjulene til å gå rundt. UNIS vil også markere seg som en viktig aktør i det internasjonale polaråret som skal gå av stabelen i 2007 og 2008.

April 2005,
Lasse Lønnum
Direktør



Report of the Board of Directors

The University Centre in Svalbard (UNIS) was reorganised as a public limited corporation on 29th November 2002. It replaced the former University Courses on Svalbard, also known as UNIS, which was a foundation established by the Norwegian University of Science and Technology in Trondheim, the University of Bergen, the University of Oslo, and the University of Tromsø, in 1994.

The objects of the present corporation are to provide study alternatives and engage in research based on the unique geographical location of Svalbard in the high Arctic, and the special advantages this confers by making use of the environment as a laboratory and observation arena, and for the collection and analysis of data. The educational offerings at university level function as a supplement to the tuition given at Norway's mainland universities. Courses are part of the regular study path leading to the various degrees of bachelor, masters, and PhD.

The range of courses offered in 2004 matched the curriculum in 2003 although the number of students has never been higher. Research activities were also high, as is reflected in the increased level of external grants, initiations of and participation in projects, and the numbers of scientific papers.

DEVELOPMENT OF STUDIES PROGRAMME

The studies offered at UNIS are international in profile and all tuition takes place in English.

UNIS offers four lines of study: Arctic Biology, Arctic Geology, Arctic Geophysics, and Arctic Technology. In 2004 the range of studies in the four lines was consolidated. Tuition was offered in 39 subjects, including a course on the History of Svalbard. Twenty courses were at masters and doctoral level.

Students at UNIS achieve good results and there is a less than 1 per cent failure rate in the degree awards. Semester students averaged 32.5 credits with a failure rate of roughly 1 per cent. Until 2008 UNIS intends to develop activities with a special focus on masters and doctorates. At the same time it is important to maintain the quality of offerings at the ordinary degree level.

UNIS is an active partner in The University of the Arctic (Uarctic) and is responsible for coordinating the Field School activity.

STUDENT BODY

There were 299 students either taking tuition in the year or working on their masters or doctoral degrees. This is equivalent to 126 student years worked. The number breaks down to 62 student years on a lower degree, 32 on a masters and doctoral courses, and 32 on masters and doctoral theses.

UNIS boasts a high complement of international students and this student category accounted for 62 per cent of the student body. About half the international students came from the Scandinavian countries with 24 nationalities being represented all told. The proportion of female students in the Institution overall was roughly 46 per cent in 2004.

RESEARCH ACTIVITY

In 2004 UNIS had 47 students doing work on their masters thesis in association with UNIS and 31 students registered at UNIS doing doctoral theses. The programmes are a partnership with another university in Norway or abroad. The students are appointed a tutor at UNIS and also have their own tutor at the home university.

During 2004 there were 17 masters degree students doing their thesis at UNIS, and two doctoral candidates were graduated. Development and continuation of research partnerships with Norwegian universities and other Norwegian and international research institutes is one of our priorities at UNIS. In 2004 UNIS staff authored or coauthored 91 publications under referee schemes, representing an increase of 30 per cent over 2004.

The Directors are highly satisfied with this positive development. Several of our research fellows are central figures in EU projects and several projects are funded, or partially funded, by the Norwegian Research Council. In 2004 three new adjunct professor positions were provided in conjunction with the Norwegian Polar Research Institute.

OTHER ACTIVITIES

The Directors consider it vital to continue to work actively to promote UNIS. In January-February the so-called "Svalbard Seminar" was held in conjunction with the Norwegian Polar Research Institute and the Governor of Svalbard. Patronage was high, as always. UNIS draws many technical conferences and seminars and in 2004 nine such gatherings were held, four with international participation, including a NATO seminar involving 60 delegates and 11 ministers of education from the European Union. Many other presentations were also given for visiting groups from Norway and abroad.

One means of communicating our research results is via a webbased publication series. In order to ensure optimal promotion of research in the new Science Centre, UNIS is providing planning input for the new exhibition at the museum.

ORGANISATION

UNIS is organised into four academic departments, a technical department, and an administrative department. The department heads and the Managing Director together make up the Executive Committee. The academic committees for each line of study meet with their representatives from the universities once a year and act as the consultative body for the departments.

STAFF DETAILS

As of 31st December 2004 the Institute retained an scientific staff of 15 persons in full-time positions plus 18 professor IIs and research assistant IIs. The technical staff of nine and administrative staff of ten made up the rest. UNIS also has six externally funded positions.

The Directors have noted that the proportion of women in these associate positions is lamentably low, a fact that replicates the state of the employment market ten years ago. The Directors intend to address this problem in the future. Despite this aberration however, UNIS generally features a high proportion of women in the bachelor and masters courses, and indeed among scholarship holders.

The breakdown by gender is as follows:

	Women	Men	Total	Working years
Administration	6	4	10	8.5
Technical department	2	7	9	9
Scientific staff	3	12	15	15
Associate positions	1	17	18	3.6
Externally funded	5	1	6	6

UNIS BUILDING, ACCOMMODATION, STUDENT ROOMS

The UNIS building was completed in 1995 and contains laboratories, classrooms, a large auditorium, library, canteen, 30 offices and reading alcoves for 100 students. For many years there has been a great shortage of space in the laboratories and staff offices, and for visiting lecturers, visiting research scholars and our scholarship holders. This situation will persist until UNIS can move into the new Science Centre in November 2005.

At year's end 2004 UNIS organised 29 family residences and ten apartments for staff. With the increase in research activity the Directors see an obvious need to allocate funds for residential investment.

The Student Welfare organisation in Tromsø (SiTø) is responsible for the rooms that UNIS students use and has renovated four old miners' dormitories in Nybyen, bringing the total now to 120 rooms. SiTø has long been planning a new block of student rooms in Nybyen and when this project materialises the total accommodation available to students will be 144 rooms.

It is absolutely vital for UNIS's activities that students are accommodated with satisfactory living conditions. The Directors are therefore determined to continue the good cooperation we have always enjoyed SiTø.

FINANCES AND FUNDING

The funds for operation and investments available to UNIS are allocated through the Ministry of Education and Research's budget. In 2004 the grant totalled 44,649,000 Norwegian kroner, of which kr 43,562,904 was spent on operations. The 2004 accounts show that 42.7 per cent of goods and services were purchased locally. The operating profit reported in the accounts for 2004 was kr 725,633. After financial adjustments and the extraordinary items the accounts show a profit of kr 2,278,953. The institute's total assets at 31st December 2004 were kr 16,522,327, of which kr 7,932,954 constitute the buildings, and kr 2,621,533 is share capital and other equity. In 2004 the two successive Managing Directors received kr 479,542 and 238,074, respectively. Emoluments to the Board in 2004 amounted to kr 35,000 to the Chairman and kr 20,000 to the other directors.

GOING CONCERN

The Annual Report and Accounts are presented on the assumption of a going concern. This assumption is based on the prognosticated results for 2005 and the long-range strategic plans that UNIS has for 2001-2010.

WORKING ENVIRONMENT AND STAFF

Sickness absence in the year was 0.96 per cent. The Institute has a contract with Longyearbyen City Hospital for corporate health services and will be applying for status as an IA corporation. There have been no reports of injuries or serious work incidents or accidents in 2004 resulting in serious material damage or personal injury.

The UNIS building, put up in 1995, now has very stringent standards for the indoor environment. Modern building methods, careful choice of materials and good technical solutions all result in an excellent internal climate.

From left: Rolf Langvatn, Lasse Lønnum, Kjell A. Sælen, Else Hegseth, Steinar Nordal, Annik Myhre, Frank Nilsen, Fredrikke J. Musæus, Kjell Mork, Simon Jessen Photo: Helen Flå

UNIS is not aware of any pollution caused to the external environment by Institute operations.

In April three UNIS students were the targets of a rescue operation that was widely reported in the media. The Directors wish to commend Institute personnel for the excellent manner in which the situation was handled. The Directors will also express their satisfaction that the incident ended happily, and are pleased that the lessons learned will be incorporated into future safety training for students and staff.

BOARD ACTIVITIES

In 2004 the UNIS Board held four meetings, two of them in Longyearbyen. Some 80 cases were dealt with. Key issues included the Annual Plan, appointment of the incoming Director, continual review of the plans for the new building, and the budget.

GENERAL MEETING

The General Meeting was held in Oslo on 3rd May 2004.

THE ROAD FORWARD

The design plans for fitting out the UNIS areas in the Science Centre have been finalised. Work at the Institution will be coloured in coming years by the introduction of the Science Centre as a working establishment. The Directors have adopted a Development Plan for the period 2004-2008 entailing the consolidation and development of the Institution's activities, with a growth of 16 positions in all, and an increase in student numbers of 50 per cent.

In accordance with the Storting Resolution to expand activities at UNIS the Board will engage in active and constructive dialogue with the Ministry of Education and Research. The Directors will give priority to the plans for a new Aurora Station which will make it possible to sustain Norwegian activities in optical Northern Lights research.

Styrets beretning 2004

Universitetssenteret på Svalbard AS (UNIS) ble opprettet som statlig aksjeselskap den 29. november 2002. Selskapet avløste stiftelsen Universitetsstudiene på Svalbard (UNIS), som ble opprettet av Norges teknisk- naturvitenskapelige universitet, Universitetet i Bergen, Universitetet i Oslo og Universitetet i Tromsø i 1994.
Selskapets formål er å gi studietilbud og drive forskning med utgangspunkt i Svalbards geografiske plassering i et høyarktisk område, og de spesielle fortrinn dette gir gjennom bruk av naturen som laboratorium og arena for observasjoner og innsamling og analyse av data. Studietilbudet skal være på universitetsnivå og fremstå som et supplement til den undervisning som gis ved universitetene på fastlandet, og inngå i et ordinært studieløp som fører frem til eksamener og grader på bachelor-, master- og doktorgradsnivå.

Kursomfanget har i 2004 vært på samme nivå som foregående år, men antallet studenter var det høyeste noensinne. Forskningsaktiviteten har vært høy, noe som gjenspeiles i økte eksterne bevilgninger, initiering og deltakelse i prosjekter og antall vitenskapelige publikasjoner.

UTVIKLING AV STUDIETILBUDET

Studietilbudet ved UNIS har en internasjonal profil, og all undervisning foregår på engelsk.

UNIS har fire studieretninger: Arktisk biologi, Arktisk geologi, Arktisk geofysikk og Arktisk teknologi. I 2004 ble studietilbudet innen de fire studieretningene konsolidert. Det ble gitt undervisning i totalt 39 emner, inkludert et kurstilbud i Svalbards historie. 20 av kursene er på hovedfags- og doktorgradsnivå. Studentene ved UNIS oppnår gode resultater og har mindre enn en prosent stryk til eksamen. Semesterstudentene tok i 2005 i gjennomsnitt 32,5 studiepoeng og strykprosenten var om lag 1 %. Frem mot 2008 ønsker UNIS å videreutvikle aktiviteten med hovedvekt på mastergrads- og doktorgradsnivå. Samtidig er det viktig at kvaliteten på studietilbudet på lavere grad vedlikeholdes.

UNIS deltar aktivt i utviklingen av The University of the Arctic (Uarctic) og har ansvar for å koordinere aktiviteten "Field School".

STUDENTTALL

Til sammen 299 studenter fulgte undervisning, eller arbeidet med mastergrads- og doktorgradsoppgaver i 2004. Dette tilsvarer en studentaktivitet på 126 studentårsverk. Av årsverkene var 62 på lavere grad, 32 på mastergrads- og doktorgradsemner og 32 i forbindelse med mastergrads- og doktorgradsoppgaver. Ved UNIS er det et stort innslag av utenlandske studenter, og denne studentgruppen utgjorde i alt 62 % av studentmassen. Omtrent halvparten av de utenlandske studentene kom fra Norden, og i alt 24 nasjoner var representert i 2004. Kvinneandelen blant studentene lå i 2004 rundt 46% for institusjonen som helhet.

FORSKNINGSAKTIVITET

I 2004 var det 47 studenter som arbeidet med sin mastergradsoppgave i samarbeid med UNIS, og 31 doktorgradsstudenter var registrert ved UNIS. Dette skjer i samarbeid med et universitet i Norge eller i utlandet. Studentene får oppnevnt en veileder ved UNIS og har i tillegg en veileder ved sitt hjemmeuniversitet. I løpet av 2004 tok 17 mastergradsstudenter sin mastergradsoppgave ved UNIS, mens 2 doktorgradsstudenter ble uteksaminert. Utvikling og videreføring av forskningssamarbeidet med de norske universitetene og andre norske og utenlandske forskningsinstitusjoner er en prioritert oppgave. I 2004 var UNIS- ansatte medforfatter på 91 publikasjoner med referee-ordning, noe som innebærer en økning på 30 % i forhold til 2004. Styret er svært fornøyd med denne positive utviklingen. Flere forskere er sentrale i EU-prosjekter og flere prosjekter er finansiert/delfinansiert av Norges forskningsråd. Det ble i 2004 opprettet 3 professor-II/førsteamanuensis-II stillinger ved UNIS i samarbeid med Norsk Polarinstitutt.

ANNEN VIRKSOMHET

Styret ser det som viktig at det fortsatt arbeides aktivt med formidling ved UNIS. I januar/februar ble det såkalte "Svalbardseminaret" arrangert i samarbeid med Norsk Polarinstitutt og Sysselmannen på Svalbard. Oppslutningen var som vanlig meget god. UNIS tiltrekker seg mange faglige konferanser og seminarer, og i 2004 ble det i alt avholdt 9 slike, derav fire med internasjonal deltakelse, blant annet et NATO-seminar med 60 deltager og 11 undervisningsministre fra EU. I tillegg ble det gitt en rekke presentasjoner for gjestende grupper fra inn- og utland.

Forskningsresultater formidles bl.a. ved en nettbasert publikasjonsserie. For å bidra til en god forskningsformidling i den kommende Forskningsparken deltar UNIS i planarbeid for den nye utstillingen ved museet.

ORGANISERING

UNIS er organisert med fire fagavdelinger, en teknisk avdeling og en administrativ avdeling. Avdelingslederne utgjør sammen med direktøren institusjonens lederteam. Fagutvalgene for hver av de fire studieretningene med representasjon fra universitetene møtes en gang i året og skal fungere som rådgivende organ for avdelingene.

STABEN

Pr. 31. desember 2004 utgjorde den vitenskapelige staben 15 personer på full tid, samt 18 med professor II/ førsteamanuensis II tilknytning. Det var en teknisk stab på 9 personer og en administrativ stab på 10 personer. I tillegg har UNIS 6 eksternt finansierte stillinger.

Styret ser at andelen av kvinner i II-stilling er spesielt lav. Dette gjenspeiler arbeidsmarkedet for 10 år siden, og styret ønsker å fokusere på dette i fremtiden. Styret vil likevel fremhev at UNIS har en høy kvinneandel på bachelor- og masternivå, og også blant stipendiater.

Fordelingen mellom kjønnene er som følger:

	Kvinner	Menn	Antall personer	Årsverk
Administrasjonen	6	4	10	8.5
Teknisk avdeling	2	7	9	9
Vitenskaplig stab	3	12	15	15
II-stillinger	1	17	18	3.6
Eksternt finansierte	5	1	6	6

UNIS-BYGGET, BOLIGER OG STUDENTHYBLER

UNIS-bygget stod ferdig i 1995 og inneholder laboratorier, undervisningsrom, et stort auditorium, bibliotek, kantine, 30 kontorer samt lesesalsplasser for 100 studenter. Det har gjennom flere år vært stor knapphet på laboratorier, kontorer til ansatte, gjesteforelesere, gjesteforskere og stipendiater. Denne situasjonen vil vedvare frem til UNIS kan flytte inn i Forskningsparken i oktober 2005.

Ved utgangen av 2004 disponerte UNIS 29 familieboliger og 10 hybelleiligheter til sine ansatte. Med økende forskningsaktivitet ser styret det som viktig at det fortsatt bevilges midler til investeringer i boliger.

Studentsamskipnaden i Tromsø har ansvaret for hybler til UNIS-studenter og har pusset opp fire gamle gruvearbeiderbrakker i Nybyen slik at de i dag kan tilby til sammen 120 hybler. Studentsamskipnaden i Tromsø har lenge hatt planer om et nytt bygg for studenthybler i Nybyen. Når det nye bygget realiseres vil den samlede boligmassen for studentene utgjøre til sammen 144 hybler.

For UNIS' virksomhet er det helt avgjørende å kunne gi studentene tilfredstillende boforhold, og styret legger stor vekt på å videreføre det gode samarbeidet med Studentsamskipnaden i Tromsø.

ØKONOMI

Midler til drift og investeringer for UNIS bevilges over budsjettet til Utdannings- og forskningsdepartementet. I 2004 var bevilgningen på totalt kr 44.649.000, hvorav kr 43.562.904 gikk til drift. Regnskapet for 2004 viser at 42,7 % av varer og tjenester kjøpes lokalt. Driftsresultatet på årsregnskapet for 2004 viser et driftsresultat på kr 725.633 Etter finansinntekter/finanskostnader samt ekstraordinære poster viser regnskapet et overskudd på 2.278.953.

Selskapets totalkapital pr 31.12.04 var på kr 16.522.327 hvorav kr 7.932.954 utgjør institusjonens bygningsmasse og kr 2.621.533 utgjøres av aksjekapital og annen egenkapital. I 2004 er lønn til direktørene utbetalt med henholdsvis kr 479.542 og 238.074 . Styrehonorar er i 2004 utbetalt med kr 35 000 til styrets leder og kr 20 000 til styrets øvrige medlemmer.

FORTSATT DRIFT

Årsoppgjøret er avlagt under forutsetning om fortsatt drift. Til grunn for antagelsen ligger resultatprognoser for 2005 og UNIS langsiktige strategiske plan for 2001-2010.

ARBEIDSMILJØ OG PERSONALE

Sykefraværet var i 2004 på 0,96 %. Institusjonen har avtale med Longyearbyen Sykehus om bedriftshelsetjeneste og har vedtatt å søke status som IA-bedrift. Det er ikke forekommet skader eller rapportert om alvorlige arbeidsuhell eller ulykker i 2004 som har resultert i store materielle skader eller personskader.

I UNIS bygget, som ble oppført i 1995, er det stilt store krav til innemiljøet. Moderne byggemetoder, materialvalg og tekniske løsninger gir et godt inneklima.

UNIS kjenner ikke til at selskapets drift forurenser det ytre miljø.

I april var tre UNIS-studenter innblandet i en leteaksjon som fikk stor oppmerksomhet i media. Styret vil gi honnør til de ansatte som håndterte situasjonen på en svært god måte. Styret er glad for at det ble et lykkelig utfall på hendelsen, og at erfaringene tas med i det videre arbeidet i utvikling av sikkerhetsopplæringen for studenter og ansatte.

STYRETS VIRKSOMHET

I 2004 har styret for UNIS avholdt 4 møter, hvorav 2 i Longyearbyen. Det er i alt behandlet 80 saker. Viktige saker som ble behandlet i 2004 var årsplan, tilsetting av ny direktør, løpende gjennomgang av planene for nybygget og budsjett.

GENERALFORSAMLING

Generalforsamlingen ble avholdt i Oslo den 3. mai 2004.

VEIEN VIDERE

Planene for innredning av UNIS´s areal i Forskningsparken er ferdigutformet. Arbeidet ved institusjonen de nærmeste årene vil være preget av at Forskningsparken tas i bruk. Styret har vedtatt en utviklingsplan for perioden 2004-2008 som innebærer en konsolidering og videreutvikling av selskapets virksomhet med en vekst på i alt 16 stillinger og økning av studenttallet med 50 %. I henhold til Stortingets vedtak om en økning i aktiviteten ved UNIS vil styret ha en aktiv og konstruktiv dialog med Utdannings- og forskningsdepartementet. Styret vil prioritere høyt å få realisert planene for en ny Nordlysstasjon for å kunne beholde en norsk aktivitet innen optisk nordlysforskning.

Kjell A. Sælen
leder

Steinar Nordal
nestleder

Annik Myhre

Else Nøst Hegseth

Kjell Mork

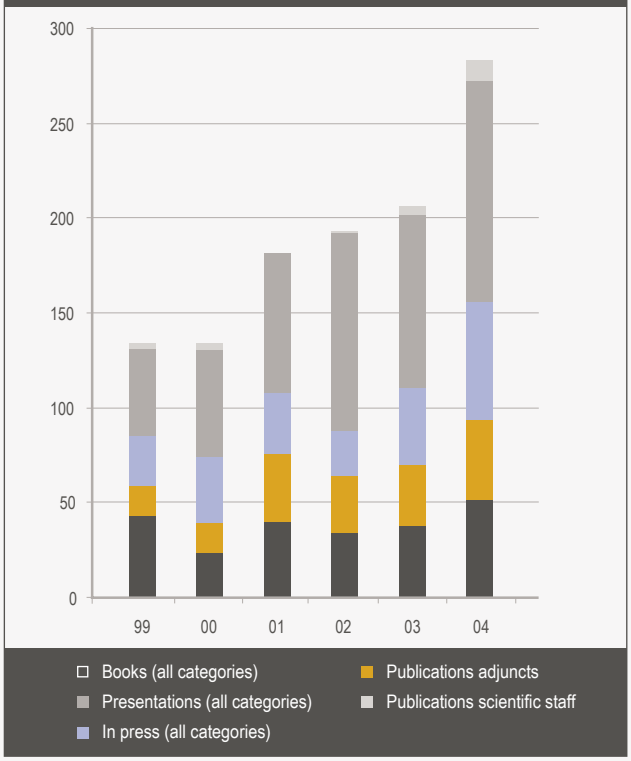
Fredrikke Johansen Musæus

Frank Nilsen

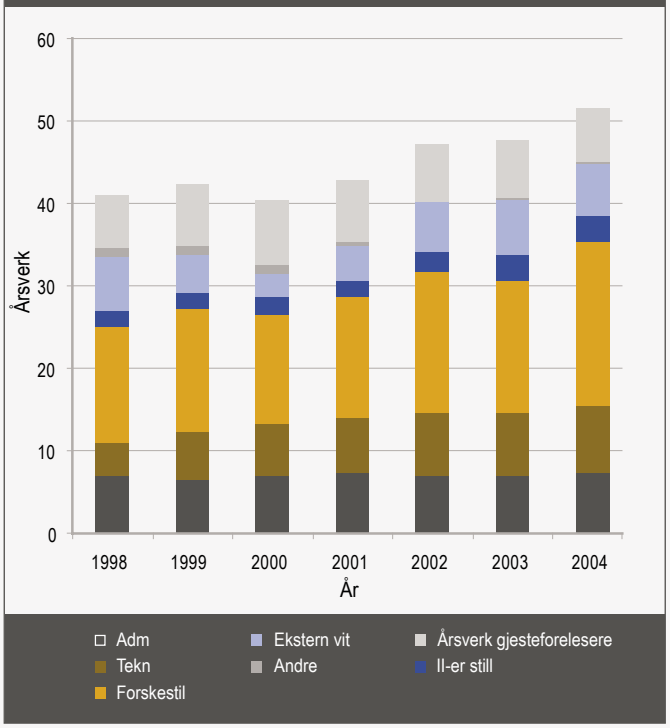
Lasse Lønnum
direktør

Statistics / Statistikk

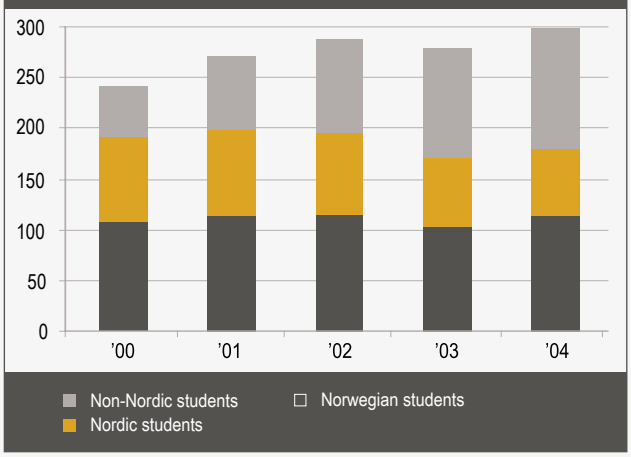
Publications etc at UNIS 1999–2004.
Publikasjoner etc. ved UNIS 1999–2004.



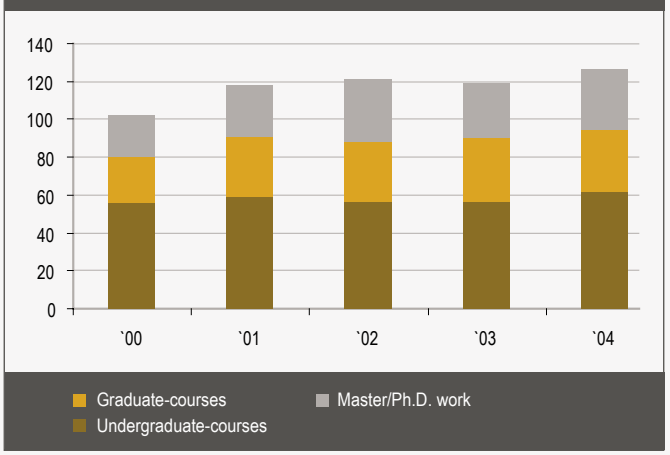
Workforce in man-labour years according to occupational category at UNIS 1998–2004.
Årsverk ved UNIS 1998–2004 fordelt på stillingskategori.



Number of students categorised as Norwegian Nordic and non-Nordic students 2000–2004.
Totalt antall studenter ved UNIS 2000-2004 fordelt på norske, nordiske og ikke-nordiske.



Production in Student-labour years (1 year equals 60 ECTS credits) categorised on teaching levels.
Produksjon av studentårsverk (ett årsverk = 60 studiepoeng) ved UNIS 2000-2004, fordelt på undervisningsnivå.



Resultatregnskap pr. 31.12.2004

	2004	2003
Driftsinntekter og driftskostnader		
Driftstilskudd fra KUF	43 562 904	40 083 550
Utsatt inntektsføring av tilskudd	135 100	-135 100
Eksterne prosjektinntekter	8 730 286	7 306 580
Øvrige inntekter	1 810 588	1 595 295
Brutto driftsinntekter	54 238 878	48 850 425
Eksterne prosjektkostnader	8 048 798	6 829 514
Netto driftsinntekter	46 190 080	42 020 810
Lønn og sosiale kostnader	24 150 303	21 551 616
Felt- og toktkostnader	6 980 050	6 978 650
Øvrige driftskostnader	14 334 094	15 390 628
Sum driftskostnader	45 464 447	43 920 894
DRIFTSRESULTAT	**725 633**	**-1 900 084**
Finansinntekter og finanskostnader		
Finansinntekter	71 333	267 128
Finanskostnader	98 012	78 490
Netto finansinntekter	-26 679	188 638
Ordinært resultat	698 953	-1 711 446
Ekstraordinære inntekter	1 580 000	
ÅRSRESULTAT	**2 278 953**	**-1 711 446**
Disponeringer:		
Til/ fra annen egenkapital	2 278 953	-1 711 446

Balanse pr. 31.12.04

	2004	2003
EIENDELER		
Anleggsmidler:		
Bygninger	7 932 953	2 709 901
Andeler Svalbardhallen	1	1
Sum anleggsmidler	7 932 954	2 709 902
Omløpsmidler		
Varebeholdning	33 023	84 311
Debitorer	2 371 814	3 364 752
Andre kortsiktige fordringer	883 971	564 956
Betalingsmidler	5 300 565	8 250 222
Sum omløpsmidler	8 589 373	12 264 241
SUM EIENDELER	16 522 327	14 974 143
GJELD OG EGENKAPITAL		
Aksjekapital	100 000	100 000
Annen egenkapital	2 521 533	242 579
Sum egenkapital	2 621 533	342 579
Avsetninger for forpliktelse:		
Ubenyttet invester.tilsk.,utstyr		922 038
Ubenyttet invester.tilsk.bygg		3 400 000
Utsatt inntektsfør. tilskudd stipendiat	535 000	135 000
Sum avsetninger med forpliktelse	535 000	4 457 138
LANGSIKTIG GJELD:		
Boliglån SparebankEN Nord- Norge	5 250 000	
Sum langsiktig gjeld	5 250 000	
Kortsiktig gjeld:		
Leverandørgjeld	1 543 813	3 690 138
Skyldige offentlige trekk og avgifter	2 016 594	1 707 885
Annen kortsiktig gjeld	4 555 387	4 776 403
Sum kortsiktig gjeld	8 115 794	10 174 427
SUM GJELD OG EGENKAPITAL	16 522 327	14 974 143

Blue mussel discovered at Sagaskjæret in August 2004.

Photo: Bjørn Gulliksen

Arctic Biology

The Department of Arctic Biology provides a full one-year curriculum of undergraduate course offerings as well as an extensive course calendar for graduate studies in addition to performing research in Arctic biology and ecology. The strategic plan of the department is to build up two active research groups, one in terrestrial and one in marine ecology. Each group has two full-time staff members currently in addition to five adjunct professors three of which are marine oriented and two terrestrial (2004).

In this year's annual report we have chosen to present one of the ongoing research projects run by the marine research group.

OCEAN TEMPERATURE OSCILLATIONS CAUSES THE REAPPEARANCE OF BLUE MUSSELS IN SVALBARD AFTER 1,000 YEARS OF ABSENCE

By: Jørgen Berge and Geir Johnsen

BACKGROUND

During two UNIS-expeditions in August and September 2004, a small population of blue mussels (*Mytilus edulis* L.) were discovered close to the rocky islet Sagaskjæret at the mouth of Isfjorden. This is the first recorded observation of a viable population of blue mussels in Svalbard since the Viking Age. Analyses of available data indicate that the re-appearance of this species is closely connected to a recent increase in sea surface temperatures in the Svalbard sector of the Arctic.

BLUE MUSSELS IN SVALBARD DURING THE HOLOCENE

During warm intervals of the Holocene, blue mussels have been common and numerous along the coast of Svalbard. Today, we find evidence of their previous distribution pattern in elevated beach beds such as one recently found in the fan delta in Adventfjorden: deposits of 3-5000 years old blue mussel shells were in abundance in the sediments in the Hiorthfjellet fan delta. Similarly, at Kapp Linné, a locality close to Sagaskjæret, remains of Holocene blue mussel are common that have been found to be approximately 7,200 years BP.

RECENT SPREADING OF BLUE MUSSELS

Our data indicate that most of the current mussel population found in Isfjorden settled at Sagaskjæret as spats in 2002, and that larvae were transported by the West Spitsbergen Current northwards from the Norwegian coast up to Svalbard the same year. This extension of the blue mussel's distribution was made possible by an unusually high northward flowing mass-transport of warm Atlantic water in addition to elevated sea surface temperatures in 2002. Remotely sensed data suggest that the temperatures in the surface layer in 2002 were 3 to 4 degrees (C) higher than normal (e.g. in 2004). In addition, oceanographic measurements in Isfjorden suggest that unusually large amounts of warm Atlantic water (transported northwards by the West Spitsbergen Current) penetrated Isfjorden in 2002. Transport of mussel larvae by way of ballast water is considered an unlikely route for the arrival of these mussels because all ships coming to Svalbard fill up ballast water off-shore, hence reducing the probability of transporting blue mussel larvae. Thus, three factors that occurred during the autumn of 2002 are probably those that provided the opportunity for larvae to reach Svalbard:

1. Increased northward transport of Atlantic Water by the northern branches of the Gulf Stream System. The estimated transport time from Vesterålen to Svalbard is around 35 days, which matches the longevity of blue mussel larvae.
2. Increased influx of Atlantic Water into Isfjorden.
3. Increased sea surface temperatures on the west coast of Svalbard providing acceptable conditions for blue mussel growth.

FUTURE RESEARCH ON BLUE MUSSELS IN SVALBARD

During 2005 an underwater time-series station will be set up at Sagaskjæret which will allow us to measure both the physical key-environment variables (temperature, salinity,

currents, light climate etc) and monitor the blue mussel population. Also, the new lab facilities that will become available in the Science Centre will permit experimental work on survival and growth related to water temperatures to be conducted.

THE MARINE BIOLOGY RESEARCH GROUP AT UNIS AND THE INTERNATIONAL POLAR YEAR (IPY)

By Ketil Eiane

The marine research group at UNIS aims at contributing to IPY through participation in several projects. Firstly, we take part in the ARCTOS network, which is based on an agreement between The Norwegian College of Fishery Science (NCFS), The Norwegian Polar Institute (NPI), Akvaplan-niva (APN), The University Centre in Svalbard (UNIS) and The University of Tromsø (UoT) (Department of Geology) to coordinate parts of their marine ecological activities. The intention for establishing the ARCTOS network is to increase the visibility of the marine ecological research being carried out in northern Norway and on Svalbard, and through our joint efforts to increase impacts of our scientific efforts during IPY and beyond. ARCTOS will have a suite of activities, among those annual scientific plenum meetings, symposia on timely topics in Arctic marine ecosystem studies, and the ARCTOS scientific trainee school (established at UoT).

Secondary, members of the research group has participated in the initiation of the IPY project Marine Mammal Exploration of the Oceans - Pole to Pole (MEOP). This international initiative is based on our low level of knowledge about the oceanic habitat requirements of marine mammals, especially those of the large, highly mobile pelagic seals and whales that occupy Polar Regions. MEOP will deploy novel but field-proven satellite-linked animal-borne CTD-tags that will provide accurate data on the location of tagged animals, their detailed dive patterns and the temperature and salinity profiles of the water columns they utilize. By providing oceanographic-quality environmental data directly from the animals, we can explicitly link physical oceanographic conditions to the animal's behavior,

A 7200 year old blue mussel found by Hanne Christiansen at Kapp Linné. Photo: Frank Nilsen

overcoming the problems of time and scale inherent in using more conventionally derived ocean information, while reducing logistics costs and requirements (e.g. boat-time). Such *in-situ* data will allow precise identification of the water masses visited by the animals and quantification of their characteristics. At the same time, they will create unique oceanographic data sets, which can enrich existing ocean data archives.

ACIA AND BIOLOGICAL RESEARCH AT UNIS

By Ingibjörg Jonsdóttir

The recent comprehensive assessment of climate change in the Arctic and its consequences (Arctic Climate Impact Assessment, ACIA, http://www.amap.no/acia/index.html), places UNIS into a renewed international focus. The key findings of the ACIA report point to the need for a stronger emphasis on research and education in potential climate impacts on biodiversity, species distribution and adaptations in both marine and terrestrial environments. On land, artic vegetation zones are expected to shift northwards with wide-ranging consequences for ecosystems and wildlife. Reduction of sea ice is expected to alter substantially the structure and function of marine ecosystems. The Department of Biology at UNIS is well prepared to meet this challenge. Most ongoing research projects already focus on effects of changing climate on individual organisms, trophic interactions or ecosystem function. The Svalbard Archipelago with its variable landscape and diverse fjord systems provides ideal opportunities for such studies. Within short distances, highly variable conditions are encountered in the sea and on land that provide an opportunity for comparative work. The new Science Centre will improve opportunities for experimental evaluations of processes behind natural patterns as well as studies the explore to what extent these patterns reflect conditions in a changing climate.

GRADUATES 2004:

Dr. Students/ PhD

Piotr Kuklinski: Ecology of Bryozoa in Svalbard waters.

Matthias Zielke: Diversity and nitrogen fixation of cyanobacterial communities in terrestrial arctic ecosystems.

Cand. Scient/Master students

Gry Bendiktson: Development of digital photography as a means to estimate species composition and species cover in tundra vegetation.

Arjen Breur: Dynamics of overwintering zooplankton in an Arctic fjord.

Helena Grev: Effects of grazing and warming treatments on growth commencement and above production in Alopecurus borealis.

Tore Kristian Leren: Hatch asynchrony: Consequences and possible causes in a population of snow bunting at Svalbard.

Bernt Rydland Olsen: Population structure of Laminaria Digitata (Hudson) J.V. Lamouranx from three different areas in the Notheast Atlantic ocean.

Geology students searching for active ice-wedges in Adventdalen in March 2004

Photo:Hanne Christiansen

Arctic Geology

By HANNE H. CHRISTIANSEN

The Department has four main teaching and research areas: Pre-Quaternary Geology, Quaternary Geology, Marine Geology and Physical Geography. The research vision of the Department focuses on Svalbard, its fjords and adjacent shelf that offer an excellent opportunity to study a wide range of landforms, processes and sediments related to the development and infill of sedimentary basins. As an area of terrestrial outcrop on the Barents Shelf, Svalbard provides excellent access to a vast range of basin settings, from the low-latitude infill of the Devonian basins, to the present glacial and periglacial erosion and infill of valleys and fjords.

In 2004 the Department offered 13 courses; five at 200-level and eight at 300-level. The 200-level courses together make up the one-year 65 ECTS study programme offered at undergraduate level. The eight 300-level courses, offered to master and doctoral students, had a total of 68 ECTS. In total 1444 ECTS were produced in Geology in 2004.

Our academic staff now consists of 4 full-time faculty and 3 adjunct professors. Additional to that we have 7 Ph.D. students. Professor Tine Rasmussen finished her position at UNIS in Marine Geology in the autumn 2004, and started at the Department of Geology, University of Tromsø, Norway. Associate Professor Tove Nielsen from the Danish and Greenlandic Survey, took over as the Marine Geologist in December 2004. As the new Quaternary geologist Associate Professor Alexander Wolfe, University of Alberta, Canada, started in July. Professor Gary Nichols, came from Royal Holloway University of London, and started in June as the Pre-Quaternary Geologist in our Department.

Adjunct Professor Olafur Ingolfsson, University of Iceland, finished his position in Quaternary Geology in the autumn. Adjunct Professor Ole Humlum, Physical Geography, and Adjunct Professor Arild Andresen, Pre-Quaternary Geology, both from the University of Oslo, were prolonged for three years in the autumn. Two new Ph.D. students, Lene Kristensen and Charlotta Lüthje started their studies in the autumn. During 2004 we have taken up one new external Ph.D. student, Neil Ross from the University of Cardiff, U.K, who visited the department for 2 months in 2004, to attend a UNIS course and perform an intensive field campaign with georadar measurements of pingos in the Adventdalen area.

The Department in 2004 thus experienced quite large staff changes, and gained new professional competence. Guest lecturers, however, still remain an important resource for implementation of our extensive range of courses. They are also regularly partners in our ongoing scientific projects. The contact with guest lectures is of great value to our students, who this way get to know closely more examples of research conducted on Svalbard and elsewhere in the Arctic.

During 2004 staff at the Department of Geology was actively engaged in several research projects. A number of projects were continued from the previous years and several new projects were initiated. Some examples of ongoing research at the Department are shortly outlined below.

Charlotta Lüthje started in 2004 a Ph.D. study on sedimentology and stratigraphy of the coal-bearing Firkanten Formation, Palaeocene, Spitsbergen. Her Ph.D. study is funded by the Store Norske coal company in Svalbard. The productive coal-mining in the Central Basin in Longyearbyen and Svea areas exploits seams within sandstone and mudstone strata of Palaeocene age, but details of the depositional environment are largely unknown. This project aims to use core material, provided by the ongoing exploration programme of Store Norske, to carry out a basin-wide sedimentological and stratigraphic analysis of the Firkanten Formation. The result will be an integrated sequence-stratigraphic model useful as a predictive tool for coal exploration.

Lene Kristensen also started a Ph.D. study in 2004 on the relationships between climate, ground temperatures and

Discussions on Linnebreen 25 July 2004. Photo: Hanne Christiansen

processes in the active layer and permafrost on Svalbard. She is investigating the thermal offsets between the air, snow and ground temperatures for improved understanding of the effects of climate change on permafrost conditions and in particular on active layer thickness in different types of sediment and bedrock of Svalbard.

Within stratigraphy and sedimentary geology Gary Nichols is focussing his research on climatic and tectonic controls on sedimentation in basins, with several large-scale basin analysis projects from Thailand and Spain, and Tertiary and Upper Palaeozoic basins in Svalbard. Integrated studies include uplift histories of the sediment source areas, provenance studies and basin-wide facies distribution analysis to determine the tectonic-climatic controls on the stratigraphic development of clastic sedimentary basins. He has future plans for working on the stratigraphic record of wildfire, by analysing fossil charcoal in the Palaeocene of the Central basin, Spitsbergen, and looking for evidence of fires in early land vegetation from the Devonian of Spitsbergen.

Alexander Wolfe works on compiling a large circum-arctic perspective of recent environmental change, including several sites on Svalbard, with co-authors from five countries. He continued investigating the potential synergistic effects of climate change and nitrogen deposition in the biogeochemistray of arctic lakes, with work in progress for Svalbard. This work, in collaboration with Olafur Ingolfsson and Ph.D. student Sofia Holmgren also in at the Department, explores why the lake record of the last century is truly exceptional in the context of the late Holocene. Other work concerns Andean palaeoclimate, last interglacial climate in the arctic, Eocene microfossils, spectral reflectance of sediments, and recent changes in alpine lakes.

In Physical Geography Hanne H. Christiansen is continuing periglacial research focused on process measurements of ice-wedge activity, snow cover and ground thermal relationships, active layer - permafrost dynamics and slope processes. In addition palaeoenvironmental reconstructions based on ice-wedges and loess deposits are being carried out in the Adventdalen area. In 2004 a cooperation project using four different methods for registration of ice-wedge activity was initiated with Prof. N. Matsuoka, University of Tsukuba, Japan. The intensive automatic and manual measurements of ice-wedge dynamics have given new data on ice-wedge growth that enable improved interpretation of the palaeoenvironmental signal from the ice veins of the ice-wedges.

Masters degree students at the Department in 2004 studied various issues including snow distribution in the landscape and its relation to the distribution of glaciers, permafrost, Little Ice Age glaciation in Van Keulenfjorden, glacier hydrology of Longyearbreen using isotope geochemistry and georadar investigations, isotope variations along Longyearbreen, geochemistry of mine waste in Bjørndalen, the thermohaline ocean circulation and its control on sedimentation in the sea and marine sedimentation in a sediment core from the Svalbard area.

In March 2004 we had a visit by the Executive Committee of the International Union of Geological Sciences, IUGS. The IUGS President gave a presentation at UNIS about the IUGS initiative Planet Earth 2005-2007 about Earth Sciences for Society. We presented the activities of our Department to the Executive Committee. In September we hosted a field workshop of the ESF network Permafrost and Climate in the 21st Century (PACE21) with 36 participants; the workshop consisted of 2 days of presentations and 3

Duststorm in Adventdalen 30 September 2004. Photo: Hanne Christiansen

days of visits to permafrost and periglacial research sites around Longyearbyen. At the 32 International Geological Congress (IGC) in 2004, Norway was elected the host country of the next IGC in 2008. The topic of this Congress will be the arctic, with several field tours planned for Svalbard. This event will occur during the International Polar Year 2007-2009, bringing a large focus on geology in the arctic. The International Permafrost Secretariat of the International Permafrost Association was hosted in 2004 in the Department.

GRADUATES 2004:

Cand. Scient/Master students

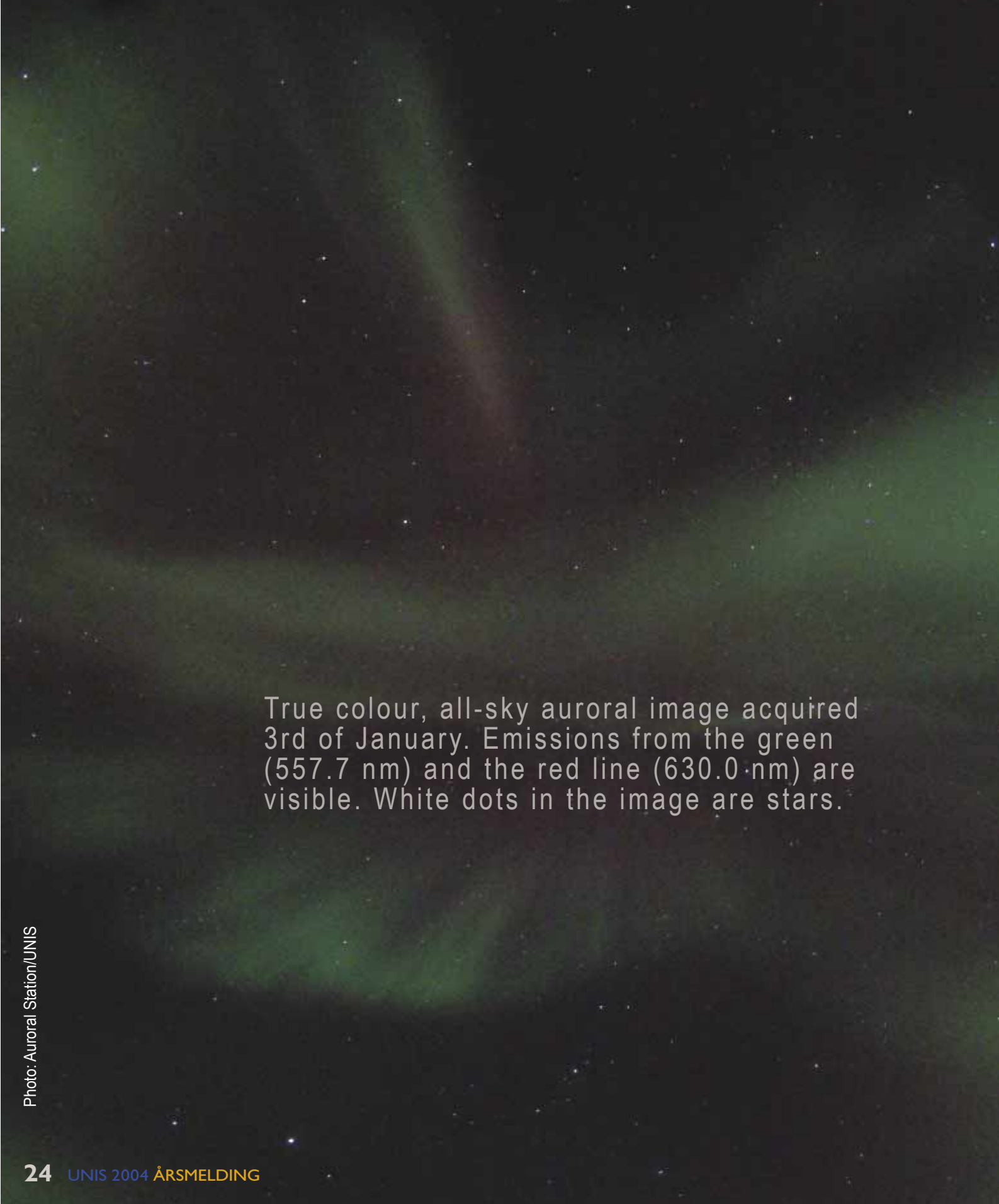
Åse Hjetland Bringedal: Stable oxygen isotopes in Longyearbreen, Svalbard.

Marit Carlsen: Lille Istids Maksimum i Van Keulenfjorden; deglasiasjonsdynamikk og sedimentasjon under tilbaketrekningen.

Anja Fleig: Snow distribution dynamics and ground thermal regimes.

Jonas Ellehauge Hansen: Influence of meteorological and topographic conditions on snow avalanches on central Spitsbergen, Svalbard.

Malte Michel Jochmann: The geology of the Ispallen-area with emphasis on the coal bearing Firkanten formation.



True colour, all-sky auroral image acquired 3rd of January. Emissions from the green (557.7 nm) and the red line (630.0 nm) are visible. White dots in the image are stars.

Photo: Auroral Station/UNIS

Arctic Geophysics

By FRED SIGERNES

INTRODUCTION

The Arctic Geophysics Department specialises in 4 fields of teaching and research: Oceanography, Meteorology, Middle- and Upper Atmosphere. Hence we cover the vertical column from below the sea surface out to near space. Our emphasis is on Polar geophysical phenomena with global implications, such as ocean currents, weather systems, and atmospheric processes related to environmental issues as well as the interaction between the solar wind and the Earth's magnetosphere.

4 full professorships and 5 adjunct professors cover the specialist fields. In 2004 the department had 6 doctoral fellows, 11 master's students and 1 Post Doc. 7 master's students completed their theses. Our Department has been accredited as a Madam Curie Training Site by the European Commission, and 2 of our PhD students were Madam Curie fellows.

TEACHING

We currently offer 7 undergraduate and 5 postgraduate courses for students with background in physics. Students are introduced to processes and theories related to the Arctic environment. Fieldwork is an important element. Students get hands-on experience in instrument operation, data collection, and analysis of field data.

RESEARCH

Our department supervises the daily operations of the Auroral Station in Adventdalen. The station has 25 instruments and engages 18 collaborating institutions from eight different countries. The activity at the station is high. In January 2004 the rocket SERSIO (Svalbard Eiscat Rocket Study of Ion Outflows) was launched from Ny-Ålesund. Data from the Auroral Station was ported via internet to UNIS where the launch decision was made. This is the first time a sounding rocket is launched into space using the internet as transfer medium.

The Auroral Station suffers from increased light pollution, an outdated building, and limited space to accommodate new instrumentation. A building program for the new Auroral Station has been finalized by the Norwegian Directorate for Public Construction and Property. Funding for the construction has been appropriated.

Mesospheric temperature logs have been kept at the Auroral Station for almost 25 years, constituting one of the longest time series in the world. Quality assurance on the readings, as well as analysis of the data, is carried out at UNIS. Temperature records are important both in a global context, and for our understanding of the interaction between the upper and middle atmosphere.

A new generation of airborne spectral imagershas been developed at the department. The instruments detect spectral signatures of any target at high spectral and spatial resolution. The classification of clouds, snow, ice, melt water, and vegetation provide a few of the potential uses. Furthermore, the department has started a joint venture with the Technical University of Berlin, the Norwegian Space Agency and SVALSAT to use and operate the TUBSAT satellites. A S-band data downlink and a VHF command station are already in daily operation. The partners have also initiated a proposal to launch a micro satellite with hyper spectral capability: SVALBIRD.

A major project for the department is on estimating wind speed and wind stress on the Arctic Ocean from ERS-2 and ENVISAT satellites. Meteorological field campaigns were undertaken in September 2003 and September 2004, in conjunction with filed courses in meteorology, to provide in situ data for comparison with data derived from microwave space borne satellite imagery.
We carry out studies of accretion and precipitation icing on structures located in complex terrain by collecting data

from two locations: Gaustadtoppen (1800 m), in south east Norway; and Brosviksåta (900 m), situated on the west coast of Norway. Instrumentation to monitor atmospheric turbulence and ice loads on cylindrical structures is installed. TV cameras monitor the icing process.

In 2004 we have contributed to the CLUE project (2003-2007), funded by the research council of Norway. In CLUE (Effects of Climate and Land Use change on nitrogen/carbon cycle) we measure the atmospheric nitrogen input to alpine regions in Norway by newly developed micrometeorological methods. Regional modeling by a chemical transport model supports the measurements and scenarios are made for future climate effects based on the RegClim-project.

In 2004 the department has cooperated with the Norwegian Institute for Air Research (NILU) on monitoring and modeling of troposphere ozone deposition in Norway, as part of an international monitoring program funded by the United Nations. We have also been involved in measurements of mercury concentrations in Ny-Ålesund and evaluated the connection to local meteorology during the recently discovered so called mercury depletion events.

Our department takes part in studies of variability and exchanges in the North Atlantic, Fram Strait and the Arctic

Ocean. The oceanography group at UNIS focuses on how much heat the Atlantic Water core loses on its northward path along west Spitsbergen, and therefore also how this warm and saline water is guided into our fjord systems around Svalbard. Discovery of blue mussels in Isfjorden resulted in larger activity in the interdisciplinary ecology research community at UNIS, on the topic 'AW in Spitsbergen fjords', but also in a verification that our oceanographic models are doing a good job. Master students at UNIS are working on improving our understandings of physical oceanographic processes in Svalbard fjord systems.

Our Polar Ocean Climate Processes (ProClim) Post Doc in oceanography, Dr. Ragnheid Skogseth, have mainly focused on brine-enriched water resulting from sea-ice formation in coastal polynyas and along topographically influenced fronts and ice edges, and used Storfjorden as a laboratory for both observations and modeling.

Our Atmosphere/Ice/Ocean interaction studies project (NFR) continued in 2004. Van Mijenfjorden was used as our measuring sites and we performed field campaigns in March, April and June. Thanks to the Norwegian Coast Guard's icebreaking vessel KV Svalbard, we were able to conduct a major air-ice-ocean filed program on melting sea ice in June 2004.

The collaborative project with Svalbard Samfunnsdrift (SSD) resulted in the UNIS report 'Sjøis-, vann og vindkrefter på nytt kaikonsept i Longyearbyen', and reflects the good dialog between the Geophysical Department at UNIS and the local community in Longyearbyen.

GRADUATES 2004:

Dr. Students/ PhD

Richo Belke: Cluster measurements at the Earth's bow shock, Space Physics. Madam Curie training site.

Cand. Scient/Master students

Jon Bergh: Measured and modelled tidally driven mean circulation under ice cover in van Mijenfjorden.

Cai Dong: Mass balance of Nyaingen Tanglha glacier, Tibet, 1977 to 2001, derived by topographical maps and satellite images

Margit Elisabeth Dyrland: A multi-instrument analysis of postnoon auroral morphology and reconection events during southeast IMF orientation.

Ivan Føre: Sea ice, snow cover and cloud detection using remote sensing.

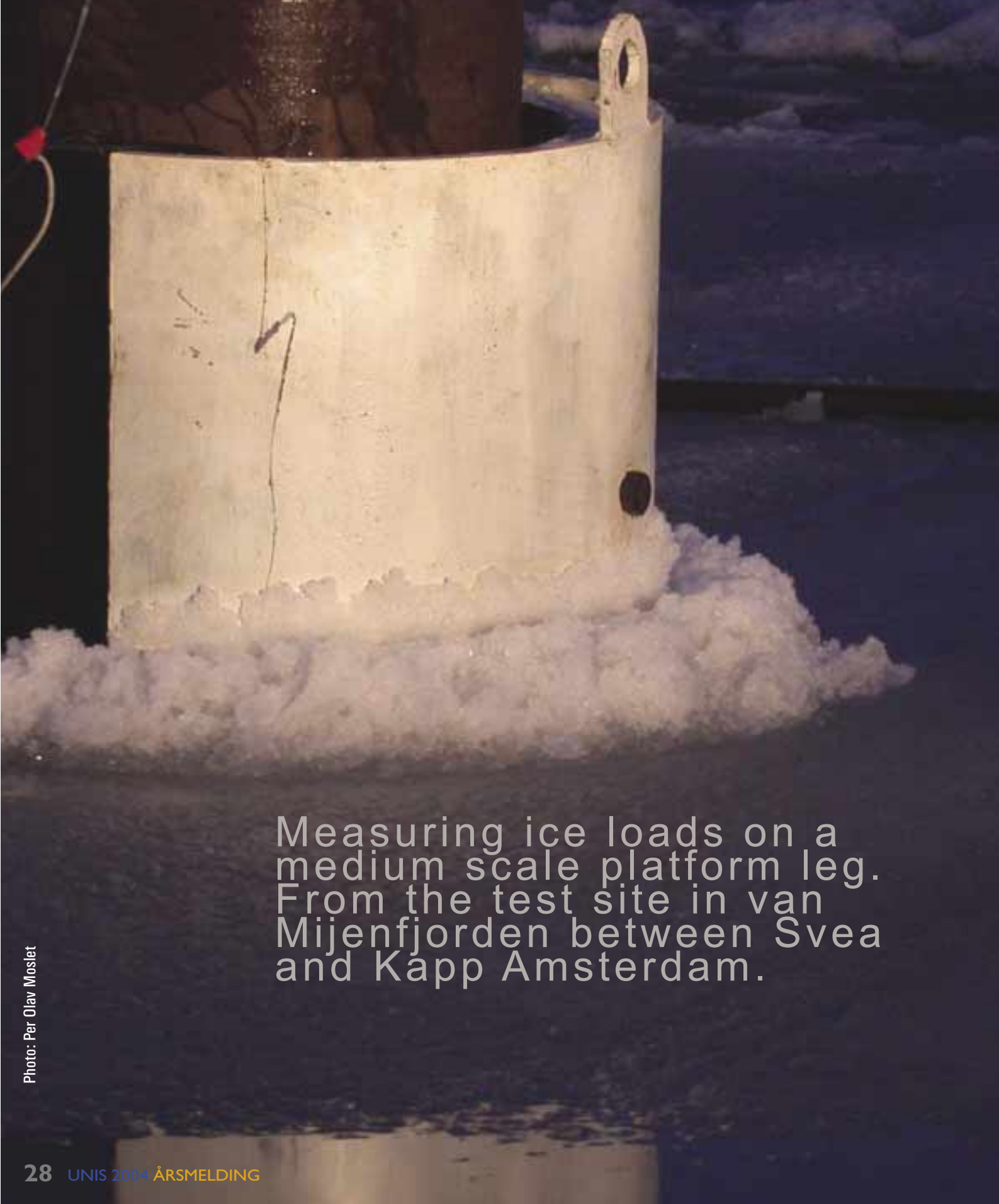
Frank Gaardsted: The east Greenland current. Structure and variability.

Elen Monsen: Observation of plasma density patches by ESR.

Kristian Snekvik: CLUSTER Satellite Studies.

Johnny Grøneng Aase: Electron density measurements in the polar cusp.

Previous page: Oceanography and sea ice studies in Van Mijenfjorden June 2004 with principal investigators from UNIS, NP and The University of Washington. Due to the very good help from the Norwegian Coast Guard and the coast guard vessel KV Svalbard, we were able to do controlled experiments on melting sea ice. The collaborating scientist in the "Air-Ice-Ocean Interaction" AIO project focus on how rapid sea ice is really melting, which again will be used to improve today's climate models. Photo: Frank Nilsen



Measuring ice loads on a medium scale platform leg. From the test site in van Mijenfjorden between Svea and Kapp Amsterdam.

Photo: Per Olav Moslet

Arctic Technology

By LARS GRANDE

The Arctic Technology Department offers education and research opportunities in Arctic Engineering and in Arctic Environmental Technology and Chemistry. Arctic Engineering concentrates on engineering problems to be tackled when settling in the Arctic environment: living and building on frozen ground that may be subject to landslides and avalanches (Geotechnics), Arctic offshore oil and gas exploitation (Ice Mechanics, Geotechnics), and potable water supply (Hydrology). Arctic Environmental Technology and Chemistry concentrates on current and potential pollution problems, environmental impacts and feasible remediation techniques in Arctic areas.

ARCTIC ENGINEERING

The Department offers a full-time program in *Arctic Engineering*, offering level 200 courses in the spring (AT-205 and AT-208) and level 300 courses in the autumn (AT-323, AT-327 and AT-329). Students may combine their studies with courses from AETC and the other UNIS departments.

ARCTIC ENVIRONMENTAL TECHNOLOGY AND CHEMISTRY

The Department also offers a full-time program in *Arctic Environmental Technology and Chemistry*, focusing on pollution in the Arctic. The courses making up the program can be heavily technology-biased, but we also encourage students to include offerings from other Departments, to form an interdisciplinary Arctic Environment program. Many students from the other Departments at UNIS also include our courses in Environmental Technology.

RESEARCH

The technological challenges springing from increased human activity in the northern marine environments, as well as locally here on Svalbard, continue to be our main focus. The faculty staff continued to work on established research programs at UNIS and new studies were initiated. The projects are detailed later in this section.

Key topics of interest within *Environmental Technology* include: The fate of oil spills in an Arctic environment and possible countermeasure techniques; levels and spreading of persistent organic pollutants (PCB pesticides in reindeer, Arctic fox, Polar cod, lake sediment and seaweed); and spreading and effects of pollution from local mining industry. Oil spills in an Arctic environment, for instance the waters around Svalbard, can be expected to behave significantly differently than oil spills in warmer waters, like the North Sea. The differences in spreading, evaporative loss, emulsification, dispersion and other factors add up to important modifications in operational oil spill contingency planning. There is a range of potential sources of oil spills in and around Svalbard, including fishing boats and freighters, tourist ships, and leakage or seepage from oil depots on land.

A new three-year program funded by the Norwegian Research Council, Statoil and Norsk Hydro focuses on oil spills in an Arctic marine environment. The purpose of this project is to investigate the weathering processes in marine oil spills under Arctic conditions. The focus is on the following processes: weathering of the bulk oil phase (evaporation, emulsification and dispersion), dissolution of water-soluble components, photo-oxidation and biodegradation processes. The PhD program by Liv-Guri Faksness is an integral part of this project.

The key topics within *Arctic Engineering* are permafrost and ice. We perform measurements and simulations of thermomechanical response in relation to onshore, coastal and offshore infrastructure. The main sites of our investigations are Longyearbyen, the Van Mijenfjord and Svea. We monitor ground temperature profiles down to 10 metres depth in open country, down the supporting piles at the Science Park, and in the waste tip in Adventsdalen. The development of the infrastructure and harbour facilities in Longyearbyen, as indeed in the Svea community, poses

important scientific and engineering tests for our staff and students. The ice cover in the Van Mijenfjord is stable throughout the season, allowing us to perform seasonal studies without risk of loosing our equipment.

Several unique medium-scale experiments have been performed on the ice, close to the Svea community, over the last three years. In 2004 two medium-scale ice/vertical structure interaction experiments were performed as part of a PhD program by Per Olav Moslet. These experiments bring together a unique combination of real sea ice with measurements of load-determinants. The numerical analysis will continue in 2005. Ice conditions on the Van Mijenfjord were monitored, as usual, and in-situ ice stresses were monitored. The main focus here is on how environmental variables (meteorological and oceanographic) determine ice conditions. In the Barents Sea we did our annual measurements and experiments on first-year sea ice ridges.

Our new SNSG-sponsored PhD student started his studies on techniques for utilising the local low-strength rock in exposed structures like erosion barriers, stone quays and road-fills. The project is a cooperative enterprise involving SNSG, SSD, Sintef and Bidim, the geotextile manufacturer. Tests will be performed in the harbour at Longyearbyen and in Sveasundet at Svea. Additionally the project will take a closer look at problems related to the possible transportation of coal from Ispallen to Cape Amsterdam, crossing the Credner Moraine and the Sveasundet channel.

Ground sampling on an ice-cored moraine near Svea. Photo: Fabrice Caline

GRADUATES 2004:

Cand. Scient/Mast er students

Anna Anderson: Analysis of polychlorinated biphenyls (PBCs) in arctic char from Svalbard using HRGC-ECD, with special emphasis on the correlation between physiological factors and contaminated load.

Jean-Charles Bordel: Estimation of ocean-ice heat flux from data in Van Mijen fjord (Analytical and numerical model).

Anders Laurentius Haaskjold Eide: Energy planning in Longyearbyen.

Lars Nesje Grimsmo: Wind and hydrogen Stand-alone power system.

K. Charlotta M. Rylander: Differentiation between anadromous and stationary arctic char.

Lisa Ström: Studying persistent organic pollution on Svalbard, focusing on PCB levels of Arctic Salvelinus alpinus from “Linnévatnet” and “Aresjøen”.

Synnøve Yndestad: Mikrobiell diversitet i oljeforurenset og uberørt tundra på Svalbard.

Measurement of flame temperature and burning efficiency. Burning oil spills on-site could in some scenarios be an effectiv method to reduce the environmental impact from Arctic oil spills. The students receive hands-on experience with in-situ burning during the AT-207 Pollution in the Arctic field course. Photo: Per Johan Brandvik

Student Body Annual Report

BY JORGEN BRAND

There are so many sides to student life on Svalbard that an attempt to fully describe all of them is futile. Students at UNIS come from all walks of life and many nationalities are in evidence. This creates a special blend of people, who share a fascination for the Arctic and all its facets. This fascination is certainly not limited to the lectures at UNIS. Students are fervent hikers, skiers and skidoo pilots. Many students even stay in summertime, when the studying is over, to work as a guide or undertake longer trips.

At the beginning of each semester a General Meeting of the student body is held, where all students elect the members of the Student Council. The Student Council exists to support the student body in Longyearbyen in all possible ways. In its basic form it consists of the President, Vice-president, Treasurer, Vice-treasurer, and the student representatives on the UNIS Board of Directors and on each of the four departmental boards. In addition ad hoc groups are responsible for the two cabins in Bjørndalen and Svea and our outdoor equipment, and ongoing activities like the weekly Friday gathering and Wednesday movie.

FORMAL ENGAGEMENTS AND ACTIVITIES

The Council discusses topics of concern to the students, regarding student life in general, housing, academic issues and relations with the rest of the Longyearbyen community. The Council President represents the students at monthly executive team meetings, where the heads of departments, a representative of the staff, and the Director of UNIS discuss the daily running of the Institution. The students also nominate a Student Director on the UNIS Board of Directors, and are thus intimately involved in all the larger decisions concerning UNIS. The student departmental representatives attend faculty workgroups where they can ventilate their opinions in the departmental context. Considering these different representational paths in the structure of UNIS, and the relatively small size of the Institution, it has to be said that students have quite a big say in the decision process. As a whole we feel that the administration and faculties are very receptive to student input.

INFORMAL ACTIVITIES

A huge list of activities are engaged in by students throughout the year. In almost any weather, you will find hardy students escaping from the urban sprawl of Longyearbyen to get physical with the Svalbard wilderness. To support these expeditions the Student Council has two cabins – one in Bjørndalen, near Longyearbyen, and one in Svea – and a growing itinerary of survival equipment, ranging from tents and stoves to skidoo sleds. Regular student gatherings, like the weekly Friday session and the midweek movie on Wednesdays, are also organised by the Council.

Even students in the arctic have to take a bath once in a while. Photo: Eirin Bjørkvoll

All in all the student body is very active and visible in Longyearbyen. Students don't just study and mind their own business, they are an active bunch. And in addition to their own outdoor pursuits and frequent arrangements in the Sports Hall, they also make an energetic contribution to the social calendar in Longyearbyen. During Solstice Week and the various musical festivals, students devote a lot of energy to volunteer work. Students also hold the waterfun contest for swimmers of all ages, as well as the annually reoccurring "Take a Chance" contest in Solstice Week.

Yet, despite all these diversions, a word of caution is called for. Coming to Svalbard as a student has proven addictive. Many former students cannot stay away, thanks to the intimacy of UNIS, the astounding surroundings, the magical lighting effects, and the unforgettable excursions. In short, be warned: the Svalbard experience will alter you for life!

Scientific publications 2004

SCIENTIFIC PUBLICATIONS IN REVIEWED JOURNALS BY FULL-TIME FACULTY

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Berge, J. (2004). The subfamily Andaniopsinae (Crustacea : Amphipoda: Stegocephalidae) : description of one new species and redescription of *Steleuthera maremboca*. *Journal of Natural History.* 38, 11, 1385-1395.

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SCIENTIFIC PUBLICATIONS BY ADJUNCT PROFESSORS

These publications may also occur in the annual reports of the adjunct professors home institution.

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