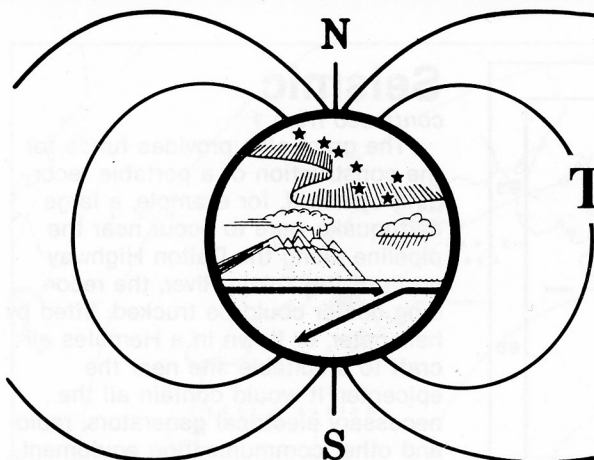




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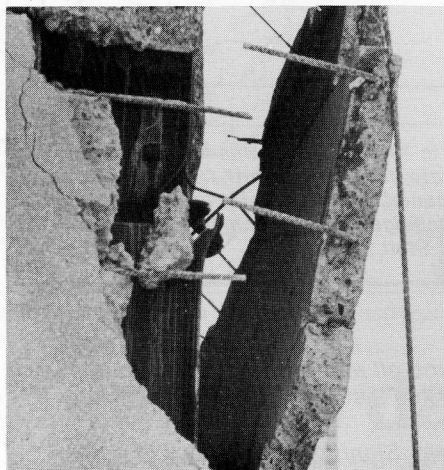
Portable seismic equipment funded

A \$350,000 grant from the W. M. Keck Foundation of Los Angeles will help fund a portable geophysical observatory for the Geophysical Institute. The award was announced January 16 by UAF Chancellor Patrick O'Rourke. Grant funds will be matched by \$200,000 in university funds.

The main component of the observatory will be a set of seismograph stations designed for quick deployment when major geophysical disturbances occur.

"Alaska is a large state with many active geological features such as earthquake faults, volcanoes, and surging glaciers," said O'Rourke. "We cannot afford to maintain sufficient permanent monitoring equipment to

AEP ARCHIVES



Well-defined seismic zones are required for adequate construction standards.

study all of these phenomena in detail, but this portable capability will allow researchers to study important and interesting events around the state as they happen."

David Stone, UAF professor of geophysics, is the principal author of the grant proposal. "Along with the seismic stations, the observatory will be equipped with several state-of-the-art sensors for recording geophysical phenomena," he said. "These will include radar and television systems for observing volcanic eruptions, and surveying systems that use signals from satellites orbiting the earth to measure fault offsets, the inflation of a volcano, or glacier motion."

continued on 2

Research supports new radio rules

Work by researchers at the Geophysical Institute, University of Alaska Fairbanks, has culminated in proposed rules changes by the Federal Communications Commission that should make life easier for AM radio station managers in Alaska and the northern tier of the contiguous states.

"The FCC has to see to it that broadcasters share fairly the frequencies of the AM broadcast band," said Bob Hunsucker, leader of the Institute's research effort. "They base decisions on what they know of radio wave propagation, but data gathered in the temperate zone doesn't necessarily apply in the high latitudes. The ionosphere in the north plays by different rules."

The ionosphere is a layer of the earth's atmosphere that acts almost like a mirror for radio waves in the AM broadcast band, reflecting them back to receivers that are otherwise too distant to receive them, or are blocked by hills and buildings.

"We've been working on the skywave portion," said Hunsucker. "Skywaves are only present in the AM band at night, because the daytime ionosphere absorbs the medium-frequency waves."

"If you're driving with the car radio on, and drive right past the transmitter, what you pick up is the ground-wave portion of the broadcast. At distances greater than several hundred miles from the transmitter, the groundwave fades out and, at night, the signal bounces off the ionosphere and can be received on your car radio."

The bounce can be deflected when the ionosphere is warped by conditions in the earth's magnetic field, as often happens in the far north.

"A good aurora show can be a sign of real trouble for radio stations," said Hunsucker. "It means things are stormy—in an electrical sense—in the ionosphere."

Hunsucker's study of radio wave

behavior showed that shifts are appropriate in FCC technical criteria for assigning AM frequencies and for nighttime operation strengths, interference calculations, and antennas. As a result of his work, the FCC has also proposed replacing the existing AM broadcast skywave propagation curves with a new propagation model, which was developed at the Geophysical Institute. Along with Hunsucker, the team working on the project included Brett Delana, Stan Schwafel, Kay Lawson, Rick Guritz, and Celia Rohwer. The new model lends itself easily to computerization, which should improve its accuracy and usefulness for all 50 states.

The study was built on several years of basic research by Hunsucker and colleagues in the fields of ionospheric physics and radiowave propagation. The most recent work was supported by funds from the Federal Communications Commission and the state of Alaska.

— Carla Helfferich

Seismic

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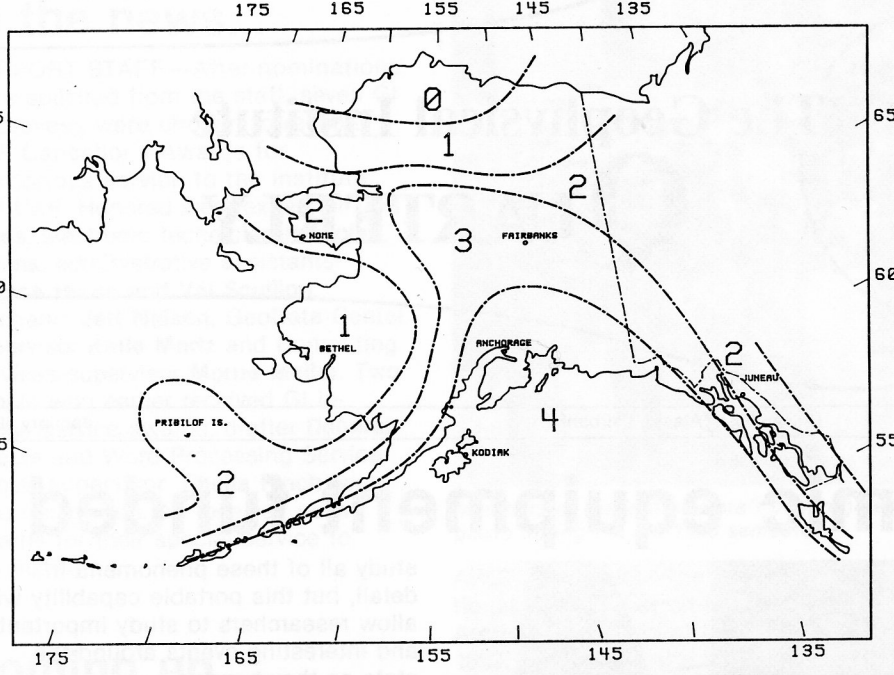
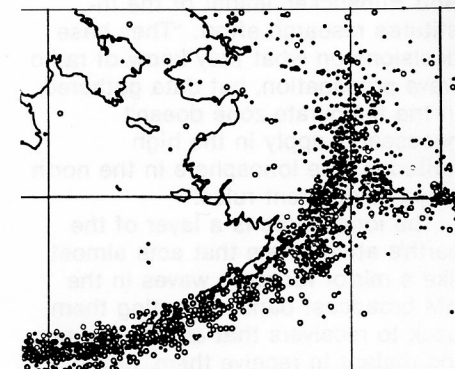
The grant also provides funds for the construction of a portable recording center. If, for example, a large earthquake were to occur near the pipeline along the Dalton Highway north of the Yukon River, the recording center could be trucked, lifted by helicopter, or flown in a Hercules aircraft to a suitable site near the epicenter. It would contain all the necessary electrical generators, radio and other communication equipment, recorders, and computers, to record the earthquake data, locate the earthquakes, and transmit the information to the nearest population center.

"I'm very excited about the portable seismic stations because they will improve our ability to provide public safety information before or during a volcanic eruption," said John Davies, Alaska's state seismologist. "And over the long run, they will provide key information about the activity of faults that will aid in designing buildings to better withstand Alaska's earthquakes."

The W.M. Keck Foundation grant project will complement the existing network of permanent seismic stations. "The strong support given the seismology program by the university and the state in recent years definitely strengthened the grant request," Davies said. He is also a research associate at the Geophysical Institute and affiliate associate professor in the department of geology and geophysics at UAF.

The W.M. Keck Foundation, one of the nation's largest foundations in terms of annual grants, was established in 1954 by the late William M. Keck, founder of the Superior Oil Company, who also created in his will the W.M. Keck Trust for the benefit of the foundation. The foundation's primary focus is on grants to universities and colleges throughout the United States, with particular emphasis in the fields of earth sciences, engineering, and medical research.

— Doreen Fitzgerald



New seismic zones for Alaska were established in 1988 based on this information from the institute's seismic program. The zones indicate degree of hazard: 0, no damage; 1, minor damage (distant earthquakes with fundamental periods greater than 1.0 second may cause damage to structures); 2, moderate damage; 3, major damage; 4, areas within zone 3 determined by proximity to certain major fault systems.

Director's note...

I want to take this opportunity to wish you all a happy and prosperous 1989, and to thank readers of the Geophysical Institute Quarterly for their interest and support.

At the institute, 1988 was an exciting year. Significant advances in auroral physics and atmospheric chemistry were made and well recognized by our colleagues at the December meeting of the American Geophysical Union in San Francisco. In the area of solid earth research, the Alaska Volcano Observatory was established, and the recent award of a W.M. Keck Foundation grant will help advance our seismic program.

The Alaska SAR (Synthetic Aperture Radar) Facility was dedicated at the institute in September, and preparations for receiving signals from earth resource satellites are well underway. The beautiful white and blue antenna installed on top of our building in August has become a landmark of the UAF campus and Fairbanks.

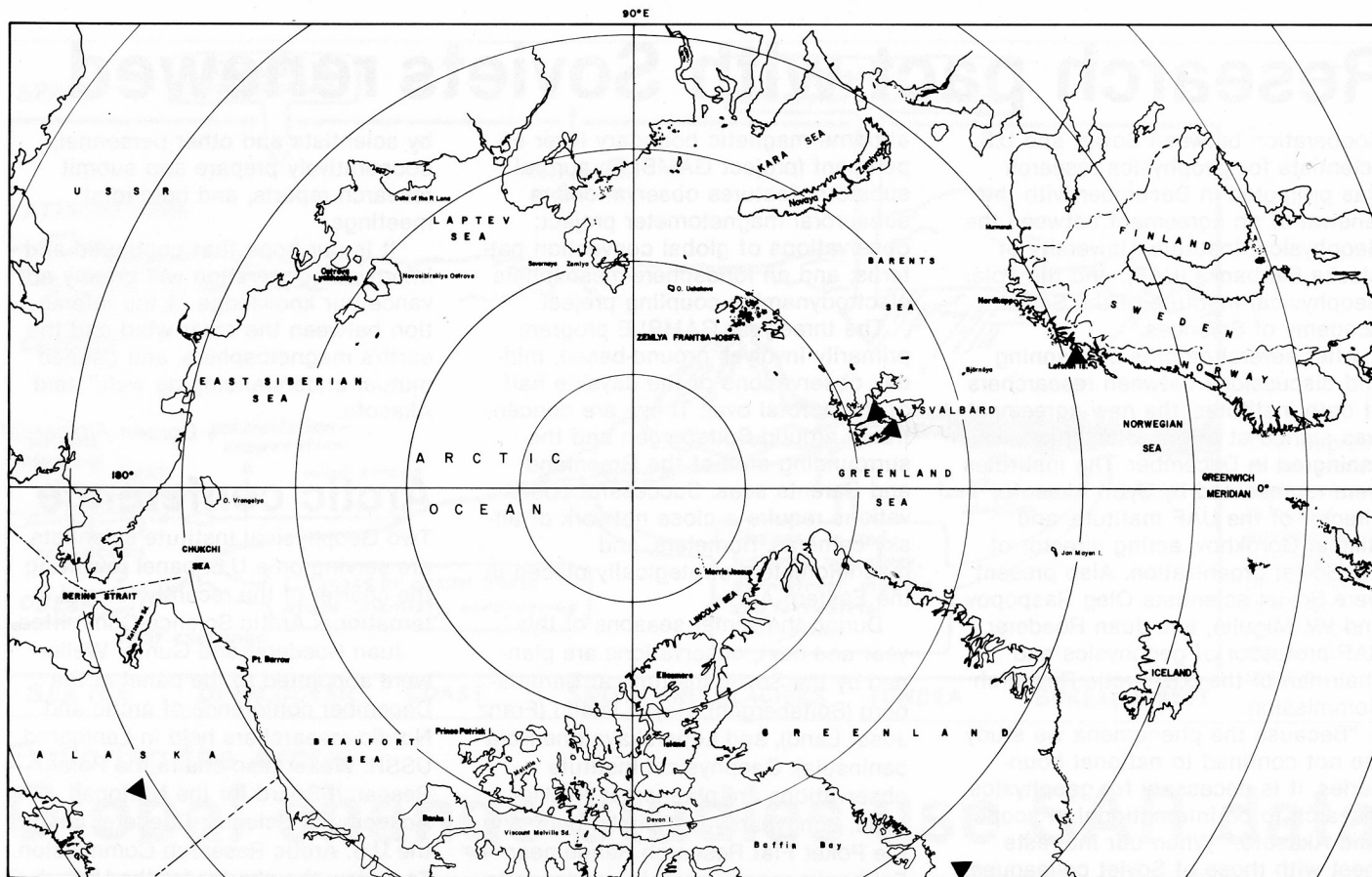
In the international arena, research agreements were renewed with the Polar Geophysical Institute of Murmansk, USSR, and the National Polar Research Institute of Tokyo, Japan. The year 1988 will also be remembered as a new beginning of cooperative study of the Arctic by all arctic nations. To coordinate arctic research, a major conference was held in Leningrad in December for representatives of all arctic and nordic nations and others who are interested in arctic research.

Along with our normal research activities, events at home in Fairbanks included the 1988 Open House, where we welcomed 1700 visitors to the institute. The event's great success reminded us that while research and university education are our primary activities, we also have an important role to play in communicating our activities to the public and stimulating children to an interest in science.

Throughout 1988, the institute staff has been dodging construction workers and equipment as various modifications are made to the C.T. Elvey Building. In the area of new construction, major planning is now underway to upgrade the Poker Flat Research Range and research facility. During 1989 we will continue to report our progress and activities through this publication.

Syun-Ichi Akasofu

Syun-Ichi Akasofu, Director



An experiment directed from Svalbard Island in the Greenland Sea involved a launch from northern Norway and observations at Poker Flat in Alaska, Svalbard, and Sondrestromfjord in southern Greenland.

Winter launch targets dayside aurora

Scientists from six countries manned observation posts spanning the Arctic in mid-December for the launch of an Alaskan research rocket from Andoya, an island in northern Norway. The powerful four-stage Black Brant X rocket carries two barium shaped-charge releases as well as a complex instrument package.

"It's similar to some launches we've made here, from Poker Flat," said Hans Nielsen, a Geophysical Institute scientist and member of the research team. "But this year we fired into the dayside aurora, and used the optical observatory at Poker Flat as a data-gathering station." The launch was directed by principal investigator Gene Wescott of the Geophysical Institute from the joint UAF-Norwegian station at Longyearbyen, on Spitsbergen in the eastern Arctic Ocean.

The research is part of the institute's continuing studies on the interactions of the sun with the earth's magnetic field. The aurora is the most visible effect of that interaction. On the Alaska side of the North Pole, the zone where the aurora is most active lies far enough south so that the northern lights can't be seen near noon, even during the shortest days. On the

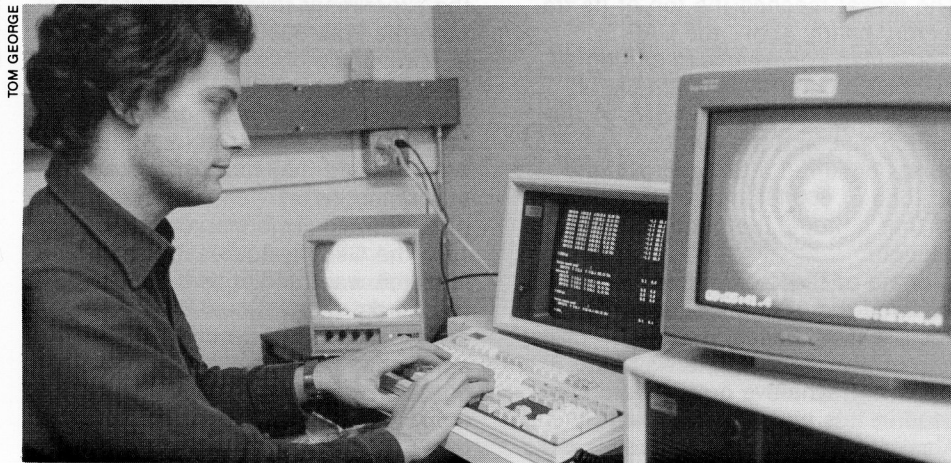
Norwegian side, the auroral zone lies further north, in regions where the sun does not rise in midwinter and the noontime aurora is easily visible in the dark sky.

"We're trying to understand the electrodynamics of the daytime aurora. We know the dayside aurora is different," said Nielsen. "For one thing, it's produced by particles from the sun that have followed a more direct path into Earth's upper atmosphere." During this launch, particle counters were carried aboard the

rocket as part of Canadian and Norwegian experiments.

In connection with the experiment, researchers worked at the Andoya launch site, Sondrestromfjord in Greenland, the Poker Flat Research Range north of Fairbanks, the Soviet station on Heyss Island, and the UAF-Norwegian station on Spitsbergen.

"There aren't many places where you can be on dry land and still see dayside aurora," Nielsen said. "Spitsbergen is about the best site." *continued on 4*



Graduate student Donald Hampton monitors equipment at the institute's Poker Flat optical observatory.

Research pact with Soviets renewed

Cooperation between Soviet and U.S. scientists for geophysics research was promoted in December with the renewal of an agreement between the Geophysical Institute, University of Alaska Fairbanks (UAF), and the Polar Geophysical Institute of the Soviet Academy of Sciences.

After several months of planning and discussions between researchers of both institutes, the new agreement was signed at a formal ceremony in Leningrad in December. The institutes were represented by Syun Akasofu, director of the UAF institute, and Nikolai Gorokhov, acting director of the Soviet organization. Also present were Soviet scientists Oleg Raspopov and V.V. Migulin, and Juan Roederer, UAF professor of geophysics and chairman of the U.S. Arctic Research Commission.

"Because the phenomena we study are not confined to national boundaries, it is necessary for geophysics research to be international in scope," said Akasofu. "When our interests meet with those of Soviet colleagues, it is particularly appropriate that we find ways to cooperate with them." Akasofu commented on the agreement after returning to Alaska.

Since the first agreement was signed in 1984, a number of projects have been developed by the two organizations. The 1988 agreement enables both institutions to cooperate closely for new international projects: the Geospace Environment Modeling (GEM) program, the International Solar-Terrestrial Program, and other projects of mutual interest.

GEM includes several coordinated observing campaigns: a ground-based

airborne magnetic boundary layer experiment (project GAMBLE); auroral substorm features observations; a subauroral magnetometer project; observations of global convection patterns; and an ionosphere-mesosphere electrodynamics coupling project.

The three-year GAMBLE program primarily involves ground-based, mid-day observations of the dayside half of the auroral oval. These are concentrated around Spitsbergen and the surrounding area of the Greenland and Barents seas. Successful observations require a close network of all-sky cameras, riometers, and magnetometers strategically placed in the Eastern Arctic.

During the winter seasons of this year and next, observations are planned by the Soviet institute at Barentsburg (Spitsbergen), Heyss Island (Franz Josef Land), and Loparskaya (the Kola peninsula). Geophysical Institute observations are planned at Ny Ålesund, Longyearbyen (Spitsbergen), and the Poker Flat Research Range near Fairbanks.

UAF professors Roger Smith and Charles Deehr are participating in these observations. Soviet scientists were involved in the Geophysical Institute's December rocket campaign in the Eastern Arctic. Observations made by the Soviets during Wescott's barium release experiment will contribute new data on the dayside aurora.

Along with the observation campaigns, the institutes have agreed to standardize instruments and data formats when possible, exchange and jointly process data, exchange visits

were prevented by cloud cover.

Along with scientists from the U.S. and the University of Bergen, Norway, the experiment involved researchers from the Polar Geophysical Institute in Murmansk, USSR; the University of Saskatchewan in Canada; University College, London, England; and the Danish Space Research Institute. Wescott said they hope to repeat the experiment in two years using a Black Brant XII rocket.

At the Geophysical Institute, the research was funded by a \$250,000 grant from the National Aeronautics and Space Administration. The institute has been involved with rocket-borne shaped-charge experiments for more than 20 years. Rockets were first launched at the institute's Poker Flat Research Range in 1969.

— Carla Helfferich

by scientists and other personnel, cooperatively prepare and submit research reports, and hold joint meetings.

"It is our hope that continued and improved cooperation will greatly advance our knowledge of the interaction between the solar wind and the earth's magnetosphere, and deepen mutual understanding as well," said Akasofu.

— Doreen Fitzgerald

Arctic conference

Two Geophysical Institute scientists are serving on a U.S. panel reviewing the charter of the recently formed International Arctic Science Committee.

Juan Roederer and Gunter Weller were appointed to the panel at the December conference of arctic and Nordic researchers held in Leningrad, USSR. Weller also chairs the Polar Research Board for the National Academy of Science; Roederer chairs the U.S. Arctic Research Commission. To review the charter for the United States, they will be joined by Robert Correll, director of the geoscience division of the National Science Foundation.

Approximately sixty U.S. scientists, including Roederer, Weller and Syun Akasofu of the Geophysical Institute, were among the five hundred who attended the Leningrad meeting. It was sponsored by the Soviet Academy of Sciences.

The conference covered science topics and discussion of future polar research opportunities. Working groups are addressing an organizational framework to improve international coordination of arctic research.

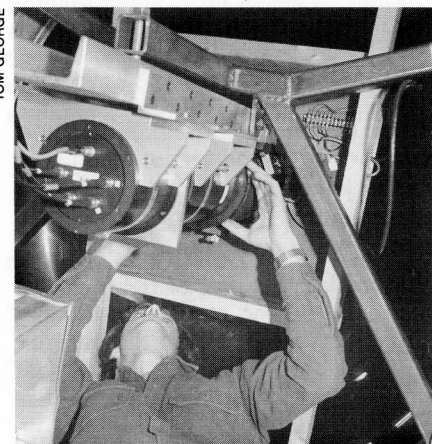
Rocket launch

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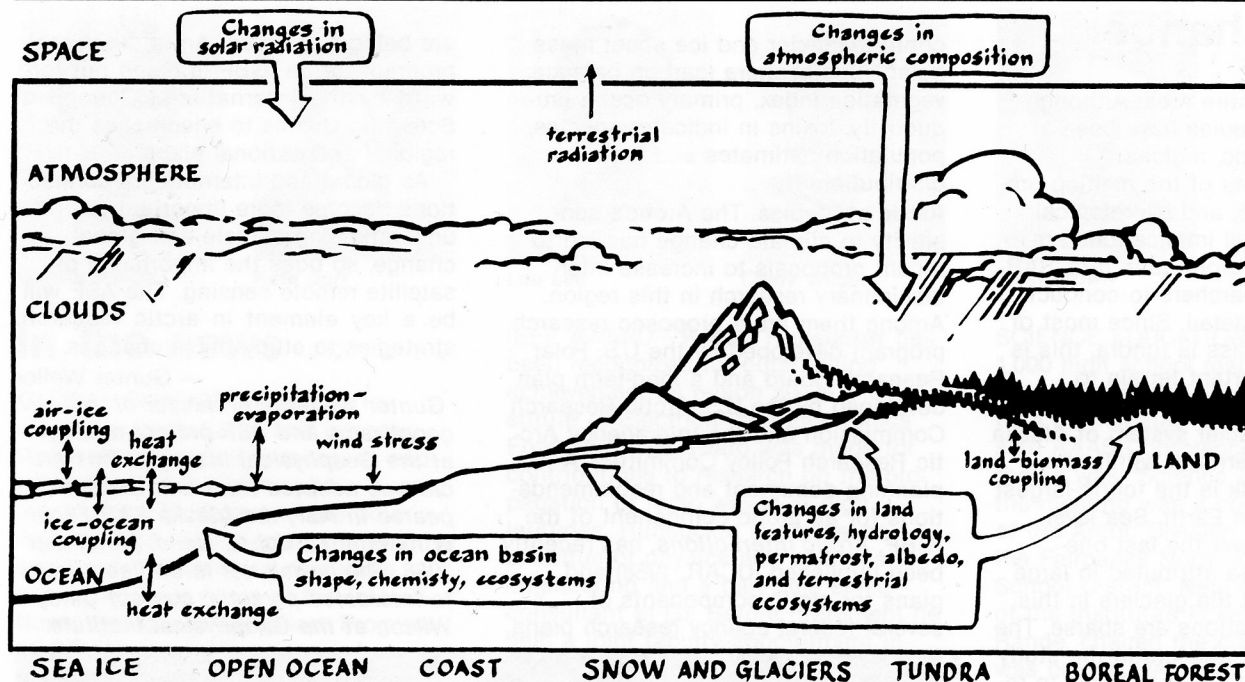
The rocket reached the top of its trajectory nearly above the UAF-Norwegian Longyearbyen station as planned. The various instruments telemetered data to recorders at the launch site, and the two barium bursts occurred at an approximate altitude of 600 kilometers (373 miles). At that altitude, the barium was in sunlight.

Some of the barium particles followed the earth's magnetic field lines, leaving traces in the form of a trail of blue light that is visible to the extremely sensitive optical equipment used in this type of experiment. In Alaska, observations planned for the optical observatory at Poker Flat Research Range optical observatory

TOM GEORGE



Graduate student Donald Hampton adjusts an imaging interferometer he built, one of the most sensitive devices of its kind. Interferometers are important instruments for studying auroral processes.



Exploring the Arctic

Global change studies use SAR data

Over the past thirty years, studies of the continents, oceans, atmosphere, biosphere, and ice cover show they are components of a far more dynamic and complex world than could have been imagined only a few generations ago. Research has delineated, with increasing clarity, the complicated interactions among the earth's components and their effects upon Earth history and evolution. High-latitude regions play a vital part in these interactions because they profoundly affect climate variability and are sensitive indicators of climate change.

A goal of many major studies planned for the next decade is a scientific understanding of the entire Earth system on a global scale—how its component parts and their interactions have evolved, how they function, and how their evolution can be expected to proceed. This research includes such work as the International Geosphere-Biosphere Program (IGBP), the Global Geosciences Program of the National Science Foundation, and the NASA Earth System Science Program.

As a means of receiving and analyzing synthetic aperture radar (SAR) satellite data, the new Alaska SAR Facility has the potential to become a key element in research programs on climate and global change. It will enable scientists to monitor and analyze the causes and effects of changes in relation to the

atmosphere, glaciers, oceans, and biosphere in the western high-latitude region centered on Alaska.

This region is one of the most dynamic parts of the northern hemisphere fluid system, and interactive processes in this area affect not only the region itself, but also the *downstream* weather and climate of North America and the entire northern hemisphere.

Arrangements made with flight agencies controlling three earth-observing satellites to be launched in the 1990s will give the facility access to data from these spacecraft. This should provide very useful information for routine monitoring and interpreting of high-latitude, climate-related parameters, including sea ice, snow cover, glaciers, and vegetation. The monitoring will continue and intensify with the launch of the first Earth Observing System (Eos) platform.

Monitoring change. Numerical models of the global greenhouse effect from increased atmospheric carbon dioxide and other radiatively active gases show that temperature increases are likely to be highest in the Arctic. This will lead to changes in the extent and quality of snow and ice, which can be routinely monitored from satellites.

The presence or absence of snow and ice greatly affects the percentage of solar illumination reflected from the earth's surface (albedo), and hence the planet's energy balance and atmospheric circulation. The

largest albedo variations are between 60-70 degrees latitude. There the seasonal sea ice variability is large in both hemispheres; in the northern hemisphere, the seasonal snow cover variability on land is also large. In the central Arctic, melting of snow and ice lowers the albedo in summer, but on the central antarctic plateau, no melting occurs at all.

Sea ice. With an increase in atmospheric temperatures, sea ice is likely to be reduced in extent and thickness. Modeling sensitivity studies carried out with an exaggerated greenhouse model (four times present carbon dioxide levels) show drastic decreases of sea ice thickness and extent, and complete disappearance of the ice in summer.

Sea ice is very sensitive to climate change, and in turn affects the global climate through feedback processes. That sea ice extent and conditions play a major role in the heat budget of the Arctic is well known; SAR data will provide high resolution information for automatically classifying ice types and determining ice motion.

Snow. Snow dominates the arctic terrestrial environment for most of the year, and snow melt on the arctic tundra is the most significant hydrologic and climatological event of that region. During snow melt, the surface energy balance increases rapidly by an order of magnitude to affect the *continued on 6*

Global change

continued from 5

climate of the entire area. Although isolated point studies have been made in the Arctic, regional mesoscale studies of the melting process, its patterns, and hydrological and climatological implications are difficult and therefore quite rare. SAR data enable researchers to conduct such studies in detail. Since most of the arctic landmass is tundra, this is particularly important terrain to examine.

Glaciers. The glacier system of Alaska and the Yukon Territory within the ASF station mask is the fourth-largest glaciated area on Earth. Sea level rises observed over the last one-hundred years are attributed in large part to retreat of the glaciers in this area, but observations are sparse. The mass balance of glaciers in the study area have responded sensitively to recent climate changes; an attempt to determine mass balance changes from radar responses of various glacier surfaces could provide a regional assessment otherwise unobtainable on the ground.

Other parameters. It would be useful to monitor the sensitivity of other parameters to climate change. A recent listing of arctic parameters includes such essential variables as: **atmosphere** (carbon dioxide, methane, stratospheric ozone, cloud cover, aerosols, precipitation, surface pressure and temperature, and radiation budget); **ocean** (surface temperature, salinity, sea ice extent, thickness and composition, and deep water formation); **hydrosphere** (snow cover extent, thickness, and water

content, glacier and ice sheet mass balance); **biosphere** (carbon balance, vegetation index, primary ocean productivity, toxins in indicator species, population estimates and their distribution).

Arctic strategies. The Arctic's sensitivity to climate change has led to recent proposals to increase interdisciplinary research in this region. Among them are a proposed research program developed by the U.S. Polar Research Board and a long-term plan developed by the U.S. Arctic Research Commission and the Interagency Arctic Research Policy Committee. A planning document and recommendations for an arctic component of the IGBP, *Arctic Interactions*, has recently been published (UCAR, 1988) and plans for arctic components of several federal agency research plans

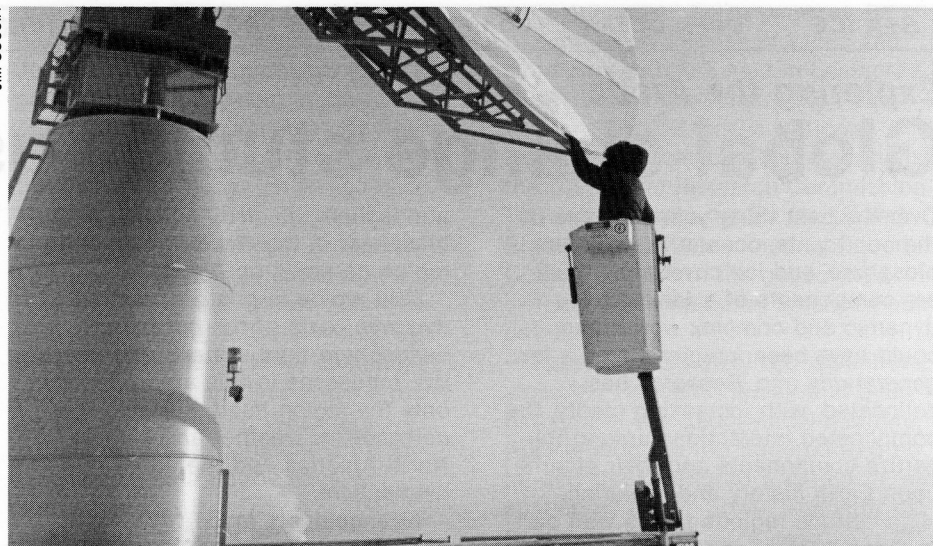
are being developed. An international program for an IGBP is being put forward by the International Council of Scientific Unions to encompass the regional and national plans.

As global and international connections become more important to understanding climate and global change, so does the importance of satellite remote sensing. The ASF will be a key element in arctic research strategies to study these changes.

— Gunter Weller

Gunter Weller is professor of geophysics and ASF project manager at the Geophysical Institute. This article was adapted from one that appeared in ASF, the Alaska SAR Facility newsletter, Vol. 2, No. 4, November 1988. The newsletter is available free to interested persons: contact Cindy Wilson at the Geophysical Institute.

JIM COCCIA



Ice fog is evident as a cherry picker is used to check the cold-weather operation of the Alaska SAR Facility antenna on the roof of the Elvey Building.

Cold weather photographers to meet at UAF

Frozen fingers, sticky shutters, and shattered film are subjects for photographers from around Alaska who attend the February 25 Symposium on Cold Weather Photography at the University of Alaska Fairbanks (UAF).

The Geophysical Institute is promoting the meeting, which aims to explore technical aspects of cold weather photography and physical problems of coping with the environment. Other sponsors are the UAF Department of Journalism and Broadcasting and KUAC-TV.

Professionals and amateurs working with still photography, motion pictures, and video are welcome to attend

the meeting. Activities will include expert presentations, panels, and informal discussions. Main events will be at Schaible Auditorium in the Bunnell Building. Admission is \$10 (\$3 for students and members of the Society of Professional Journalists).

Lael Morgan, an Alaskan author and UAF assistant professor of photojournalism, is organizing the event. "The ultimate goal of this get-together is to publish a book on cold weather photography, and that has gotten a lot of the major camera manufacturers interested," she said.

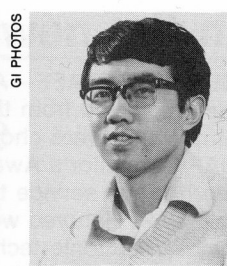
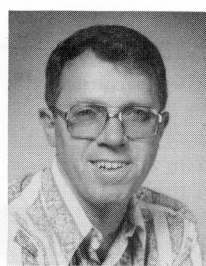
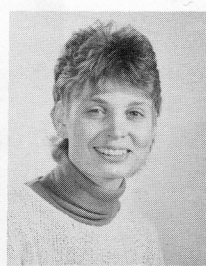
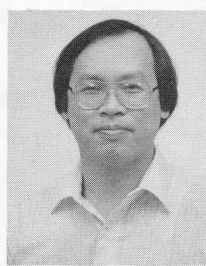
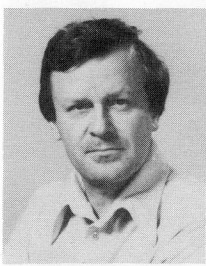
Morgan hopes the book will help prevent cold weather injury and encourage cold weather testing by manufacturers of cameras and films. The need for more information about cold weather photography was demonstrated during 1988 press coverage of

the stranded gray whales at Barrow.

The Fairbanks meeting is a prelude to a 1990 international symposium, to be held in conjunction with the Arctic Film Festival and the International Inuit Conference. Presenters include experienced Alaskan photographers and videographers, experts in cold weather survival tactics, and camera technicians.

Anyone interested in attending the symposium or contributing ideas or assistance should contact Morgan at the UAF Journalism and Broadcasting Department (907) 474-7761. For Anchorage and southcentral Alaska photographers, a special excursion fare has been arranged by agreement with MarkAir and the Alaska Railroad. Participants can fly north and return to Anchorage by train for \$148.18.

— Sam Winch



GI PHOTOS

Gunter Weller

Kate Barr

Lou Lee

Cindy Wilson

Neal Brown

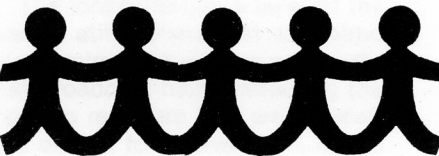
Lie Zhu

In the news

GLOBAL CHANGE—Planning is underway on national and international levels to study processes and intractions of the atmosphere, ocean, ice, and the biosphere in the polar regions. Understanding this interactive system and developing predictive capabilities are goals of the International Geosphere-Biosphere Program (IGBP), an emerging program for research on global change. **Gunter Weller**, professor of geophysics, has been appointed by the Scientific Committee on Antarctic Research (SCAR) to chair its steering committee on the IGBP. While attending the November SCAR meeting in Australia, Weller was also appointed to the steering committee for the 1991 Antarctic Science Conference.

ICE AND STRUCTURES—**Bill Sackinger** has been appointed to the new Technical Committee on Ice and Construction for RILEM (International Union of Testing and Research Laboratories for Materials and Structures). The committee will review the use of ice as construction material and problems related to construction on ice, preparing a state-of-the-art report on properties of natural and reinforced ice and techniques for using ice in construction. It will also review topics of ice and structure interaction, including structural problems caused by ice (particular erosion of concrete from friction and repeated freezing and melting). Sackinger is associate professor of geophysics and electrical engineering at UAF.

UNITED WAY—In 1988 GI doubled the number of employees participating in the United Way campaign and the donors more than doubled the amount of their total contribution. **Kate Barr** of the business office organized the fund drive at the institute.



IEEE AWARD—**Robert Hunsucker** has been recognized for outstanding achievement by region six of the Institute of Electrical and Electronics Engineers. The award was made for contributions to research on the propagation of radio waves at high latitudes. Hunsucker is professor emeritus of physics and electrical engineering and a part-time senior consultant at GI. Before retirement he held a joint faculty appointment in geophysics and electrical engineering. The Alaska Section of IEEE named Hunsucker 1988 Engineer of the Year.

SAN FRANCISCO—Many polar-oriented sessions were held during the fall meeting of the American Geophysical Union, including a two-day symposium on arctic research challenges organized by GI professors **Juan Roederer**, chairman of the Arctic Research Commission, and **Gunter Weller**, chairman of the Polar Research Board of the National Academy of Sciences. More than sixty papers were presented at a special symposium honoring GI professor **Wilford Weeks**, a renowned sea ice specialist. Ice cores, glaciers, and ice sheets were also subjects of sessions.

EDITOR—Professor of Geophysics **Lou-Chang Lee** has been appointed to a two-year term as associate editor for space physics by the *Journal of Geophysical Research*. The journal is published by the American Geophysical Union.



HATS OFF—to our UAF neighbor, the **Institute of Arctic Biology**, where faculty and staff celebrated IAB's 25th anniversary during 1988. In November the institute's commemorative lecture was presented by Harold Mooney, chairman of the U.S Committee on Global Change for IGBP. Mooney spoke on the topic of global carbon balance. A professor at Stanford University, he is an expert on the adaptation of plants to changes in environment.

SCIENCE EDUCATION—More than 1,000 high school teachers and students, college students, and scientists participated in the Arctic Division AAAS Conference last fall. The theme was "Science Education" and the meeting was a cooperative effort of the Arctic Division of AAAS and the Fairbanks North Star Borough School District. **Neal Brown**, director of the institute's Poker Flat Research Range, chaired the conference, which was held at UAF. The meeting closed with Educator Day, when scientists and 900 teachers met for special symposiums and demonstrations. **Cindy Wilson**, technical secretary at GI, was program coordinator for the meeting. Approximately 185 papers were presented.

JIM COCCIA



Syun Akasofu assists a young student.

PAPERS HONORED—Graduate student **Lie Zhu** received an "Outstanding Student Paper Award" for his presentation at the fall meeting of the American Geophysical Union in San Francisco. Seven of the seventy-one papers in the Solar Planetary Relationship Section were so honored. Lie Zhu's paper was entitled "Effects of Ionospheric Recombination Time Scale on the Signature of Substorms." His advisor is **Joe Kan**, professor of geophysics at the institute. **Julia Triplehorn**, GI librarian, received the annual award for the best paper in geoscience information from the Geological Society of America for "Geologic Information in Alaska," an annotated qualitative bibliography emphasizing nontraditional geology sources. Triplehorn is an assistant professor of library science at GI.

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In the news...

SUPPORT STAFF—After nominations were solicited from the staff, seven GI employees were chosen to receive UAF Cancellor's Awards for meritorious service to the institute and UAF. Honored were expeditor **Don Ames**, electronic technician **Patricia Collins**, administrative assistants **Jeanne Hume** and **Val Scullion**, mechanic **Jeff Nelson**, GeoData Center supervisor **Katie Martz** and Computing Services supervisor **Morna Mellor**. Two people who earlier received GI in-house service awards, drafter **Deborah Coccia** and Word Processing Service Center supervisor **Sheila Finch**, were also recognized. All received cash awards for their special service to the institute.

JIM COCCIA



Members of the institute staff congregated on the Elvey Building steps for a group photo during the fall 1988 semester.

Coming up...

AAAS '89—Global change is the theme of the **1989 Arctic Science Conference**, September 14-16, 1989, in Fairbanks. The meeting will focus on arctic and subarctic regions and provide the usual forum for information exchange about current scientific activities in Alaska and Canada's Northwest and Yukon territories. Groups that would like to have an organized session in conjunction with the conference should contact conference chair Francis Williamson, Institute of Arctic Biology, UAF, Fairbanks 99775-0800, (907) 474-7648. The first call for titles, abstracts, and posters was issued in January and they are due by May 1. Send to the attention of Suzanne Williams, IAB, same address and phone as above.

ARCTIC MINING—The first **International Symposium on Mining in the Arctic** will be held at UAF July 17-19, 1989. Sponsoring the meeting are: the UAF Dept. of Mining & Geological Engineering and Vice Chancellor for Research; Mining & Mineral Resource Research Institute, U.S. Bureau of Mines; Canadian Institute of Mining and Metallurgy; Usibelli Coal Mine, Inc.; Western Gold Exploration & Mining Co.; and Doyon, Limited. For more information, contact symposium chair Sukumar Bandopadhyay, 108 Brooks

Building, UAF, or Frank Skudrzyk, symposium co-chair, 205 Brooks Building.

TRANSPORTATION—The **1989 Alaska Transportation Forum** will be held in Anchorage on March 31. The forum, sponsored by the UA Transportation Center, encompasses a wide range of interests related to road, air and marine transportation in Alaska. For more information contact UAF Conferences and Continuing Education, 117 Eielson Building, UAF, Fairbanks 99775.

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