GEOPHYSICAL INSTITUTE *QUARTERLY*

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Guided Rocket Caps Successful Winter Season

Spirit II made history as the first guided rocket ever to be launched from Poker Flat Research Range when it blasted off amid brilliant fiery fanfare at 11:07 p.m. Saturday, March 28. The spectacular launch also marked the end of a busy and successful winter rocket season.

Six rockets were scheduled for launch this winter from Poker Flat, a 5,132-acre site about 30 miles northeast of Fairbanks. After waiting through many long nights for acceptable atmospheric and auroral conditions, all six rockets were launched in March.

Scientists associated with Spirit II were forced to wait the longest for launch. Crucial parts of that 17,000-pound rocket arrived at Poker Flat in October. After technical difficulties were ironed out, the rocket was ready to fly in December, but the right auroral and atmospheric conditions for blast off didn't occur until three months later.

"Exuberance is the feeling around here," said Vernon Baker, shortly after the rocket was finally launched. Baker, the project scientist who gave the final word for lift-off, said the Spirit II mission was a success.

"The rocket kept to its path and did what it was supposed to do," Baker said.

As the first guided rocket ever to be launched in the 23-year history of the range, it was particularly important that Spirit II stay on course.

Unlike other rockets launched from Poker Flat, Spirit II was guided during flight by four computerized exhaust nozzles that directed the rocket as a steering wheel directs a car. All other rockets launched from the range have been unguided, which means they stay on course because they spiral through the air like a football that has been lobbed long-distance.

Guided rockets like Spirit II are more complicated technically and are therefore subject to greater risks. Because of this, a team of technicians from the National Aeronautics and Space Administration were on site during blast off to make sure the rocket flew in the programed direction. They were prepared to destroy the rocket in flight if it veered off course.

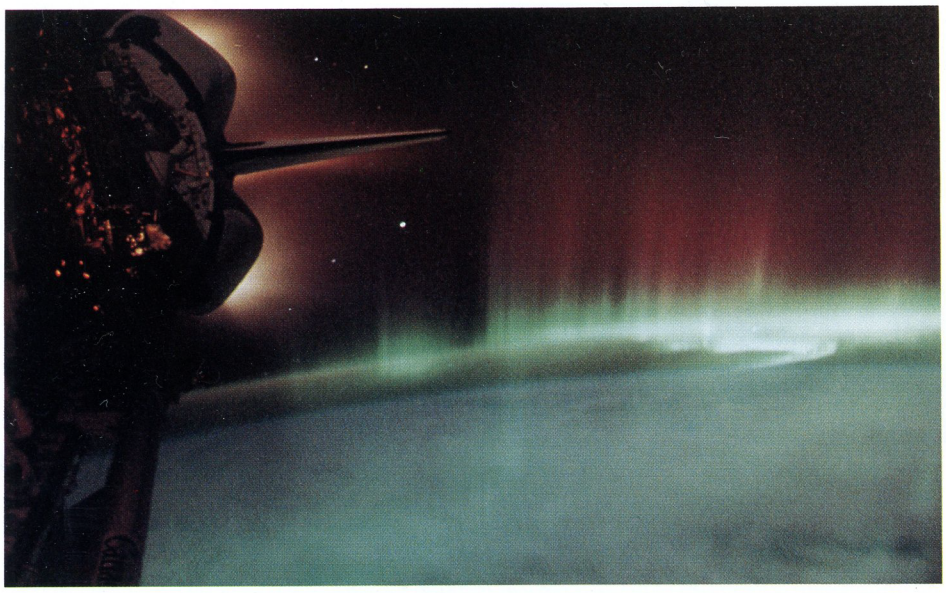
Most rockets carrying heavy instrumentation into space are guided. Spirit II's payload weighed 2770 pounds.

Funded by the U.S. Air Force, Spirit II carried a high-tech telescope about 205 miles above the earth to measure infrared emissions given off by auroral displays. The new data gained from the launch will probably take at least 18 months to analyze, Baker said.

Researchers at Hanscom Air Force Base in Massachusetts plan to use the measurements as part of a larger Strategic Defense Initiative Organization study on atmospheric disturbances. Studying infrared light is important because it can prevent some Air Force satellites from being able to detect targets, other satellites, or clutter in space, just as city lights can prevent people from seeing stars in the sky.

After a 10-minute flight, the Spirit II payload landed about 110 kilometers north of Poker Flat, then was picked up by helicopter rescue and recovery crews with the 210th Air National Guard from Elmendorf Air Force Base.

continued on 4



A high-tech telescope aboard Spirit II, the first guided rocket to be launched from Poker Flat, flew 205 miles above the earth to measure infrared emissions given off by a brilliant display of northern lights this March. The view of the aurora borealis from Spirit II was similar to this view of the aurora australis shown at left, taken during a recent space shuttle flight as part of an experiment called CIRRUS, a precursor to Spirit II (NASA photo courtesy of Tom Hallinan and Don Lind).

Students to Launch Home-made Rocket

A rocket designed and built by University of Alaska Fairbanks students was scheduled for launch from Poker Flat Research Range this winter, but minor technical difficulties prevented blast off. Now, students hope to send their rocket off during the summer launch season.

The rocket will be the first with student-made components ever to be launched from Poker Flat. It's also the first time that university students from several disciplines have joined forces to see a highly technical rocket project through from beginning to end, according to Joe Hawkins, assistant professor of electrical engineering with a joint appointment to the Geophysical Institute, who has supervised the student project since its inception.

"We are setting a precedent with what we are doing here," Hawkins said.

The students, who have experience in electrical, mechanical or aerospace engineering, built the rocket "payload," the portion that houses an intricate computer control unit, transmitter, magnetometer, accelerometer and other support components.

They also built a 16-foot launch tube the rocket can shoot through initially to guide and stabilize it and they designed a parachute small enough to fit in the missile nose.

After launch, the six-foot-long, four-inch-round rocket will fly nine miles off the ground to measure acceleration speed and the earth's magnetic field on the way up, then air pressure and temperature on the way down.

The measurements will be used mostly to gauge the performance of the rocket, but students hope eventually to launch vehicles that can fly high enough to measure X-ray emissions from the aurora or electric currents in the middle atmosphere, Hawkins said.

DOUG SIGLER



Blaine Henry, a graduate student in electrical engineering from Saint Marys, Alaska, adjusts a telemetry antenna that will track the student rocket payload as it descends back to earth via parachute.

Data sent to earth from the payload during flight will be logged on three computers set up near the launch site. Those computers also will receive information sent down from a small balloon equipped with devices to measure temperature, humidity and air pressure to be released just after the rocket launch.

Plans to design the rocket have been underway for a year, but the Alaska Student Rocket Project officially began last May when it received $50,000 from the Alaska Space Grant Program, which is one of many federally funded programs set up in schools and universities around the country to encourage space science research at all grade levels.

Only $3,000 was used to build and purchase rocket components. Most of the money went to fellowships for the students originally involved in designing the rocket, which enabled 10 of them to work through last summer break. Five of those students are from Alaska. The other five come from New York, China, Mexico, India and Sri Lanka.

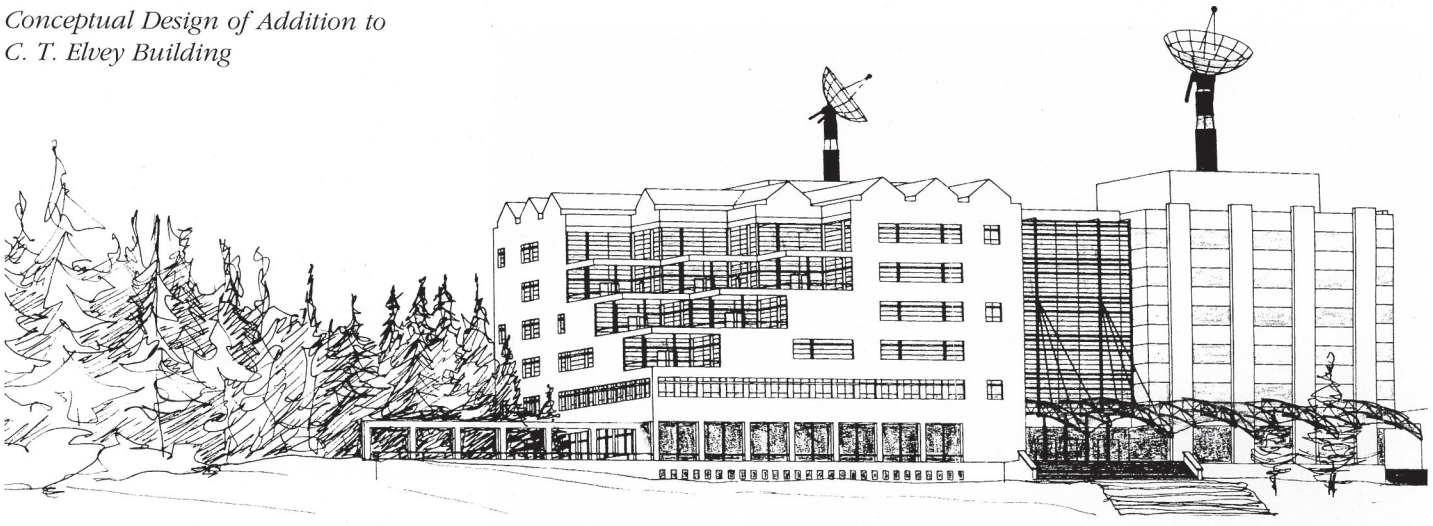
If the flight goes as planned, the rocket motor will burn for six seconds while forcing it through the air at three times the speed of sound. The rocket will then coast to the top of its arc, before the parachute ejects to cushion the payload's hour-long ride back to earth.

If personnel at Poker Flat are not busy with another launch, they'll track the descending payload with radar so it can be recovered later. In any case, the students will follow their rocket with a home-made antenna and a receiver. After the flight, the students will analyze the data they received, then log it in a formal journal.

Students have performed several tests to make sure the rocket components behave as they should in the air. To test the parachute, they dropped an aluminum model of their payload off the top of the Geophysical Institute building.

continued on 8

Conceptual Design of Addition to C. T. Elvey Building



This conceptual design was prepared by Charles Bettisworth and Company, Inc. in April. The addition will collocate several federal, state, and private organizations with the rapidly expanding educational and research programs of the Geophysical Institute for mutually beneficial use of laboratories, classrooms, and facilities for environmental and natural resource studies.

Will Commercial Satellites Be Launched from Poker Flat?

Like a rare gem in a nation full of jewelers, Poker Flat Research Range received a lot of attention this winter from entrepreneurs interested in pursuing the nation's new, fledgling commercial microsatellite industry.

Thanks to 23 years of experience in launching rockets and the range's access to polar orbit, Alaska finds itself in the position of being able to compete with other states for a potential chunk of the nation's growing aerospace business.

This prospect interests state legislators because it could mean the start up of a new industry for Alaska, which is now plagued with diminishing returns from a declining oil industry.

To encourage and assist commercial launch firms in their exploration and development of space, Representative Tom Moyer created a bill that was later signed into law, forming the Alaska Aerospace Development Corporation (AADC), a public entity within the Alaska Department of Commerce and Economic Development. The legislature awarded $302,500 to AADC to get started.

The corporation met twice this winter, once in Anchorage to discuss the history of the legislation that fostered the creation of AADC and to firm up its by-laws for operation, and a second time in Fairbanks to tour the range and to initiate a search for an executive director for the corporation. An executive director for the corporation is expected to be selected and announced this spring.

Not long after the AADC was formed, the Alaska Science and Technology Foundation awarded a $700,000 state grant—their largest ever—to International MicroSpace, a commercial company that hopes to build a four-stage rocket to carry microsatellites into space.

Microsatellites are smaller, lighter satellites than those that have been circling the earth for years. Technological advances have made it possible to shrink the components of the traditional, larger satellites into smaller components that do similar jobs, but have shorter life spans. Traditional communication satellites weigh 3,000 to 5,000 pounds, while most microsatellites weigh 800 pounds or less.

Some of the leading uses for microsatellites are environmental monitoring and global cellular telephone communication. A launch into polar orbit, which circles pole to pole, allows the satellite to cover more of the earth.

A $132,715 study to determine the feasibility of turning Poker Flat Research Range into a potential site for commercial launches was financed by the Alaska Industrial Development and Export Authority and released in February. That study suggests it will cost between $17 million and $31 million to equip Poker Flat with the necessary launchers and facilities to accommodate commercial entrepreneurs.

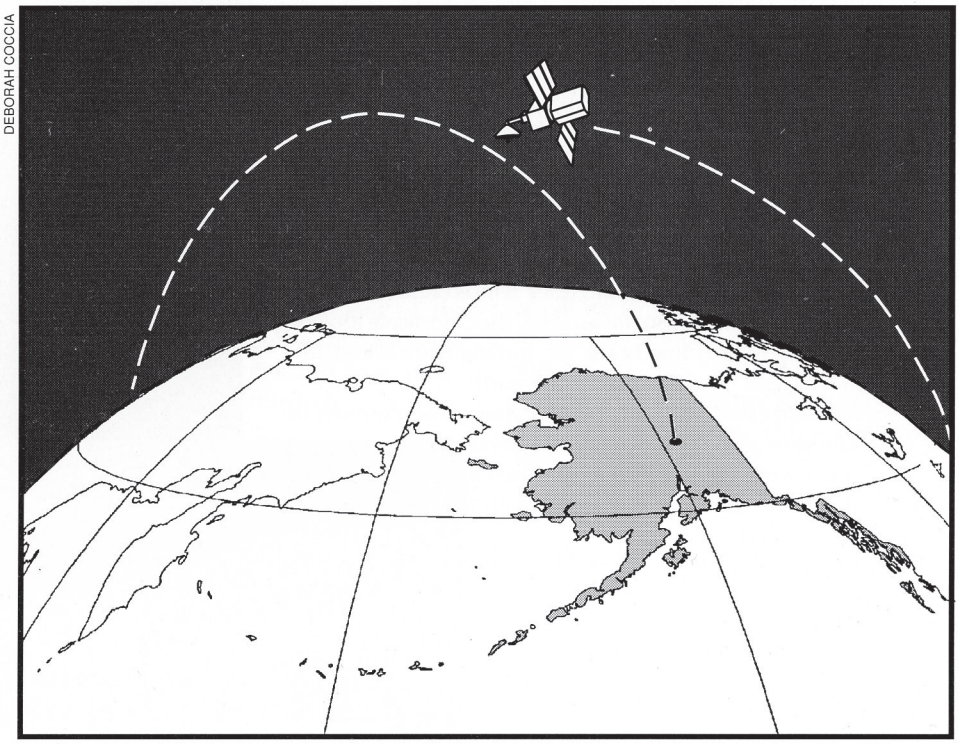
Alaska has some advantages over other states for the launch of microsatellites. Poker Flat is the only nonfederal, university-run rocket range in the world and it is the largest land-based rocket range in existence with an established chain of downrange observing facilities from inland to the Arctic Ocean for monitoring and recovery purposes. It is also easier to launch slightly heavier satellites into polar orbit from Alaska than from most other U.S. rocket ranges.

The successful launch of Spirit II, the first guided rocket to be shot off from Poker Flat, means the range is capable of executing sophisticated launches. Spirit II was a suborbital mission, but important because rockets that carry microsatellites into polar orbit are guided.

University scientists say they will work hard to make sure commercial launches fit in well with the research-oriented launches that have traditionally flown from the range. Some scientists worry about a conflict, but others say an increased number of launches from Poker Flat could offer increased opportunity to "piggyback" their experiments into space.

In either case, it's expected that commercial business at Poker Flat will take some time to develop. It takes time to build an infrastructure for commercial launches at the range and it takes time for the commercial companies themselves to get up and running.

A congressional mandate to switch the launch of small, sophisticated satellites from the public sector to commercial vendors in the private sector began in 1984 with the enactment of the Commercial Space Launch Act, but the commercial launch business is still too young to take off. Until it does, the future of the space business in Alaska, or anywhere else, is uncertain.



DEBORAH COCCIA

Some commercial entrepreneurs have expressed an interest in launching microsatellites into polar orbit from Poker Flat Research Range. Microsatellites are smaller, lighter satellites than those that have been circling the earth for years. Some of the leading uses for microsatellites are environmental monitoring and global cellular telephone communication. A launch into polar orbit, which circles pole to pole, allows the satellite to cover a large portion of the earth.

Winter Rocket Season *continued from 1*

Four rockets studied heat generated by the aurora after they were launched from Poker Flat this winter, revealing surprising information about the effects the northern lights have on the upper atmosphere.

The rockets were launched as part of a federal experiment called Atmospheric Response in the Aurora, or ARIA. Designed by 25 scientists affiliated with the National Aeronautics and Space Administration, ARIA will help researchers learn more about how auroras affect the atmosphere between 70 to 200 miles above the earth.

The heat generated by a brilliant auroral display creates wind in space, causes some chemical changes in the atmosphere, and alters the earth's electric and magnetic fields, according to Miguel Larsen, a Clemson University physics professor in charge of three of the four rockets in the experiment.

Data from the ARIA rockets will help NASA scientists learn more about how these changes in the upper atmosphere can affect the orbits of satellites and shuttle missions as they circle the earth, and why auroral displays can interfere with communication between satellites, space vehicles, and earth stations, Larsen said.

Three of the four rockets were launched within an hour of each other between 4:57 a.m. and 5:57 a.m. on Tuesday, March 3. The first rocket released chemicals that made colorful designs in the night skies so scientists could trace winds created by heat generated in the aurora. From the ground, the chemicals looked like a vertical silver gray line in the air, trailing from about 140 miles high to about 50 miles above the earth.

The tracer surprised scientists by revealing wind currents in the opposite direction than expected, Larsen said.

"The winds were going towards the west and we had more or less expected them to be going east with the current of the aurora," Larsen said.

The wind direction implies that the upper atmosphere may heat up more with an active aurora display than scientists expected.

Larsen had been watching the skies between midnight and early morning for more than a week prior to the launch, waiting for the right auroral conditions to occur. He began his watch after midnight because active auroral displays usually calm down and spread out in a dimly glowing mass across the sky during early morning hours, heating up a large part of the atmosphere.

Four minutes after the first rocket flew, a second rocket carrying instruments to calibrate heat and chemical changes in the upper atmosphere was launched. During that flight, data was transmitted back to earth as radio waves that were received by large telemetry dishes at Poker Flat, then stored on magnetic tape for future study. The principal investigator for that successful mission was David Kayser of the Aerospace Corporation, Los Angeles, California. A third rocket carrying more chemical wind tracer was shot off an hour after the first.

The fourth and final rocket in the ARIA experiment was launched at 4:57 a.m. on March 6. The rocket released chemicals during a "quiet time" in the atmosphere in which no auroral display was visible in the sky. Information from the flight will be used as a baseline for measurement so scientists can determine what heat and wind occur in the atmosphere when it is not disturbed by an aurora.



GENEZARET BARRON

The first stage of the final rocket in the four-part ARIA experiment is tracked as it rose, then fell back to earth, in the photo above. The 31.5-foot rocket fleu nearly 200 miles high after it was launched from Poker Flat Research Range at 4:57 a.m. on March 6. The rocket released chemicals that made colorfu designs in the sky to help researchers trace winds created by heat generated in the aurora.

Two Electron Guns Were Carried into Space by one of the final rockets launched from Poker Flat this winter.

Launched at 10:27 p.m. Saturday, March 28, the rocket was the third in a series of Cooperative High-Altitude Rocket Gun Experiments (CHARGE) funded jointly by NASA and the U.S. Air Force. The previous two experiments were flown in 1983 and 1985.

The 69-foot rocket carried two electron guns powered by 3,000-volt batteries about 270 kilometers above the earth. The guns created an electron beam designed to act as an antenna to transmit very low frequency radio waves from space to earth.

"The purpose was to test the feasibility of using a modulated electron beam instead of a very long antenna in space," said John Raitt, a Utah State University professor who was principal investigator for the launch.

Very low frequency radio waves are useful because they can penetrate the ocean when higher frequencies won't, and therefore can potentially carry radio transmission from space to platforms below the sea, Raitt said.

The electron beam was monitored from three down-range ground stations in Beaver, Venetie, and Fort Yukon. The payload that carried the electron guns was recovered by helicopter from the foothills of the Brooks Range the day after launch.

Improvements Coming for Poker Flat

Projects underway should soon make Poker Flat Research Range a national center for space and environmental research in the Arctic, as well as the world's best polar, upper atmospheric research facility.

Since Poker Flat is the only rocket launch facility on U.S. soil in polar regions, it frequently has been used for research purposes by the National Aeronautics and Space Administration (NASA) and the Department of Defense (DoD). To date, nearly 250 major high-latitude sounding rockets have been launched from the range to conduct atmospheric research for a wide variety of purposes.

Recently, Congress appropriated funds to improve and modernize the range in response to a national need to upgrade Poker Flat for future missions.

Plans to improve the range were initiated four years ago after the U.S. Arctic Research Commission emphasized the importance of Poker Flat as a national resource for polar, upper atmospheric studies.

Since then, $5.6 million has been spent on planning, initial range improvements, and science development programs. An "Implementation Plan for the Improvement and Modernization of Poker Flat Research Range," which includes a master plan for future development at the range, is scheduled for completion this spring. More construction is proposed for the range this summer.

Already, improvements have been made to considerably increase the safety and comfort of the blockhouse and payload assembly buildings, to carry out electrical, mechanical, and safety code corrections throughout buildings, power distribution and launch areas, to establish a data communications system from an array of observatories across North America and from the Space Environment Lab in Boulder, to construct a data display system to guide mission scientists in making launch decisions, and to construct a launch enclosure for the Spirit II rocket.

More improvements are needed at Poker Flat before it can support the U.S. rocket program planned for the future. Funds designated for the improvement of the range will be used mainly to make the site more efficient to operate and more effective for atmospheric research.



EVELYN TRABANT

A new "clean room" was added to the payload assembly building at Poker Flat Research Range last summer so technicians can work on instruments within rocket payloads surrounded by air that contains very little dust. The clean room was built to accommodate Spirit II, the first guided rocket ever to be launched from the range.

For example, new optical instruments for the collection of auroral images are scheduled to be built, as well as other equipment scientists can use to probe the middle atmosphere to research global climate change. Improvements to an air sampling station at Poker Flat will enable scientists to get better measurements of ozone, greenhouse gases, and arctic aerosols.

A network of downrange observatories linked to Poker Flat via real-time television satellite links also will be established, along with a satellite downlink antenna receiving station to aid in the launch decision and support of the NASA small satellite program.

New construction will include a control center, maintenance shop, vehicle storage, and cold storage buildings. A new rocket motor assembly building, rocket vehicle storage and igniter storage buildings also are planned for the pad service area.

Several radar facilities also are scheduled for construction, as well as a LIDAR system that will measure density, temperature and winds between 25 and 100 kilometers. Other improvements will be made to communications networks suitable for data transmission, computer activity, video and voice communications, as well as to roads, water and electric power distribution, and sanitary facilities.

These improvements will make it possible for Poker Flat to continue as a modern national research facility for polar, upper-atmosphere studies, and to play a major role as a focal point for future space and environmental research by NASA, DoD, the National Science Foundation, the Department of Energy, and other agencies and universities.



DOUG SIGLER

Aaron Davidson, Roger Smith, Ed Hoch, and Rick Morgan (pictured from left to right) work with the new Geospace Environmental Data Display System at Poker Flat Research Range, the first of its kind to display real-time information on the aurora, the magnetic field, joule heat production, ionospheric currents, and thermospheric wind from a network of stations in North America. The new display gives rocket scientists precise information that helps them select the best time to launch for research purposes. It is almost equivalent to receiving data from several satellites at once and it can be used as a classroom for space scientists. GI researchers Tom Hallinan, Hans Nielsen, Chuck Deehr, and their support staff Jim Baldridge, Ed Hoch, and Jim Desrochers designed and built the system.

GI NOTES

PROFESSORS HONORED: Professor **Juan Roederer** is the first Alaskan to be elected to the Third World Academy of Sciences, an international organization whose main goal is to promote scientific research in underdeveloped and developing countries. Roederer's election this winter recognizes his lifetime of scientific contributions to research in developing countries. He is one of five American scientists elected to the prestigious post; two of the others are Nobel Laureates. Only 300 scientists worldwide have received the honor since the Third World Academy of Sciences was founded by the United Nations nine years ago. Inaugurated by United Nation Secretary General Perez de Cuellar in 1984, the Third World Academy of Sciences is a non-governmental, non-political, and non-profit organization.

In January, Professor Emeritus **Robert Hunsucker** became the first Alaskan to be elected to the grade of fellow within the Institute of Electrical and Electronic Engineers, the largest professional and technical organization in the world. Fewer than one tenth of one percent of the 300,000 members of this international organization have been elected to the grade of fellow, bestowed on Hunsucker for his extensive research contributions to middle- and high-latitude inonospheric radio science. Hunsucker worked as a professor of physics and electrical engineering for 34 years, before he retired from the Geophysical Institute in 1987. Since then, he's worked as a senior consultant at the Geophysical Institute and as a senior partner of RP Consultants in Fairbanks, specializing in high-latitude ionospheric radio propagation research.

Also in January, Professor **Manfred Rees** was elected to fellowship in the American Geophysical Union. Fellowship in the AGU is awarded to scientists who have attained acknowledged eminence in a branch of geophysics. It is one of the few honors that AGU confers. Only 27 fellows were elected this year. The number of fellows elected each year is limited to one tenth of one percent of the total membership of AGU.

PROMOTIONS: Several employees at the institute received promotions this winter: **Charlotte Rowe** is now deputy state seismologist, and **Walter Rutherford** is the new systems manager at the Alaska Synthetic Aperture Radar Facility. **Tom Hallinan** and **Brent Watkins** are now professors of geophysics, and **Koji Kawasaki** is an associate professor of geophysics.

WELCOME

NEW HIRES: Several new staff members and professors were hired at the Geophysical Institute this winter. In alphabetical order, they were: **Richard Benner**, who joined the institute as an assistant professor of chemistry. His principle research activities are in atmospheric chemistry. Benner holds a Ph.D. in chemistry (University of Denver, '91), an M.S. in engineering (Washington State University, '84), and a B.S. in meteorology (State University of New York, '81). He previously worked as a research and teaching assistant at the University of Denver, as an atmospheric scientist with North American Weather Consultants and as a research assistant with Washington State University. Benner is a member of Sigma Xi, the American Chemical Society, and the American Geophysical Union.

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Kathryn Berry started work as the Geophysical Institute's public information officer and science writer in September. Berry received a Masters of Public Administration with an emphasis on science journalism from Indiana University in 1982, and a B.A. in communications and science journalism from Wittenberg University in 1980. During her 12 years in the Interior, she's written for the National Park Service, the Fairbanks Daily News-Miner, the Alaska Natural History Association, and worked as a free-lance science editor, author, and writer for statewide and national newspapers, magazines and book publishers. She has won several Alaska and national awards for her work.

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John Craven is a professor of physics who divides his time equally between the Geophysical Institute and the Department of Physics. His principle research activities are in auroral and magnetospheric physics. He joined the faculty last fall after moving to Fairbanks from the University of Iowa, where he received his Ph.D. in physics in 1969. Craven earned an M.S. in physics in 1964, and a B.A. in physics and mathematics in 1963 from the University of Iowa. While there, Craven participated in the design, fabrication, calibration, and flight operations of numerous instruments flown on more than 14 spacecraft. Craven is affiliated with the American Association for the Advancement of Science, the American Geophysical Union, the European Geophysical Society, and Sigma Xi.

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John Eichelberger is a professor of volcanology for the Geophysical Institute and the Department of Geology and Geophysics. He also is the coordinating scientist for the Alaska Volcano Observatory and the group leader for volcanology. Eichelberger holds a Ph.D. in geology (Stanford University, '74) and an M.S. and a B.S. in earth sciences from the Massachusetts Institute of Technology. He is the chairman for the Organizing Committee for the Continental Scientific Drilling Forum, the chief scientist for the Katmai Scientific Drilling Project, and a member of the IUGG Working Group for Continental Drilling with the International Lithosphere Program. He is a member of the American Geophysical Union, and the Geological Society of America.

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Stephen McNutt joined the institute as a research professor and a volcano seismologist with the Alaska Volcano Observatory this winter. McNutt received a Ph.D. in volcanology in 1985, an M. Phil. in geological sciences in 1984, and an M.A. in Geological Sciences in 1982, all from Columbia University. He also holds a B.A. in earth science (Wesleyan University, '77). Prior to coming to the institute, McNutt was a senior seismologist with the California Division of Mines and Geology in Sacramento, California. He is a member of the American Geophysical Union, the International Association of Volcanology and Chemistry of the Earth's Interior, the International Society for the Prevention and Mitigation of Natural Hazards, the Seismological Society of America, and Sigma Xi

SUMMER TOURS—Tours of the Geophysical Institute are scheduled for Thursdays at 2 p.m. from June 4 through August 29, except there will be no tours on July 2, 9, and August 13. Tours of Poker Flat Research Range are scheduled for Fridays at 10 a.m. on June 12 and 26, July 10 and 24, and August 7 and 21.

Ronald Pierce became the new manager of Poker Flat Research Range this winter, after retiring from a distinguished 23-year career as a U.S. Army Officer. Pierce, 42, spent the final two years of his military service as the chief of the test division for the Cold Regions Test Center at Fort Greely, near Delta. Prior to that, Pierce worked for four years as an army officer and assistant professor of military science at the University of Tennessee, for three years as the commander of the U.S. Army Special Forces Underwater School in Key West, Florida, and for two years as an infantry commander at Fort Wainwright in Fairbanks. Pierce holds an M.A. in management and supervision (Central Michigan University, '85), a B.S. in social science (Troy State University, '80), and he's just about to complete an M.A. in political science from the University of Tennessee.

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Jack Robertson was hired as the new Poker Flat Research Range safety officer in December. Robertson received an M.S. in mechanical engineering in 1987 and a B.S. in mechanical engineering in 1985 from the Georgia Institute of Technology. Prior to his arrival at Poker Flat, Robertson was the project engineer with United Technologies in Ogden, Utah, working in the liaison office to Thiokol Corporation.

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Davis Sentman joined the space physics division of the Geophysical Institute as an associate professor of physics last fall. He earned a Ph.D. in physics in 1976, an M.S. in physics in 1973, and a B.A. in mathematics, all from the University of Iowa. Sentman was a senior scientist for TRW Systems Group in California, and was on the research staff with the University of California Institute of Geophysics and Planetary Physics. He is a member of the American Geophysical Union, the American Physical Society, and Sigma Xi.

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Max Wyss joined the Geophysical Institute as the Wadati Professor in Seismology. Wyss earned a Ph.D. in Geophysics in 1970 and an M.S. in 1967 from the California Institute of Technology. Prior to his arrival, he worked as a professor of geology at the University of Colorado. He's also worked as a visiting lecturer, scientist, and professor at various universities in Germany, Switzerland, and Mexico. He is the chairman of the Subcommission for Earthquake Prediction of the International Association of Seismology and Earth's Interior. He is a member of the Seismological Society of America, the American Geophysical Union, and he received the Alexander von Humboldt Senior U.S. Scientist Award in 1985-86.

DOUG SIGLER



Pictured in the front row (from left to right) are Tracy Zeiler, Max Wyss, John Eichelberger, Kathryn Berry, and Richard Benner. Pictured in the back row (from left to right) are Stephen McNutt, Ronald Pierce, and Davis Sentman. John Craven and Jack Robertson were not available at the time the photo was taken.

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Tracy Zeiler joined the Alaska Synthetic Aperture Radar Facility as a systems engineer last fall. Zeiler received her professional engineering license from the State of Connecticut in 1990. She also holds an M.S. in computer science (Rensselaer Polytechnic Institute, '86), and a B.S. in mechanical engineering (University of Virginia, '83). She previously worked as a marketing/sales engineer and a project engineer for United Technologies with Pratt and Whitney Aircraft in East Hartford, Connecticut.

NEWTON'S APPLE, a national television series that makes science understandable to children, visited the GI this winter to get interviews for segments they plan to air soon on the aurora, permafrost, and ASF. Interviewed on camera were Neal Brown, Tom Hallinan, Gina Price, Kathe Rich, Ray Martinez, Jack Robertson, Ralph New, Tom Osterkamp, Larry Sweet, Rick Guritz, Ken Dean, Ron Faust, and John Morack. Thanks to others who helped the crew with background information, including Syun-Ichi Akasofu, Ron Pierce, Dan Osborne, Jim Desrochers, Mary Farrell, John Mahoney, Clifton Moore, Carl Benson, Will Harrison, and Nils Johansen.

CLARIFICATION: In the article entitled "Weather data access improved" in Vol. 9, Nos. 3 and 4 (Summer 1991), we failed to mention that the UNIDATA program was established by the National Science Foundation Division of Atmospheric Sciences in 1984. ATM has been the sole sponsor of this activity from its inception. NCAR manages the UNIDATA program.

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Editor: Kathy Berry
Publications Asst.: Jan Dalrymple
Graphic Artist: Deborah Coccia

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A Favor Returned

A man who established a high-tech toy store in Fairbanks honored his father and returned a favor to a life-long friend this winter by establishing a scholarship fund for high-tech research.

The Ed Hones Space Physics Award was set up to honor Ed Hones, a physicist and auroral researcher who recently retired from the Los Alamos National Laboratory in New Mexico. The award was established by his son, William Hones, founder and past owner of Fascinations, a toy store in the Bentley Mall.

The first recipient of the $1,200 award was Ling-Hsiao Lyu, a doctoral student in space physics. Lyu received the award for her in-depth examination of the waves and shocks that transport energy from the sun to other regions in space.

The honor is to be given annually for the next three years to outstanding graduate students working toward doctoral degrees in space physics.

The idea for the award began as a friendly joke between William Hones and Geophysical Institute Director Syun-Ichi Akasofu. Akasofu and Ed Hones had been research partners for years, so it was natural for the young Hones to ask for advice from a family friend. The advice had nothing to do with university research, however. William wanted to start a high-tech toy store.

Ten years ago, the hopeful entrepreneur accompanied Akasofu on a business trip to his native country, Japan. During the weekend, the duo visited stores displaying fascinating toys, but none of the Japanese store owners would release information on who manufactured their wares.

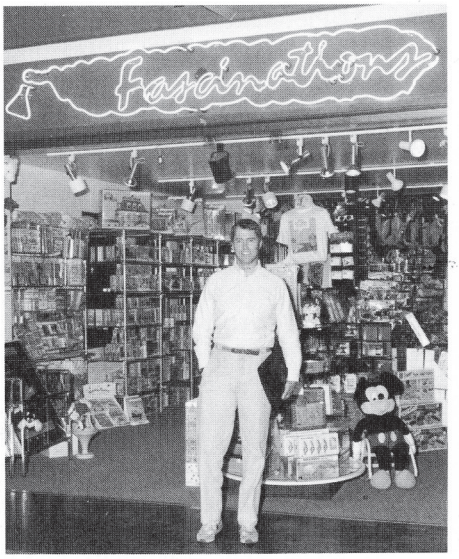
Later, high-ranking university professors in Japan agreed to help Hones because they were colleagues of his father. After flipping through the yellow pages of a telephone book, the professors decided to call the president of a small and then relatively unknown company, Nintendo. Shortly thereafter, Hones began to make plans for his own toy store.

After business boomed in Fairbanks, Hones sold the retail store to local resident Jon Bowne. Hones still owns Fascinations Trading, Inc., a wholesale toy manufacturing company in Seattle.

"I jokingly told Bill that he could repay me for my help when he became successful," Akasofu said.

Hones expressed his gratitude for Akasofu's help and honored his father's life-long research by establishing the scholarship fund. The award was presented during the four-day 1991 Substorm Workshop, a gathering of 30 space physicists from around the world here to exchange information and improve their understanding of the substorm. The workshop was organized by Joseph Kan, the Geophysical Institute's associate director for research.

EVELYN TRABANT



William Hones, pictured above, honored his father when he created the Ed Hones Space Physics Award to be given annually for the next three years to outstanding graduate students working on doctoral degrees in space physics.

Student Rockets *cont. from 2*

The rocket payload was shaken by a vibrator, then tested in a vacuum chamber so the students could see how it will work at reduced atmospheric pressures during flight. They also spun it in a centrifuge to 50 times the force of gravity to see how it will react under increased forces associated with take off.

GEOPHYSICAL INSTITUTE
University of Alaska Fairbanks
C. T. Elvey Building
Fairbanks, Alaska 99775-0800

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