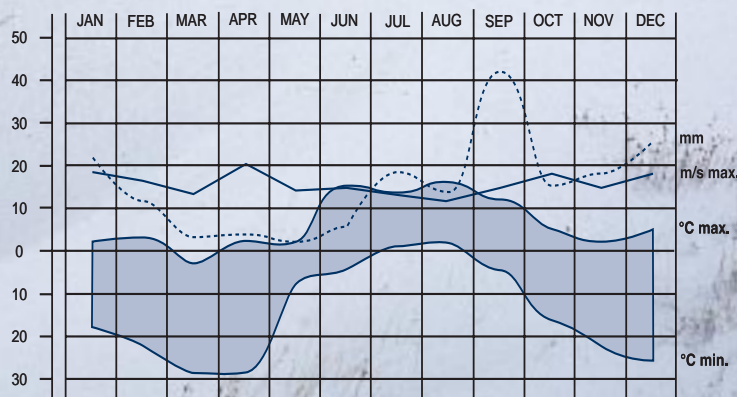


Annual Report Årsmelding

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Wind, precipitation and temperature year 2001 in Longyearbyen



The UNIS cabin at Cape Laila.
UNIS-hytta på Kapp Laila.
Photo: Katja Weigel

Vind, nedbør og temperatur i Longyearbyen år 2001

UNIS Board 2001

From left: Ole Jørgen Lønne, Åse Hjetland Bringedal, Kjell Sælen, Lasse Lønnum (director), Viva Mørk Kvello, Steinar Nordal, Dag Hessen, Noralv Bjørnå.



Director of Faculty Kjell A. Sælen, University of Bergen (Leader)

Deputy Member: Head of Administration Siri Jansen

Professor Noralv Bjørnå, University of Tromsø

Deputy Member: Deputy Director Rigmor Bjørkli

Professor Dag Hessen, University of Oslo

Deputy Member: Director Toril Johansson

Professor Steinar Nordal, Norwegian University of Science and Technology

Deputy Member: Professor Sverre Ola Johnsen

Director Viva Mørk Kvello, Svalbardrådets Representative

Deputy Member: Executive officer Jan Ove Scheie

Associate professor Trond Dokken, UNIS, Staff Representative (Spring term)

Head of Security and Logistics Fred S. Hansen, UNIS, Staff Representative (Autumn term) and Deputy Member (Spring term)

Deputy Member: Olafur Ingolfsson (Autumn term)

Martin Berg, Student Representative

Observer: Student Åse Hjetland Bringedal (autumn term)

Academic Workgroups

Academic workgroup in Arctic Biology:

Associate Professor Fredrika Norrbin, University of Tromsø
Professor Yngve Espmark, Norwegian University of Science and Technology
Associate Professor Torsten Solhøy, University of Bergen
Professor Hans Petter Leinaas, University of Oslo
Associate Professor Ketil Eiane, UNIS
Student Gunnar Rise,
Student representative

Academic workgroup in Arctic Geology:

Professor Jürgen Meinert, University of Tromsø
Associate Professor Sverre Ola Johnsen, Norwegian University of Science and Technology
Professor Eirik Sundvor, University of Bergen
Professor Jon Ove Hagen, University of Oslo
Professor Ole Humlum, UNIS
Student Tore Humstad, Student representative

Academic workgroup of Arctic Geophysics:

Professor Cesar La Hoz, University of Tromsø
Associate Professor Berit Kjeldstad, Norwegian University of Science and Technology
Professor Tor Gammelsrød, University of Bergen
Professor Jan Erik Weber, University of Oslo
Associate Professor Fred Sigernes, UNIS
Student Niels von Festenberg Packisch, Student representative

Academic workgroup in Arctic Technology:

Associate Professor Torbjørn Eltoft, University of Tromsø
Professor Arne Myrvang, Norwegian University of Science and Technology
Professor Jakob J. Stamnes, University of Bergen
Professor Kaare Høeg, University of Oslo
Associate Professor Per Johan Brandvik, UNIS
Student Lisa Ström, Student representative

Administration:

Study Counsellor Jan Gunnar Brattli
Office Manager Helen Fossmo Flå
Department Secretary Wenche Guldberg
Department Secretary Marianne Hatlestad
(from November)
Librarian Berit Jakobsen
Director Lasse Lønnum
Study Counsellor Eystein Markusson
Senior Executive Officer Ingrid Vinje

Technical staff:

Chief Lab Technician Gerd Irene Andersen
IT-Engineer Gunnar Aske
Engineer Stefan Claes (from November)
Engineer Jørn Dybdahl
Head of Safety and Logistics Fred Skancke
Hansen
Janitor Frithjof Kildal
Cleaner Tove Kaldbekken Larsen
Engineer Knut Sandaker

Department of Arctic Biology:

Associate Professor Ketil Eiane
Professor Ingibjörg Svala Jonsdottir
Associate Professor Rolf Langvatn
Associate Professor Ole Jørgen Lønne
Adjunct Professor Bjørn Gulliksen,
University of Tromsø
Adjunct Professor Rolf Arnt Olsen,
Agricultural University of Norway

Department of Arctic Geology:

Associate Professor Trond Dokken (until
August)
Assistant Professor Mona Henriksen (August
– November)
Professor Ole Humlum
Professor Olafur Ingolfsson
Associate Professor Ida Lønne
Associate Professor Tine Rasmussen (from
October)
Adjunct Professor Jenö Nagy, University of
Oslo (until August)
Adjunct Professor Ron Steel, University of
Wyoming, USA
Adjunct Professor Anders Solheim,
Norwegian Geotechnical Institute (from
August)

Department of Arctic Geophysics:

Professor Tor Gammelsrød (until February),
Adjunct Professor, University of Bergen
(from August)
Professor Yngvar Gjessing
Associate Professor Dag Lorentzen (from
August)
Adjunct Professor Jøran Moen, University of
Oslo
Assistant Professor Frank Nilsen (until June),
Associate Professor (from June)
Professor Niels Reeh (until June)
Associate Professor Fred Sigernes
Associate Professor Trond Svenøe (until
June)
Adjunct Professor Asgeir Brekke
Adjunct Professor Arne Foldvik (until
August)
Adjunct Professor Ove Havnes

Department of Arctic Technology:

Associate Professor Per Johan Brandvik
Associate Professor Knut V. Høyland (from
August)
Associate Professor Arne Instanes (until
August), Adjunct Associate Professor,
Instanes AS (from August)
Adjunct Professor Elis Holm, University of
Lund, Sweden (from November)
Adjunct Professor Sveinung Løset,
Norwegian University of Science and
Technology

Externally financed researchers:

Research Fellow Magne Andersen Drage,
FBT-financed (from September)
Research Fellow Christian Jaedicke, NFR-
financed (until July)
Research Fellow Leif Egil Loe, NFR-financed
Post.doc. Angelique Prick, EU-financed (from
June)
Research Fellow Ragnheid Skogseth, NFR-
financed (from August)
Post.doc. Audun Stien, EU-financed

The University Courses on Svalbard (UNIS) were established in the form of a beneficial trust on 18th January 1994 by Norway's four mainland universities. Thus 2001 was the eighth full year of operation. Again in 2001 the range of courses offered was impressive and the number of students finding their way to the far north was more than ever before. Research was another field of high activity as reflected in the larger external funding, the number of scientific papers published, and UNIS representation in no less than three short-listed projects under the Centres of Excellence scheme.

Studies development

There are four lines of study at UNIS: Arctic Biology, Arctic Geology, Arctic Geophysics, and Arctic Technology. The year saw consolidation of the offerings with few new titles. Even so, in 2001 tuition was given in 38 subjects, compared to 35 in 2000. Nineteen of the total are at master's or doctoral level. Our students have the pleasant habit of achieving good results and fewer than 1 per cent fail to graduate. Students taking a full year of courses amass on average 19 Norwegian credits. The Directors hope to increase activity on master's and doctoral subjects from now until 2006.

Student statistics

There were 272 students taking courses or working on master's or doctoral projects in 2001. The workload corresponds to 118 full student years and is the highest figure ever recorded at the Institution. There were 59 years of study at undergraduate level, and 32 on higher degrees. UNIS is blessed with a high complement of international students who made up 58.5 per cent of the student body. More than half the international students come from Scandinavia, and all together 21 nationalities were represented in the year.

Research activity

The year saw 31 students working on master's degrees at UNIS. They come to us on a program sponsored by a university in Norway or abroad and are assigned a tutor here in addition to their home university tutor. In 2001 there were 21 master's and diploma candidates and two graduates took a PhD. The continuing expansion of research affiliations with the other Norwegian and international universities continues to be a vector of development. UNIS staff contributed to 40 publications under referee schemes. A number of research staff hold central positions in EU projects and part of the reason is that the Institution has achieved the status of Marie Curie Training Site for auroral research. In connection with the processing of applications under the Centres of Outstanding Research scheme, funded by the Norwegian Research Council, all three proposals sponsored by UNIS were promoted to the second round.

Public relations

The Directors are adamant that active efforts continue to be made to advertise the attractions of a course of study at UNIS. Again in 2001, the *Svalbard Seminars* were held jointly with the Norwegian Polar Institute and the County Governor of Svalbard. These took place in January and February. Patronage was excellent with 50-150 in the audience on each occasion. During the *Research Days* in September an *Open Day* was held with lectures, equipment presentations, and popular experiments. UNIS is the favoured venue of many scientific conferences and seminars and in 2001 four such arrangements were held.

Organisation

The formal organisation of UNIS is into four Departments supported by the Administration. Department leaders join the Institute Director on the Executive Committee. Academic workgroups with representation from the affiliated universities meet once a year and act as the departments advisory councils

Staff

One new position was established in 2001 as a computer applications consultant. At year's end there were 14 persons working full time on the scientific staff, and another 11 associate professors and research fellows with reduced obligations. The technical staff comprised 6.6 positions and the administration seven persons.

UNIS campus

The main UNIS building was completed in 1995 containing the laboratories, class-rooms, large auditorium, library, canteen, 30 offices and reading cubicles for 100 students. There is a great



PHOTO: INGO BETHKE

The mountain "Hjortfjell" will form a magnificent setting, varying during the seasons, for the new Science Centre.

dearth of lab space and offices for staff, visiting lecturers, researchers, and fellows. The situation will persist until we can move into the Svalbard Science Centre in December 2005.

At year's end UNIS had 24 residences for the use of staff. With the increase in research activities at the Institution the Directors find it imperative to continue to appropriate funding for residential investment.

The Student Union in Tromsø is in charge of residences for students at UNIS and has refurbished four old mining dormitories in Nybyen. The Union can now offer 120 units. During 2002 a new building project will commence to bring the total student accommodation to 144 units in 2003.

It is absolutely vital to UNIS activities that we are able to offer students satisfactory accommodation. The Directors are therefore keen to continue the good relations we enjoy with the Student Union in Tromsø.

Funding

Funds for operations and investments are appropriated to UNIS over the budget of the Ministry of Education and Research. In 2001 these funds totalled NoK 37 968 000, of which NoK 33 708 000 was committed to operations. The Annual Accounts for 2001 show that 50 per cent of goods and services are purchased from the local community. The operating account for the year reports a deficit of NoK 215 590. After allowing for financial incomes and expenses and extraordinary items the net surplus is NoK 69 518. This operating surplus will be carried forward to the free reserve. The Trust had a posted capital at 31st December 2001 of NoK 59 410 429, of which NoK 48 905 234 represents the UNIS buildings and NoK 1 296 645 is

the founding capital and free reserve. In 2001 the Institute Director received a salary of NoK 420 853. The Chairman of the Board of Directors received NoK 20 000 and the other Directors a bursary of NoK 10 000.

Going concern

The Annual Report and Accounts as presented are based on the assumption of continued operation. This assumption is based on the predicted budget surplus in 2002 and the UNIS long-range Strategy Plan for 2001-2010. The Institution is financially in a sound position.

Working environment and staff

Sickness absence recorded in 2001 constituted 152 working days. UNIS has an arrangement with Longyearbyen Hospital to provide an institutional health service. No incidents or accidents at work causing material damage or personal injury were reported in 2001.

The UNIS main building was constructed in 1995 to high environmental standards. Modern construction techniques, careful selection of materials and appropriate technical systems provide a good internal climate.

As far as we know, there is nothing to suggest that operations at UNIS in any way pollute the external environment.

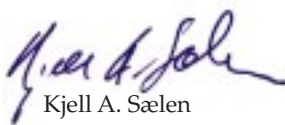
Directors' commitments

During the year the UNIS Directors held five meetings, three of them in Longyearbyen. The Directors considered 51 separate issues. Among the most important were the new Strategy Plan for 2001-2010, the Budget, and the new building plans.

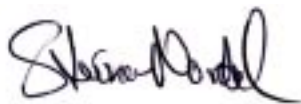
Looking forward

Work at the Institution in coming years will concentrate heavily on design of the UNIS spaces in the Science Centre and the anticipation of expanded external funding for research projects. One very important task prior to the erection of the new premises will be to find flexible solutions for the increasing level of activities at UNIS. Under the terms of the Storting resolution to expand activities at UNIS the Directors will engage in active and constructive discussions with the Ministry of Education and Research on the matter.

Longyearbyen 30th of March 2002



Kjell A. Sælen
Chairman



Steinar Nordal
Vise Chairman



Åse Hjetland Bringedal



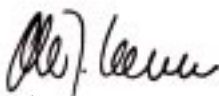
Viva Mørk Kvello



Dag Hessen



Noralv Bjørnå



Ole Jørgen Lønne



Lasse Lønnum
Director



PHOTO: INGO BETHKE

Det relieffaktige Hjortfjellet vil utgjøre en praktfull bakgrunn – varierende etter årstiden, – for den nye Forskningsparken.

Styrets beretning 2001

Universitetsstudiene på Svalbard (UNIS) ble etablert som en stiftelse 18. januar 1994 med de fire norske universitetene som stiftere. 2001 var åttende hele driftsår for stiftelsen. Kurstilbudet har i 2001 vært stort og antallet studenter det høyeste noensinne. Forskningsaktiviteten har også i 2001 vært høy noe som også gjenspeiles i økte eksterne bevilgninger, antallet vitenskapelige publikasjoner og at UNIS var involvert i tre søknader som gikk videre til andre runde om såkalte Sentre for fremragende forskning.

Utvikling av studietilbudet

UNIS har fire studieretninger: Arktisk biologi, Arktisk geologi, Arktisk geofysikk og Arktisk teknologi. I 2001 ble studietilbudet innen de fire studieretningene konsolidert og i liten grad utvidet. Mens det i 2000 ble gitt undervisning i totalt 35 emner, ble det i 2001 gitt undervisning i 38 emner, hvorav 19 er på hovedfags og doktorgradsnivå. Studentene ved UNIS oppnår gode resultater og har mindre enn en prosent stryk til eksamen. Laveregradsstudentene tar i gjennomsnitt 19 vekttall pr år. Frem mot 2006 ønsker UNIS å øke aktiviteten på hovedfags- og doktorgradsnivå.

Studenttall

Til sammen 272 studenter fulgte undervisning, eller arbeidet med hovedfags- og doktorgradsoppgaver i 2001. Dette tilsvarer en studentaktivitet på 118 studentårsverk og er det høyeste noensinne ved institusjonen. Av dette var 59 årsverk på lavere grad, 32 på hovedfags og doktorgradsemner og 27 årsverk i forbindelse med hovedfags- og doktorgradsoppgaver. Ved UNIS er det et stort innslag av utenlandske studenter, og denne studentgruppen utgjorde i alt 58,5 % av studentmassen. Over halvparten av de utenlandske studentene kom fra Norden, og i alt 21 nasjoner var representert i 2001.

Forskningsaktivitet

I 2001 var det 31 studenter som arbeidet med sin hovedfagsoppgave 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 2001 tok 21 hovedfagsstudenter sin hovedfags- eller diplomoppgave og det ble avlagt 2 doktorgrader. Utvikling og videreføring av forskningssamarbeidet med de norske universitetene og andre norske og utenlandske forskningsinstitusjoner er en prioritert oppgave. I 2001 var UNIS-ansatte medforfatter på 40 publikasjoner med referee-ordning. Flere forskere er sentrale i EU-prosjekter ved bla. at institusjonen har fått status som såkalt Marie Curie Training Site innen nordlysforskning. I forbindelse med prosessen rundt søknadene til såkalte Centre for fremragende forskning som finansieres av Norges forskningsråd, gikk alle tre søknadene UNIS var involvert i videre til andre søknadsrunde.

Annen virksomhet

Styret ser det som viktig at det fortsatt arbeides aktivt med formidling ved UNIS. Også i 2001 ble det i januar/februar arrangert såkalte «Svalbardseminar» i samarbeid med Norsk Polarinstitutt og Sysselmannen på Svalbard. Oppslutningen var meget god med mellom 50 og 150 tilhørere hver gang. Under Forskningsdagene i september ble det arrangert åpen dag med forelesninger, visning av utstyr og eksperimenter. UNIS tiltrekker seg mange faglige konferanser og seminarer, og i 2001 ble det i alt avholdt fire slike.

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

Det ble opprettet en ny stilling som edb-konsulent i 2001. Ved årsskiftet 2000/2001 utgjorde den vitenskapelige staben 14 personer på full tid, samt 11 med professor II/førsteamanuensis II tilknytning. Det var en teknisk stab på 6,6 stillinger og en administrativ stab på 7 personer.

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 er stor knapphet på laboratorier, kontorer til ansatte, gjesteforelesere, gjesteforskere og stipendiater. Denne situasjonen vil vedvare frem til vi kan flytte inn i Forskningsparken i desember 2005.

Ved utgangen av 2001 disponerte UNIS 24 boliger 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. I løpet av 2002 vil det bli påbegynt ett nytt byggeprosjekt slik at den samlede boligmassen for studentene tidlig i 2003 vil utgjøre til sammen 144 hybler.

For UNIS' virksomhet er det helt avgjørende å kunne gi studentene tilfredsstillende 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 Kirke-, utdannings- og forskningsdepartementet. I 2001 var bevilgningen på totalt kr 37 968 000, hvorav kr 33 708 000 gikk til drift. Regnskapet for 2001 viser at 50% av varer og tjenester kjøpes lokalt. Driftsresultatet på årsregnskapet for 2001 viser et underskudd på kr 215 590. Etter finansinntekter/finanskostnader samt ekstraordinære poster viser regnskapet et driftsoverskudd på kr 69 518. Driftsoverskuddet settes av på disposisjonsfondet. Stiftelsens egenkapital pr 31.12.01 var på kr 59 410 429 hvorav kr 48 905 234 utgjør institusjonens bygningsmasse og kr 12 966 645 utgjøres av grunnkapital og disposisjonsfond. I 2001 er lønn til direktør utbetalt med kr 420 853. Styrehonorar er i 2001 utbetalt med kr 20 000 til styrets leder og kr 10 000 til styrets øvrige medlemmer.

Fortsatt drift

Årsoppgjøret er avlagt under forutsetning om fortsatt drift. Til grunn for antagelsen ligger resultatprognoser for 2002 og UNIS langsiktige strategiske plan for 2001-2010. Institusjonen er i en sunn økonomisk finansiell stilling.

Arbeidsmiljø og personale

Sykefraværet var i 2001 152 dagsverk. Institusjonen har avtale med Longyearbyen Sykehus om bedriftshelsetjeneste. Det er ikke forekommet skader eller rapportert om alvorlige arbeidsuhell eller ulykker i 2001 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 stiftelsens drift forurensrer det ytre miljø.

Styrets virksomhet

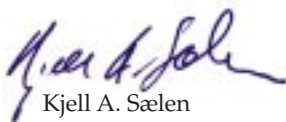
I 2001 har styret for UNIS avholdt 5 møter, hvorav tre i Longyearbyen. Det er i alt behandlet 51 saker. Viktige saker som ble behandlet i 2001 var ny strategiplan for 2001-2010, budsjett og planene for nybygg. UNIS har i 2001 arbeidet videre med omdannelsen av stiftelsen til aksjeselskap.

Veien videre

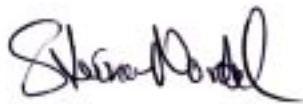
Arbeidet ved institusjonen de nærmeste årene vil være preget av utformingen av UNIS' areal i Forskningsparken, og en forventet økning i eksternt finansierte forskningsprosjekter. En svært viktig utfordring frem mot realiseringen av nybygget vil være å finne fleksible løsninger for institusjonens økende aktivitet. I henhold til Stortingets vedtak om en økning i aktiviteten ved UNIS vil styret ha en aktiv og konstruktiv dialog med Utdannings- og forskningsdepartementet om dette.

Longyearbyen 30. mars 2002

9



Kjell A. Sælen
leder



Steinar Nordal
nestleder



Åse Hjetland Bringedal



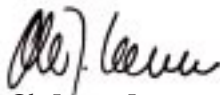
Viva Mørk Kvello



Dag Hessen



Noralv Bjørnå



Ole Jørgen Lønne



Lasse Lønnum
direktør

RESULTATREGNSKAP PR. 31.12. 2001

RESULTATREGNSKAP

Tekst	Note	2001	2000
Driftsinntekter og driftskostnader			
Driftstilskudd fra KUF		33 708 000	31 340 000
Investeringsstilskudd fra KUF, utstyr		1 260 528	1 801 340
Investeringsstilskudd fra KUF, boliger		2 594 614	2 561 613
Eksterne prosjektinntekter		3 781 588	2 058 914
Øvrige inntekter		1 797 945	1 264 041
Brutto driftsinntekter		43 142 675	39 025 908
Eksterne prosjektkostnader		3 781 588	2 058 914
Netto driftsinntekter		39 361 087	36 966 994
Lønn og sosiale kostnader	3	17 620 622	15 168 174
Avskrivninger	2	3 855 142	4 362 953
Felt- og toktkostnader		6 179 194	5 619 632
Øvrige driftskostnader	1	11 921 719	12 459 744
Sum driftskostnader		39 576 677	37 610 503
Driftsresultat		-215 590	-643 509
Finansinntekter og finanskostnader			
Finansinntekter		335 976	449 669
Finanskostnader		50 868	53 686
Netto finansinntekter		285 108	395 983
Resultat før ekstraordinære poster		69 518	-247 526
Årets over-/underskudd		69 518	-247 526
Disponeringer:			
Til/ fra annen egenkapital		69 518	-247 526

NOTER TIL

Note 0: Regnskapsprinsipper

Årsregnskapet er satt opp i samsvar med regnskapslovens regler og er utarbeidet etter norske regnskapsstandarder og anbefalinger til god regnskapsskikk.

- **Tilskudd fra Kirke-, utdannings- og forskningsdepartementet**

Totalt tilskudd til drift og investering fra KUF er mottatt med 37.968.000. Derav er 4.260.000 ført i balansen som "investeringstilskudd". Tilskuddet blir inntektsført i takt med årlige avskrivninger.

Driftstilskuddet er ført etter bruttometoden som egen inntektspost i resultatoppstillinga.

- **Eksterne prosjektinntekter /prosjektkostnader**

Inntektsføring på eksternt finansierte prosjekter skjer i takt med kostnader på tilhørende prosjekt.

Note 1: Øvrige driftskostnader

	2001	2000
Fraktkostnader	kr 195 009	218 184
Vareforbruk	kr 85 195	114 204
Kostnader vedr. lokaler	kr 2 053 112	2 299 479
Fremmedtjenester	kr 972 233	1 571 025
Bibliotekkostnader	kr 1 188 733	1 017 488
Kontorkost., tlf, fax	kr 932 643	945 765
Drift kjøretøyer	kr 361 054	328 655
Undervisningsmaterieell	kr 484 201	755 316
Reisekostnader	kr 3 107 913	2 780 990
Forskningstøtte og stip.	kr 1 500 821	1 403 799
Annonser/profilering	kr 343 005	413 781
Kontigenter/forsikring	kr 290 388	166 739
Diverse kostnader	kr 407 411	444 310
Sum øvrige driftskost.	kr 11 921 583	12 459 744

Note 2: Driftsmidler

Stiftelsen UNIS har i perioden 1993-1997 overtatt driftsbygning og tilsammen 20 boliger fra Svalbard Samfunnsdrift A/S. Svalbard Samfunnsdrift A/S var byggherre for bygningene og mottok tilskudd til oppføringen. Eiendomsretten til bygningene er overført vederlagsfritt til Stiftelsen UNIS og innført i balansen i 1997, med motpost "utsatt inntektsføring på investeringstilskudd, boliger".

Ved overtakelse av boligene er det i avtalen mellom Stiftelsen UNIS og Svalbard Samfunnsdrift A/S en klausul om tilbakeføring av boligene/leilighetene ved varig reduksjon av boligbehovet.

Note 3: Avskrivninger bygninger:

	UNIS-bygget	4 boliger	5 leiligheter	5 leil/6 boliger	2 leiligheter	1 leilighet	1 leileilighet	Hytte	Hytte	Hytte	SUM
Ferdig år	aug-95	jan-94	jan-95	jan-97	des-98	jan-99	des-00	apr-98	aril-95	arpil-97	
Avskrivningssats	4 %	4 %	4 %	4 %	4 %	4 %	4 %	4 %	4 %	4 %	
Kostpris	42 423 484	5 074 721	4 960 431	7 994 711	2 460 000	875 000	825 000	82 000	130 000	40 000	64 865 347
Bokført verdi 31.12.00	33 260 012	3 653 799	3 769 928	6 715 557	2 263 200	805 000	825 000	73 252	100 100	34 000	51 499 848
Årets avskrivninger	1 696 939	202 989	198 417	319 788	98 400	35 000	33 000	3 280	5 200	1 600	2 594 614
Akkumulerte avsk. 31.12.01	10 860 412	1 623 911	1 388 921	1 598 942	295 200	105 000	33 000	12 028	35 100	7 600	15 960 113
Bokført verdi 31.12.01	31 563 072	3 450 810	3 571 511	6 395 769	2 164 800	770 000	792 000	69 972	94 900	32 400	48 905 234

REGNSKAPET

Utsatt innt.føring på investerings- tilskudd bygninger 31.12.00	49 799 848
Inntektsføring av investerings- tilskudd boliger 2001	- 2 594 614
Utsatt innt.føring på investerings- tilskudd bygninger 31.12.01	<u>47 205 234</u>

• Utstyr og inventar

Økonomisk levetid for teknisk/vitenskapelig- og datautstyr er satt til 2 år mens inventar og kjøretøyer er satt til 5 år. Utstyret er avskrevet etter saldometoden.

	Tekn./vit utstyr	Kjøretøy	Inventar	Datautstyr	SUM
Avskriv.sats	50 %	20%	20 %	50 %	
Kostpris 31.12.00	1 006 606	287 08	300 229	647 906	2 241 823
Anskaffelser 2001	934 394	0	216 409	963 743	2 114 546
Avskrivning 2001	632 412	57 416	83 551	487 149	1 260 528
Bokf. verdi 31.12.01	1 308 588	229 665	433 087	1 124 501	3 094 841

I tillegg har Stiftelsen overtatt vederlagsfritt de driftsmidler som ble anskaffet i 1993.

Utsatt innt.føring på investerings- tilskudd utstyr 31.12.00	2 454 428
Investeringsstilskudd 2001	+ 4 260 000
Inntektsføring av investerings- tilskudd utstyr 2001	- 1 260 528
Utsatt innt.føring på investerings- tilskudd utstyr 31.12.01	<u>5 453 900</u>

Note 3: Lønn og sosiale kostnader

UNIS har i 2001 lønnet 33 fast ansatte .

	2001	2000
Ordinære stillinger	10 046 744	9 309 009
Arbeidsgiveravgift	389 401	273 987
Arbeidsgivers andel pensjon	535 497	534 453
Andre ytelser	481 884	372 551

Note 4: Andre kortsiktige fordringer:

Reiseforskudd ansatte	118 375
Fordringer ansatte	45 029
Forskudd leverandører	38 088
Sum andre kortsiktige fordringer	<u>201 492</u>

Note 5: Andeler Svalbardhallen (anleggsmidler)

Av velferdsmessige hensyn for ansatte og studenter er det tegnet andeler i «Svalbardhallen A/L» for kr. 50.000. Andelene er nedskrevet til kr. 1,- , da andelene ikke har noen omsetningsverdi.

Note 6: Godtgjørelser

Lønn til direktøren er utbetalt med	420 853
Arbeidsgivers andel pensjon direktør	28 829
Andre ytelser direktør	43 500

Styrehonorar er utbetalt med kr. 20.000 til styrets leder og kr 10.000 til styrets øvrige medlemmer.

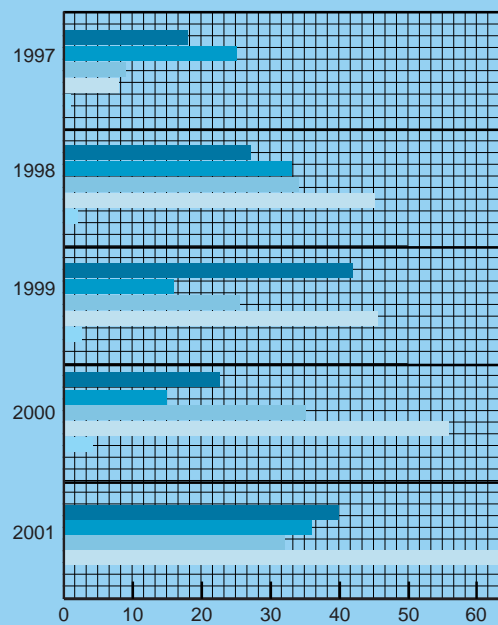
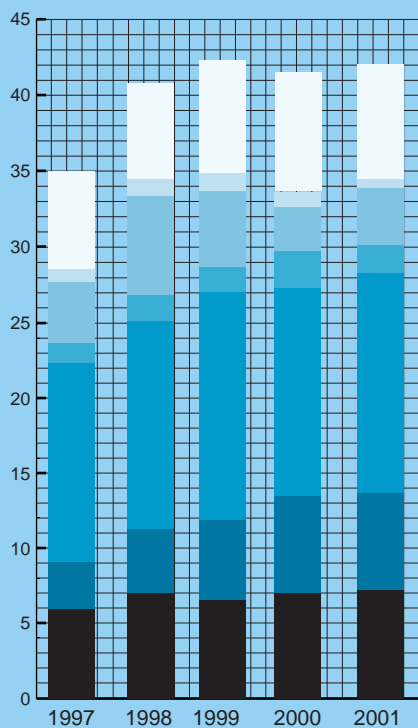
Virksomheten revideres av Riksrevisjonen . Det utbetales ingen revisjonshonorar.

Tekst	Note	2001	2000
EIENDELER			
Anleggsmidler			
Bygninger	2	48 905 234	51 499 848
Utstyr og inventar	2	3 095 841	2 241 823
Andeler Svalbardhallen	5	1	1
Sum anleggsmidler		<u>52 001 076</u>	<u>53 741 672</u>
Omløpsmidler			
Varebeholdning		108 790	103 143
Debitorer		3 244 744	554 958
Andre kortsiktige fordringer	4	201 492	250 089
Betalingsmidler		3 854 327	5 098 752
Sum omløpsmidler		<u>7 409 353</u>	<u>6 006 942</u>
SUM EIENDELER		<u>59 410 429</u>	<u>59 748 613</u>

GJELD OG EGENKAPITAL

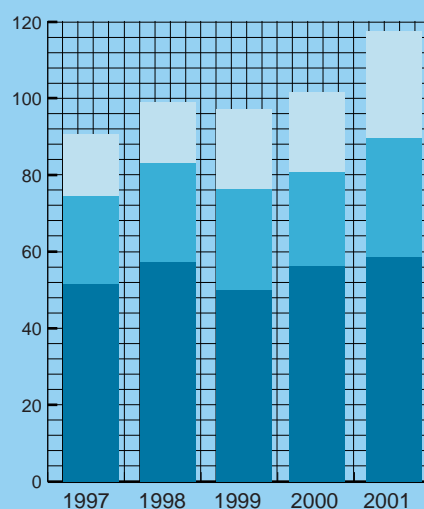
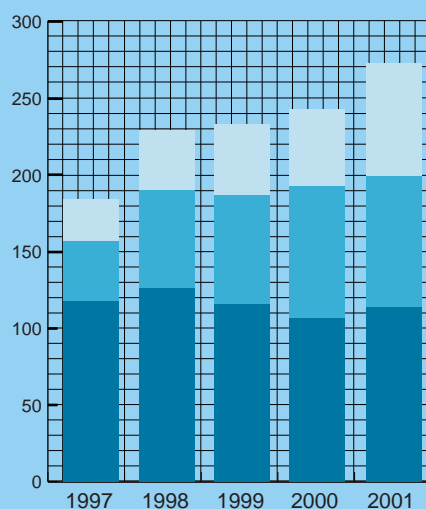
Egenkapital			
Grunnkapital		200 000	200 000
Annen egenkapital		1 096 645	1 027 127
Sum egenkapital		<u>1 296 645</u>	<u>1 227 127</u>
Avsetninger med forpliktelse:			
Utsatt innt.føring på invester.tilsk.,utstyr		5 453 900	2 454 428
Utsatt innt.føring på invester.tilsk.bygg	2	47 205 234	49 799 848
Sum langsiktig gjeld		<u>52 659 134</u>	<u>52 254 276</u>
Kortsiktig gjeld:			
Leverandørgjeld		1 368 611	3 767 646
Skyldige offentlige trekk og avgifter		1 458 614	1 179 912
Annen kortsiktig gjeld		2 627 425	1 319 653
Sum kortsiktig gjeld		<u>5 454 650</u>	<u>6 267 210</u>
SUM GJELD OG EGENKAPITAL		<u>59 410 429</u>	<u>59 748 613</u>

- Workforce in man-labour years according to occupational category at UNIS 1997–2001.
- Årsverk ved UNIS 1997–2001 fordelt på stillingskategori.
- Publications etc at UNIS 1997–2001.
- Publikasjoner etc. ved UNIS 1997–2001.



- Administrative staff
Administrativt ansatte
- Technical staff
Teknisk ansatte
- Scientific staff
Fast vitenskapelig ansatte
- Adjunct professors
Professor II
- Research fellows
Stipendiater
- Others
Andre
- Guest lecturers
Gjesteforelesere
- Publications scientific staff
Publikasjoner vitenskapelig ansatte
- Publications adjuncts
Publikasjoner professor II
- In press (all categories)
Publikasjoner in press (alle)
- Presentations (all categories)
Presentasjoner (alle)
- Books (all categories)
Bøker (alle)

- Student nationality categorised as Norwegian Nordic and non-Nordic students 1997–2001.
- Totalt antall studenter ved UNIS 1997–2001 fordelt på norske, nordiske og ikke-nordiske.
- Production in Student-labour years (1 year equals 20 Norwegian credits) categorised on teaching levels.
- Produksjon av studentårsverk (ett årsverk = 20 vekttall) ved UNIS 1997–2001, fordelt på undervisningsnivå.



- Norwegian students
Norske studenter
- Nordic students
Nordiske studenter
- Non-Nordic students
Ikke-nordiske studenter
- 200-courses
200-emner
- 300-courses
300-emner
- Master/Ph.D. work
Hovedfags- og doktorgrads arbeid

Courses

Emner undervist 2001 / Courses taught 2001

Course No.	Course name	Credits (ECTS)	Semester	No. of students
AS-101	Arctic Safety and Survival	1 (3)	spring and autumn	79
AB-201	Terrestrial arctic biology	5 (15)	autumn	15
AB-202	Marine arctic biology	5 (15)	autumn	14
AB-203	Arctic environmental management	5 (15)	spring	27
AB-204	Polar ecology and population biology	5 (15)	spring	17
AB-301A	Marine benthic fauna of Svalbard	3 (9)	autumn	15
AB-302	Flux of matter and energy from sea to land	3 (9)	spring	9
AB-306	Arctic flora, phytogeography and bioclimatology	3 (9)	spring	11
AB-311	Biotelemetric methods	3 (9)	spring	12
SUM	Arctic biology	32 (96)		
AG-201	The geology of Svalbard	5 (15)	autumn	17
AG-202	Arctic marine geology	5 (15)	spring	14
AG-204	The physical geography of Svalbard	5 (15)	autumn	17
AG-205	Seismic exploration	5 (15)	spring	11
AG-301	Arctic terrestrial and marine quaternary stratigraphy - excursion	2 (6)	autumn	19
AG-302	Geometry and kinematics of foreland fold and thrust belts	3 (9)	spring	12
AG-303	Sequence stratigraphy: A tool for basin analysis	2 (6)	autumn	17
AG-304	Glacial and periglacial processes	3 (9)	spring	22
AG-305	Glaciology	2 (6)	spring	19
AG-306	The quaternary climate history of the arctic	3 (9)	autumn	9
AG-308	Sedimentary facies analysis - From processes to systems tracts	3 (9)	spring	21
AG-309	Quaternary climate records and climate models	2 (6)	autumn	9
SUM	Arctic geology	40 (120)		
AGF-207	Space activity and remote sensing	5 (15)	autumn	11
AGF-210	The middle polar atmosphere	5 (15)	autumn	4
AGF-211	Air/ice/sea interaction	5 (15)	spring	19
AGF-212	Processes in snow and ice	5 (15)	spring	17
AGF-213	Polar meteorology	5 (15)	autumn	11
AGF-214	Polar oceanography	5 (15)	autumn	8
AGF-301	The upper polar atmosphere	5 (15)	spring	9
AGF-304	Radar diagnostics of space plasma	5 (15)	spring	9
AGF-330	Remote sensing and advanced spectroscopy	5 (15)	spring	8
SUM	Arctic geophysics	45 (135)		
AT-204	Thermo-mechanical properties of materials	3 (9)	spring	8
AT-205	Frozen ground engineering for arctic infrastructure	5 (15)	spring	6
AT-206	Arctic water resources	5 (15)	autumn	10
AT-207	Pollution in the arctic	5 (15)	autumn	19
AT-307	Arctic offshore engineering	2 (6)	autumn	8
AT-309	Cold regions field investigations	3 (9)	spring	16
AT-310	Heat and mass transfer	3 (9)	autumn	2
AT-311	Fate and modelling of pollutants in the arctic	3 (9)	spring	13
SUM	Arctic technology	29 (87)		

The Svalbard Science Centre will host a range of activities and institutions with different visions and agendas. What these activities share however is the determination to achieve, not simply specific space needs and economies of joint use, but also scientific benefits from the collocation of the academic environments in Longyearbyen, service benefits to external users of Centre facilities, as well as benefits to the local community and general public. The quest for scientific synergies will be embodied in the architecture and space assignments in existing and new buildings.

In June 2001 the National Building Administration (Statsbygg) invited selected competitors to bid for the Svalbard Science Centre project. The following architectural offices took part:

Jarmund/Vignæs AS Arkitekter MNAL, Oslo
A3 Arkitektkontor AS, Harstad
KHR AS Arkitekter, Copenhagen
Arkiplan AS, Trondheim
Per Knudsen Arkitektkontor AS, Trondheim
Borealis Arkitekter AS, Tromsø

The competition sought to define the ideal solution for a new building connected with the pre-existing building in relation to the overall goals of the project.

The following criteria were important in evaluating the competitive submissions: architectural expression and volume assignments relative to existing buildings and landscape; utility and functional requirements; space economies and space efficiencies; technical superiority of concepts; appropriate climatic and environmental solutions; and level of operational and investment costs.

Following a long and thorough evaluation of the submissions the «Svalbarskt» entry by Jarmund/Vignæs AS Arkitekter MNAL, Oslo was nominated the winner.

The winning submission features an attractive academic setting: an enclosed campus with spaces for discourse, close proximities, and good contact between users. The building is integrated with the pre-existing units wherever possible to form a coherent organisation. The architects have sought in their design to create a complex that clearly signifies an academic environment in a challenging climate.

Altogether this was an exciting project that successfully addressed the relevant concerns and the architectural issues involved. The project is flexible in terms of functional disposition, and volumes are varied and dispersed to suit the location. The project seems robust in terms of possible changes in space needs and functional criteria.

The winning submission successfully achieves the competition goals of academic synergies and smooth transitions with the pre-existing UNIS building.

Jarmund/Vignæs AS have many other prestigious projects to their credit, including the new Administration Block for the Governor of Svalbard and the College of Architecture in Oslo.

The timetable for realisation of the Svalbard Science Centre is as follows:

2002: Outline and preliminary projects
2003: Detailing and foundations start
2004: Construction start
2005: Possession in December

Facing north / Fasade mot nord.



Svalbard Forskningspark

Svalbard forskningspark består av forskjellige virksomheter med ulik bakgrunn for prosjektet. Felles for virksomhetene er imidlertid målsetningen om i tillegg til å tilfredsstillende konkrete arealkrav samt arealøkonomisering ved sambruk, å oppnå faglige synergieffekter gjennom samlokaliseringen av de akademiske miljøene i Longyearbyen, hensiktsmessighet for eksterne brukere av virksomhetenes tjenester, lokalbefolkningen og publikum. Målsetningen om faglige synergieffekter skal tydeliggjøres gjennom arkitekturen og arealdisponeringen i eksisterende og ny bebyggelse.

I juni 2001 inviterte Statsbygg til en begrenset prosjektkonkurranse om Svalbard Forskningspark. Følgende arkitektkontorer deltok: Jarmund/Vignæs AS Arkitekter MNAL, Oslo

A3 Arkitektkontor AS, Harstad
KHR AS Arkitekter, København
Arkiplan AS, Trondheim
Per Knudsen Arkitektkontor AS, Trondheim
Borealis Arkitekter AS, Tromsø

Gjennom prosjektkonkurransen ønsket man å finne fram til den best mulige løsning av et nybygg i tilknytning til eksisterende bygning i forhold til de overordnede målsetningene for prosjektkonkurransen.

Følgende kriterier ble vektlagt under evalueringen av konkurransebesvarelsene: arkitektonisk uttrykk og masseoppbygning i forhold til eksisterende bebyggelse og landskap, bruksmessige og funksjonelle krav, arealøkonomi/arealeffektivitet, teknisk gode løsninger, klima- og miljøriktige løsninger samt drifts- og investeringskostnader.

Etter en lang og grundig evaluering av de innkomne forslag ble bidraget «Svalbarskt» fra Jarmund/Vignæs AS Arkitekter MNAL, Oslo kåret som vinner av konkurransen. Vinnerprosjektet tilrettelegger for et godt akademisk miljø, en innvendig campus med plassdannelser for samkvem, nærhet og mulighet for god kontakt mellom brukerne. Bygget søkes integrert best mulig med eksisterende bygningsmasse for å skape en samlet organisasjon. Arkitekten ønsker at byggets design skal tydeliggjøre et akademisk miljø i et barskt klima.

Totalt sett er dette et spennende prosjekt som har et klart grep om situasjonen og det arkitektoniske konseptet som er valgt. Prosjektet har fleksibilitet i forhold til funksjoner, og har en variasjon i volumoppbygningen tilpasset stedet. Prosjektet vurderes som robust i forhold til å kunne takle endringer i rom- og funksjonskrav.

Vinnerforslaget er godt i forhold til konkurransens målsetning om faglige synergieffekter, med god tilknytning til eksisterende UNIS-bygg.

Jarmund/Vignæs AS har vunnet mange prestigefylte prosjekter tidligere bla. det nye administrasjonsbygget til Sysselmannen på Svalbard og Arkitekthøgskolen i Oslo.

Tidsplan for realiseringen av Svalbard Forskningspark:

2002: Skisseprosjekt og forprosjekt

2003: Detaljprosjekt og oppstart grunnarbeider

2004: Oppstart byggarbeider

2005: Innflytting i desember

Facing south / Fasade mot sør.





PHOTO: TOR BREKKE

Diving into information.

The UNIS Library provides the portal to a world of information for scientists and students at UNIS and the research staff at the Norwegian Polar Institute in Longyearbyen. Although the exact number of visitors is not known, there were 234 registered patrons who used the lending services more than once in 2001, almost the same as in 2000. The total number of card-holders at UNIS and the Norwegian Polar Institute is 318.

The Library was open from 10 a.m. to 4 p.m. most working days with the librarian on-call at the reference desk on 210 days in 2001. Other duties of the librarian included providing set books for sale to students, archive maintenance, and publication lists for the Annual Report.

In 2001 there were 2278 over-the-counter loans, which is an increase from 1662 in 2000.

Interlibrary loans (articles and books, etc.) increased to a total of 1141 in 2001 (990 interlibrary loans were recorded in 2000). Libraries outside Norway helped with some of these loans (75 in 2001). Our self-supply rate is still low compared to other institutions.

A total of 145 documents in the UNIS Library

were requested by libraries elsewhere, and most of the requests were processed here.

The Library subscribed to 142 periodicals (representing a total of 1400 registered issues of journals, etc.) and 10 newspapers, while 520 books, theses, etc. were registered in BIBSYS in 2001. Additionally, a total of 186 records were verified and registered in the Annual Report for 2000.

Due to the high turnover of library users, the task of training and assisting new patrons and dealing with reference questions is very important.

The UNIS Library has been a member of the Polar Libraries Colloquy since 1996, and in June 2000 the UNIS librarian was elected a member of the Steering Committee of the Polar Libraries Colloquy (June 2000 - June 2002). The librarian has represented UNIS on the BIBSYS Council from 1995 onwards.

For more detailed figures, see the library's website: www.unis.no/library/. Click «About the UNIS Library».

As the study counsellor said when he presented UNIS at my home university: "We may be the smallest university in the world, but we have got the largest laboratory in the world!" – referring to all the work that a student at UNIS will be doing outdoors. The combination of such a small university with some of the best lecturers in their field, the unique Arctic "laboratory environment", and the pint-size, big-hearted city of Longyearbyen where we live, are sure to provide a year you will not forget!

Studies

You will spend a lot of time outdoors in the "laboratory" as a student at UNIS. There you will be looking at peculiar features of the Arctic environment, taking samples of snow, ice, plants, animals, soil, measuring activity in the atmosphere, exploring the sea, and much more. All this on excursions that "normal" students can only dream about! We get around using snowmobiles, helicopters, planes, boats, cars and by foot. Although UNIS is a Norwegian institution, all the lectures are held in English. In 2001 we had students from 21 different countries, e.g. Tibet, Japan, Canada, USA, Brazil and Australia. But still most of our students come from Europe, predominantly from Scandinavia.

The Student Democracy

At the beginning of every term a General Meeting is held to elect the Study Council (SC). The GM is the highest organ in the Student Union (SU), which comprises all the students. The Council oversees the daily work of the Union, including upkeep of our two cabins and touring equipment, management of funds, holding Norwegian courses for non-Scandinavian members, arranging parties, and representing the students in the formal administration of UNIS.

The students have one representative on the UNIS Board of Directors, which is the governing body of the University. On the Board we have a vote, just like the other Directors. We are also represented on the Executive Committee, which handles the daily business of the University. Thanks to this representation and the comparatively small size of the Institution, the voice of students at UNIS is really heard.

The Study Council also publishes a handbook for the new students, the UNIS Student Survival Kit (USSK), which will tell you more about what to expect and what to do besides studying when you come to UNIS. This handbook is updated when needed.

Funding

The Student Union receives financial support from UNIS and we can apply for additional funding from the Student Union in Tromsø. These funds go towards maintenance and renewal of cabins, sleds and touring essentials. Sleds are available on a modest hire basis, and you will also be asked to leave a deposit. Other touring gear is available at no charge to students. Some of the money also goes to covering unlucky students' medical bills, where you pay the basic fee of kr 220 and the Student Union picks up whatever is left after your private insurance.

Social calendar

So – what is there to do, except study, up here on the top of the world? UNIS is actually closer to the North Pole than to the nearest McDonald's – a fact that a lot of us appreciate. Although Longyearbyen will satisfy most of your civilised needs, it is not a bad quality to be able to see the beauty in the surrounding mountains and mighty glaciers, and enjoy the eerie world of the polar night.

Within a 45 minute walk from Nybyen, the part of the city where the students live, there are several interesting ice grottoes and caves, there is wonderful skiing, rambling, and kayaking – and of course you can always go somewhere by snowmobile. On the island there are more snowmobiles than inhabitants, and some of the students pair up to buy one. It is also possible to rent a skidoo if you want to take a longer trip, for instance to the east coast, the land of the Polar Bear.

If outdoor activities do not interest you, or even if they do, Longyearbyen always beckons with its rather intense night life, especially when you compare it to other cities of its size. There is also a large, active sports club, you can attend the choir, work for the Red Cross, join a band or volunteer to help arrange our big fun events: the Polar Jazz Festival and Sun Festival.

Many former students of UNIS have never quite managed to get the experience out of their blood, and keep coming back for more – again and again. The close fellowship with staff and lecturers, the spectacular surroundings and the incredible excursions make "the Svalbard experience" something to remember.



PHOTO: HRAFNHILDUR HANNESDOTTIR

Hitchhiking in the ski-scooter tracks.

Arctic Biology

By Ingibjörg Jónsdóttir

The Department of Arctic Biology offers education and performs research in Arctic Biology/Ecology in both marine and terrestrial environments. In spite of this broad range of biospheres and the relatively small size of the Department we have a coherent and unifying research strategy. This year we have chosen to highlight research in *Terrestrial Plant Ecology* within the Department.

Arctic Terrestrial Plant Ecology

The Arctic terrestrial environment is usually characterised as harsh and stressful to all life forms. Low temperatures are not the only source of the stress, however: drought conditions, the extremely short period available for primary production, the slow turnover of nutrients, and the sudden shifts in the weather are all contributing factors. As we would expect, the plants that thrive here have several adaptations that enable them to survive, grow and reproduce. The main focus of plant ecological research at our Department is on population biology and adaptations, or life-history strategies among Arctic plants, the primary producers. This is fundamental to our understanding of plant community processes and the ecology of other trophic levels (herbivores, predators, scavengers), and the resilience of Arctic terrestrial ecosystems to environmental change.

At first glance the sparse, low-growing Arctic vegetation all looks alike to the untrained eye, but whoever takes time for a closer look will quickly discover how diverse it is, even on a small scale. Arctic vegetation is composed of a variety of growth forms (mosses, lichens, dwarf-shrubs, grasses, sedges, other herbs), and even within these broad categories great variety will be seen among the species. In other words, the plants show many different 'solutions' to the problem of survival on the Arctic land mass and one of our aims is to understand this variety and identify the factors that are most responsible for shaping life here. To this end we collaborate with scientists at the University of Tromsø, the Swedish University of Agricultural Sciences at Göteborg University, the Icelandic Institute of Natural History, and Colorado State University. We approach the question on different scales: on a circumpolar scale where different patterns among plant populations (population structures, physiological and genetic diversity) are studied in relation to climate, herbivory and glaciation history; and on much smaller spatial scales, where functions and processes are studied within and between populations.

One aspect of plant strategies is resource acquisition and how the resources are alloca-

ted to different life-history functions, i.e. growth, reproduction, storage etc. Mosses and lichens acquire most of their nutrients from above via rainwater, mist droplets and dry deposition, while vascular plants depend heavily on processes in the soil. The time the plants have for acquisition of resources is critical for the timing of reproduction. The growing season in unfrozen soils extends over little more than two months on Svalbard. With this in mind it is not hard to understand why most Arctic plants have a long life span, of up to hundreds or even thousands of years. Once they have established themselves, it may take many years before they start reproducing and, because reproduction is unsuccessful in most years, it can take an extremely long time before they complete their life cycle. In this context, the very existence of a small number of annual species in the Arctic is even more fascinating. The establishment of successful offspring is another critical process. Even though the short Arctic summer is the time of most biological activity, it is also important to consider winter conditions, because the long winter season puts serious constraints on plant life, and the summer conditions are largely determined by the distribution, thickness and duration of the snow cover. Therefore, changes in winter conditions may have an even greater effect on terrestrial plant life than changes in summer conditions.

Another aim of terrestrial research within the Biology Department is to understand interactions between plants with different growth forms and plant interactions with other trophic levels. Mosses are an important component of Arctic vegetation and they have a large effect on other plant growth forms, both directly and indirectly, by altering the physical properties of the soils by their insulation capacity. For example, the depth of the active layer in summer is strongly reduced by continuous moss cover and becomes shallower the thicker the moss mat is. The role of mosses in Arctic vegetation is the focus of a Ph.D project jointly supervised by the University of Aberdeen, Centre for Ecology and Hydrology, in Banchory, and UNIS.

The Arctic plants sustain large populations of herbivores, some of which are stationary while others are migratory. These in turn sustain different types of predators. Our studies over large productivity gradients on the Canadian tundra have shown that even at the extreme end of the gradient in the High Arctic, three trophic levels are sustained: plants, herbivores and predators. Migratory herbivores build an important link between the Arctic and other biomes and through

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PHOTO: INGIBJÖRG JÓNSDÓTTIR

The arctic vegetation has very low stature and only at a close look can the surprisingly high diversity among the plants be discovered.

Thick mats of mosses and lichens develop in coastal areas where humidity is relatively high and where grazing by reindeer is absent or at low intensity.



PHOTO: INGIBJÖRG JÓNSDÓTTIR

them environmental changes in one biome may be projected upon another. This was clearly seen in Canada where a degradation of low arctic goose grazed ecosystems occurred after a dramatic increase in goose populations caused by changes in conservation policy and land use at goose wintering grounds. On Svalbard, goose populations

have increased during the last decades for similar reasons. The aim of an upcoming EU project involving UNIS as one of 13 partners is to study the consequences of European land use and bird conservation on goose grazed ecosystems on Svalbard in a context of future climatic change.

Research Projects



PHOTO: INGIBJÖRG JÓNSDÓTTIR

Water is the most limiting factor for plant life in Svalbard. Vegetation is only found where the substrate is stable and water is not immediately drained away.

Title: The role of plant-herbivore-parasite interactions in the regulation of Svalbard reindeer.
Collaborating institutions: Center of ecology and hydrology (CEH), Scotland, University of Oslo, Norwegian College of Veterinary medicine
Financing: UNIS, CEH
Duration: 1996-2002
UNIS: Rolf Langvatn

Title: Population biology of red deer, - environmental effects and demographic processes.
Collaborating institutions: University of Oslo (UiO)
Financing: UNIS, UiO, Norwegian Research Council, Norwegian Institute of Natural Research, Directorate for Nature Management
Duration: 2000-2003
UNIS: Rolf Langvatn

Title: Effect of climate warming on tundra vegetation, The International Tundra Experiment, ITEX.
Collaborating institutions: Agricultural Research Institute and Icelandic Institute of Natural History, Iceland, Göteborg University, Sweden
Financing: Icelandic Science Foundation, Carl XVI Gustafs 50-års fond, UNIS
Duration: 1994-2003
UNIS: Ingibjörg S. Jónsdóttir

Title: Population ecology of clonal tundra plants: impacts of herbivores, climate and glaciation history
Collaborating institutions: University of Tromsø, Swedish University of Agricultural Sciences at Balsgård, Colorado State University
Financing: UNIS, National Science Foundation
Duration: 1999-2002
UNIS: Ingibjörg S. Jónsdóttir

Title: Terrestrial trophic dynamics in the Canadian Arctic.
Collaborating Institutions: University of British Columbia, Vancouver Canada, Swedish University of Agricultural Sciences at Umeå and Uppsala, Stockholm University, Göteborg University, Lund University, University of Joensuu Finland, University of Tromsø, University of Bergen, McGill University, Canada.
Financing: Swedish Polar Research Secretariat, UNIS, various others
Duration: 1999-2001
UNIS: Ingibjörg S. Jónsdóttir

Title: Quantitative aspects of biodiversity in the Arctic: Vegetation differentiation, species diversity, diversity of life forms and reproduction strategies
Collaborating Institutions: Home institutions of participants in AB-306
Financing: UNIS
Duration: 2001
UNIS: Ingibjörg S. Jónsdóttir



PHOTO: INGIBJÖRG JÓNSDÓTTIR

Micro-topography and nutrient availability are important in shaping conditions for plant growth in the Arctic as illustrated by the effects of this piece of driftwood at Norden-skiöldkysten.

Title: Image analysis techniques in quantitative marine benthic ecology
Collaborating institutions: University of Tromsø
Financing: UNIS
Duration: 1997-
UNIS: Ole J. Lønne

Title: Arctic fjords, an ecosystem approach
Collaborating institutions: University of Cape Town, Norwegian Polar Institute
Financing: UNIS
Duration: 2001
UNIS: Ole J. Lønne

Title: Sympagic communities
Collaborating institutions: Norwegian University of Technology and Science, Norwegian Polar Institute
Financing: UNIS
Duration: 2001
UNIS: Ole J. Lønne

Title: Population dynamics of zooplankton in the North Sea
Collaborating institutions: University of California San Diego, University of Bergen
Financing: UNIS
Duration: 1997-2002
UNIS: Ketil Eiane

Title: Distribution of zooplankton in relation to biophysical gradients associated with frontal systems
Collaborating institutions: University of Kiel, Germany
Financing: UNIS
Duration: 2000-2002
UNIS: Ketil Eiane

Title: Population dynamics of *Calanus* spp. in environmental gradients in Arctic fjords
Collaborating institutions: University of Bergen
Financing: UNIS
Duration: 2000-2002
UNIS: Ketil Eiane

Title: Zooplankton communities under differing advective influence in coastal areas on Svalbard
Collaborating institutions: Norwegian Polar Institute (NP), University of Kiel, Germany
Financing: NP, UNIS
Duration: 2000-2003
UNIS: Ketil Eiane

Graduates 2001 Cand.scient.

Title: Diet analysis of harbour seals in the Prins Karls Forland area of Svalbard
Collaborating institutions: University of Copenhagen
Student: Signe May Andersen
Supervisors: Kit Kovacs (Norwegian Polar Institute), Per Rosenkilde (University of Copenhagen)
Finished: Spring 2001

Title: Food-preferences of sympagic amphipods from arctic ice
Collaborating institutions: University of Hamburg
Student: Carolin E. Arndt
Supervisors: Ole Jørgen Lønne (UNIS), Angelika Brandt (University of Hamburg)
Finished: Spring 2001

Title: Distribution of zooplankton in relation to biophysical gradient associated with frontal systems
Collaborating institutions: Christian Albrecht University of Kiel
Student: Malin Daase
Supervisors: Ketil Eiane (UNIS), Michael Spindler (Christian Albrecht University of Kiel)
Finished: Spring 2001

Title: Does availability of resources influence on grazing strategies in female reindeer?
Collaborating institutions: Norwegian University of Technology and Science (NTNU)
Student: Snorre Henriksen
Supervisors: Bernt-Erik Sæter (NTNU), Ronny Aanes (Norwegian Polar Institute), Rolf Langvatn (UNIS)
Finished: Spring 2001

Title: Does female plumage ornamentation signal parental quality in the snow bunting (*Plectrophenax nivalis*)
Collaborating institutions: Norwegian University of Technology and Science (NTNU)
Student: Morten Ingebrigtsen
Supervisors: Yngve Espmark (NTNU), Arne Moksnes (NTNU), Rolf Langvatn (UNIS)
Finished: Spring 2001

Title: Effect of day length on spatial and temporal patterns of behaviour of Svalbard reindeer (*Rangifere tarandus platyrhynchus*)
Collaborating institutions: Friedrich-Schiller University, Jena
Student: Elke Lindner
Supervisors: Rolf Langvatn (UNIS), Stefan Halle (Friedrich-Schiller University, Jena)
Finished: Autumn 2001

Title: Carbon and nitrogen cycling in Sassen Valley, Svalbard
Collaborating institutions: University of Tromsø (UiT)
Student: Stian Røberg
Supervisors: Sigmund Spjelkavik (Longyearbyen Lokalstyre), Bjørn Solheim (UiT)
Finished: Spring 2001

Graduate students 2001 Ph.D.

Title: Reduction in the Arctic ice cover; sources for and pathways of ice faunal production in the Svalbard region
Collaborating institutions: Norwegian University of Technology and Science, TOTALFINA-ELF
Student: Carolin E. Arndt
Supervisors: Geir Johnsen (NTNU), Ole J. Lønne (UNIS)

Title: How soil fauna influence plant-microbial competition for N in arctic ecosystems
Collaborating institutions: Lancaster University, UK, Centre for Ecology and Hydrology (CEH), Scotland
Student: Stephen Dutton
Supervisors: Richard Bardgett (Lancaster University), René van der Wal (CEH), Ingibjörg S. Jónsdóttir (UNIS)

Title: The role of mosses in high arctic vegetation: competition, facilitation, herbivory
Collaborating institutions: University of Aberdeen, Centre for Ecology and Hydrology (CEH), Scotland
Student: Jemma L. Gornall
Supervisors: Sarah J. Woodin (University of Aberdeen) René van der Wal (CEH), Ingibjörg S. Jónsdóttir (UNIS)

Title: Ecology of Bryozoa in Svalbard waters
Collaborating institutions: University of Gdansk
Student: Piotr Kuklinski
Supervisors: Jan Marcin Weslawski (University of Gdansk), Bjørn Gulliksen (UNIS/University of Tromsø), Ole J. Lønne (UNIS)

Title: Mechanisms of density dependence in Norwegian red deer
Collaborating institutions: UNIS, University of Oslo (UiO)
Student: Leif Egil Loe
Supervisors: Rolf Langvatn (UNIS), Nils Christian Stenseth (UiO), Atle Mysterud (UiO)

Title: Biology and ecology of marine cold-water species in the Arctic
Collaborating institutions: University of Tromsø (UiT), TOTALFINAELF
Student: Sten R. Richardsen
Supervisors: Bjørn Gulliksen (UNIS/UiT), Ole J. Lønne (UNIS)

Title: Diversity and nitrogen fixation of cyanobacterial communities in terrestrial arctic ecosystems
Collaborating institutions: University of Tromsø (UiT)
Student: Matthias Zielke
Supervisors: Rolf Arnt Olsen (UiT/UNIS)

Cand.scient.

Title: Marine soft-bed communities along environmental gradients in Kongsfjorden
Collaborating institutions: University of Oslo
Student: Tormod Glette Hansen
Supervisors: Ole J. Lønne (UNIS), John S. Gray (UiO)

Title: On the structure of benthic soft-bottom macrofauna at Jan Mayen; A comparison of data retrieved by Van Veen grab samples and video recording using ROV
Collaborating institutions: University of Bergen (UiB)
Student: Trine Moland
Supervisors: Torleiv Brattgard (UiB), Ole J. Lønne (UNIS)

Title: Analysis of succession of a rocky bottom community in Smeerenburgfjorden
Collaborating institutions: Fredrich-Schiller Universität - Jena
Student: Ulrike Bartke
Supervisors: Ole J. Lønne (UNIS), Bjørn Gulliksen (UNIS/UiT), Winfried Voigt (Fredrich-Schiller Universität - Jena)

Title: A comparison of different benthic techniques (underwater photographs, video-recording and handpicking) in Isfjorden, Svalbard
Collaborating institutions: University of Tromsø
Student: Tore Magne Hoem
Supervisors: Ole J. Lønne (UNIS), Bjørn Gulliksen, (UNIS/UiT)

Title: Dynamics in *Calanus* spp. populations in Arctic fjords.
Collaborating institutions: University of Bergen (UiB)
Student: Gyda Arnkvern
Supervisors: Ketil Eiane (UNIS), Dag L. Aksnes (UiB)

Title: Life strategies and massive blooms in *Limacina helicina*
Collaborating institutions: University of Tromsø (UiT)
Student: Charlotte Gannefors
Supervisors: Ketil Eiane (UNIS), Bjørn Gulliksen (UNIS/UiT), Stig Falk-Pettersen (Norwegian Polar Institute)

Title: Population structure and tropic interactions in polar cod (*Borealis saida*) in fjord on Svalbard.
Collaborating institutions: University of Oslo (UiO)
Student: May Arnberg
Supervisors: Ketil Eiane (UNIS), Stein Kaartved (UiO)

Title: On the echinoderm fauna around Spitzbergen
Collaborating institutions: Christian Albrecht University of Kiel
Student: Rupert Krapp
Supervisors: Ole J. Lønne (UNIS), Michael Spindler (Christian Albrecht University of Kiel)

Title: Makebeovokning og sang hos hanner av snøspurv *Plectrophenax nivalis*, på Svalbard sett i relasjon til deres foreldreinnsats.
Collaborating institutions: Norwegian University of Science and Technology (NTNU)
Student: Marie Lier
Supervisors: Rolf Langvatn (UNIS), Yngve Espmark (NTNU), Arne Moksnes (NTNU)

Title: The importance of Advective Processes for the Zooplankton community in Arctic Fjord (Kongsfjorden, Svalbard)
Collaborating institutions: Christian-Albrecht-University of Kiel
Student: Sünne Linnèa Basedow
Supervisors: Ketil Eiane (UNIS), Michael Spindler (Christian Albrecht University of Kiel)



PHOTO: INGIBJÖRG JÓNSDÓTTIR

Students analysing the diversity of the vegetation at Nordenskiöldkysten.

Arctic Geology

By Ole Humlum



PHOTO: OLE HUMLUM

Glacier at Magdalenefjorden (NW Spitsbergen) with large lateral moraines deposited during the Little Ice Age stage.

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The Arctic Geology research vision for the period 1999-2003 as presented in the 1998 issue of the UNIS Annual Report is still the background for both tuition and research within the Department of Arctic Geology. In 2001 the Department offered 12 courses: four at level 200 and eight at level 300. The level 200 courses making up the one-year study program (20 Norwegian credits, equal to 60 ECTS) were offered in their present form for the eighth time. We have continued to work towards greater consistency within the level 300 courses and a stronger theoretical profile matching ongoing research activities. The eight level 300 courses (duration from 2 to 5 weeks) offered for master's and doctoral candidates represent a total of 20 credits.

Our academic staff numbers four full-time faculty and three associate positions. A vacant position in Geology was filled during the autumn by Associate Professor Tine L. Rasmussen. Specialising in Marine Geology, she came to us in place of Associate Professor Trond Dokken, who has taken up a position at the new Bjerknes Centre for Climate Research (University of Bergen). Associate Professor Ida Lønne was on sabbatical leave at the University of Boulder, Colorado, USA, in autumn 2001. Her position was filled on a temporary basis by Mona Henriksen (University of Bergen) who took care of educational issues most successfully. Adjunct Professor Jenö Nagy (University of Oslo) ended his engagement with UNIS in 2001, following several years of excellent service. Adjunct Professor Anders Solheim (Norwegian Geotechnical Institute) was appointed during the autumn 2001, developing a new course *AG-206 Marine Geological and Geophysical Studies*, which will be launched in spring term 2002. In June 2001 Angélique Prick (Belgium) joined the Department on a two-year Marie Curie Fellowship, funded by the European Commission (Project: Rock weathering in high latitude environments). In cooperation with the University of Gothenburg and in collaboration with the Universities of Stockholm and Alberta, a Ph.D student working on the *Late Glacial and Holocene Climate and Environmental Variability on Svalbard* joined the Department in August. Finally, on 1st December 2001, we saw the closing date for applications for a new Norwegian funded Ph.D scholarship at the Department. The successful candidate will start his/her project during spring 2002.

The Department thus continues to attract new professional blood although guest lecturers still remain a vital resource for implementation of the extensive range of courses offered. These visitors are frequently involved in ongoing scientific projects, and

these partnerships help build commitment and improve the predictability and continuity of the teaching. The contact with visiting authorities is also of immense value to our students, who in this way get a first-hand insight into the sorts of research conducted on Svalbard and other Arctic regions.

During 2001 the staff at the Department of Geology were actively engaged in several research projects. A number of projects were continued from the previous year and several new projects were initiated, as reported here and on our webpage. A few examples of ongoing research at the Department are described in brief below.

One recently started project studies the climate and vegetation history of Svalbard over the past 10 000 years. This investigation is based on high resolution analyses of lake sediment cores collected from lakes in western Spitsbergen. Six lakes in the Isfjorden area were cored during the 2001 field season, and new cores will be collected from the Brøgger peninsula, south of Kongsfjorden, in spring 2002. A range of tests, including analyses of diatoms, biogenic silica, chironomids, macrofossils, C/N ratios and CN content, will be applied to the sediment sequences to trace shifts in the ecosystem over time. These records will help us decipher climatic evolution and reveal the pattern and timing of early/mid Holocene warming, Neoglacial cooling, Little Ice Age changes, and temperature variability during the past 150 years.

Another research project is based on a series of case studies of the moraines of temperate glaciers in Norway, from which an allostratigraphic model is suggested as a conceptual guide for the field analysis of ice-contact deposits, based on outcrop sections, as well as seismic or ground-penetrating radar profiles. Allostratigraphic mapping of the internal facies architecture of marine moraines reveals the development history of ice-contact sedimentary systems. This new method of high-resolution analysis of the dynamic stratigraphy of moraines provides important information on the ice-front behaviour, glacier dynamics, and regional climatic variations.

An avalanche investigation project was initiated in 2001, making use of automatic digital cameras and automatic meteorological stations, to investigate modern snow cover variations in the landscape around Longyearbyen. This project was prompted by a tragic snowslide in February 2001. The avalanche killed two persons near the town. The extensive mountain plateaus around

Longyearbyen act as source areas for drifting snow during the winter, and this redistribution of precipitation is significant for avalanche activity and related phenomena such as glacier mass balance. On a more local scale the thickness of the snow cover is also an important determinant of ground temperatures, due to its insulating effect, and therefore also the ground temperature and permafrost depths in the region. Also the plant cover is influenced by the thickness and duration of the snow cover: During winter when the snow protects from physical wind abrasion and low temperatures; and during the growing season when surviving snow patches act as water reservoirs. A research model of snow cover, permafrost depth, active layer, growth temperatures and so forth is being constructed from the data obtained from this field-based project.

Finally, a detailed research program on rock weathering in high latitude environments was initiated in summer 2001. Frost weathering of bedrock is highly important in permafrost environments, and has been studied by scientists for about a century now, both in the field and in the laboratory at various

research institutions. The mechanism involved in frost shattering was for many years thought to be the dilation of freezing water, but this process requires a very high saturation level in order to induce a shattering effect. New experimental results indicate that cryogenic suction is the mechanism that most likely causes shattering at the temperatures and moisture conditions that occur in nature, where full water saturation is rare. Near Longyearbyen a detailed research program on rock weathering, rock temperatures and rock moisture content has been instigated at a location accessible on a daily year-round basis, making detailed observations possible.

Master's degree students at the Department of Geology studied various issues related to active layer development, permafrost, ice wedges, the relation between rock glaciers and debris-covered glaciers, glacial geomorphology at a surge-type glacier, englacial drainage systems in polythermal glaciers, the dynamics of surge-type glaciers, and the geomorphic impact of snowmobiles. Further details of M.Sc projects are given below.

Research Projects



PHOTO: OLE HUMLUM

Sorted circles at Kvadrehuksletta, NW Spitsbergen. This periglacial phenomenon was produced by active layer processes above permafrost at shallow depth.

Title: «Temporal and spatial variations in circulation of deep and intermediate water masses in the North Atlantic region since 150 kyr BP».

Collaborating institution: Woods Hole Oceanographic Institution, Aarhus University, Geological Survey of Denmark and Greenland, Amsterdam Free University, The Netherlands, Rostock University, Germany, Cardiff University, UK.

Financing: UNIS, University of Rostock, Cardiff University

Duration: 1999-

UNIS: Tine L. Rasmussen

Title: LAMSCAN: Detecting Rapid Environmental Changes through Studies of Annually Laminated Sediments in Northern Scandinavia and the Faeroe Islands: Linkages to the North Atlantic Ocean.

Collaborating institution: Lund University, Stockholm University, Sweden, Norwegian Polar Institute.

Financing: UNIS, Lund University, Stockholm University

Duration: 1999-2003

UNIS: Tine L. Rasmussen

Title: Linking land and sea at the Faroe Islands: Mapping and understanding north Atlantic changes (LINK)

Collaborating institutions: University of Lund, University of Copenhagen, Geological Survey of Denmark and Greenland, Faroese Museum of Natural History, University of St. Andrews (Scotland)

Financing: Danish Natural Science Research Council

Duration: 1999-2002

UNIS: Tine L. Rasmussen, Ole Humlum

Title: Mapping snow cover duration, avalanches and other geomorphic processes by automatic digital cameras, Longyeardalen, Svalbard

Financing: UNIS

Duration: 1999-2005

UNIS: Ole Humlum

Title: Monitoring surface climate and active layer temperatures in various landforms around Longyearbyen, Svalbard

Financing: UNIS

Duration: 1999-2005

UNIS: Ole Humlum

Title: Isotopic composition of modern precipitation in Longyearbyen, Svalbard
Collaborating institutions: Niels Bohr Institute, University of Copenhagen
Financing: UNIS
Duration: 1999-2005
UNIS: Ole Humlum

Title: Modeling energy balance, surface temperatures, active layer depth and permafrost thickness around Longyeardalen, Svalbard
Financing: UNIS
Duration: 1999-2005
UNIS: Ole Humlum

Title: Monitoring surface climate and active layer temperatures in various landforms around Longyearbyen, Svalbard
Financing: UNIS
Duration: 1999-2005
UNIS: Ole Humlum

Title: The climatic and palaeoclimatic significance of rock glaciers
Financing: UNIS
Duration: 1999-2005
UNIS: Ole Humlum

Title: Holocene geomorphic activity in coastal Greenland at glacier equilibrium line altitudes
Collaborating institutions: University of Copenhagen, Arctic Station (Greenland)
Financing: Danish Natural Science Research Council
Duration: 1999-2002
UNIS: Ole Humlum

Title: Late Weichselian ice sheet dynamics in the coastal regions of western and northern Spitsbergen.
Collaborating institutions: Norwegian Agricultural University, University of Tromsø.
Financing: UNIS
Duration: 1999-2003
UNIS: Ólafur Ingólfsson

Title: Holocene glacial and climate history of Alexander Island, Antarctica
Collaborating institutions: Göteborg University, Lund University
Financing: Swedish Natural Sciences Research Council
Duration: 1999-2002
UNIS: Ólafur Ingólfsson

Title: Late Quaternary glaciations of the Kara Sea area, Yamal and Yugorski Peninsulas, western Siberia.
Collaborating institutions: Göteborg University, Sweden, University of Illinois at Chicago, USA, Earth Cryosphere Institute, Russia.
Financing: Swedish Natural Sciences Research Council
Duration: 1998-2002
UNIS: Ólafur Ingólfsson

Title: Reconstructing late Pleistocene history of Arctic coastal zone, based on origin of massive ground ice.
Collaborating institutions: Earth Cryosphere Institute, Russia.
Financing: Swedish Natural Sciences Research Council
Duration: 1998-2001
UNIS: Ólafur Ingólfsson

Title: Late Quaternary glacial history of Severnaya Zemlya, Arctic Russia
Collaborating institutions: Göteborg University, Lund University, Sweden, Institute of Arctic and Alpine Research, University of Illinois at Chicago, USA
Financing: Swedish Natural Sciences Research Council, Swedish Polar Research Secretariat, National Science Foundation (USA), UNIS
Duration: 1999-2002
UNIS: Ólafur Ingólfsson

Title: Sediment transport during and after the last deglaciation and its effect on the development of a high-arctic arid landscape, Svalbard
Collaborating institutions: University of Bergen
Financing: UNIS
Duration: 1997-2003
UNIS: Ida Lønne

Title: The dynamics of marine glacier termini as read from moraine architecture
Collaborating institutions: University of Bergen
Financing: UNIS
Duration: 1999-2003
UNIS: Ida Lønne

Title: Norwegian Ocean Climate Project (NOClim)
Collaborating institutions: University of Bergen, University of Tromsø, Norwegian Meteorological Institute, Nansen Environmental and Remote Sensing Center, Norwegian Polar Institute
Financing: Norwegian Science Foundation
Duration: 2000-2003
UNIS: Trond Dokken

Title: International Marine Global Change Study (IMAGES)
Collaborating institutions: Several nations
Financing: Norwegian Science Foundation financing the Norwegian membership
Duration: 2000 -
UNIS: Trond Dokken

Title: Brine generation and deep water formation in the Barents Sea (Storfjorden and adjacent slope) – present and past
Collaborating institutions: University of Bergen (UiB)
Financing: UNIS, UiB
Duration: 1999-2002
UNIS: Trond Dokken



PHOTO: ANGÉLIQUE PRICK

Rock weathering research site near Longyearbyen.

Title: Sea level control on turbidite accumulations, the Battfjellet formation
Collaborating institutions: University of Bergen, University of Wyoming
Financing: WOLF-consortium
Duration: 1995-2003
UNIS: Ronald Steel

Title: Rock weathering in high latitude environments
Collaborating institutions: European Commission
Financing: European Commission (Marie Curie Fellowship)
Duration: 2001-2003
UNIS: Angélique Prick

Graduates 2001 Cand.scient

Title: Internal drainage of some subpolar glaciers on Svalbard
Collaborating institutions: University of Bergen (UiB)
Student: Odd Harald Hansen
Supervisors: Ole Humlum (UNIS), Stein-Erik Lauritsen (UiB), Jon Ove Hagen (UiO)
Finished: Autumn 2001

Title: Geomorphology and processes in the marginal zone of Drønbreen, Svalbard
Collaborating institutions: University of Bergen (UiB)
Student: Martin Berg
Supervisors: Ole Humlum (UNIS), Atle Nesje (UiB)
Finished: Autumn 2001

Title: Glacier dynamics and surge at Bjuvbreen, Kjellstrømdalen, Svalbard
Collaborating institutions: University of Oslo (UiO)
Student: Sofia Åsberg
Supervisors: Ole Humlum (UNIS), Jon Ove Hagen (UiO)
Finished: Autumn 2001

Graduate Students 2001 Ph.D.

Title of project: Late Glacial and Holocene climate and environmental variability on Svalbard.
Collaborating institutions: Göteborg University, Stockholm University, University of Alberta, Edmonton
Student: Sofia Holmgren
Supervisors: Ólafur Ingólfsson (UNIS), Barbara Wohlfarth (Stockholm University)

Cand.scient

Title: Stratigraphy and sedimentary environments during the Jurassic-Cretaceous transition on Spitsbergen, based upon foraminifer
Collaborating institutions: University of Oslo (UiO)
Student: Birgitte Brattebø
Supervisors: Jenö Nagy (UNIS/UiO)

Title: The oxygen isotope stratigraphy of Longyearbreen, Svalbard
Collaborating institutions: University of Bergen (UiB)
Student: Åse Hjetland Bringedal
Supervisors: Ole Humlum (UNIS), Atle Nesje (UiB)

Title: Lille Istids Maksimum i Van Keulenfjorden; deglasiasjonsdynamikk og sedimentasjon under tilbaketrekningen
Collaborating institutions: University of Oslo (UiO)
Student: Marit Carlsen
Supervisors: Ida Lønne (UNIS), Jon Ove Hagen (UiO)

Title: Glacier dynamics at Höganeshögen, Svalbard
Collaborating institutions: University of Oslo (UiO), Store Norske Spitsbergen Kulkompani
Student: Thomas Chareyron
Supervisors: Ole Humlum (UNIS), Jon Ove Hagen (UiO)

Title: Ice wedges as a palaeoclimatic indicator in Adventdalen, Svalbard
Collaborating institutions: University of Copenhagen
Student: Jon Willaing Jeppesen
Supervisors: Ole Humlum (UNIS), Hanne H. Christiansen (University of Copenhagen)

Title: Ugledalen rock glacier response on Holocene climatic variations, Svalbard
Collaborating institutions: University of Copenhagen
Student: Sisse Korsgaard
Supervisors: Ole Humlum (UNIS), Hanne H. Christiansen (University of Copenhagen)

Title: Influence of the snowpack on vegetation and active layer thickness, Adventdalen, Svalbard
Collaborating institutions: University of Copenhagen
Student: Mette Oht
Supervisors: Ole Humlum (UNIS), Hanne H. Christiansen (University of Copenhagen)

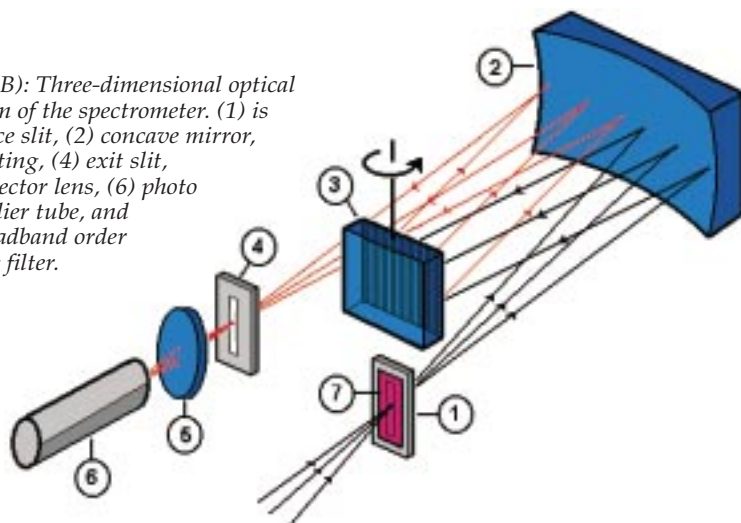
Title: The Geomorphic impact of snowmobiles around Longyearbyen, Svalbard
Collaborating institutions: Lund University
Student: Malin Elisabeth Persson
Supervisors: Ole Humlum (UNIS), Jonas Åkerman (Lund University)



PHOTO: FRED SIGERNES

Image of the 1/2m focal length Ebert-Fastie spectrometer at the Auroral station in Adventdalen, Svalbard. (1) is shutter, (2) instrument housing, (3) cooler for the photo multiplier tube, (4) tripod, (5) photo multiplier amplifier and discriminator, (6) light protective cell, (7) high voltage supply, (8) driver to shutter motor, and (9) stepper motor connected to grating shaft.

Panel (B): Three-dimensional optical diagram of the spectrometer. (1) is entrance slit, (2) concave mirror, (3) grating, (4) exit slit, (5) collector lens, (6) photo multiplier tube, and (7) broadband order sorting filter.



Introduction

The Arctic Geophysics Department specialises in four fields of teaching and research: Oceanography, Meteorology, and Middle and Upper Polar Atmosphere. Together they cover the vertical column from below the sea to the solar wind in near space. The emphasis is on polar geophysical phenomena with global implications, such as ocean currents, weather systems, and atmospheric radiation. The Department has four full professorships covering the specialist fields. There are also four adjunct professors in 20 per cent positions in Oceanography, Middle Atmosphere, and Upper Atmosphere (two positions). The second adjunct professor in Upper Atmosphere is funded by the Andøya Rocket Range. In 2001 there were two alterations in the full-time staff: Frank Nilsen took the position in Oceanography, and Dag A. Lorentzen took the position in Upper Polar Atmosphere. In 2001, the Department had 7 Ph.D fellows and 9 master's students doing their research at UNIS.

Teaching

The Geophysics Department currently offers six undergraduate and four graduate courses. All courses except one count as 15 ECTS credits, the exception being a graduate course for nine ECTS credits. The courses are aimed at students with a geophysics background, and introduce them to processes and theories related to the Arctic environment. Fieldwork is an important element in the majority of the courses given, and the students get hands-on experience in instrument operation, data collection, and analysis of field data.

Research

The Arctic Geophysics Department at UNIS engages in a broad range of Arctic research. The Department is in charge of the daily operations of the Auroral Station in Adventdalen. This optical research station has 25 instruments and 17 collaborating institutions in eight different countries. The Station

serves as a platform for research and teaching in middle and upper polar atmospheres. The focus of the research is on plasma physics processes in the ionosphere and magnetospheric boundary processes, combined with temperature measurements in the mesosphere. The Research Station is actively involved in research campaigns in collaboration with the EISCAT radar, and serves as an optical ground support station for rocket campaigns.

Mesospheric temperature logs have been kept at the Auroral Station for almost 25 years, constituting one of the longest time series in the world for this type of measurement. The Geophysics Department does the quality assurance on the readings, as well as analysis of the data. The temperature records are important both in a global context, and for our understanding of the interaction between the upper and middle atmosphere. In this connection we actively use data from the SOUSY radar located near Longyearbyen, and the LIDARs located at the Koldewey Station in Ny-Ålesund.

A new generation of spectral imagers has been developed at the Geophysics Department. The instruments detect spectral signatures of any target at high spectral and spatial resolution. Two of the units are now deployed by the Fishery Institute in Tromsø, and at the Institute of Physics in Lhasa, Tibet. The Geophysics Department has conducted several airborne campaigns in order to identify possible applications. The classification of ice, melt water, vegetation, etc., provides a few of the potential uses. A new version of these spectral imagers with a faster frame rate (30 fps) is being constructed in cooperation with Statoil for airborne classification of bedrock layers on Svalbard.

The Geophysics Department initiated a new project for the determination of energy transfer of the solar wind plasma to the Earth's magnetosphere/ionosphere system in 2001. This PROTONICS project utilises two low-light, high sensitivity spectrometers – one located near Longyearbyen and another located in Ny-Ålesund – measuring hydrogen Doppler profiles in the Aurora. The main object of the project is to establish links between the ionospheric signatures of auroral hydrogen emissions in the dayside Aurora, and the spatial and temporal variations of the reconnection process at the dayside magnetospheric boundary. The solar wind plasma feeds the Earth's magnetosphere and ionosphere with energetic particles, which in turn cause anomalies in the

ionospheric plasma densities. As the process can disrupt important commercial and military satellite systems, it is therefore vital to fully understand the entry mechanisms of this energetic plasma.

In the project designated *Environmental Research in Tibet*, three new instruments designed to record atmospheric, global and diffuse global radiation were installed on the roof of the Institute of Physics, University of Tibet, in Lhasa, at 30 N and 3,700 metres altitude. Two five-channel instruments for UV radiation and an imaging spectrometer were already installed at the site. This instrumentation is similar to the package operated at UNIS. One of the objects in the Tibetan project is comparison with similar data from Svalbard at 78 N.

Postgraduate Norsang Gelsor uses the data collected for his Dr. Scient thesis in Physics, and Gylsang Drunma uses the data on solar radiation and atmospheric radiation to test and develop radiation models for the Tibetan Plateau as part of her master's degree in Meteorology. In his work for a similar degree, Wang Lha is applying a numerical climate model to study possible climate changes in Tibet due to green-house effects.

One of our doctoral candidates, Christian Jaedicke, worked on issues related to snow drift and drift formation around buildings and snow accumulation as a function of topographical features. He defended his doctoral thesis at UNIS in October. Another doctoral candidate, Hans Olav Hygen, has been working on problems related to sound propagation in the atmosphere under different atmospheric conditions. He defended his doctoral thesis at UNIS in May.

In another project, Cand.Scient student Ola Brandt has studied climatic changes and variations in mass balance on glaciers in Iceland, based on historical distribution of ash layers. He finished his Cand.Scient degree in May. Another candidate, Alexei Stulei, has correlated data from tethered soundings in the atmosphere at up to 1000 metres altitude and data from satellites, to study momentum exchange and heat exchange in the marginal ice zone. He completed his master's degree in May.

The Geophysics Department takes part in studies of variability and exchanges in the North Atlantic and Arctic Ocean. Focus is on seasonal and other variations in water exchange between the Norwegian Sea, Greenland Sea, Arctic Ocean and contiguous sea areas.

The Geophysics Department is also involved in the project *Dense Water Production Processes in Storfjorden*. The main objectives here are related to modelling, first of the ice and dense water formation process, then of outflow and entrainment, and finally of the general circulation in the fjord, to study its seasonal exchange with the surroundings and the effects on the exchange of the processes themselves. Global climate modellers consider these very same processes on a larger scale to be crucial to the response of the atmosphere-ice-ocean system to external perturbations. The present project aims to shed light on the working of the ice-ocean system by developing and testing representations of dense water formation and outflow from a basin where observations provide useful parameters for system behaviour. The project will use available hydrographical and sea ice data from extensive surveys in combination with conceptual descriptions from earlier investigations in order to quantitatively model formation and outflow of dense water from a marginal sea. The study area is Storfjorden, which due to its limited size offers a suitable test bed for model representation of crucial climate processes.

Research into processes in the coastal and fjord areas on Spitsbergen has continued in 2001, with participation on excursions by our partner institutions and in connection with our own teaching excursions. An extended field program was conducted in Van Mijenfjorden to support the *Joint US/Norwegian Studies of Ice/Ocean Interaction in Frozen Fjords*. Experiments were performed during a period of strong freezing. Under-ice turbulence was studied with the help of an advanced ROV, and a program on ice physics was conducted. A collaborative project was also started with Store Norske Spitsbergen Kulkompani in which ice thickness distribution and historical time series of the ice cover in Van Mijenfjorden are the main project objectives.

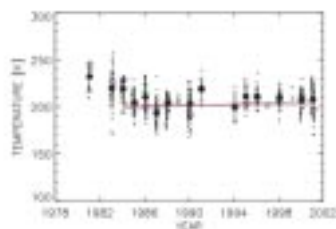


Fig. 1. Panel (A): Fig. 2. Seasonal mesospheric OH airglow winter temperature trend over Svalbard 1980 - 2001. The daily mean temperatures are plotted as small dots. The monthly mean temperatures are plotted for December (triangles) and January (circles). The seasonal averages (filled circles) have the standard deviation plotted as error bars. The dotted color line represents the linear trends.

Research Projects

Title: Monitoring Atlantic inflow north of Svalbard
Collaborating institutions: University of Bergen (UiB)
Financing: UNIS, UiB
Duration: 1999-
UNIS: Tor Gammelsrød, Frank Nilsen

Title: Dense water production processes in Storfjorden
Collaborating institutions: University of Bergen
Financing: Norwegian Research Council
Duration: 2000-2003
UNIS: Tor Gammelsrød, Ragnheid Skogseth

Title: Atmospheric accretion and icing
Collaborating institutions: University of Bergen, Norwegian Defence Construction Service
Financing: Norwegian Defence Construction Service, Norkring, Statnet, Telenor
Duration: 2001-2004
UNIS: Yngvar Gjessing, Magne Andersen Drage

Title: Snow metamorphosis and distribution in Finland
Collaborating institutions: University of Helsinki, Finland
Financing: University of Helsinki, Finland
Duration: 2001-2004
UNIS: Yngvar Gjessing, Tari Oksanen

Title: Mass balance and climate on glaciers in Iceland
Collaborating institutions: University in Iceland
Financing: University in Iceland, UNIS, University of Bergen
Duration: 2000-2004
UNIS: Yngvar Gjessing, Ola Brandt

Title: Environmental research in Tibet
Collaborating institutions: Meteorological Bureau Lhasa, University of Bergen
Financing: Norwegian Foreign Ministry, Norwegian Agency for Development Cooperation
Duration: 1995-
UNIS: Yngvar Gjessing

Title: Sound propagation in the atmosphere
Collaborating institutions: Norwegian Defence Construction Service, University of Bergen, Norwegian University of Science and Technology
Financing: Norwegian Defence Construction Service, UNIS
Duration: 1995-2001
UNIS: Yngvar Gjessing, Hans Olav Hygen

Title: Study of snowdrifts and snow storage around buildings and constructions
Collaborating institutions: University of Bergen (UiB)
Financing: Narvik University College, UiB, UNIS
Duration: 1997-2001
UNIS: Yngvar Gjessing, Thomas Thiis

Title: Snowdrift and snow accumulation in complex landscapes
Collaborating institutions: University of Bergen, Norwegian University of Science and Technology
Financing: UNIS, Norwegian Research Council
Duration: 1998-2001
UNIS: Yngvar Gjessing, Christian Jeadicke

Title: Air-ice-sea interaction in the West Spitsbergen Current
Collaborating institutions: University of Bergen
Financing: Norwegian Research Council
Duration: 1998-2001
UNIS: Peter M. Haugan

Title: Variability of exchanges in the Northern Seas (VEINS)
Collaborating institutions: University of Hamburg, Germany and 19 European Institutions
Financing: European Union MAST programme
Duration: 1997-2001
UNIS: Peter M. Haugan, Tor Gammelsrød, Vigdis Tverberg

Title: Protonics
Collaborating institutions: University of Alaska, Fairbanks (UAF)
Financing: UAF, UNIS
Duration: 2001-
UNIS: Dag A. Lorentzen

Title: Auroral substorm and the magnetospheric boundary layer
Collaborating institutions: University of Oslo
Financing: UNIS
Duration: 2001-
UNIS: Dag A. Lorentzen

Title: A national project for studying solar wind-magnetosphere coupling in the polar cusp region
Collaborating institutions: University of Oslo, University of Tromsø
Financing: Norwegian Research Council, UNIS
Duration: 1997-2001
UNIS: Jøran Moen, Fred Sigernes

Title: ESR-studies of atmospheric dynamics in the polar cleft region
Collaborating institutions: US Air Force Research Laboratory, EISCAT, Rutherford Appleton Laboratory
Financing: Norwegian Research Council, UNIS
Duration: 1999-2000
UNIS: Jøran Moen

Title: Studies of the upper polar atmosphere
Financing: UNIS
Duration: 1999-
UNIS: Jøran Moen

Title: Studies of temporary and spatial variations in particle precipitation and current systems in the polar cleft region
Collaborating institutions: University of Bergen, University of Oslo
Financing: Norwegian Research Council
Duration: 2000-2003
UNIS: Jøran Moen, Kjellmar Oksavik

Title: On the effect of atmospheric forcing and topography at the Vøring Plateau
Collaborating institutions: University of Bergen
Financing: Norwegian Research Council
Duration: 1996-2001
UNIS: Frank Nilsen

Title: Measured and modelled tidal circulation under ice covered Van Mijenfjorden
Collaborating institutions: Institute of Marine Research
Financing: UNIS
Duration: 2001-
UNIS: Frank Nilsen

Title: Isdannelse og isvekst i Van Mijenfjorden
Financing: Store Norske Spitsbergen Kulkompani, UNIS
Duration: 2001-
UNIS: Frank Nilsen, Knut V. Høyland

Title: Long-time variation in the Svinøy section
Collaborating institutions: University of Bergen, Norsk Hydro
Financing: Norsk Hydro
Duration: 2000-
UNIS: Frank Nilsen

Title: Atlantic water in Spitsbergen fjords: How instability processes in the West Spitsbergen current influence fjord ecosystems
Collaborating institutions: University of Bergen, Norwegian Polar Institute
Financing: UNIS
Duration: 2001-
UNIS: Frank Nilsen

Title: Objectiv analysis applied on mapping oceanic and atmospheric scattered data
Financing: UNIS
Duration: 2001-
UNIS: Frank Nilsen, Ingo Bethke

Title: Atmosphere / Ice / Ocean interaction studies
Collaborating institutions: University of Bergen, University of Washington, McPhee Research Company, Norwegian Polar Institute
Financing: National Science Foundation, UNIS
Duration: 2001-2005
UNIS: Frank Nilsen

Title: The ecological effects of climate fluctuations and change: A multi-disciplinary and integrated approach
Collaborating institutions: University of Oslo, Norwegian Institute of Natural Research, Institute of Marine Research, University of Iowa, National Center of Atmospheric Research
Financing: Norwegian Research Council
Duration: 2001-
UNIS: Frank Nilsen, Rolf Langvatn

Title: Monitoring of OH rotational temperatures in the mesosphere
Collaborating institutions: University of Alaska (UAF), Embry-Riddle
Financing: UAF, UNIS, Embry-Riddle, Max Planck Institute
Duration: started in 1980 -
UNIS: Fred Sigernes

Title: Imaging spectroscopy by plane
Financing: UNIS
Duration: 1998-
UNIS: Fred Sigernes

Title: Proton precipitation on the dayside
Collaborating institutions: University of Alaska (UAF)
Financing: UAF, UNIS
Duration: 1998-
UNIS: Fred Sigernes, Dag A. Lorentzen

Title: Multiplatform observatories of the polar middle and upper atmosphere at the Auroral Station (campaigns)
Collaborating institutions: The Auroral Station and its partners. See haldde.unis.no
Financing: Multiple institutions
Duration: 1993-
UNIS: Fred Sigernes, Dag A. Lorentzen

Title: Rocket-instrumentation
Collaborating institutions: University of Tromsø (UiT)
Financing: UiT, UNIS
Duration: 2000-
UNIS: Fred Sigernes

Title: Imaging spectroscopy of Spitsbergen mountain rocks
Collaborating institutions: Statoil
Financing: UNIS, Statoil
Duration: 2001-
UNIS: Fred Sigernes

Graduates 2001

Ph.D.

Title: Sound propagation in the atmosphere
Collaborating institutions: Norwegian University of Technology and Science
Student: Hans Olav Hygen
Supervisor: Yngvar Gjessing (UNIS)
Finished: Spring 2001

Title: Snowdrift and snow accumulation in complex landscapes
Collaborating institutions: University of Bergen
Student: Christian Jaedicke
Supervisor: Yngvar Gjessing (UNIS)
Finished: Autumn 2001

Cand.scient.

Title: Mapping of ashlayer in Myrdalsjökul, Iceland, as a measurement for massbalance and icedynamics – with comparison to an icecore taken at Lomonosovfonna –99.
Collaborating institutions: University of Bergen (UiB)
Student: Ola Brandt
Supervisor: Yngvar Gjessing (UNIS/UiB)
Finished: Spring 2001

Title: Comparison of ice classification done by plane and satellite
Collaborating institutions: Danmarks Tekniske Universitet
Student: Mikael Lühje
Supervisors: Fred Sigernes (UNIS), Leif Toudal Pedersen (Danmarks Tekniske Universitet)
Finished: Spring 2001

Title: Measurements and evaluation of OH-air-glow spectra
Collaborating institutions: University of Bergen (UiB)
Student: Kristian Pagh Nielsen
Supervisors: Yngvar Gjessing (UNIS/UiB), Fred Sigernes (UNIS)
Finished: Autumn 2001

Title: Atmospheric boundary layer (ABL), Structure during cold air outbreak (CAO), within the Marginal ice zone (MIZ) both observational and modelling study.
Collaborating institutions: University of Bergen (UiB)
Student: Alexei Stuliy
Supervisor: Yngvar Gjessing (UNIS/UiB)
Finished: Spring 2001

Graduate Students 2001 PhD.

Title: Atmospheric accretion and icing
Collaborating institutions: University of Bergen, Norwegian Defence Construction Service
Student: Magne Andersen Drage
Supervisors: Yngvar Gjessing (UNIS/UiB)

Title of project: UV modelling and validation of UV models for Tibethian Plateau
Collaborating institutions: University of Bergen (UiB)
Student: Norsang Gelsor
Supervisors: Fred Sigernes (UNIS), Jakob Stamnes (UiB)

Title: Snow metamorphosis and distribution in Finland
Collaborating institutions: University of Helsinki, Finland
Student: Tari Oksanen
Supervisors: Yngvar Gjessing (UNIS/UiB)

Title: Studies of temporary and spatial variations in particle precipitation and current systems in the polar cleft region
Collaborating institutions: University of Bergen, University of Oslo
Student: Kjellmar Oksavik
Supervisors: Jøran Moen (UNIS/UiO)

Title: Dense water production processes in Storfjorden
Collaborating institutions: University of Bergen (UiB)
Student: Ragnheid Skogseth
Supervisors: Tor Gammelsrød (UNIS/UiB)

Cand.scient.

Title: Currents and water mass fluxes between Novaya Zemlja and Franz Josefs Land 1991-1992
Collaborating institutions: University of Bergen (UiB)
Student: Øyvind Leikvin
Supervisors: Tor Gammelsrød (UNIS/UiB), Frank Nilsen (UNIS)

Title: Diagnostics and notification of the expansion phase of magnetic substorm
Collaborating institutions: University of Oslo (UiO)
Student: June Lunde
Supervisors: Dag Lorentzen (UNIS), Jøran Moen (UiO/UNIS)

Title: Investigation of the polar cap boundary by EISCAT and optics
Collaborating institutions: Universitetet i Oslo (UiO)
Student: Carl Petter Nielsen
Supervisors: Jøran Moen (UiO/UNIS), Espen Trondsen (UiO)

Title: Cosmic radiation, space weather, and radiation exposure of civil air crew.
Collaborating institutions: Lund University
Student: Bjarte Gees Solheim
Supervisors: Jøran Moen (UNIS/UiO), Dag Lorentzen (UNIS), Carl-Erik Magnusson (Lund University)

Title: Monitoring sea ice fluxes through Fram Strait
Collaborating institutions: University of Bergen (UiB)
Student: Karolina Widell
Supervisors: Tor Gammelsrød (UNIS), Astrid Marie Nerbø Dahl (UiB)

Arctic Technology

By Per Johan Brandvik

Teaching

The Arctic Technology Department expanded its courses in 2001 to offer four level 200 courses (total 20 credits) and four courses at level 300 (12 credits). This makes the course load in the Department roughly comparable with the sister departments at UNIS. Further expansion is in train, and in spring/summer 2002 three new level 300 courses (7 credits) will be offered. The level 200 courses combine to form a full year of study in Arctic Technology and the option to specialise for a M.Sc or Ph.D degree based on level 300 studies.

The Department is relatively small by UNIS standards, with two associate professors and three adjunct professors on staff. This reflects the still young age of the Department. When fully established in a few years it is intended that Arctic Technology will have doubled its staff to roughly the level of the other departments.

In 2001 Arctic Technology taught 31 students on level 200 courses and 41 master's degree candidates doing level 300 courses. The average attendance on the lower series was 10 and all courses went ahead as scheduled with excellent results. Teaching of the undergraduate courses combines lectures, fieldwork and laboratory exercises.

Arctic Engineering

The Department offers a full-time program in Arctic Engineering which combines courses in Frozen Ground Engineering, Arctic Water Resources and Ice Mechanics. Students follow a unique program of lectures and fieldwork and laboratory practice. The work performed in our ice-laboratory, where mechanical properties of frozen ground and ice samples are

tested, is only one example. Fieldwork often goes ahead despite severe climatic conditions and operating in this harsh environment gives the student valuable skills which are not directly documented on the degree certificate. We also note with great satisfaction that UNIS graduates are sought-after candidates for key positions in local industry on Svalbard and on the mainland.

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 follow our courses in Environmental Technology. A new level 300 course *AT-311 Fate and Modelling of Pollutant in the Arctic* was offered for the first time in 2001 and filled to capacity. The twelve hard-working students earned excellent marks. In 2002 another new 300 course in Environmental Technology will be offered called *AT-312 Radioactive Pollution on Svalbard*.

Research

The faculty staff continued to work on established research programs at UNIS and a few new studies were initiated. The projects are detailed later in this section.

Examples of research studies in the Department include: The fate of oil spills in an Arctic environment and possible countermeasure techniques; levels and spreading of persistent organic pollutants (reindeer, sea ice, tundra, 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 are 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. As the new Environment Act for Svalbard

Experiments with oil in Svea to study oil-sediment interactions.

PHOTO: ANNE HOVDA



(Norwegian Public Reports NOU 1999:21) so rightly points out: an oil spill from a large cargo carrier could have a massive and unwelcome impact on the fragile ecosystems of Svalbard.

UNIS and SINTEF's Applied Chemistry Department are combining forces on a project sponsored by Store Norske Spitsbergen Kullkompani to analyse different oil spill scenarios related to coal transportation in Van Mijenfjorden. The project looks at a whole range of parameters: weathering properties of different bunker fuels, evaluation of recovery systems and strategies, and full-scale testing of oil spill booms and absorbants and other gear. The project will continue in 2002.

The Department's research in frozen ground and permafrost engineering focuses on the effects of climate change on Arctic infrastructure and the permafrost response to environmental and industrial loads, with a special emphasis on the physical properties of oil-contaminated soils. Research on ice-mechanics focuses on in-situ measurements of the thermomechanical properties of first-year sea ice, and monitors the ice conditions off the new jetty at Cape Amsterdam in Svea. Strain, temperature, motion, weather and currents are all monitored. The aim is to identify how environmental factors such as wind, currents and thermal expansion of the ice induce stresses in the sheet and its resultant motion. The Arctic Engineering Department also cooperates with the Arctic Geophysics Department in studies of general ice conditions in Van Mijenfjorden.

Our graduate students and doctoral candidates make important contributions to the research done by faculty staff in the Depart-

ment. During the year there were 11 graduate students working on a master's degree in the Department. Here is a brief specification of the projects:

- Modelling of the oil spills and contingency measures in the Arctic with emphasis on the Pechora Sea region, Northwest Russia
- Characterisation of acid drainage as a function of melting process from tailings deposit on permafrost in Bjørndalen, Svalbard
- Modelling permafrost temperature response to short-term (annual) and long-term (50 year) variations in meteorological data
- Leakage of water-soluble components from Arctic oil spills
- Temperature regime and permeability of a tailings deposit on permafrost in Bjørndalen, Svalbard
- Field investigations and numerical modelling of snow cover in the De Geer valley, Svalbard
- Leakage of toxic water-soluble components from different oil types during an oil spill in an Arctic environment
- Studying persistent airborne pollutants by sampling and analysis at the Longyear glacier
- The effects of sea ice loads on the coal export jetty at Cape Amsterdam, Svea.

Several of the master's degree projects have focused on topics important to the local communities on Svalbard and were performed in close cooperation with national and local industry. The master's degree projects were carried out under the guidance of supervisors from UNIS, the Norwegian University of Science and Technology (NTNU) in Trondheim, other universities and colleges, and industry.



Characterisation of iceridge in the marginal-ice-zone south of Hopen.

PHOTO: SVEINUNG LØSET

Research Projects

Title: Pollution from mine tailings on Svalbard
Collaborating institutions: Store Norske Spitsbergen Kullkompani (SNSK)
Financing: SNSK, UNIS
Duration: 1999-2003
UNIS: Per Johan Brandvik, Arne Instanes

Title: Level and transport of polychlorinated-biphenyls (PCB) in the Arctic (reindeers, char, snow/ice, tundra and seaweed)
Collaborating institutions: Norwegian Institute of Air Research
Financing: UNIS
Duration: 2000-2003
UNIS: Per Johan Brandvik

Title: Level and transport of heavy metals from local industry on Svalbard (river water, tundra and seaweed)
Collaborating institutions: Norwegian Geotechnical Survey (NGU)
Financing: NGU, UNIS
Duration: 2001-2003
UNIS: Per Johan Brandvik

Title: Permafrost response to industrial and environmental load
Collaborating institutions: Norwegian Geotechnical Institute (NGI)
Financing: Norwegian Research Council, NGI
Duration: 1999-2003
UNIS: Arne Instanes

Title: Arctic oil spills on Russian permafrost soils
Collaborating institutions: Norwegian Geotechnical Institute (NGI), Moscow State University, Earth Cryosphere Institute, Moscow
Financing: Program for research and higher education, co-operation programme for Eastern Europe, NGI
Duration: 1998-2002
UNIS: Arne Instanes

Title: Arctic Climate Impact Assessment (ACIA)
Collaborating institutions: University of Alaska Fairbanks, Moscow State University, Ecole Polytechnique, Montreal, Canada, Norwegian University of Technology and Science, Norwegian Polar Institute
Financing: Ministry of the Environment
Duration: 2000-2004
UNIS: Arne Instanes

Title: Leakage of water soluble components from oil spilled in Arctic environment
Collaborating institutions: SINTEF
Financing: UNIS, SINTEF
Duration: 2000-2002
UNIS: Per Johan Brandvik

Title: Resistant organic pollutants on Svalbard – sampling and analysis of ice samples from glaciers on Svalbard.
Collaborating institutions: Norwegian Institute of Air Research (NILU)
Financing: UNIS, NILU
Duration: 2000-2001
UNIS: Per Johan Brandvik, Ole Humlum

Title: Oil spill contingency for Arctic areas
Collaborating institutions: SINTEF
Financing: UNIS, SINTEF
Duration: 2000-2001
UNIS: Per Johan Brandvik

Title: Ice ridge-pipeline interaction
Collaborating institutions: Norwegian University of Technology and Science, Technical University of St. Petersburg, Russia
Financing: Norwegian Research Council
Duration: 2001-2003
UNIS: Sveinung Løset, Knut V. Høyland

Title: Measurements of structures in ice (STRICE)
Collaborating institutions: Norwegian University of Technology and Science, Ship model basin in Hamburg, Helsinki Technical University, Luleå Technical University, Technical Research Centre in Finland, Cambridge University and Geophysical and glaciological environmental laboratory, Grenoble
Financing: European Union
Duration: 2001-2003
UNIS: Sveinung Løset og Knut V. Høyland

Title: Konsolidering av skruis
Collaborating institutions: Norwegian University of Technology and Science, St. Petersburg Technical University, Russia
Financing: UNIS
Duration: 2001-2004
UNIS: Knut V. Høyland

Graduates 2000/2001

Ph.D. 2000

Title: Measurements and simulations of consolidation in first-year sea ice ridges, and some aspects of mechanical behaviour
Collaborating institutions: Norwegian University of Technology and Science (NTNU)
Student: Knut V. Høyland
Supervisors: Sveinung Løseth (NTNU/UNIS)
Finished: Autumn 2000

Cand.scient. 2000

Title: Winter water balance for Isdammen, Svalbard
Collaborating institutions: Stavanger University College
Student: Klaus Klungeland
Supervisors: Ånund Killingtveit (UNIS)
Finished: Autumn 2000

Title: Modelling permafrost temperature response to variations in meteorological data
Collaborating institutions: Université de Marne-la-Vallée
Student: Fabrice Caline
Supervisors: Arne Instanes (UNIS), Bruno Sportisse (Université de Marne-la-Vallée)
Finished: Autumn 2000

2001

Title: Modelling of the oil spills and contingency measures in the Arctic with emphasis on the Pechora Sea region
Collaborating institutions: St. Petersburg State Technical University (SPTU)
Student: Victoria Broje
Supervisors: Per Johan Brandvik (UNIS), A. I. Alkhimenko (SPTU)
Finished: Spring 2001

Title: Design, fabrication and installation of modularized platform for the Pechora Sea
Collaborating institutions: St. Petersburg State Technical University (SPTU), Statoil
Student: Svetlana Chafrova
Supervisors: Sveinung Løset (UNIS/NTNU), Karl N. Shkhinek (SPTU), Ove T. Gudmestad (Statoil)
Finished: Spring 2001

Title: Estimation of loads exerted by sea ice on the quay at Kapp Amsterdam, the Van Mijenfjord
Collaborating institutions: Norwegian University of Technology and Science (NTNU)
Student: Per Olav Moslet
Supervisors: Sveinung Løset (NTNU/UNIS)
Finished: Spring 2001

Title: Impacts of climate change on Arctic infrastructure: Case study on Svalbard Airport
Collaborating institutions: Uppsala University School of Engineering
Student: David Mjurreke
Supervisors: Arne Instanes (UNIS), Allan Rodhe (Uppsala University)
Finished: Autumn 2001

Title: Distributed snow modelling and verification in a High Arctic catchment
Collaborating institutions: Vrije Universiteit, Amsterdam (VU)
Student: Jorien Elisabeth Vonk
Supervisors: Per Johan Brandvik (UNIS), Ånund Killingtvedt (NTNU/UNIS), Hank Lingeman (VU)
Finished: Autumn 2001

Graduate Students 2001**Ph.D.**

Title: Ice ridge – pipeline interaction
Collaborating institutions: Norwegian University of Technology and Science (NTNU), St. Petersburg Technical University
Student: Pavel Liferov
Supervisors: Knut V. Høyland (UNIS), Sveinung Løset (NTNU/UNIS)

Cand.scient.

Title: Characterisation of acid drainage as a function of melting process from tailing deposit on permafrost in Bjørndalen, Svalbard
Collaborating institutions: Norwegian University of Technology and Science (NTNU)
Student: Eva Holm
Supervisors: Per Johan Brandvik (UNIS), Eiliv Steinnes (NTNU)

Title: Dissolution of water soluble components from an arctic oil spill
Collaborating institutions: Chalmers Tekniska Högskola
Student: Martin Anders Nelden
Supervisors: Per Johan Brandvik (UNIS), Katarina Abrahamsson (Chalmers)

Title: Studying airborne pollution by sampling and analysis from the Longyear glacier
Collaborating institutions: Åbo Akademi
Student: Pia Carolina Norrgård
Supervisors: Per Johan Brandvik (UNIS), Ole Humlum (UNIS), Carl Ehlers (Åbo Akademi)

Title: Oljeforurensing i Arktis; Karakterisering av oljenedbrytende bakterier isolert fra tundra som er forurenset med oljesøl
Collaborating institutions: University of Bergen (UiB)
Student: Irja Roiha Sunde
Supervisors: Per Johan Brandvik (UNIS), Lise Øvreås (UiB)

Title: Temperature regime and permeability of a tailing deposit on permafrost, Spitsbergen
Collaborating institutions: Uppsala University School of Engineering
Student: Helen Eva Sundström
Supervisors: Arne Instanes (UNIS), Nicholas Jarvis (Uppsala University)

Title: Oljeforurensing i Arktis; Kartlegging av diversiteten og sammensetningen av bakteriesamfunn i tundra som er kontaminert med oljesøl
Collaborating institutions: University of Bergen (UiB)
Student: Synnøve Yndestad
Supervisors: Per Johan Brandvik (UNIS), Lise Øvreås (UiB)



Scientific publications 2001

- **Scientific publications in reviewed journals
by full-time faculty**
- **Scientific publications
by adjunct professors**
- **Scientific publications «in press»**
- **Reports, published abstracts, etc.**
- **Popular scientific publications**
- **Presentations (oral or poster)**

Guest lecturers



Scientific publications in reviewed journals by full-time faculty

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- Lønne, I.** Bruk av georadar ved søk i snøskred. Systemmannen på Svalbard & Hovedredningssentralen, 4 April.
- Lønne, I.** Development of the Egge-Lyngås moraine, southern Norway : implications for glacier dynamics and subglacial sediment supply. Glacier-influenced sedimentation on high-latitude continental margins : modern and ancient, School of Geographical Sciences, University of Bristol, 29-30 March.
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- Moén, J.** Auroral signatures of dayside boundary layer dynamics. 28th Annual European Meeting on Atmospheric Studies by Optical Methods, Oulu, Finland, 19-24 August. (Invited).
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- Moén, J.** Ionospheric signatures of dayside magnetospheric boundary layers. AGU Chapman Conference on The Low-Latitude Boundary Layer and Its Dynamic Interaction with the Solar Wind and Magnetosphere, New-Orleans, Louisiana, 16-20 April. (Invited).
- Moén, J.** Magnetospheric boundaries and geomagnetic conjugate phenomena, China-Norway Joint International Symposium on Polar Science, Shanghai, China, 30 July-3 August. (Invited).
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- Moén, J.,** Holtet, J.A., Pedersen, A., Lybekk, B., **Oksavik, K.,** Østgaard, N. & Gustafsson, G. CLUSTER observations related to postnoon auroral arcs. EGS XXVI General Assembly, Nice, 25-30 March.
- Moén, J.,** Holtet, J.A., Pedersen, A., Lybekk, B., Svenes, K., **Oksavik, K.,** Søraas, F. & André, M. Cluster boundary-layer measurements and optical observations at magnetic conjugate sites. Fysiker-møtet 2001, Trondheim, 14-17 June.
- Moén, J.,** Lockwood, M., Denig, W.F., van Eyken, A.P., McCrea, I.W., Carlson, H.C., **Oksavik, K.** & Nielsen, K.P. EISCAT identification of Polar Cap Boundary Layer Dynamics. 10th International EISCAT Workshop, Tokyo, Japan, 23-27 July. (Invited).
- Neldén, M., **Brandvik, P.J.** & Daling, P.S. Characterisation of water-soluble components from oil spills at Arctic conditions. «HELCOM Oil-in-Ice seminar». Helsinki, October.
- Oksavik, K.** Har vi klær for romvær? Fagpedagogisk dag, Bergen, 2 February. (Lecture).
- Oksavik, K.** Introduction to Norwegian space research. Hanscom Air Force Base, Massachusetts, USA, 10 April. (Lecture).
- Oksavik, K.** Romvær til besvær. Realfagsdagen, Bergen, 15 March.

Oksavik, K. Space physics in Norway. Center for Space Physics, Boston University, Massachusetts, USA, 29 October. (Lecture).

Oksavik, K., Fritz, T.A., Zong, Q.G., Søråas, F. & Wilken, B. Sounding the magnetopause surface in three-dimensions with Cluster/RAPID. 2001 AGU Fall Meeting, EOS Transactions, SM22A-0795, San Francisco, California, USA, 10-14 December.

Oksavik, K., Søråas, F., Aksnes, A., Moen, J. & Wilken, B. The Svalbard archipelago : a window to CLUSTER. EGS XXVI General Assembly, Nice, 25-30 March.

Oksavik, K., Søråas, F., Moen, J. & Burke, W.J. Open and closed LLBL : optical and particle signatures. AGU Chapman Conference on The Low-Latitude Boundary Layer and Its Dynamic Interaction with the Solar Wind and Magnetosphere, New Orleans, Louisiana, USA, 16-20 April.

Oksavik, K., Søråas, F., Moen, J. & Burke, W.J. Optical and particle signatures of the low-latitude boundary layer near noon : satellite and ground-based observations. EGS XXVI General Assembly, Nice, 25-30 March. (Invited).

Prick, A. Gélifraction et chutes de pierre : le point sur les recherches récentes et quelques exemples du Spitsberg. Université de Reims, Institut de Géographie, 17 December. (Invited lecture).

Prick, A. Les risques naturels dans la région de Zermatt. Université Jean Moulin Lyon 3 – CGRA (Centre de Recherche en Géographie et Aménagement), 12 December. (Invited lecture).

Prick, A. Rock fall and weathering processes in an arctic environment : preliminary results from a research project carried out in Longyearbyen. Science Day exhibition, UNIS, 12 October. (Poster).

Prick, A. Le Spitsberg vu par une géographe liégeoise. Société Géographique de Liège, 19 December. (Invited lecture).

Rasmussen, T.L., Oppo, D.W., Thomsen, E. & Lehman, S.J. Deep-sea records from the SE Labrador Sea : timing of ice-rafting events during the last 150,000 years. International Conference on Paleoceanography ICP-VII, Sapporo, 16-21 September.

Schellpeper, M. & **Steel, R.J.** (2001). A shelf-edge delta-to-estuary couplet in the Early Eocene of Spitsbergen. AAPG Annual Meeting, Denver. (Poster).

Sigernes, F., Nielsen, K.P., Deehr, C.S., Svenøe, T., Shumilov, N. & Havnes, O. The Hydroxyl rotational temperature record from the Auroral Station in Adventdalen, Svalbard (78°N, 15°E). The 28th Annual European Meeting on Atmospheric Studies by Optical Methods, Oulu, Finland, 19-24 August. (Invited).

Sigernes, F., Svenøe, T. & Deehr, C.S. OPTICS at the Auroral Station in Adventdalen, Svalbard (78°N, 15°E). The 28th Annual European Meeting on Atmospheric Studies by Optical Methods, Oulu, Finland, 19-24 August.

Sigernes, F., Svenøe, T. & Deehr, C.S. OPTICS at the Auroral Station in Adventdalen, Svalbard (78°N, 15°E). China-Norway Joint Symposium on Polar Science, Shanghai, China, 30 July-3 August.

Steel, R.J. Models for deepwater sand deposition. Phillips Alaska, March. (Seminar).

Steel, R.J. Presented the Qualline Endowed Lecture Series, University of Texas at Austin. September.

Søråas, F., Aarsnes, K. & **Oksavik, K.** A space-based DST-index estimated from low altitude proton observations. Fysikermøtet 2001, Trondheim, 14-17 June. (Lecture).

Søråas, F., Aarsnes, K. & **Oksavik, K.** Ring current intensity estimated from low altitude proton observations. 15th ESA Symposium on European Rocket and Balloon Programmes and Related research, Biarritz, 28 May-1 June. (Lecture)

Vontrat-Reberac, A., Marchaudon, A., Taylor, M.G.G.T., Lavraud, B., Fontaine, D., Cornilleau-Wehrin, N., Cerisier, J.C., **Oksavik, K.**, Bosqued, J.M., Canu, P., Dunlop, M., Laakso, H., Décréau, P., Fazakerley, A. & Rème, H. Detailed cusp study for variable (mostly northward) IMF and quiet conditions. 2001 AGU Fall Meeting, EOS Transactions, SM22A-0804, San Francisco, California, USA, 10-14 December.

Widell, K., Østerhus, S., Hansen, E. & **Gammelstrød, T.** Measuring the Fram Strait ice and freshwater flux. NFR Climate and Ozon Programme, Bergen, 27-29 November.

Zielke, M., Ekker, A.S., Olsen, R.A., Spjelkavik, S. & Solheim, B. The influence of abiotic factors on biological nitrogen fixation in different types of vegetation in the High Arctic, Svalbard. NARP Symposium : The Arctic on Thinner Ice, Oulu, 10-11 May.

Zielke, M., Forney, L.J., Olsen, R.A. & Solheim, B. The influence of environmental factors on the nitrogen fixation activity and diversity of cyanobacterial communities in the High Arctic. CYANOFIX Workshop on Natural Communities of Nitrogen-fixing Cyanobacteria : New Techniques for Field Studies (European Science Foundation), Bertinoro, 6-10 November.

Guest lecturers

Name	Institution	Name	Institution
Aasen, Åge	Vervarslinga på Vestlandet	Finseth, Jomar	Norwegian University of Science and Technology
Alm, Göran	Stockholm University, Sweden	Flatberg, Kjell Ivar	Norwegian University of Science and Technology
Andresen, Arild	University of Oslo	Foldvik, Arne	University of Bergen
Andresen, Steinar	Fridtjof Nansens Institute	Forman, Steven L.	University of Illinois at Chicago, USA
Arlov, Thor Bjørn	Norwegian University of Science and Technology	French, Hugh M.	University of Ottawa, Canada
Arntsen, Oivind	Norwegian University of Science and Technology	Fuglei, Eva	Norwegian Polar Institute
Asplin, Lars	Institute of Marine Research, Bergen	Furevik, Tore	University of Bergen
Astakhov, Valery	Institute for Remote Sensing Methods in Geology, Russia	Gabrielsen, Geir Wing	Norwegian Polar Institute
Austegard, Atle	University of Bergen	Geirsdóttir, Àslaug	University of Iceland, Iceland
Ballantyne, Colin C.	University of St. Andrews, Scotland	Gjevik, Bjørn	University of Oslo
Berggren, Anne-Lise	Geofrost Engineering A/S	Goering, Douglas	Norwegian Geotechnical Institute
Berndt, Christian	University of Tromsø	Grønnevedt, Martin Dahl	University of Bergen
Björnsson, Helgi	University of Iceland, Iceland	Gudmestad, Ove Tobias	Statoil
Bjørnå, Noralv	Tromsø Geophysical Observatory	Guio, Patrick	University of Oslo
Bogen, Jim	Norwegian water resources and energy administration	Haagensen, Per J.	Norwegian University of Science and Technology
Brattegard, Torleiv	University of Bergen	Hagen, Jon Ove	University of Oslo
Brigham-Grette, Julie	University of Massachusetts, USA	Hagen, Oddvar	Region Hospital in Tromsø
Bruland, Oddbjørn	SINTEF	Hamre, Johannes	Institute of Marine Research, Bergen
Camus, Lionel	Akvamiljø AS	Hansen, Alfred	University of Tromsø
Cooper, Elisabeth	Norwegian Polar Institute	Hansen, Edmond	Norwegian Polar Institute
Crawford, Robert M.M.	University of St. Andrews, Scotland	Haug, Tore	Norwegian Institute of Fisheries and Aquaculture
Dale, Trine	Norwegian Institute of Fisheries and Aquaculture	Haugan, Peter M.	University of Bergen
de Lange, Tor	University of Bergen	Heia, Karsten	University of Tromsø
Derocher, Andrew E.	Norwegian Polar Institute	Hoflandsdal, Endre	Svalbard Community Services Company Ltd
Digranes, Per	University of Bergen	Holm, Elis	Lund University Hospital, Sweden
Ditlefsen, May Kristin	SINTEF	Hop, Haakon	Norwegian Polar Institute
Dokken, Trond	University of Bergen	Hoppe, Ulf Peter	Norwegian Defense Research Establishment
Dowdeswell, Julian	University of Bristol, UK	Huse, Geir	University of Bergen
Egeland, Alv	University of Oslo	Høgda, Kjell A.	NORUT IT
Eiken, Trond	University of Oslo	Isaksen, Ketil	University of Oslo
Eltoft, Torbjørn	University of Tromsø	Isham, Brett	EISCAT
Elvebakk, Arve	University of Tromsø	Jansen, Eystein	University of Bergen
Falk-Petersen, Stig	Norwegian Polar Institute	Jansson, Peter	Stockholm University, Sweden
Finch, Ivan	Rutherford Appleton Laboratory, UK	Jensen, Bjørn Munro	Norwegian University of Science and Technology

Name	Institution	Name	Institution
Johansen, Bror	SINTEF	Miller, Gifford	University of Colorado, USA
Johansen, Tor Arne	University of Bergen	Mjelde, Rolf	University of Bergen
Johansen, Torunn B.	Norwegian University of Science and Technology	Myhren, Bjarte	University of Bergen
Johnsen, Geir	Norwegian University of Science and Technology	Myrvang, Arne	Norwegian University of Science and Technology
Johnsen, Sverre Ola	Norwegian University of Science and Technology	Mølmann, Truls	Barlindhaug Consult AS
Kallenborn, Roland	The Norwegian Institute for Air Research	Nagy, Jenö	University of Oslo
Kangas, Tor-Villy	University of Bergen	Nemec, Wojtek	University of Bergen
Kilander, Carl Erik	The Gouernor on Svalbard	Nesje, Atle	University of Bergen
Killingtvedt, Ånund	Norwegian University of Science and Technology	Nilsen, Jan Even Øie	University of Bergen
Kjærnet, Torfinn	Commissioner of Mines at Svalbard	Nordal, Inger	University of Oslo
Klementsén, Anders	University of Tromsø	Norem, Harald	Norwegian University of Science and Technology
Knutsson, Sven	Luleå University of Technology, Sweden	Nøst, Ole Anders	Norwegian Polar Institute
Komorov, Olga Khitun	Botanical Institute, St. Petersburg, Russia	Pagel, Gajus	Technical University of Berlin, Germany
Kovacs, Kit	Norwegian Polar Institute	Paulsen, Jan Erik	Forecasting Division for Northern Norway
Kuhn, Michael	University of Innsbruck, Austria	Presterud, Pål	Norwegian Polar Institute
Kuvaas, Berit	Statoil	Ramstad, Svein	SINTEF
La Hoz, Cesar	University of Tromsø	Raustein, Elmer	University of Bergen
Laberg, Jan Sverre	University of Tromsø	Reed, Mark	SINTEF
Landrø, Martin	Norwegian University of Science and Technology	Reeh, Niels	Technical University of Denmark, Denmark
Landvik, Jon	Agricultural University of Norway	Renner, Udo	Technical University of Berlin, Germany
Lein, Berit	Directorate for Nature Management	Reymert, Per Kyrre	Svalbard Science Forum
Leinaas, Hans Petter	University of Oslo	Roettger, Jürgen	Max Plank Institut für Aeronomie, Germany
Leppäranta, Matti	University of Helsinki, Finland	Roth, Mary	Norwegian Geotechnical Institute
Lockwood, Mike	Rutherford Appleton Laboratory, UK	Rønning, Jan Steinar	Norwegian Geotechnical Institute
Loeng, Harald	Institute of Marine Research, Bergen	Sand, Knut	SINTEF
Lundén, Bengt	Stockholm University, Sweden	Sandven, Rolf	Norwegian University of Science and Technology
Malaize, Bruno	University of Bordeaux, France	Shkinek, Karl	State Technical University of St. Petersburg, Russia
Marchal, Oliver	Woods Hole Oceanographic Institution, USA	Shumilov, Nikita	University of Tromsø
McPhee, Miles	McPhee Research Company, Washington State, USA	Siggerud, Erling	PGS Reservoir AS
Mehlum, Fridtjof	University of Oslo	Siren, Pubu	Environmental monitoring Section, Canada
Mienert, Jürgen	University of Tromsø	Skeie, Paul	STORM
		Smedsrud, Lars Henrik	University of Bergen
		Sneli, Jon Arne	Norwegian University of Science and Technology
		Solheim, Anders	Norwegian Geotechnical Institute

Name	Institution	Name	Institution
Solheim, Inger	NORUT IT	Telebond, Turid	Svalbard Community Services Company Ltd
Solhøy, Torstein	University of Bergen	Thiede, Jörn	GEOMAR, Germany
Sorteberg, Asgeir	Norwegian Metrological Institute	Thorolfsson, Sveinn	Norwegian University of Science and Technology
Spielhagen, Robert	Alfred Wegner Institute, Germany	Totland, Ørjan	Agricultural University of Norway
Spielkavik, Sigmund	Longyearbyen Lokalstyre	Tverberg, Vigdis	Norwegian Polar Institute
Steinnes, Eiliv	Norwegian University of Science and Technology	Ulfstein, Geir	University of Oslo
Stenseth, Nils Christian	University of Oslo	van der Wal, René	Centre for Ecology and Hydrology, Banchory, U.K.
Stette, Gunnar	Norwegian University of Science and Technology	van Eyken, Tony	EISCAT
Strømme, Anja	University of Tromsø	von Quillfeldt, Cecilie	Norwegian Polar Institute
Sundet, Jan	Norwegian Institute of Fisheries and Aquaculture	Walløe, Lars	University of Oslo
Sundvor, Eirik	University of Bergen	Weber, Jan Erik	University of Oslo
Svendsen, Harald	University of Bergen	Werner, Al	Mount Holyoke College, USA
Svenning, Martin	Norwegian Institute for Natural Research	Winther, Jan G	Norwegian Polar Institute
Svenøe, Trond	University of Tromsø	Wohlfarth, Barbara	Lund University, Sweden
Sæltun, Nils Roar	University of Oslo	Zolotukhin, Anatoly	State Technical University of St. Petersburg, Russia
Sæther, Ola Magne	The Geological Survey of Norway	Øritsland, Nils A.	Norwegian Polar Institute
Søraas, Finn	University of Bergen	Østerhus, Svein	University of Bergen
		Øyvind A., Schnell	University of Bergen

