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The Geophysical Institute QUARTERLY

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1986—The Institute's 40th Year!

A Commitment to the Future of the Nation and the State

On July 31, 1946, the United States Congress passed a Public Law "to authorize an appropriation for the establishment of a geophysical institute at the University of Alaska." It is interesting to examine, in retrospect, the findings of the Act:

- *Whereas the need for a geophysical station in this country, dedicated to the maintenance of geophysical research concerning the Arctic regions, is recognized; and*
- *Whereas the University of Alaska has been performing geophysical research in cooperation with the Department of War, the Department of the Navy, the Federal Communications Commission, the United States Coast and Geodetic Survey, the United States Weather Bureau, and other agencies since 1941; and*
- *Whereas said research has produced results not only of direct military application in the war emergency but also of value as a contribution to scientific knowledge; and*
- *Whereas there is a necessity for indefinite continuation of geophysical research in the Arctic in the postwar period; and*
- *Whereas geophysical exploration can lead to increases in supplies and reserves of important minerals and can furnish information of direct value both for military and nonmilitary projects; and*
- *Whereas the University of Alaska, because of its unique location and the work it has accomplished in the past, is a logical site for a permanent geophysical research station; Now, therefore, Be it enacted . . .*

If Congress were to establish the Geophysical Institute *today*, very few changes in content and wording would be required! Indeed, the needs for an institution "dedicated to the maintenance of geophysical research concerning the Arctic" and for "indefinite continuation of geophysical research in the Arctic" persists to this very day. The facts that "said research . . . (produces) . . . results not only of direct military application . . . but also of value as a contribution to scientific knowledge" and that "geophysical exploration can lead to increases in supplies and reserves of important minerals . . ." are as true today as they were forty years ago.

Since its establishment, the Geophysical Institute has faithfully followed the original congressional mandate with a deep commitment to solving problems of national interest. I consider the unrelenting dedication of our scientists toward achieving better knowledge and understanding of the environment around us, the space above us and the Earth below us, to be a direct contribution toward the achievement of national goals in economic development, protection of the environment and national defense.

This contribution to national goals, especially as they pertain to the Arctic and the subarctic regions, also benefits Alaska in a very direct way. And, in addition, there is the myriad of problems of more site-specific and practical interest that our scientists address in their research. But perhaps the most direct impact of our work in Alaska lies in the instructional domain. Indeed, let us not forget that the Geophysical Institute is an integral part of the University of Alaska. We do have research commitments to the Nation but we are not a national laboratory; we do have research commitments to the State but we are not a state agency—we are a *university* research institute.

What does this really mean? It adds to our obligations a most crucial third dimension: the commitment to train the future generations of experts that the Nation and the State will need for their economic and cultural development and for the well-being and security of their citizens.

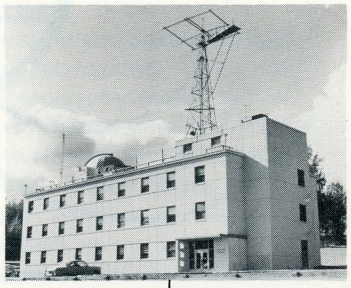
As the chart on the centerfold shows, institute directors have come and gone; research projects have grown and waned; budgets have risen and decreased—what did remain unchanged throughout all these years, though, is our staff's dedication to help provide a better future, through research and education, for the Nation and the State.

Juan G. Roederer
Director

MILESTONES IN OUR

Stuart L. Seaton becomes first Institute director

Chapman Building completed



Act of Congress authorizes establishment of Geophysical Institute

1946

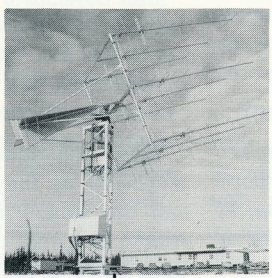
1948

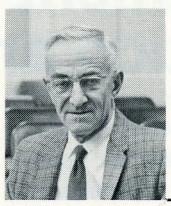
President Truman signs Appropriations Bill for the Institute

1950

Establishment of first Advisory Board

Institute operates first satellite-tracking station in Alaska for NASA





Bernhard Haurwitz's first association with the Institute

Auroral substorm concept put forth by Syun Akasofu

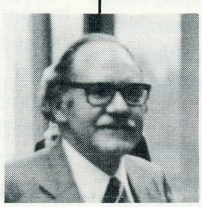
1958

1960

1962

1964

Potassium-argon rock dating laboratory established



Keith Mather becomes Institute director

Great Alaskan Earthqual

Institute starts seismic research

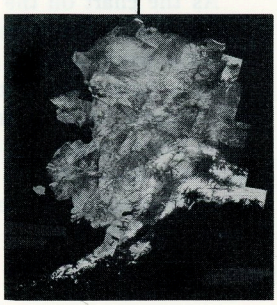
First observation of the electric fields that accelerate auroral electrons, using barium injection from rockets

100th higher degree awarded (includes M.S. and Ph.D.)

1972

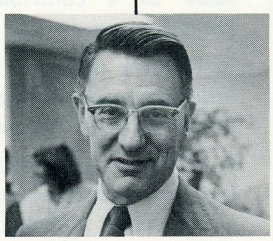
1974

1976



Major program on NASA's ERTS (Landsat) satellite

Outer Continental Shelf Environment Assessment Program starts

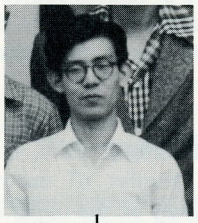


Juan Roederer becomes Institute director

40-YEAR HISTORY

Christian T. Elvey becomes Institute director

First Ph.D. degree, awarded to Masahisa Sugiura



Institute Research:

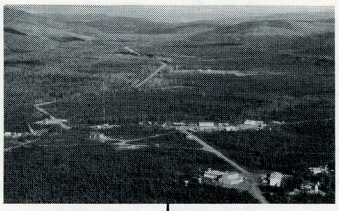
Aurora
Geomagnetism
Ionospheric studies

Rocketry
VLF propagation
Cosmic radio noise

1957 – 1958

1952 1954 1956 1958

Sydney Chapman is Advisory Scientific Director



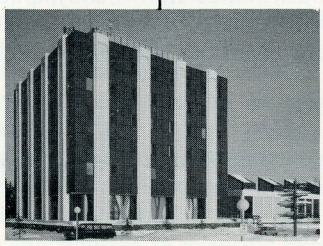
Poker Flat Research Range established—the only university-operated rocket range in the United States

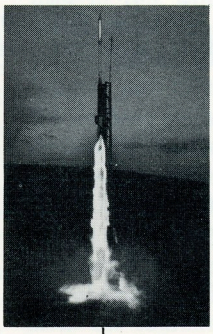
First successful rocket barium release from Poker Flat

1966 1968 1970

Institute helps during Fairbanks flood

Institute moves to Elvey Building





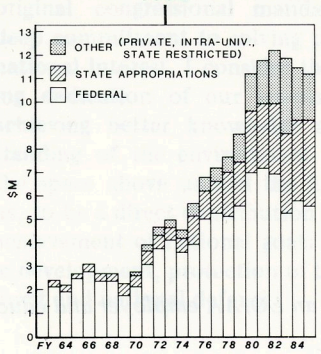
200th rocket launched at Poker Flat Research Range

Paul Goodwin is first Alaska Native Ph.D. at Institute

150th higher degree awarded at the Institute

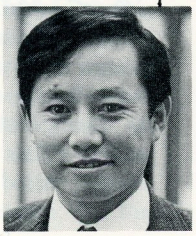
8 1980 1982 1984 1986

Institute acquires its own VAX computer



Institute budget peaks at $12 million per year

37 full-time professors
20 associates and post-docs
44 graduate students
172 total staff



Syun Akasofu is selected as Institute director

What's Inside the Elvey Building?

The C.T. Elvey Building, home of the Geophysical Institute, is located on the West Ridge of the University of Alaska-Fairbanks campus.

The *first floor* (basement) contains the **electron microscope laboratory** where the ultrastructure of physical and biological specimens is determined, and a **rock crushing laboratory** where rock samples are prepared for determination of their age and mineral content. Also on the first floor are the **machine shop and electronics shop** where specialized instrumentation for scientific research is designed and constructed. Adjacent to this area are the **carpentry and welding shops,** and the **garage.**

The Institute's **computing and data analysis section** and the associated data-processing equipment are located in the annex on the *ground floor.* The Institute has VAX 780 and VAX 785 computers, with more than 70 terminals scattered throughout the building. The **seminar room** is also in the annex. **Photo-graphics Service** provides photographic and drafting support to the scientists of the Geophysical Institute and other University and community agencies. In the **Globe Room,** across from Photo-graphics, are several photographs and technical displays.

The *third floor* houses the "solid earth" research group, including **seismology** (earthquake studies), **geochronology** (determining ages of rocks), **paleomagnetism** (locating earlier magnetic poles of the earth, and studying continental drift), **volcanology** (studies of volcanic activity) and a variety of related subjects. The seismology laboratory contains the equipment that records earth movements at 35 locations in the state.

The *fourth floor* is the home of the **optical aeronomy laboratory.** Here, low-light-level television studies of auroral forms and color analyses of the upper atmospheric emissions are conducted as part of the optical research on aurora and airglow. **Glaciology,** located across the floor, includes many aspects of research on snow, ice and frozen ground. Much of the work is done in the field and includes glacier surges, the interaction between glaciers and volcanic heat, Greenland glaciers, permafrost, and river and lake ice.

The Institute's **library,** on the *fifth floor,* offers a comprehensive collection of books, periodicals, and papers dealing with geophysics. The **archives**, adjacent to the library, include worldwide collections of auroral and magnetic records, and the most comprehensive collection of satellite images of Alaska. In the **meteorology laboratory** investigators analyze weather, track thunderstorms, and monitor snow melt and sea-ice movement. Alaska temperature inversions and related pollution problems, including ice fog and long-range pollution transport from Eurasia, are also studied here.

The **administrative and business offices** of the Geophysical Institute, as well as the **mail and stenography rooms,** are located on the *sixth floor.* Also on this floor are the **Northern Remote Sensing Laboratory and the Arctic Project Office,** where studies of Alaskan resources and environmental hazards such as sea ice, river ice jams, etc., are conducted. The **editorial office** of *The Northern Engineer,* a quarterly magazine published by the Institute, is located here.

The *seventh floor* is devoted primarily to studies of **space physics and the arctic upper atmosphere** (30 miles and higher) including the aurora borealis. The experimental observations for these studies are made at field stations located in both polar regions, from satellites, rockets, and from aircraft. The data are brought to the Institute for analysis and theoretical studies. **Ionosphere research** includes predictions of radio propagation conditions and development of communications systems.

The *eighth floor* contains most of the utilities of the building as well as the **optics test laboratory.** This floor provides access to the top deck, the outside antennas, and the optical domes for photometers, spectrometers, and other instrumentation.

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