The Antarctic Sun

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Photo by Kristan Hutchison/The Antarctic Sun

Bella Bergeron, a driller with the Ice Core Drilling Services, guides the drill out of one of three holes they are drilling for the South Pole Remote Earth Science Observatory. Two of the holes are complete and the seismic instruments are expected to be operating in January.

SPRESO serves up seismic holes

By Kristan Hutchison
Sun staff

"SPRESO camp" may sound like a roadside java stand but the specialty at this scattering of mountain tents and Weatherhavens is drilling holes for seismic instruments.

SPRESO is short for South Pole Remote Earth Science Observatory, a new seismic monitoring facility five miles (8 km) from Amundsen-Scott South Pole Station.

Despite the project acronym, the drillers don't have much time to stop for more than a cup of regular coffee, tea or cocoa, as they drill three of the deepest cored holes ever punched at the South Pole. An espresso maker tucked in a corner under the table is saved for special occasions.

See Spreso on page 7

Looking for pebbles from the heavens

By Mark Sabbatini
Sun staff

This year's search for rocks from space may help efforts to travel there.

A longtime meteorite-gathering project in Antarctica will explore a new icefield this season, deploying a team that includes U.S. space program officials. Among this season's goals is studying the efficiency of working in extreme environments, in the hope the results can help plan future space missions such as work on the International Space Station and manned flights to Mars.

"How many hours in a given day do we actually get to do science?" said Dean Eppler, senior scientist for Science Applications International Corp., which works with the Johnson Space Center in Houston. He said knowing how much time is consumed by everyday living tasks such as cooking and cleaning is important when making space plans because "we don't want to oversell the program."

"There may be pieces of Venus or Mercury out there."
— Dante Lauretta, member of meteorite team

Eppler is part of a four-person team that will explore the western end of the Transantarctic Mountains as part of this season's Antarctic Search for Meteorites (ANSMET) program. An eight-person team will return to Beardmore South Camp to search the second half of a site where more than 400 meteorites were recovered during the 1999-2000 season.

More meteorites have been recovered from Antarctica than all other places on Earth combined. About 12,000 meteorites ranging from pea-sized to more than 1,000 pounds have been recovered and categorized since 1976 by the National Science Foundation-funded ANSMET project. Another 20,000 have been recovered by Japanese teams working separately, but

See Meteorites on page 11

Quote of the Week

"Where did we put baby Jesus?"

— Comment made while searching for Nativity figurine during midnight Mass at the Chapel of the Snows, McMurdo

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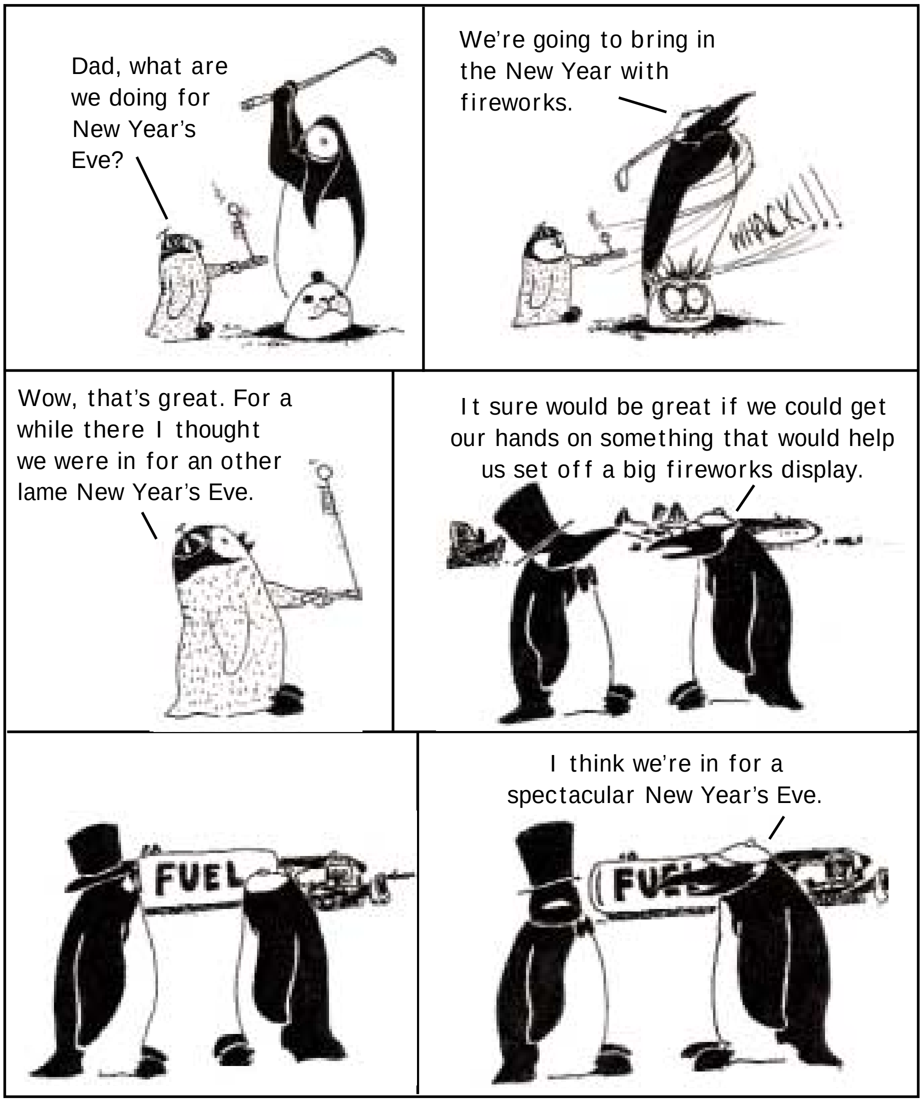
Ross Island Chronicles By Chico



Cold, hard facts

Antarctica vs. Mars

Length of a day in Antarctica: **24 hours**

Length of a day on Mars: **24 hours and 37 minutes**

Surface pressure at the South Pole: **The equivalent of 10,600 ft (3,231 m) [actual elevation: 9,300 ft]**

Surface pressure on Mars: **The equivalent of 100,000 ft (30,480 m) altitude on Earth**

Temperature ranges in Antarctica:

59F (15C) high, Vanda Station 1/74

-128F (-89C) low Vostok Station 5/83

Ground temperature recorded on Mars by the Pathfinder:

65F (18C) high during daylight

-130F (-90C) low at night

Highest point in Antarctica: **Vinson Massif, 16,067 ft (4.9 km)**

Highest point on Mars: **Olympus Mons, 78,740 ft (24 km)**

Deepest point in Antarctica: **Bentley Subglacial Trench -8,333 ft (-2.5 km)**

Deepest point on Mars: **Hellas Planitia, an impact crater in the southern hemisphere -25,590 ft (-7.8 km)**

Sources: NSF, Steve Hoffman of SAIC, NASA

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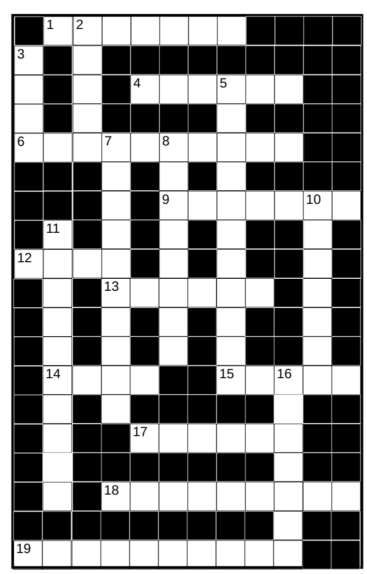
Web address: www.polar.org/antsun

Katabatic Krosswords: Out of this world

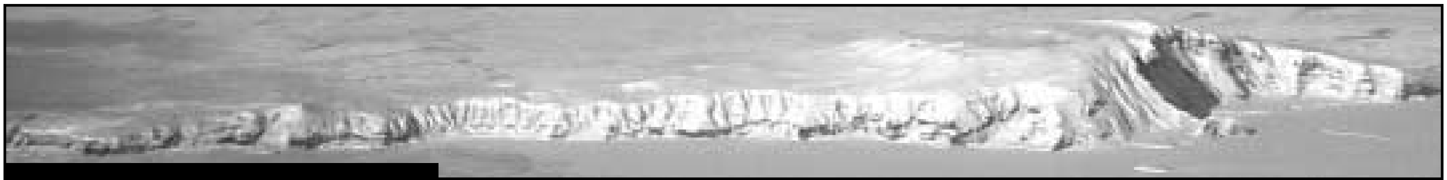
Across
1. Total or partial blocking of one celestial body by another
4. A cloud of dust and gas in space
6. Particles with charges opposite that of ordinary matter
9. The passage of a celestial body across a meridian
12. A measure of the total amount of material in a body
13. A particle of light composed of a minute quantity of electromagnetic energy
14. The Antarctic Meteorological Research Center (abbrv.)
15. Balloon researching cosmic elements (acryn.)
17. Telescope project at South Pole
18. Where dust and gas accumulated into larger bodies
19. The amount of light emitted by a star

Down
2. A gigantic ball of ice and rock in a highly eccentric orbit
3. A star that flares up to several times, before returning to its original state.
5. Electromagnetic radiation at wavelengths shorter than the violet end of visible light
7. A region of charged particles in a planet's upper atmosphere
8. A small planetary body in orbit around the Sun, larger than a meteoroid but smaller than a planet
10. Proposed neutrino telescope at South Pole
11. Matter in the universe that cannot be seen, but can be detected by its gravitational effects on other bodies
16. Telescope project at South Pole

Solution on page 12



Squares too small? No pencil to erase your mistakes? Try our interactive online puzzle at www.polar.org/antsun



Perspectives

It's like fishing, but for meteorites

by Andy Caldwell

The first week of December, as part of the Antarctic Search for Meteorites, we left our comfortable quarters and amazing meals at McMurdo station for a field camp about 300 miles from the South Pole. I sat in the cockpit as the LC-130, a ski-equipped cargo plane, took off and I think I had the best seat in Antarctica. The flight lasted a little over two hours and dropped us off at an abandoned field camp, about 60 miles from our destination. I thought I would feel abandoned when the plane left, but I actually felt excited to get this expedition underway.

The next morning we left for our first traverse to our field camp at Goodwin Nunatak. A week and a half later we left for the MacAlpine Hills, about 40 miles north of Goodwin. We are in the Beardmore Glacier region of Antarctica, which is where the Antarctic ice sheet runs into the Transantarctic Mountains.

This location is ideal for meteorites because the ice from the Antarctic plateau runs up against the mountains. This forces the ice upward where strong, pressure-driven winds called katabatics ablate the ice. Meteorites are literally stranded on the surface. Unfortunately, so are a number of other rocks that we have to sift through to find the meteorites. One member of our team brought a metal detector that has helped, but not all meteorites contain iron. So it just takes careful observation to pick out the meteorites from the rest of the rocks. Dr. Daniel Glavin of the Max Plank Institute of Mainz, Germany, compared this to an Easter egg hunt. I think it's more like fishing where for a while it seems they're biting — and then nothing for hours. It's also rewarding like fishing. Some days you get a large quantity of meteorites that are all the same, and other days you get one rare variety. I will always trade quantity for quality.

Meteorites are very important, scientifically, because they are the best source of information as to where our solar system came from and how it formed. Dr. Scott Messenger of the Beardmore team actually studies "pre-solar grains" which are dust sized particles found in meteorites that come from supernovae (exploding stars) that existed before our sun and solar system formed. Some meteorites contain complex carbon compounds that may be related to the origin of life on Earth. It's thought that most meteorites come from the asteroid belt between Mars and Jupiter, however, on very rare occasions, meteorites from the moon or Mars are discovered. Mars and the moon have a lower gravity than Earth, so if a large impactor hits them, some of their material can be ejected into space. When we recover these meteorites, it's like a present from space without even having to go there to get these samples. Meteorites are really packages of information about our solar system that come to us, literally dropping from the sky. All it takes is a little effort to recover them.

Not only are we recovering meteorites, but we are also doing a lot of other science. One project involves testing a set of "sensor pods" for NASA. They are about a dozen temperature and humidity sensors that communicate with each other and work in unison to gather data. We also are planning to set out a number of rocks outfitted with temperature and humidity probes to gain a better understanding of the weathering that occurs in meteorites after they land on the ice. NASA is also interested in our reconnaissance team, which we call the Rekki team, to see how a small group of people reacts to extreme situations and doing sample recovery as an analog for a mission to Mars. The Rekki team has two NASA employees; Dr. Cady Coleman is an astronaut who has been on two shuttle missions, and Dr. Dean Eppler who tests space suits. They will certainly have some valuable observations after this field season is over. Another member of the Rekki team, Dr. Diane DiMassa has our team testing out a new design for a wind turbine.

Field camp life can be difficult. Two days after we arrived, 20-knot winds and sub-zero temperatures hit us. We calculated one morning that the wind chill was -45F. To add to our frustration, our solar panels could not operate in the wind to give us power and our wind turbine was going out. On top of this, our camp stoves kept malfunctioning. We not only rely on the stoves for cooking, but also for heating our tents. We don't run them at night while we are sleeping, so the temperature inside the tent can easily approach 0F. It's really necessary that they work to keep us alive. Now everything is working fine and we actually have a power surplus.

We get our water from melting the same blue ice on which we're looking for meteorites. The blue ice is really beautiful and looks like a frozen ocean. There are areas where it is forced up on a mountainside and the wind cuts grooves into it. Snow piles on these grooves and, from a distance, it looks like a giant swell on the ocean complete with whitecaps. Blue ice is really compacted and recrystallized snow that can be over 100,000 years old. I'm sure there is someone who would love to bottle this as pure glacial water, but to us it's just for basic needs.

There is never a time in camp where there isn't something to do, whether it's tinkering with a snowmobile, filling camp stoves, chipping ice, or figuring out how to make your computer work on minimal battery power at temperatures hovering around freezing. With burning stoves in our tents, we always have to be on guard against fire and fumes. Yet, we are really struck by the awesome beauty of this place. As the sun goes around counterclockwise, the mountains look different and the ice brings out its full color.

We have had great success meteorite hunting, and that makes this all worthwhile. Our guide, Jamie Pierce, measures success by whether we all make it back from the field safely. Between the two teams, we have already found hundreds of meteorites, but we would gladly trade quantity for a unique variety or a Martian or lunar meteorite.

You can follow our progress on my website:
http://tea.rice.edu/tea_caldwellfrontpage.html

Hopefully we have many more meteorites to recover, or just one unique one.

Andy Caldwell is part of the Teachers Experiencing Antarctica program. He teaches high school astronomy, geology, and physical science in Castle Rock, Colo.

A dozen days to collect cosmic rays

By John P. Wefel

speaking of science...

The Advanced Thin Ionization Calorimeter (ATIC), one of two astrophysics payloads the Long Duration Balloon program will carry this season, is attempting to understand the 'cosmic accelerator' – the process by which bits of matter can be accelerated to speeds far above those available in Earth-based accelerators. These particles are the nuclei of atoms of all of the elements. They are called galactic cosmic rays since they bombard the Earth continually, from all directions, and originate outside our solar system, i.e. elsewhere in the galaxy. Galactic cosmic rays are the only complete sample of matter from beyond our solar system available for direct study, but they are traveling at nearly the speed of light.

When one of these high energy particles enters the Earth's atmosphere, it encounters an air atom, usually nitrogen or oxygen, and undergoes a nuclear interaction that produces a copious spray of secondary particles. Many of these secondary particles also interact to form an 'air shower,' some of which reach the surface - mostly electrons and mesons. These latter secondary particles form the cosmic ray background seen in the laboratory. However, to study the primary galactic cosmic rays, it is necessary to get above most of our protective atmosphere into the near-space environment. This is the job of the large, thin, polyethylene, helium-filled balloons that will be launched at Williams Field. Filled with about 0.8 million cubic meters of helium, these balloons carry payloads of about two metric tons to altitudes around 37 km, above 99 percent of the Earth's atmosphere.

The ATIC experiment is attempting to push the high-energy frontier, measuring galactic cosmic rays at the highest energy possible from balloons. The galactic cosmic rays follow a power law in energy with the integral intensity (particles per unit area per unit time) decreasing as energy to the 1.7 power. For every increase by ten in energy, the intensity decreases by just over a factor of 50. So, to collect a significant number of the highest energy particles we need to fly as big an experiment as possible for as long as possible. The size of the payload is limited by the weight the balloon can lift, and the flight time is determined by the high altitude winds.

In Antarctica, during the austral summer, the upper altitude winds form into a vortex centered on the pole. The air moves in approximately a circle around the pole, so a balloon launched in mid-December to mid-January travels with these winds, circumnavigating the continent in 12-15 days, and arriving back in the vicinity of William's Field. In contrast, balloons launched in most U.S. flight locations tend to have maximum flight times of only a few days.

ATIC must collect as many ultra-high energy particles as possible to determine if there are differences between the energy spectra of different elements and measure the change in relative composition. Theory predicts that such changes should be observed at these high energies where the cosmic accelerator has reached its maximum energy. This widely accepted theory identifies the cosmic accelerator with young supernova remnants.

Antarctic Sun File Photo

Preparing for the 1999 launch of the long duration balloon.

All stars evolve, with the more massive stars burning their hydrogen to helium, and helium to heavier elements. The higher the internal temperatures, the faster this process occurs. Compared to our sun, which will continue to evolve for 4 or more billion years, a very massive star can complete its life cycle in 10s of millions of years, very rapidly on the cosmic time scale. For a star, say 20 or more times as massive as our sun, the end of that evolution is a large explosion, called a supernova. For months a supernova can be brighter than most other stars in the sky, depending upon its distance from us. Supernova have been observed, historically, by all cultures and were often called "guest stars."

Supernova represent some of the most powerful events, occurring in the galaxy about once every 10 to 50 years, we believe. The core of the evolved star becomes gravitationally unstable, collapsing in upon itself, heating the matter to form the explosion that throws off the surrounding mantle of the old star. This results in a collapsed core – a neutron star or a black hole – and shells of matter moving at high speed away from the center out into the surrounding space, the interstellar medium. Since most, if not all, stars have magnetic fields, these moving shells are magnetized. As the shock wave moves out, it sweeps up interstellar matter in a snowplow effect, and it is at this shock boundary that theory predicts particle acceleration to occur. Charged particles are trapped in the region of the shock by the magnetic field and bounce back and forth across the shock boundary, gaining energy from the shock wave on each crossing.

However, just as a snowplow can be stopped when it has pushed up too much snow, so the supernova shock wave eventually comes to equilibrium when it has swept up enough interstellar matter. At this point the acceleration turns off, and this determines the maximum energy to which a particle can be accelerated.

The theory predicts a charge dependent maximum energy. Above 100 TeV (terra electron volts) the hydrogen should decline first, followed by helium, then carbon, and lastly iron. This is the characteristic signature of the supernova remnants acceleration that ATIC is designed to detect, if it can record sufficient numbers of events in the vicinity of 100 TeV or higher. Hopefully, the data will confirm (or refute) the supernova remnants acceleration theory, and, if a refutation, the results may point to another type of 'cosmic accelerator'.

Technically, ATIC combines three separate high-energy particle detection subsystems, enclosed in a pressurized shell 2.3 meters in diameter and weighing 3,400 pounds. We attempt to duplicate what happens in the Earth's atmosphere to make the measurement.

From the possible 6,000 channels of data, those that are triggered are pulse height analyzed and written to an on-board 70 Gbyte disk archive. At the termination of the flight, the data disk is recovered and returned to the ATIC institutions for detailed analysis.

John P. Wefel, a researcher from Louisiana State University, is the principal investigator for the Advanced Thin Ionization Calorimeter project.

around the continent

SHIPS

OAE onboard

By Chris Kenry
NBP correspondent

You never know whom you'll meet on board a United States Antarctic Program vessel. Oh, there are the same recognizable faces of crew members and the Raytheon staff, but when the rotating cast of grantees arrives it's a bit like the beginning of The Love Boat, minus the sexual high jinks and fancy cocktails, of course.

On this trip from Lyttelton to McMurdo there is a stately older man with a vague resemblance to Buddy Epsen. His name is John Behrendt and, as I discovered from talking to him, he is retired from the U.S. Geological Survey and is a professor of geophysics at the University of Colorado. He is also a modest man who has to be coaxed into revealing his many achievements: He has been to Antarctica 12 times and has a range of mountains named after him; he's published over 300 academic papers; and he won the 1999 Colorado Book Award for non-fiction.

On this, his 13th trip to Antarctica, he is sailing on the *Nathaniel B. Palmer* to assist scientists Steve Cande and Joanne Stock in their study of the Ross Sea floor. Behrendt recently took time out of his shipboard schedule to give a slide show and tell stories about his 40-plus years doing science in Antarctica, some of which he has turned into a book: *Innocents on the Ice: A Memoir of Antarctic Exploration.*

The book, a combination of journal entries and pictures from the 1950s mixed with present day commentary, begins when he and several other researchers set sail on a Navy vessel from Rhode Island in 1956. They were headed to Antarctica to participate in an expedition marking the International Geophysical Year (IGY) of 1957; a worldwide program of geophysical research that was conducted by 70 countries and about 30,000 scientists.

In his talk and his book Behrendt gives a lively account of the sea voyage from Rhode Island to the Weddell Sea, but his story really picks up when he tells about his party's 81-day oversnow traverse of the crevasse-riddled Filchner Ice Shelf. They traveled in snow cats that had been specially equipped with mine-sweeper-like "crevasse detectors" which, Berendt says, "didn't really work." A fact that is underscored by several nail-biting photographs of the back half of the cat slipping into a crevasse.

The most dramatic part of the story, however, is when Behrendt relates the clash between the science party and their naval commander who insisted on doing things "the Navy way." When you read about Capt. Finn Ronne, a man who once left the science party out in the field for six weeks without any way of communicating with the outside world, it is easy to grasp the scientists' frustration. There is also a gruesome account of a senseless incident with two Emperor penguins that will make even the most hardened reader squirm.

Behrendt may give a talk and show some slides while at McMurdo in early January. He had also intended to sell copies of his book, but those eager to purchase one will have to wait. He sold all of the copies he brought with him to people on the ship.

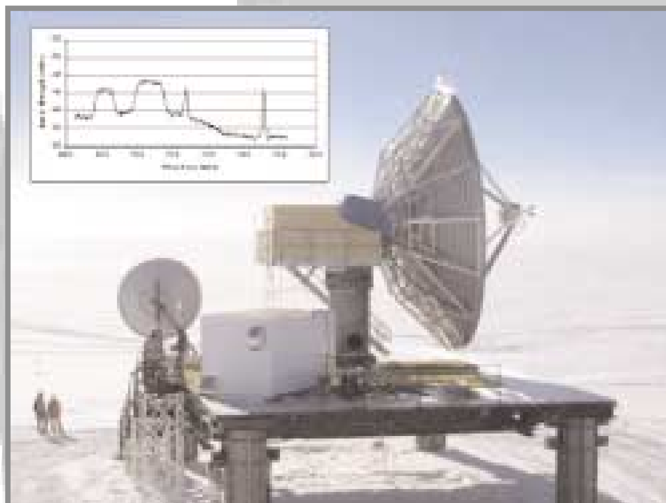


Photo by Nick Powell/Special to The Antarctic Sun

South Pole's 9m full motion tracking antennas next to the 3m backup antenna. The inset graph shows the first signal plot of connections over GOES. From left to right, the signal peaks represent South Pole outbound and inbound high speed links, the low speed link from Onset-D field camp and the GOES beacon.

SOUTH POLE

Comms milestone

By Nick Powell
South Pole IT project engineer

Amundsen-Scott South Pole Station, one of Earth's most isolated places, made a giant technology leap forward last week. The South Pole MARISAT GOES Terminal (SPMGT) achieved its design objectives for improved off-continent communications. MARISAT F2, TDRSS F1 and GOES-3 combined now give South Pole 11.5 hours of high-speed satellite communications a day.

South Pole depended on high-frequency (HF) radio for voice and low-speed teletype communications to McMurdo for many years after station opening in 1957. However, HF radio is slow, subject to interference and suffers from solar flare-induced blackouts, sometimes lasting for days. ATS-3 and LES-9 initially demonstrated South Pole satellite communications potential. However, increasing science and operational data transmission demands, the Internet and e-mail showed the need for even faster service. TDRSS was the first high-speed data communication satellite used by South Pole. MARISAT and GOES followed adding capability which will support the station's intra- and intercontinental communications needs well into the next decade.

SPMGT upgraded the MARISAT and GOES data rates to T-1 (1.544 Mbps) slightly faster than the 1.024 Mbps available over TDRSS. The new

See Pole on page 6

the week in weather

McMurdo Station
High: 31F/-0.4C Low: 21F/-6C
Wind: 39 mph/63 kph
Windchill: -6F/-21C

Palmer Station
High: 44F/7C Low:32F/0C
Wind: 20mph/31kph
Melted precipitation: 8mm
Snowfall: Trace

South Pole Station
High: -10F/-23C Low:-24F/-31C
Wind: 20mph/32kph

Pole

From page 5

MARISAT/GOES service lengthens the daily satellite window providing more telephone call, e-mail, Web browsing and instant messenger opportunities, while higher data rates speed Web access and file transfer, as well as improve telephone audio quality. Satellite ground stations in Miami, Clarksburg, Md., and White Sands, N.M., support links through MARISAT, GOES and TDRSS, respectively. Circuits through Raytheon Polar Service (RPSC) HQ in Denver provide telephone and Internet network connectivity.

Photo by Jeff Kietzman/Special to The Antarctic Sun

An iceberg reflects in the still waters near Palmer Station.

Originally installed during the 2000-2001 austral summer, SPMGT required considerable attention the first year and data throughput did not meet expectations. The following summer brought greater understanding of operating a 30-foot diameter, full-motion satellite tracking antenna in the harsh South Pole environment.

Though improvements increased MARISAT performance, GOES integration was another season away. System performance showed the antenna feed which collects and transmits radio signals required replacement. Over the austral winter, RPSC, NSF and subcontract engineering staff developed a repair and modification strategy so SPMGT would meet design goals.

Repair and modifications began in late November with feed replacement the central activity. The task required a crane because of feed size, weight, position in the antenna and sensitive interior electronics. Delicate, precise crane work permitted task completion by FEMC and IT personnel within an hour. Integration and testing brought SPMGT up to its full potential within weeks. Now, complete automatic control of SPMGT allows unattended system operation to minimize 4,000 foot walks from the main station for service calls, a welcome system feature!

SPMGT represents the first large, complex satellite communications ground station of its type installed in an Antarctic interior environment. Engineering, installation, operations and support personnel drew from a limited body of knowledge when designing, installing and operating SPMGT. Their efforts made SPMGT a reality and brought South Pole a new communication system designed for the 21st century.

PALMER

Ice movement

By Jeff Kietzmann
Palmer correspondent

At Palmer Station you can go to sleep at midnight to a crystal-clear harbor and wake only hours later to a brash ice-filled inlet punctuated with a group of massive icebergs. The ice here moves fast regardless of size or type, and this year the bergs have been prolific in both abundance and majesty.

Icebergs are formed when glaciers or ice shelves calve into floating blocks of ice. Icebergs are considered blocks of ice larger than five meters above sea level. Flat-topped icebergs (tabular bergs) are normally created by an ice shelf, whereas more sculpted and irregular shaped icebergs are formed from glaciers. At any given time, a selection of icebergs may be present just offshore from Palmer Station.

Photography of icebergs is a favorite pastime for station personnel. Everyone wants to capture the magnificent blues and greens of the perfect berg. Icebergs are tinted blue due to light scattering within ice that has compressed out all of its air bubbles and gases. The green seen on icebergs can be from metallic compounds or the result of algae growing.

Aside from being picturesque, the icebergs provide a playground and additional safe havens for the local penguin colonies. If they are not using the icebergs to avoid becoming the delightful dinner of a leopard seal, they are using them as slides. And as much as everyone on station would like to jump aboard a berg and play with the penguins, there are precautions to be taken so as not to put personnel, equipment and wildlife in danger.

Icebergs have a tendency to split, calve or even turtle, a term used to explain the phenomenon of icebergs flipping over. Though up to 90 percent of an iceberg can be underwater, it can become top heavy and flip at will. Sometimes a slight rise in the waves will cause a berg to turtle or calve without warning. Thus, we do not go within 300 feet of the glacier face or within three times the height of an iceberg while on board a zodiac. If an iceberg comes to within three times its height from shore we all keep our eyes, ears and camera shutters wide open.

It has been almost 10 years since Palmer Station has seen this much iceberg activity, and it is certainly enjoyable for the whole crew. Unfortunately, this increase may indicate bad tidings for the ice shelves and glaciers in the Antarctic.

Climate change could be responsible for the 10 meter per year retreat of the Marr Ice Piedmont glacier located just behind Palmer Station, as well as the recent breakup of the Larson-B Ice Shelf. Giant icebergs calving from the Ross Ice Shelf seem a more random.

Arguably, it is possible that our increase in local icebergs is a matter of natural fluctuation in regional climate. More research is definitely necessary to get to the bottom of this trend. Many organizations are actively investigating the questions surrounding the changes in Antarctic ice.

In the meantime, we here at Palmer Station will continue to enjoy the splendor that icebergs bring to our small community.

Photo by Jeff Kietzman/Special to The Antarctic Sun

Icebergs float in the distance beyond Palmer Station.

Spreso

From page 1

"It's more symbolic," said Terry Gacke, lead driller with Ice Core Drilling Services of the University of Wisconsin at Madison.

SPRESO is a quiet place. From SPRESO the South Pole station can be seen but not heard. About a 25-minute snowmobile ride away, the new, elevated station and old silver dome flicker on the horizon like a mirage in the desert. The rest of the view from SPRESO is flat, white and very still.

SPRESO is the first experiment in the newly formed "Quiet Sector," an area set aside for experiments that need a location free from the ground vibrations caused by activities at and around the South Pole Station.

"The problem is the station at the South Pole is getting noisy to the point where the data is less and less useful, so we had to move to where we could actually hear earthquakes again," said Kent Anderson, a seismologist with the U.S. Geological Survey.

The South Pole seismometers are part of a Global Seismographic Network of 126 stations. Each station on the network contains multiple sensors with the capability of measuring the motion of the ground from very long period changes, such as the deformation of the Earth caused by the orbit of the moon, up to high frequency motion, like a recent quake in the older snow at SPRESO.

By having sensors on every continent and in every ocean, the network can record smaller earthquakes and more precisely determine their location, size and learn more about the path seismic energy travels between an earthquake and the receivers. The waves from the quakes run through the Earth, giving researchers a way to understand the Earth's interior in the same way a CAT scan shows doctors the inside of the brain.

"We can start piecing together a three-dimensional image of what the inside of the Earth looks like," Anderson said.

After 40 years collecting data with the same network of stations, seismologists are beginning to notice some changes inside the Earth. The seismic waves from earthquakes recurring in the same spots as they did decades ago are following different paths, indicating the Earth's inner core may not be spherical, Anderson said. Instead, it may be a faceted, crystalline structure that is rotating separately from the spinning of the Earth's crust. This could help explain why the wandering magnetic poles sometimes wander to the other side. The polarity of the Earth's magnetic field has changed about 170 times in the past 100 million years and may change again in the next few thousand years, so a north-pointing magnet would aim south instead.

Photo by Kristan Hutchison/The Antarctic Sun

Denise Braun works the drill controls as Bella Bergeron helps guide it down. Below, a rope disappears into the 270 meter deep hole.

> "That's what makes this station important. We can kind of listen to the Earth ringing without the spinning corrupting the signal."
> — Kent Anderson, seismologist

Photo by Kristan Hutchison/The Antarctic Sun

"We speculate it's not like a switch flip. It's a more gradual thing," Anderson said.

The five Global Seismographic Network stations in Antarctica - at the South Pole, Palmer Station, Scott Base, the Dry Valleys and Casey Station - are also important because of their location on the Earth's most sparsely populated continent. The South Pole Station is unique in that it is on the axis of rotation of the earth.

Large seismic events of magnitude 8 or higher can set the Earth into an oscillation, like the vibrations of a bell after it's been struck very hard. These oscillations can continue for several days.

"Just by listening to the bell, you can figure out something about its shape," Anderson said. "The problem is, the bell (Earth) is also spinning."

Because of the spinning, it's difficult to sense the pure oscillation.

"There's only two places you can hear the bell ringing clearly without the effects of the spinning globe, and those are the axes of rotation," Anderson said.

The northern axis, at the North Pole, is a floating ice pack, making it difficult to put a seismic station there. That leaves the South Pole as the best place to listen to the Earth vibrating.

"That's what makes this station important," Anderson said. "We can kind of listen to the Earth ringing without the spinning corrupting the signal."

But recently interference from activity at South Pole station has been disrupting the Earth's signal.

When the first seismometers began recording data at the South Pole in 1957, it was a quiet place. The first station had just been built and only 18 men spent the winter. Since that initial installation, there have been three other upgrades, moving the seismic equipment from the old pole station closer to the newer dome, upgrading equipment and then changing to a safer vault at the current V1 location about 980 feet (300 meters) from the dome. SPRESO will be the fifth generation of seismic stations at the pole.

"The current station at V1 was an appropriate distance when the station was not as busy," Anderson said, "but now we've found it's more of a cultural sensor than a seismic sensor. We can see every tractor moving around."

Now bulldozers, tractors and other heavy equipment rumble around the station 24 hours a day, pushing snow, moving supplies, and helping build the new ele-

See Spreso on page 8

From page 7

vated station building. The ice-shaking vehicle traffic shows up in the seismic record, drowning out smaller earthquakes. Anderson can tell when lunch and dinner breaks are, just by looking at the seismic record.

The USGS started planning to move the seismic equipment in 1994, in collaboration with the National Science Foundation and the Incorporated Research Institutions for Seismology. First the USGS did a survey, setting instruments every mile away from the station, up to 25 miles (40 km) out, Anderson said. The instruments stopped picking up the station activity at mile 10 (16 km), but that was too far to bring power from the station.

Further analysis with the assistance of the Cold Regions Research and Engineering Lab determined that burying the seismometers 800 to 1,000 feet (240-300 meters) under the ice would be the same as going out 10 miles, Anderson said.

Burying seismometers isn't unusual, but placing them in ice is.

"We put them deep in rock all over the world, but these instruments are made to run at room temperature," Anderson said. "We'll have to heat it."

The 6-inch (15 cm) instruments will be in a 10-inch (25 cm) casing, filled with perlite insulation and heat tape.

The new seismometers have been running for a year at the V1 site near South Pole station to test them. By mid-January, Anderson expects to move them to the new holes at SPRESO.

"We'll put our instruments down at the bottom, fill in with sand, and hopefully never see them again," Anderson said.

A small building will be buried in the ice nearby to hold the computers and data recorders.

Just drilling the 885 feet (270 meter) holes is a bit of an engineering feat. The holes must be at least 12 inches (30 cm) in diameter and need to have flat bottoms for the instruments to sit on. The coring drill creates a 6-inch (15 cm) diameter hole.

The solution was to drill 6-inch holes, then shave away the sides. The difficulty has been keeping the ice chips from filling the hole as they are shaved off. Mark Wumkes of Glacier Data in Fairbanks, Alaska, designed a reamer to scrape the sides of the borehole and catch the chips in its barrel. Every 3 to 6 feet (1 to 2 meters), the drill barrel has to be pulled to the surface and emptied.

"This reamer system is an experimental engineering project in progress," said Gacke, lead driller for ICDS.

He and five other drillers - Lou & Mark Albershardt, Denise Braun, "Bella" Bergeron and Matthew Pender - are working on the project, all with many years of experience in the Antarctic, Arctic and Greenland.

"All these people are competent and talented drillers," Gacke said. "It takes a unique individual to come out here and deal not only with cold weather camping issues, like sleeping in unheated tents at -40, melting snow for our water supply, and cooking our own food, but (also) all the mechanical problems that come using this kind of experimental equipment at these temperatures."

The first two holes were drilled quickly, going down about 100 feet (30 meters) a day, because the cores weren't being saved. The third hole will be drilled more slowly and carefully, about 33 feet (10 meters) a day, so the drillers can save the core for the International TransAntarctic Scientific Expedition (ITASE). At more than 980 feet (300 meters), it will be the deepest ice core ever taken at the South Pole, dating to about 3,000 to 4,000 years old, Gacke said.

Cores from the first two holes were melted down as drinking water last summer. And once or twice, the SPRESO water did end up in a celebratory espresso or mixed with the camper's beverage of choice.

Photo by Kristan Hutchison/The Antarctic Sun

AT SPRESO camp, 8 km from Amundsen-Scott South Pole Station, the drillers live in mountain and Scott tents in temperatures always below freezing.

Photo by Kristan Hutchison/The Antarctic Sun

The drillers clean ice out of the shaft while reaming the hole to fit seismic instruments. Bella Bergeron, far left, pushes the shaft through and Terry Gacke helps from the other end as Denise Braun and Matthew Pender watch.

ANTARCTICA

Almost out of this world

Above, one of Mars' polar ice caps looks deceptively like the Antarctic in a photo taken by the Hubble Space Telescope.

By Kristan Hutchison
Sun staff

Dry streambeds, wind-carved rocks, red pebbles laid flat like paving stone — a landscape so alien it can be only Mars, or Antarctica.

Over and over writers and researchers compare Antarctica to Mars, or Europa, or the International Space Station. When Kim Stanley Robinson was researching his Mars trilogy, he read about Antarctica to understand what the red planet was like in its early years. He later came to Antarctica as a National Science Foundation grantee.

"I thought parts of the Dry Valleys looked very much like photos of Mars. The field stations and even McMurdo reminded me of what I thought early Mars stations might be like," Robinson wrote in an e-mail.

Subtle signs around the Antarctic stations show the inhabitants' thoughts also drift spaceward. A map of Mars hangs in the computer room at the South Pole. In the nearby lounge, a flag that went on the space shuttle Columbia is on display. A similar one hangs in Crary Lab at McMurdo Station.

Discount space program

It's not just sci-fi. Even the National Aeronautics and Space Administration (NASA) comes to Antarctica to find out about space. More meteorites have been collected from the Ice than anywhere else, on Earth or off. Technology and people are tested in the harsh environment and NASA looks to the Antarctic to understand what life might be like on Mars or Europa.

"Antarctica is more like Mars than any place else on Earth, and if you want to understand Mars, you start in Antarctica," said Carl Allen, astromaterial curator at the Johnson Space Center in Houston, Texas.

Like Antarctica, Mars is a polar desert. Without water eroding the surface, any weathering is from wind or sun, just like the Dry Valleys, said Dean Eppler, a NASA consultant with Science Applications International Corp., who studied the weather patterns in the Valleys in 1983 and 1984 in order to better understand Mars. The Dry Valleys look almost identical to photos the Viking lander sent back from Mars "right down to the rocks that are there," Eppler said.

Three billion years ago, Mars was probably even more like the Dry Valleys are today. Back then Mars was warmer and had water, and therefore maybe life, Eppler said.

"There's a period of time when we're almost certain Mars was warm and wet," Eppler said.

The signs of water remain in what appear to be dry lakebeds, Allen said. Now most of Mars' water is trapped in its polar regions. The Mars ice caps are part water and part dry ice, layered with dust like the face of a glacier. Rather than falling as snow, the ice crystals build up like frost, similar to the pattern on the coldest parts of the Antarctic plateau, said Stephen Hoffman, a research engineer with Science Applications International Corp., working in the exploration offices at the Johnson Space Center.

"The water shifts from the summer pole to the winter pole," Allen said. "It's sort of like the sea ice here."

The comparison between Mars and Antarctica shouldn't be taken too far. The most obvious differences are air and gravity. Mars air is a thin, unbreathable combination of mostly carbon dioxide and little nitrogen, with a surface pressure the equivalent of 100,000 feet altitude on Earth. The South Pole's surface pressure fluctuates between the equivalent of about 10,000 to 11,000 feet altitude. Gravity on Mars is 0.38 of Earth's, so 100 pounds would feel like 38 pounds. But the mass of things is the same.

"Newton's laws still apply. If you're going a certain direction at a certain speed, you're going to want to stay going a certain way at a certain speed," Hoffman said.

Mars is also much colder and drier than Antarctica, according to Berry Lyons, lead of the Long-Term Ecological Research Project in the Dry Valleys. The LTER is one of 24 LTER sites funded by the National Science Foundation around the world. Taylor Valley gets about 3 cm of precipitation a year; Mars maybe 1 cm. While the temperature in the Taylor Valley averages almost –4F(-20c), the temperature at the equator of Mars averages around –55F. Mars also has a more extreme variation temperature, even within a few feet. The Pathfinder found that when the sun shone on Mars the ground could get to 65F degrees, while five feet up it was 15F degrees. At night the same spot would drop to –130F at ground level and –105F at five feet up.

"This brackets what you experience for temperatures," Hoffman said.

Still, each time biologists working in the Dry Valleys find life – frozen into the lake ice, hiding in the sandstone – they turn toward Mars. If it's here, they say, it must be there.

A decade ago microbiologist E. Imre Friedmann found lichen and cyanobacteria growing in tiny spaces between sandstone rock crystals, a few millimeters below the surface of the rock. The cryptoendolithic organisms get just enough sunlight and water through the porous

See Mars on page 10

Photo by Kristan Hutchison/The Antarctic Sun

Photo by Viking Lander and Mary Dale-Bannister/Courtesy of NASA

A dry riverbed in the Taylor Valley, at left, blends into the equally barren landscape the Viking Lander found on Mars. Below, an image of the Mars south polar region, an area covered with ice and dry ice.

Mars

From page 9

rock to survive.

"That got the Mars people very excited," Allen said.

Now microbiologists are looking at the Antarctic ice itself and theorizing organisms may live in a web of briny veins throughout it.

"This gets us into thinking about Mars and Europa, the ice moons of Jupiter," Allen said.

Europa is thought to be much more like Lake Vostok or Lake Vida, with liquid water under a thick shell of ice. Dry Valleys' researcher Peter Doran has a grant to try a new technology, called Gopher, to draw a sample out of Lake Vida in three years without contaminating it. The Gopher will vibrate its way through the ice cover, pulling out ice cores. When it nears the water it will stick in a straw to sample the briny water. If it works, it could eventually be used on Europa.

"It's really the first step," Doran said.

Identifying the life first in Antarctica will help NASA learn to recognize it on other planets.

"We are becoming much smarter and much more humble about what microorganisms can survive," Allen said. "When we eventually do go to Mars with people, we're already going to know a huge amount about what to expect."

Planning for Mars mission

The logistics of working in the Antarctic are also similar to working in space, and NASA studies the Antarctic program to help plan a possible manned mission to Mars.

"Going to Mars is going to be a lot like going to Antarctica," Eppler said. "It's remote, it's inaccessible, and it's a hostile environment.... We have to pay attention to that or we'll at the least get hurt and at the worst die, and dead people don't do science real good."

Usually Eppler tests space suits, but he's in Antarctica this season with the meteorite team to study how much time they spend on logistics versus science. The space program could apply that knowledge to the existing space station, as well as a Mars mission, he said.

"We would prefer to design into it realism from the start," Eppler said. "Things like this give you a chance to see, in a similar environment, how much time can you do science and how much do you spend beating on snowmobiles."

The amount of time spent just living and maintaining the station versus doing science has become an issue at the International Space Station, Eppler said. The station was built for six astronauts, with the thought that three would be focusing on science. But only three astronauts are on board, doing all the science and keeping it flying.

While NASA wants to be realistic in planning how much can be accomplished by a mission crew, it also wants to give the astronauts enough to keep them busy, Eppler said.

"You run into problems not because people didn't like each other, but because they got bored," Eppler said.

Like the crew on a Mars mission, the meteorite field teams in Antarctica are made up of multi-talented people with diverse skills, so the geologist may also be a mechanic, the chemist an accomplished cook.

"That's the way the Mars mission will be. People who go to Mars will not be world-renowned scientists," Eppler said.

NASA has also looked at historical expeditions to the Antarctic, including a station set up in Queen Maud Land by the British, Norwegians and Swedes, which lasted two years unsupported.

"There are things that have been done in the Antarctic that are very similar to what we think the first Mars mission would be like in terms of duration, in terms of support you get, in terms of number of crew," Hoffman said. "Some of the bigger temporary stations like Siple Dome, the infrastructure and the capabilities and the level of support are also comparable."

Even the National Science Foundation's shopping list for the Antarctic program is a valuable resource for the space program. Antarctica's dependence on supplies delivered from elsewhere makes it similar to space stations, Eppler said.

"It's the only place on Earth you can't live unless the logistics are here. If the (supply) ship sinks you can't stay," Eppler said. "From the standpoint of Mars and the moon, it's the same thing."

He's making note of how much supplies are needed for the field party.

"Just data on fuel and heads of lettuce is priceless data nobody else has," Eppler said.

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Meteorites

From page 1

many of the specimens remain unexamined.

Meteorites are evenly scattered across the globe, but Antarctica is an ideal collection site since its vast uninhabited ice sheets make them easy to find.

"We know fairly well what's fallen on this planet through this program," said Carl Allen, a meteorite hunter who is the astromaterials curator at the Johnson Space Center. Also, he said samples collected from Antarctica tend to be cleaner than those from other parts of the world,and consequently "they're really the gold standard of meteorite samples."

One of the big reasons ANSMET keeps returning to the Ice, despite its vast collection from so many years, is only five of the meteorites are from Mars and about a half dozen are from Earth's moon. Searchers keep hoping to find more, along with other rarities from space.

"Imagine geologists trying to understand the history of Earth from 12 rocks," said Scott Messenger, a first-year meteorite hunter from St. Louis Washington University.

Scouting for space

This year's hunt got a boost from the National Aeronautics and Space Administration (NASA), which provided enough supplemental funding to allow searches by a smaller reconnaissance team. A small Twin Otter airplane stationed at the South Pole will drop the team at various locations, where they will travel relatively fast and light as they search for meteorites.

Previous scouting trips were part of the normal field season or consisted of one long trek where participants and their supplies were dropped off by a larger plane, said John Schutt, lead mountaineer and science leader for the reconnaissance party. He said there are eight to 10 potential collection sites this year, but on-call access to the Twin Otter gives them flexibility to make adjustments.

"If we get into an area that's really productive, we might want to stay an extra three or four days," he said.

The area's potential was noticed a decade ago when satellite data indicated a large surface area of "blue ice," a hard surface favored by researchers, because meteorites are less likely to disappear from view. Schutt said he flew over the area at the time to confirm the firmness of the surface and found three meteorites during a half-hour landing.

Individual sites in the area are within 100 miles of each other, Schutt said. NASA funding will also allow for an additional two years of reconnaissance searches in other areas. Locations with large or unusual meteorite collections will be marked as potential sites for full-scale field searches in future years.

The reconnaissance team is ideal in many aspects for the work efficiency study and how it might apply to space flight, Eppler said. He said teams of about three to four people are likely for the future space missions, and each person will need the versatility of those exploring the Ice this year.

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Photo by Linda Martel/ANSMET

Last year's meteorite search team approaches a meteorite, taking precautions not to contaminate it.

Mars

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Astronaut training ground?

NASA sent an astronaut to Antarctica this year, too, as a form of job training.

"It's really great training to be here in Antarctica, trying to do things in some harsh conditions and with gloves," said Cady Coleman, who has flown on two shuttle missions, "and maybe building some character."

Some Antarctic participants hope to go the other way, from Antarctica to space. This winter Chris Martin, a scientist with the Harvard-Smithsonian Center for Astrophysics, plans to send his application to NASA while he's wintering over at the South Pole with the Antarctic Sub-millimeter Telescope/Remote Observatory project.

"My interest in space is certainly connected with my interest in doing science from Antarctica, since they both share many commonalities," Martin wrote in an e-mail. "Both activities are associated with a sense of adventure and with the chance to do cutting-edge science right at the limit of what is possible with modern technology from the very best sites on or off the Earth."

He's not the first Antarctic scientist to try. As a boy, Chris Walker watched the Mercury and Gemini flights, leading to an interest in astronomy and electrical engineering, and eventually to the South Pole where he also works on AST/RO. Walker has applied to the space program twice, and keeps trying. He comes to the South Pole instead, because the conditions are similar to space – high altitude, dry climate and dark half the year.

"In many ways it mimics space, where you have no atmosphere and it's dark all the time," Walker said. "It's sort of the jumping off place to space. It's the place on Earth that's the most like space itself."

That also makes it an excellent place to develop instruments and technology for use in space. AST/RO uses prototypes of instruments NASA expects to send into space with a new telescope in a few years.

"It's kind of like a dress rehearsal for space instruments," said Walker, who also uses Antarctica as a testing site for other instruments he is developing and hopes to send into space someday, including a high-frequency receiver.

"A lot of people who want to be an astronaut end up in Antarctica," said Ted Scambos, who first came to Antarctica as a glaciology student because he was interested in space. Scambos applied to the space program while he was getting his

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Meteorites

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"We all have interesting cross-training and that would also be something you would have on Mars," said Eppler, who in addition to his space program experience is a geologist and worked in the McMurdo Dry Valleys about 20 years ago.

People are often able to put in nearly a full day's work, both on the Ice and in space, once they're accustomed to the tasks and extreme conditions. But everyday living tasks remain a consistent challenge, with conditions frequently primitive and cramped.

"I have a sense the normal everyday things of life take twice as long" at remote Antarctic field camps, said Nancy Chabot, lead field scientist for the larger meteorite-gathering team this season. "As far as collecting the meteorites, it would take a bit longer only because you have to be a bit more careful because of the weather."

Astronauts on the Apollo moon missions put in about six hours of work a day at first, but were able to increase that to eight hours with experience, Eppler said. One difference, he noted, is the weather on Earth can lead to longer delays than might occur in space.

"I've heard horror stories where they've spent 10 days at a time sitting in a tent going stir-crazy," he said.

Photo by Linda Martel/ANSMET

Twin Otter airplanes carry the meteorite search teams and their equipment to field camp sites. This year a Twin Otter has been dedicated to recoinnaissance team, allowing them to survey more territory.

The bigger hunt

Most of this year's ANSMET participants will arrive at Beardmore South Camp and make an all-day snowmobile trip to the Goodwin Nunataks icefield and MacAlpine Hills. More than 500 meteorites were removed from those sites in recent years, but only about half of the blue ice in the area was searched.

Six of the eight gatherers are participating in their first ANSMET hunt, Chabot said. She said the project typically brings in mostly new people who are involved in meteorite research so they can get hands-on experience.

"What we do is not so hard in one sense," she said, adding "I think the new people don't realize how much they bring to the team."

It typically takes about two to three days to learn how to identify meteorites among the rocks found on the surface, Chabot said. A telltale sign is a burned outer crust, caused when the specimen plunges through the atmosphere.

Participants photograph the meteorite, take a global position satellite recording of its coordinates, make any relevant notes and collect it using tongs. Chabot said teams can travel 10 to 20 kilometers a day, with the wide variety in the number and size of meteorites collected significantly affecting progress.

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Mars

From page 11

PhD, but didn't make it on his first try. An eye injury later on kept him from trying again. Instead of going to space, he's continued researching in Antarctica.

"Here you're able to go out and visit a place so different from the place you know, it's almost like another planet," Scambos said.

The closest he's been to Mars was a science fiction movie script he wrote in 1997 and a visit to the Dry Valleys.

"A day in the Dry Valleys - that was one of the most thrilling experiences of my life," Scambos said. "especially seeing the lichen there in the lee of the glaciers. These plants wait all year for those few weeks when snow blows off the hills and melts on them – that's the rainy season. That whole pattern of hunkering down, and then taking another growth step in a short burst of good conditions, that's a lot like how you'd envision Martian life to work."

This season Scambos worked on the East Antarctic Ice Sheet, in an area covered with megadunes that could be like the Mars icecap, he said.

"They're pretty, but I think the processes there, with wind and cold and vapor deposition being the main players, are similar to what's going on in the Martian caps," Scambos said.

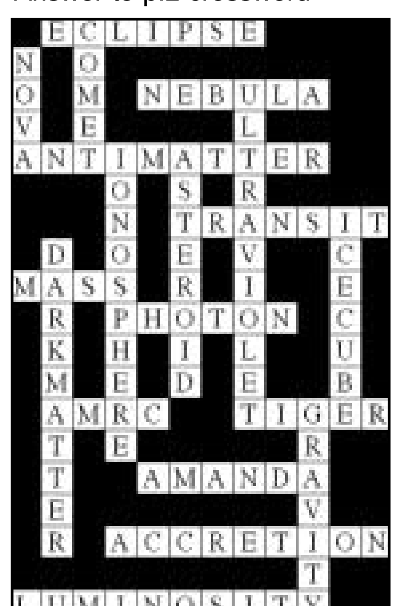
Though Scambos stays on the ground, his research sometimes takes off. He's used satellite images and aerial photos to compare the ice sheet in West Antarctica with Mars and Europa.

"Ted will always be on Mars," joked his co-researcher, Mark Fahnestock.

While Antarctica draws people who have an interest in space, the envy goes both ways. Even for people who have been to space, Antarctica holds allure of its own.

"I've had astronauts that have said, 'Wow, I'd love to go to Antarctica. That is so cool,'" Eppler said.

Answer to p.2 crossword



Meteorites

From page 12

Lab researchers usually request meteorite samples from scientific catalogs that detail their properties, so the hands-on work is an invaluable opportunity, Messenger said.

"Most people in our field basically just get samples handed to them," he said. "This allows me to get a whole other level of the process with handling the materials."

Many hunters also take time for small individual projects.

"I've brought a metal detector with me to try some of the exposed areas," said Dante Lauretta, an assistant professor in the planetary sciences department at the University of Arizona in Tuscon. He said he's done similar work in Arizona and "the problem with the metal detector is you don't find the most interesting types."

Nearly all meteorites come from the asteroid belt between Mars and Jupiter. Most of those are classified as chondrites. Perhaps 5 to 10 percent show evidence of vulcanism – a possible sign of planetary origins – and are classified as achondrites. Allen said maybe one rock in 1,000 or 2,000 definitely comes from another planet, apparently caused by the rare event of a meteorite impact knocking a piece of the planet's surface loose.

"There may be pieces of Venus or Mercury out there," he said.

One of the meteorites from Mars was found within 10 kilometers of the site, Chabot said.

The meteorites are initially classified at the Smithsonian Institution's National Museum of Natural History, where a basic chemical analysis is also performed, said Linda Welzenbach, the museum's meteorite collection manager. Specialists at the Smithsonian and Johnson Space Center provide final classification of the meteorites before sending them to researchers for detailed studies.

One notable member of the ANSMET team is missing this year, with lead investigator Ralph Harvey skipping the hunt for the first time in 11 seasons due to the birth of his second son. Harvey, a geologist at Case Western Reserve University, will get future opportunities to return to the Ice since the project is funded through 2006.

This season's team is scheduled to complete its work by mid-January. Weather and other factors permitting, it will allow them to mark off one more small area on a map loaded with potential locations for learning more about Earth's geological visitors from space.

"One of the basic principles of the ANSMET program for 25 years is we pick up everything," Allen said.

Photo and writing contest winners

Below are the winners of most categories of the Antarctic Photo and Writing Contest. The writing and photos will be published in a subsequent issue. We are still waiting for the results from the judge of the nonfiction writing category. Congratulations to all the winners and all who entered. The entries were impressive and difficult to choose among.

Photo

Other category:
1st - Self-portrait from a kite, by Eric Muhs
2nd - Flags on the Castle Rock Trail, by Robbie Liben
3rd - Bar Ice, by Cara Sucher

Wildlife:
1st - Hot Day on Torgy, by Cara Sucher
2nd - Reverie, by Joe Pettit
3rd - Penguins porpoising, by Laura Hamilton

People:
1st Halloween Sunlight, by Zac Willette
2nd - Launching XBT's from the *LM Gould*, by Graham Tilbury
3rd - Trash Truck 2002 or 1962?, by Mark Furnish
Hon. mention **-** untitled, by Geoffrey Gilbert
Hon. mention **-** Retiring Old Glory, by Douglas Ruuska

Scenic:
1st - Tom and Skua silhouette with Mt. Williams, by Laura Hamilton
2nd - Swirling Snow, by Zenobia Evans
3rd - Moon over Royal Society Range, by William Servais

Writing

Fiction
1st - "Revolt," by Rebecca Glover
2nd - "Etruscan Urn," by Karen Joyce
3rd - "Ice Cloud," by Joe Mastroianni

Poetry
1st -"The white of morning," by Stefan Pashov
2nd - "I refuse to go jogging with penguins," by Karen Joyce
3rd - "Ob Hill," by Ron Smith

Haiku
1st - "Bunny Boot Haiku," by Zac Willette
2nd - "Spring sun," by James Battaglia
3rd - "Wind strums McMurdo," by Karen Joyce

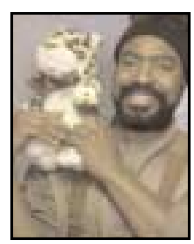
Nonfiction
The results are not back yet.

Continental Drift

What would be a good Antarctic anthem?

"'Where is my mind' by the Pixies, because we've all lost it a bit if we're down here...but isn't it fun? Happy 2003!."
Erin Diamond,
Palmer carpenter's helper from Oakland, Calif.

"'Comfortably Numb' by Pink Floyd."
Phil Broughton,
South Pole cryotech from Felton, Calif.



"That Stevie Wonder song that starts 'There's no New Year's Day to celebrate...no April rains'."
Zellard Lemon with jaguar mascot from Woodlawn Elementary school
McMurdo boiler tech from Corpus Christi, Texas

Profile

True Lobe: Seven years as Pole operator

By Melanie Conner/*Sun Staff*

Liza Lobe talks about her days of landing float planes on Alaskan lakes as she listens to radio transmissions inside a communications building at the South Pole.

Lobe's adventuresome spirit and love of flying became her path to Antarctica, where she is a communications technician at the Amundsen-Scott South Pole Station.

"I've been flying for about as long as I've been driving," said Lobe, who started flying lessons in Ely, Minn. when she was 16.

To help pay for her lessons, Lobe worked odd jobs at the flight school, anything from typing and washing windows to refueling airplanes. But upon completing the course, Lobe got more than work experience and a recreational pilot's license. There, she also met her husband, Ken Lobe, a flight instructor whom she married after finishing junior college.

Together, they expanded their flying careers. Ken continued to teach and Lobe continued her lessons to include a commercial, instrument and float plane license. But being married to the instructor added its own challenges to learning.

"My husband was my instructor for my float license," said Lobe. "Don't ever have your spouse try to teach you something like that. I used to get so ticked off at him when he would tell me I wasn't doing something right. I would take it personal and he would say he was teaching like he would any other student. It definitely was challenging."

Despite frustrations, she learned to land airplanes on the lakes of Canada and began working as a fishing guide and pilot, taking fishermen in and out of lakes.

Years later, after having two children and moving to Wisconsin, she and her husband accepted an invitation from a former flight instructor to help guide a fishing trip with his start-up tourist company in Alaska.

Over the winter, the company booked enough trips to support the couple's employment and in March 1986, Ken and Liza loaded up their son, daughter, dog and cat into their truck and Chevy Cavalier and headed to Alaska.

"We looked like gypsies," she said. "We arrived in Cordova at midnight in the pouring rain with no place to stay and only $247 to our name."

For one month, before being able to find an affordable three-bedroom apartment, all four lived in a motel with a roll-a-way and two twin beds.

"We lived very basic that summer," she said.

They worked as guides and pilots for the tourist company, flying tourists in and out of lakes, touring the state, cooking each night and tending to their guests' needs, knowing that money was coming in.

For 10 years, Lobe flew tourists around south central Alaska and provided a local courier service to Native villages, by delivering mail, chickens, dogs, and children among other things. Then she grew restless and traded flying in Alaska for communicating with planes in Antarctica. As a communications technician, Lobe talks to the pilots, who are flying to and from the South Pole, about local weather, clearances, store hours and sometimes even the dinner menu for evening arrivers.

"The whole station celebrated with us," she said. To Lobe, celebrating 25 years of marriage was a notable notch in the passing of time. "I didn't have problems turning 30, 40 or 50, but celebrating 25 years of marriage… that was devastating."

While spending a week at McMurdo Station for rest and relaxation, before returning to the South Pole, they were allowed to go aboard the U.S. Coast Guard icebreaker.

"We joke to this day, because he bought me a cup of coffee and reminded me that we had always promised us a cruise on our 25th," she said. "Well I got it, the big spender. But I still haven't gotten my warm cruise."

In December 1999, Lobe said what she thought would be a final goodbye to Antarctica. But the following October when other people were preparing to return to Antarctica, Lobe felt the South Pole pulling on her heartstrings.

Photo by Melanie Conner/The Antarctic Sun

Liza Lobe takes a note in the communications room at the South Pole, where she talks to pilots and other people around the continent.

"I figured if I couldn't fly the planes, I wanted to at least talk to them," she said.

Lobe not only talks to planes, but the entire continent. When communications people at McMurdo can't reach a field camp, they can give a message to Lobe at the South Pole, who then relays the message to the camp.

"It's listening. (The South Pole) is so high in elevation, that it is a nice vantage point for communications."

Listening was exactly what her husband did when she told him about the South Pole. The following season, she and Ken went to Antarctica together, where they spent 16 months in three consecutive seasons on the Ice and celebrated their 25th wedding anniversary.

"She has many friends here at the Pole, along with field camps across the continent" said Tracy Sheeley, communications technician and co-worker.

Lobe returned to her friends under the Dome at the South Pole one year later, while her Ken, who had started a full-time job, remained in Cordova.

Hoping to someday stay for another winter, Lobe has returned every summer and has now logged 36 months on the Ice, including two austral winters since 1995.

"I love it here," she said. "I was lucky I got the job I wanted, but I would have taken a job doing dishes to come down."