www.polar.org/antsun
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The Antarctic Sun

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Flying TIGER: Scientific balloon ride

Photo by Melanie Conner/The Antarctic Sun

After hours of delay, the winds shifted enough to launch the Long Duration Balloon at 12:30 a.m. on Dec. 21.

By Mark Sabbatini
Sun staff

In the cosmic scheme of things, this balloon might actually make a difference.

Astrophysicists are hoping a 5,000-pound high-altitude balloon carrying a data recorder half the size of a ping-pong table will be the first to orbit Antarctica twice, collecting new information about matter outside the solar system during its voyage. The recorder is sampling galactic cosmic rays, which may provide clues to the galaxy's history and composition.

The rays travel at nearly the speed of light and are the only matter - other than interstellar meteorite dust - from outside the solar system that can be directly sampled. Among the goals of researchers is collecting samples

See Balloon page 13

Visit to Italy's 'new land,' McMurdo's good neighbor

By Kristan Sabbatini
Sun staff

Though wind and snow battered McMurdo Station Dec. 13, a couple hundred miles north in Terra Nova Bay it was sunny Italy.

Sun glistened off the edges of the Campbell Ice Tongue and the smooth sides of Mt. Melbourne as a Twin Otter circled the bay. Diverted from McMurdo because of a storm, the four North Americans on board found a safe port with their Italian neighbors.

"Terra Nova Bay is a little bay, but very beautiful," said Nicola Lanotte as he welcomed the unexpected guests. "I think you like."

The bay is indeed beautiful. The blue and orange station sits on the beginning of a small peninsula surrounded by granite hills. Time and nature rounded and carved the granite into smooth shapes and sculptures, sometimes worn into curved folds like the skin on an elephant's neck.

Here Italian scientists pursue research similar to McMurdo's - launching long-distance balloons, measuring permafrost, collecting and dissecting cold-adapted fish … but beyond the realm of international science the station has its own flavor of garlic, pesto and wine.

"Everything here is a reflection of our culture," said Rita Bartolomei, administrative secretary and one of four women at the station. "The food, the base, the facilities inside. It's all our culture."

Posters of Roma, Bologna, Napoli and other Italian tourist attractions decorate the hallways. Down comforters cover the beds and the recreational lounge has a fireplace where they burn pieces from old pallets and boxes.

At breakfast they drink café latte from bowls and eat lightly sauced pizza or fresh-baked sweet rolls. Most of the week it's the only meal of the day without pasta, the exception being the Saturday pizza party.

Before meals the men crowd the hall outside the dining area, greeting and teasing

See Italy on page 9

INSIDE

Quote of the Week

"Good God, this is a waffle place."

- sign on the Belgian waffle station at Christmas brunch, McMurdo Station

Ross Island Chronicles By Chico

Cold, hard facts

Ouch

Total number of injuries reported at McMurdo Station between Oct. 1 and Dec. 20: 44.

Most common injury: sprains/strains (24).

Body part most subject to sprains/strains: back (15).

Least common injury: frostbite and burns (1 each).

Number of departments reporting injuries: 6

Department with most injuries: Operations (17).

Departments with fewest: Information Technology and Human Resources (1 each).

Source: Raytheon Polar Services Co.

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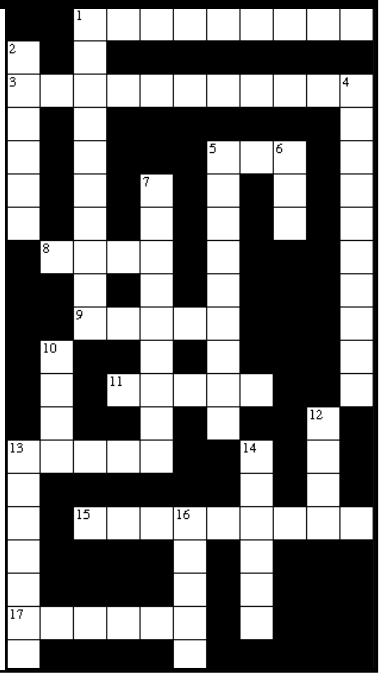
Web address: www.polar.org/antsun

Cold weather clothing

Answer on page 6

Across
1) Warm paws
3) Underwear for the extremities
5) Kept explorers warm without protest
8) Better pulled over the head than the eyes
9) Change them often or end up wet
11) A hat just like Elmer Fudd's
13) Zipped up in these, we all look alike
15) Even short Janes wear these on cold days
17) Hide inside this like an amphibian in a shell

Down
1) Hard to go hippity hop in these heavy soles
2) The new fur coat
4) Common in Hollywood and the Antarctic
5) Favorite footwear of early polar explorers
6) Most popular parka color
7) Sounds like a Greek dessert; looks like a robbers' garb
10) Where to find 'new' clothes on the Ice
12) Original owners took it up; now it's just ____
13) Red parkas have a dozen
14) Breaks wind without a stink
16) Coat that Polies wear to show their colors



A quest to capture the earth of the cool

Songs in the key of see

By Mark Sabbatini
Sun staff

Henry Kaiser found musical inspiration by rubbing a guitar against the South Pole for two hours in minus 40-degree temperatures.

He got a little cold and his digital tape recorder broke soon afterward, but he emerged from "an empty-minded trance" to find himself playing a Native American-type rhythmic cadence in perfect timing with a flapping American flag nearby. He continued playing, using the pole as a guitar slide and letting his thoughts wander, until the slow-paced Race to the Pole by the early explorers came to mind.

"Suddenly I had a set of musical ideas for a piece about that historic race and I was instantly able to play it," the Grammy-nominated guitarist wrote in his online journal, later adding "This is the kind of inspiration that I had hoped for on the ice, and here it was, like some kind of miracle out of the air, when I least expected it."

Kaiser, who has appeared on more than 180 albums in various musical genres, is collecting sounds in plenty of new ways as he puts together what he believes is the first album composed and recorded entirely in Antarctica. A member of the National Science Foundation's Artists and Writers Program, his musical quest includes playing in the ice caves of Mount Erebus at 10,000 feet and collecting sounds while scuba diving near McMurdo Station.

The Oakland, Calif., resident has recorded exotic field projects in several other countries, including seven albums in Madagascar during the early 1990s, but said this is his most adventurous trip to date. In an audio supplement to his NSF application - a custom CD designed to show off the range of his ability - Kaiser said he needed to be on the Ice to capture it in sound.

"I need to absorb the landscapes, weather, light and soundscapes with my own senses," he said while playing gentle acoustic guitar music in the background of the opening track. "I need to absorb the texture of life at the American bases. I want to talk with scientists about their Antarctic work. I'd like to visit historical sites and attempt to record in some of those locations."

Kaiser's playing styles range from delicate acoustic to highly discordant avant garde improvisations wrung out of a distorted electric guitar. He said he intends to record an Antarctica album that appeals to a general audience - meaning less avant garde stuff - but isn't limiting himself.

"I did not have a specific idea of what would musically inspire me," he said in an interview from a small office he shares with four other people at McMurdo.

He thought much of his work would be performed on acoustic guitar, for example, but switched to an electric to perform the free-form ballad "Platelet Ice," inspired by his diving experiences.

"It's about the beautiful big crystals of ice I see when I'm on the bottom," Kaiser said, adding "The acoustic guitar seemed kind of wimpy and dry for that sort of thing."

An acoustic guitar riff recorded on Erebus is "based on the rhythm of the water droplets in the ice cave." He is also trying to work ambient sounds of the continent, such as seals spotted during diving expeditions and wind sounds from around the continent, into his recordings.

Photo by Julie Palais/Special to The Antarctic Sun

Photo courtesy of Henry Kaiser/Special to The Antarctic Sun

Guitarist Henry Kaiser uses the geographic South Pole as a guitar slide, above, and plays in an ice cave at 10,000 feet on Mount Erebus, right, as part of his effort to make the first album composed and recorded entirely in Antarctica. He is using special equipment designed for the cold conditions.

Although Kaiser plans to do all of his recording on the Ice, much of the production work on the album will occur when he returns home in January. He hopes to complete the album by June so it can be released by Shanachie Entertainment in the fall.

Kaiser is using special equipment designed to withstand extreme cold, including ribbon microphones able to work in minus 60-degree temperatures and an acoustic guitar of graphite and laminated wood.

His musical adventure at the geographic South Pole was videotaped by "Cookie" Jon Emanuel, a sous chef and bass player for the Pole party band Thunderjug.

"Aside from the frozen fingers, it was a very entertaining and unusual experience for me - particularly when he slid his custom 'Ice' guitar across the sastrugi to show it's anti-freezing proper-

See Kaiser on page 4

Kaiser From page 3

Photo courtesy of Henry Kaiser/Special to The Antarctic Sun

Henry Kaiser dives under the ice in McMurdo Sound. The guitar player has been a diving instructor at the University of California at Berkeley for 15 years.

ties," Emanual wrote in an e-mail. "The sound of the guitar rasping against the pole should prove a 'chilling' one for Henry's sample collection."

Emanual also joined other South Pole musicians in a jam session with Kaiser, calling it one of the greatest nights in his three seasons of working at the station.

"You couldn't smack the smiles from our faces as we ripped through the set," Emanual wrote. "Henry has a great way of bringing not only the musicians together, but also of rallying the audience to his music and artistic ability. We are still talking about it here."

Among Kaiser's other performances in Antarctica is an appearance at today's Icestock music festival at McMurdo, where he plans to play "happy, fun music people like … but twisted" with four base employees. The name of the band: Coldfinger.

Kaiser's work in Antarctica goes beyond music, including commentaries for National Public Radio, shooting video for a National Geographic special, and providing journals and photos on Web sites hosted by the Kaiser Family Foundation and other organizations. When he gets off the Ice he also plans to give interviews to magazines such as Rolling Stone and Guitar Player, conduct lectures on Antarctica and go on a concert tour.

"I get to share my experience and information here with hundreds of thousands of people," he said.

A couple of guitars, a portable hard disc recorder, a few pieces of audio processing equipment, a digital camcorder, and various cables and microphones are among the gear crammed into the corner of his shared office. Much of his time so far, however, has been spent in the field looking for inspiration.

If his online journal entries are any indicator, that hasn't been hard to find.

"I LOVE THIS PLACE and I AM READY TO LOVE IT UNDERWATER THE MOST OF ALL," he wrote Nov. 29. That was followed by a Dec. 6 entry from the South Pole stating "This is the most inspiring place that I have ever visited" and a Dec. 21 entry declaring "Erebus is the most magnificent and impressive outdoor spot that I have experienced."

Kaiser's visit has also brought out some artistic impulses in others. Katy Jensen, area manager of the South Pole station, said she can best describe the guitarist in haiku:"pure, ingenious; thrilled to share and play and learn; immediate friend."

Born in Oakland, Calif., Kaiser started playing the guitar at the age of 20 and has worked with scores of artists ranging from Herbie Hancock to Jerry Garcia to Michael Stipe during a career that has spanned nearly 30 years. Among the musical "sources" he said he draws upon are blues, East Asian, Classical North Indian, Hawaiian, free jazz and 20th century classical.

He also has extensive diving experience, working as a scientific diving instructor at the University of California at Berkeley for 15 years. He said his diving background, along with film work he has done, helped when making the extensive preparations needed to come to the Ice.

"I'm used to getting things done safely and effectively in harsh conditions," he said.

*****

Samples of Henry Kaiser's music and videos of him performing on the Ice can be found this week at The Antarctic Sun's Web site at www.polar.org/antsun.

A 'miracle out of the air'

The following is an excerpt from the South Pole of Henry Kaiser's online journal, which can be found at www.kff.org/docs/about/henrykaiser.html:

"Setting a DAT recorder at the geographic pole, I take out my acoustic guitar (in this case an all-graphite Rain Song guitar that I have used for years as a boat guitar on dive trips; it will remain here as a gift to Pole Station) and I ready myself to attempt to play slide guitar, using the South Pole as my guitar slide. The night before, I sat out by the pole and searched for a slack key tuning that would be right for this job. Finding one that I liked, I checked it with many station residents, all of whom approved. Messing around with the pole for an hour, I found that I could produce lots of sound effects and textures, but melody, groove, and harmony seemed quite elusive. I spent another 30 minutes trying to play melodies and licks, kneeling next to the pole, as my hands and knees became colder and colder. Gloves were on and off; finger picking became more and more problematic in the 40°F below zero air. After 90 minutes, I was a little tired, so I stood up, put my gloves on again, inserted some chemical hand warmers and held the guitar's strings up against the pole. I stared off to the distant horizon, across the miles of whiteness, and I idly strummed the guitar with a gloved right hand as I slid the guitar's neck along the pole. After drifting into an empty-minded trance for a while, I returned to the mundane world to find myself strumming a peculiar rhythm pattern with my gloved right hand. What did it sound like? It seemed American Indian in cadence, not something that I had played before. It was quite enjoyable. Suddenly, I realized that the American flag next to me was flapping with exactly the same rhythm! The music had literally come to me OUT OF THE AIR. Next I tried fretting and sliding against the pole to find melody and chords. A riff jumped out at me. It was fun to play. Again, I drifted off into no-mind state for a while, as I continued to play. My thoughts returned to the pole and the Race to the Pole that the heroes of the early age of Antarctic exploration had participated in. Hmmmm? This rhythm fit my idea of a slow race, as was the race to the pole. Suddenly I had a set of musical ideas for a piece about that historic race and I was instantly able to play it! I checked the frozen DAT machine, and it was still operational. I ran off five takes of the tune without many mistakes. This is the kind of inspiration that I had hoped for on the ice, and here it was, like some kind of miracle out of the air, when I least expected it."

around the continent

PALMER

Close-knit community

By Tom Cohenour
Palmer correspondent

As the numbers increased, even the most skeptical had to admit it was spreading. Soon, 47 percent of Palmer Station residents were affected.

"It's an epidemic," declared Station Physician Kristin Van Konynenburg as she prepared a long, straight needle.

Symptoms range from bleary eyes to numb fingers and it appears to be contagious. Those affected by the epidemic talk in technical terms such as 4 mm double point, US 7 circular, or skein. But those who are baffled simply dismiss it as "knitting fever."

The fever is persistent. After Brett Pickering with the Seabird Component of the Long Term Ecological Research (LTER) (BP-013-P) and Kirk Ireson with the Bio-optical Component of the LTER (BP-032-P) returned to Punta Arenas, Chile, from Palmer Station they went shopping for knitting supplies. The two graciously sent a large box filled with skeins of colorful Chilean Alpaca yarn, double point, single point and circular needles back to Palmer..

Seemingly overnight the epidemic spread. Twice as many people were knitting in the evenings as were watching movies. Neither gender, job description, nor science group affiliation meant you were safe. Even the National Science Foundation (NSF) was not immune. Deneb Karentz, associate program manager with the Office of Polar Programs, created a beautiful multi-colored afghan. Most knitters tackled something smaller.

Knit caps of various textures and colors are now a common sight around Palmer. They're easy and fast to knit; perfect for a beginning knitter or someone who wants to make a practical handmade gift.

"Wendy knit a cap in just four hours," said Carmen Lemon, assistant logistics supervisor, referring to fellow knitter Wendy Beeler, food service supervisor. Among other presents, knit caps were highly prized items during the annual Christmas gift exchange on Christmas day.

Photo by Tom Cohenour/Special to the Antarctic Sun

Palmer knitters show off their projects.

Just prior to the holidays, both research vessels, the *Nathaniel B. Palmer* (NBP) and the *Laurence M. Gould*, called at Palmer Station. The 19th brought the NBP for a short visit. Several station residents enjoyed an informative tour; many boarding the NBP for the first time.

On the 23rd, the *Gould* stayed for most of the day before departing with nine Palmer Station passengers. Heading northbound were five from BO-022-P, 2 from BP-028-O, one NSF representative and one Raytheon Polar Services employee. Station population is currently 32 (15 knitters and 17 non-knitters).

SOUTH POLE

Sundogs for Christmas

By Judy Spanberger
South Pole correspondent

We started off this holiday week with one of the most amazing sundog shows many of us have ever seen at Pole. Sundogs are created by the defraction of light through rotating crystal clouds. Crystals being aligned in the same ways create giant prisms for the sun to refract through. The picture, of course, doesn't do the sight justice, nor does it show how from minute to minute they would change by reducing and growing again. It was as awe-inspiring as watching the auroras for the first time, and a nice way to start the holiday season.

Christmas at Pole was a three-day affair. Sunday night, after work, we had our gift exchange. To participate you bring a gift tightly wrapped so there's no clue as to what it is. The galley is arranged with the tables gone, the chairs in an auditorium fashion and pillows if you would rather sit on the floor. Your gift is placed under the tree, which is up front, and you're given a lottery ticket. When your number is chosen you can either choose from the un-opened gifts under the tree (you can't decide by feel; once you touch something it's yours), or steal a gift from someone else. And that's where the fun comes in. A gift can only be stolen three times and then it stays with that person, but up to that point anything can happen with your gift. You learn not to get too attached to the "things" because they most probably will get passed on, but start to just have fun with it all. In the end everyone has a gift, and we've had an evening of goofiness.

Monday, Christmas Eve, we had our feast. Despite the fact that our shipment of freshies didn't make it in time the galley once again put on an astounding meal. We had Beef Wellington, lobster tails, beans

See Pole on page 6

Photo by Mike Whitehead/Special to the Antarctic Sun

South Pole sundogs before Christmas.

the week in weather

McMurdo Station
High: 48F/8.6C Low:25F/-3.7C
Wind: 25 mph/41 kph
Windchill: -2F/-19C

Palmer Station
High: 41F/5C Low: 28F/-2C
Wind: 24 mph/39 kph
Snowfall: 2 in/6 cm

South Pole Station
High: -13F/-24.5C Low:-13F/-25.4C
Wind: 22 mph/35 kph
Windchill: NA

Pole

From page 5

almondine, homemade sourdough rolls and more. And the desserts…Yule log, homemade cheesecakes and baked Alaska! Much like Thanksgiving, fellow polies volunteered to pour wine and bus plates so those of us sitting could relax and enjoy the conversation and candle-lit atmosphere. It was a wonderful treat and helped take the edge off the homesickness some of us feel around the holidays.

Christmas day at 10 a.m. we held our annual Race Around The World. A track about ½ mile in length is groomed around the Pole. The course is three laps. Some folks ran, some walked, some rode snowmobiles, others were on couches being hauled by Cats. There was super-girl and a polar bear. It seemed just about everyone was there making their way around one way or another. Lisa Aiken and Josh Miller were female and male winners, and will be going to McMurdo to compete in the Scott's Hut Race. Go team pole!!

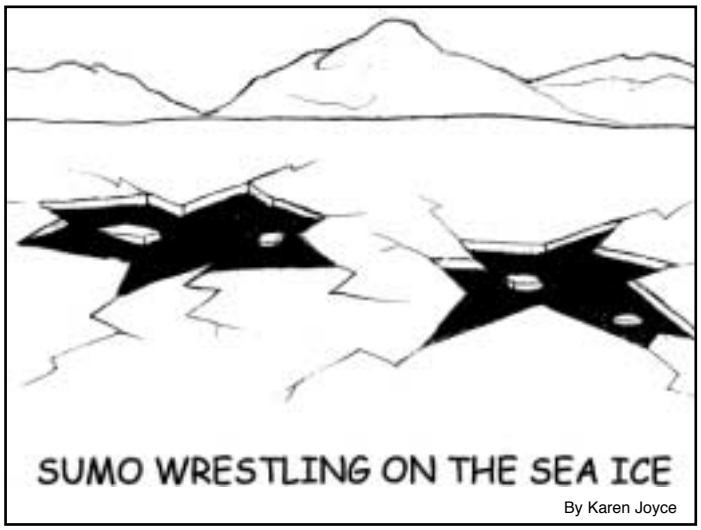
Mary Miller and Noel Wanner from the San Francisco Exploratorium at the Palace of Fine Arts spent the holidays with us. Mary and Noel travel the world and conduct live interactive broadcasts with researchers who're "on location." Mary and Noel conducted an interactive interview with our scientists here at pole. If you'd like to know more about the Exploratorium check out their Website at www.exploratorium.edu

In other science news, Umran Inan from Stanford University just completed a site visit to South Pole to plan for the installation next year of a 7 km long horizontal dipole antenna that will serve as a very low frequency (VLF) beacon transmitter. The signal transmitted by this antenna (approx. 20kHz) will be received at various Antarctic locations such as Palmer Station. This subionospheric signal will permit the continuous measurement of both steady and burst precipitation of relativistic electrons from the Earth's magnetosphere which fluctuate in association with solar activity. These highly energetic electrons can penetrate to altitudes as low as 30 to 40 kilometers, producing ionization and x-rays and possibly affecting chemical reactions involving ozone production.

Happy New Year to everyone from the South Pole.

Photo by Dan Weisblatt/Special to the Antarctic Sun

Polies prepare for a Christmas feast.



Answer to crossword on Page 2

Last Chance

To enter the ***Photo, Poetry & Prose Festival***

Deadline Dec. 31

Send submissions to sabbatkr@mcmurdo.gov or drop off at the Antarctic Sun *office in building 155*

Continental Drift

What is your New Year's Resolution?

"To shovel all the cargo berms."
Ben Barrows
General assistant at the South Pole, from Stonington, Maine

"To quit talking smack. Not."
Rich Lichtenhan
Cargo handler at Palmer Station, from Moose, Wyo.

"To finish up on my project to record most of my family history that's been lost."
Jim Holland
109th Air Guard at McMurdo Station, from Cohoes, N.Y.

3 teams to the rescue

Photo by Melanie Conner/The Antarctic Sun

McMurdo Station's secondary search and rescue team attends a bi-weekly training session. The team learned how to tie knots before going outside to practice self-arrest and crevasse rescue techniques.

By Melanie Conner
Sun staff

Emergency teams around the continent all have at least one thing in common - they learn skills in hopes of never using them.

Just as Antarctic terrain varies from open ocean, sea ice and crevassed glaciers to high elevations and extremely cold temperatures of the Polar Plateau in the continent's interiors, search and rescue teams are equally diverse.

Located on Anvers Island near the Antarctic Peninsula, Palmer Station is the only one of three United States research stations in Antarctica that uses boats for daily transportation to conduct studies in open water or on nearby islands.

"The Palmer science groups work on the water and travel to the surrounding islands regularly," wrote Bob Farrell, area manager for Palmer Station, in an e-mail. "The weather in this area is highly changeable, so the risks to personnel are always there."

According to Jeff Bechtel, leader of the Ocean Search and Rescue Team at Palmer Station, the members train bi-weekly and learn techniques to rescue a person overboard, rescue a stranded boat or boaters, care for an injured person on an island or track down a field team that is overdue on its estimated arrival time. Like the goals of other stations, Palmer's search and rescue teams' primary goals are to teach resident-workers about local hazards and prepare them for an emergency.

"Each boat is equipped with survival bags," wrote Farrell. "And many of the local islands have caches with supplies to allow a stranded party to get by for several days."

The Glacier Search and Rescue (GSAR) team at Palmer Station often trains with Ocean Search and Rescue crew members, but usually practices basic mountaineering techniques and rescue skills on a nearby glacier. The glacier team places flags and monitors safety routes and conditions on the glacier and sea ice for skiing and walking.

"Crevasse rescue is a scenario we practice for, and a very real threat to anyone who ventures off the flagged route," wrote Doug Fink, who commands the team, in an e-mail.

Similar to Palmer, McMurdo Station Search and Rescue teams also prepare for crevasse rescue and practice searching for persons who become missing during whiteout conditions. With more than 1,000 people at McMurdo during the summer, it is the biggest U.S. station and is a base for dozens of remote field camps. McMurdo is located near New Zealand's Scott Base and travel in-between the stations is frequent. Together the two countries formed the Joint Antarctic Search and Rescue Team, consisting of primary and secondary response teams and are responsible for continent-wide safety. The primary team has 12 seasoned mountaineers from Scott Base and McMurdo, who must be prepared to receive an emergency page at any time.

"You have to hang it (pager) on your towel in the shower," said Brennen Brunner, McMurdo Search and Rescue team leader on emergency preparedness.

When their pagers go off, the primary team responds immediately along with members of the fire department and the medical facility, depending on the severity of the incident. Meanwhile, the secondary search and rescue team waits as a backup and helps prepare gear for the primary team.

The secondary team members are chosen after an application process and a full day of rigorous tryouts in the early summer season.

"We are looking for people who are resourceful and have flexible thinking," said Brunner. "Basically, I'm looking for someone I'd want on my

See Rescue on page 8

Photo by Melanie Conner/The Antarctic Sun

A member of the McMurdo secondary search and rescue team learns to tie a fisherman's knot during a training.

Rescue

From page 7

lunar mission."

Winter-over status is a plus for any member of the secondary team, as it becomes the only search and rescue team during the less-populated winter months.

"When summer ends, so does field activity," said Brunner. "Then the team responds to local incidents only."

However, on the Polar Plateau, deep in the continent's interior at Amundsen-Scott South Pole Station, there are no remote field camps, glaciers, sea ice or open water to threaten scientists and recreators. The dangers at the South Pole are climatic and insidious. High altitude, cold conditions and strong winds can creep up on an unsuspecting outdoor laborer and cause serious injuries or illnesses. Thus, a South Pole trauma team replaces a search and rescue team.

Their goals are to draft and maintain a mass casualty plan and stay prepared for major emergencies, such as an injured construction worker or an airplane crash, an event that would test the preparedness of any station.

"I have been training emergency response teams for 20 years," said Tim Pollard, South Pole physician, in November, about one month after the arrival of the summer population. "Already after three weeks, we are at a point where we could respond to this (mass casualty)."

The emergency plan is a tag team operation that reacts quickly and effectively in practice drills. After the initial call, the first responders arrive on the scene. Others stay on alert in the medical facility under the South Pole Dome and prepare to receive victims, and some set up a communications system to coordinate team efforts quickly. Every team member must be able to perform a variety of skills throughout the process.

"Everyone, know where to find the emergency medical supplies," called out Pollard to the team during a training session as they rummaged through emergency gear bags, cupboards, shelves and drawers like hungry bears in a dumpster.

The team learns how to stabilize a victim until a rescue vehicle is able to transport the person to the medical facility while preventing themselves from succumbing to extreme cold.

"The problem with the Pole is that sub-zero degrees is not conducive to being stripped and undergoing emergency care," said Pollard, "Hand warmers will not bring body temperatures up, but they can help keep rescue workers' hands warm, which will enable them to keep dexterity."

Staying safe while rescuing and helping others is the goal of all search and rescue teams on the Ice, but the trainees have personal goals to fulfill as well. "I wanted to expand my knowledge of mountaineering and learn about glacier travel," said Chris Wilt of the McMurdo secondary team.

Wilt and others hope they will never use the skills for their intended purposes on the Ice. The teams have rarely been deployed in an actual emergency situation; however, they must remain prepared in case that one day should come, when they are needed most. While rescuers polish and shelve their talents, they hope to hear only one sound from their pagers: silence

"You have to hang (your pager) on your towel in the shower,"

Brennen Brunner, McMurdo Search and Rescue team leader on emergency preparedness

Italy

From page 1

each other in almost operatic tones.

"Here is like a team, like a family when you are here," said Maurizio De Cassan, who is in charge of the environmental controls for the station. "For me I'm happy because I meet some friends from other expeditions."

After meals they return to the hallway and crowd around two foosball tables. Yells of triumph and agony reverberate off the walls over the percussive beat of the foosball sticks. The Italians are very competitive about their foosball, said Mark Cary, one of three Ken Borek pilots from Canada based at Terra Nova.

"I'm sure a lot of important decisions that are made around base are made at that foosball table," Cary said. "When there's an argument they'll say, 'Well let's take it to the foosball table.'"

Cary requested to be stationed at Terra Nova this season, his third at the base. He's taking the opportunity to learn Italian and develop friends he may visit someday in Italy. Along the way he's picking up a few Italian habits as well, such as starting each meal with a plate of pasta and twirling spaghetti rather than cutting it.

"Whenever I want to get a rise out of them or get their attention I'll yell down the table 'Hey, look at this!' and start cutting," Cary said. "It's amazing just to see the look on their faces, like someone died."

Pasta is served twice a day, with lunch and dinner, and though delicious, Cary said he won't miss it.

"When I go back to Canada, the only request is to hold off on the pasta for about a month."

With the pasta comes wine, set out for lunch and dinner on the tables in the dining room. Most nights the wine comes in boxes from New Zealand, but on Sundays and special occasions the cooks bring out bottles of Italian wine. It doesn't take much to make a special occasion, and when the unexpected McMurdo guests arrived the corks were being pulled. The occasion?

"Maybe it's Thursday," said Giorgio Bruzzone, part of a team developing a new underwater robot.

Or maybe it's that the Italians succeeded in getting everything moved from the sea ice in time. In the morning when the Ken Borek pilots went to their Twin Otter parked on the sea ice runway in front of the station, they felt the ice heave and roll beneath their feet. They mentioned it to the Italian scouts, who drilled a few ice holes, then told people to start moving. By 1 p.m. the ice broke up into floes, leaving open water in front of the station. The Twin Otter diverted from McMurdo was the

See Italy on page 10

Top left, a battered Italian flag awaits another storm at Terra Nova Station in December. At left, a Twin Otter circles before making a landing on the new sea ice runway in Tethy Bay, over the hill from Terra Nova.

Photos by Kristan Hutchison
The Antarctic Sun

Photo by Kristan Hutchison/The Antarctic Sun

A work crew takes a morning break from shoveling at Italy's Terra Nova Station. They snack on pizza and cafe latte in Pinguinattollo, the original station building where visitors and staff have decorated the walls with their signatures.

Italy

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first to land on the new runway in Tethy Bay, on the other side of a hill from Terra Nova.

Though the change was sudden, it's the normal time for the sea ice to leave Terra Nova. Open water brings penguins, leopard seals and killer whales. Sometimes the penguins walk up the road to the station and through the open door of a workshop, said Paolo Capizzi, one of two station forecasters. One once tried to steal a radio from a worker, grabbing the antenna in its beak.

The open water also marks one of the transition points in their season. For the first third of the season, from October through November, the Italian program lands C-130s on the sea ice in front of the station, along with Twin Otters. That gives Terra Nova its own link to the outside world.

The last C-130 flight was Dec. 3 and now for a few weeks Terra Nova is isolated. The only mail and packages come through McMurdo, where they wait for the Twin Otter from Terra Nova to pick up about 20-30 kilograms about every 10 days.

"We don't receive fresh food at this period," Bartolomei said.

The Italian research vessel Italica will bring more supplies when it arrives in early January.

The Italian Antarctic research program is small and depends on collaboration with other countries. The annual budget is about 50 billion lira (about $22.7 million U.S. dollars), said Umberto Ponzo, the expedition leader. That's roughly a tenth the size of the U.S. Antarctic Program (USAP) budget.

"NSF program is very, very important for us," Ponzo said. "Only for (because of) the presence of McMurdo Station, Terra Nova bay is a big station in Antarctica."

An agreement with USAP allows the Italians to fly about 20 people from Christchurch to McMurdo around Oct. 15 each year to open Terra Nova, a summer-only station. The opening team turns on the generator and desalination plant, then builds the sea ice runway in front of the station.

In mid-January and early February they will send 45 people home via McMurdo. The rest will leave on the Italian research vessel Italica or through Dumont D'Urville.

Even while the Italian C-130s are flying, they depend on McMurdo as a backup airport. The Terra Nova landing strip is really just a flat area on the ice, without any navigational aids, Ponzo said. Their C-130s can't leave Christchurch unless the weather is good at Terra Nova and McMurdo, and about twice a season the planes must divert to McMurdo when bad weather moves in.

"That kind of interaction fosters a lot of communication, particularly on the government level," said Al Sutherland, National Science Foundation representative.

The two stations have a neighborly arrangement. This year for the first time the Terra Nova and McMurdo weather forecasters are exchanging data each hour. The Italians have 15 automatic weather stations. There have been some discussions of cooperation between McMurdo and Terra Nova medical staffs, but nothing firm, said McMurdo Lead Physician Will Silva. As an added gesture of goodwill this year, the Italian government also sent one of their best chefs to cook several meals at McMurdo during the holidays.

The Italians are also collaborating with the French Antarctic program (IFRTP) on a new station at Dome C, called Concordia. The new station is high on the plateau, five hours by Twin Otter from Terra Nova. It could lead to even more cooperation with the USAP.

"There are a number of science programs we have that are very interested in Dome C," Sutherland said.

The storm that diverted the McMurdo plane soon enveloped Terra Nova as well, repeatedly layering it with snow and then blowing it away for three days.

Normally Terra Nova weather is mild compared to McMurdo. Situated 213 miles (343 km) north on the Ross Sea itself, the small bay is generally warmer than Ross Island and gets less precipitation. For Christmas 1998 the temperature reached 52F (11C) said Capizzi, the forecaster.

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::Science alla Italy::

By Kristan Hutchison
Sun staff

Without leaving Rome, the president of the Italian National Research Council steered a robot under the ice near Terra Nova Bay, Antarctica, on Dec. 18.

The new e-robot, which can be controlled over the Internet and satellites, was developed by the National Research Council's Robotlab and first tried within the Italian Antarctic Program. Italy dedicates a sizeable portion of the country's research budget to the Antarctic Program, said Guguelmin Mauro, a geologist at Terra Nova. But as with Americans, most Italians don't realize there is anything to study here beyond penguins and ice.

"It is known more because there are penguins or sea animals or the big ice cap than the other science topics," Mauro said.

None of the scientists currently at Terra Nova are studying penguins, though the cartoonish birds occasionally waddle through the base. The penguin researchers went home in early December.

The four-month research season at Terra Nova is divided into three segments, with different scientists during each period. For a few weeks now astrophysicists, botanists, marine biologists and robotics technicians have the run of the station 213 miles north of McMurdo. About the time they go home the oceanographers will arrive.

Romeo must dive

Gianmarco Veruggio, head of CNR-Robotlab, started developing the e-robot in 1996 and first tested it at Terra Nova Bay in 1997-98. Compared to existing remote operating vehicles, such as JASON which was used to discover the Titanic, Veruggio tried to keep his e-robot small and lightweight. The rectangular robot, called Romeo, is about a meter high. Neutrally buoyant in the water, Romeo moves with four horizontal thrusters and four vertical thrusters. Romeo can't go deeper than 1,640 feet (500 m), but its capabilities make up for lack of depth, said Giorgio Bruzzone, a member of the e-robot team. Romeo offers each payload power plug-ins and Internet links.

"In this project it's not important how deep we can go. It's important what it can do," Bruzzone said. "This robot is very clever."

In the earlier tests in Antarctica, the e-robot roamed along the bottom of the bay filming 3-foot-wide (1 m) sponges, 25-year-old starfish and multitudes of sea urchins, Bruzzone said. The robot collected a few 4-inch (10-cm) scallops for the researchers to taste from layered beds of the crustacean. Besides testing Romeo, the e-robot team is using it to carry out two experiments for other scientists. The first is a benthic chamber Romeo will place on the seafloor to establish what lives there and how much oxygen it uses.

Photo by Kristan Hutchison/The Antarctic Sun

Scientists have varying theories about what sculpts the rock around Terra Nova Bay.

On a separate trip down, Romeo will carry a lidar, a laser radar usually used in atmospheric research which they are now trying to apply to the submarine environment, said Colao Francesco, part of the technological research team. Though the lidar has been tried underwater in a lab, this will be the first time it is tested in the field, Francesco said. The lidar will look for chlorophyll fluorescents and other fluorescent creatures at 328 to 492 feet (100 to 150 m) deep.

"Generally speaking we may say Antarctica is not a good place for doing experiments, but it also puts you in a situation for being able to stress instruments," Francesco said.

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"The only problem is wind, katabatic winds," Capizzi said.

The wind has been clocked at 96 mph (154 kph). In this storm it reached 60 mph (96 kph) and 24 to 28 inch (60 to 70 cm) of snow fell.

Actually, the wind's not the only problem, Capizzi admits. There's also the issue of women. The base currently houses 77 men and four women, an issue the Italian Antarctic program would like to remedy, said expedition leader Ponzo.

"The men are wild without women," Ponzo said.

The lack of women at Terra Nova is again a reflection of the culture, said Ponzo and Bartolomei. In Italy few women work in the trade jobs needed to support life and research in Antarctica, and by the time woman scientists have reached the point in their careers where they would be ready to research in Antarctica they usually are mothers, Ponzo said.

"The Italian tradition rests with the woman at home with the children," Ponzo said. "It's different for us."

Bartolomei knows well how skewed the gender ratios are at the Italian stations. Last season she spent three months as the only woman at Dome C. It was impossible to speak more than two minutes alone with anyone, because other men would immediately crowd in to share her attentions, Bartolomei said.

"You are like a sister for everybody," said Bartolomei, who missed the female perspective. "Italian men only speak during free time about soccer, cars, women."

Limited Internet and phone service makes Terra Nova feel even more isolated. The base gets two 30-minute windows of Internet via satellite each day, so the men can write and receive short e-mails.

"In this way you feel Antarctica more far," De Cassan said.

The men don't have much time to worry about the lack of women or world news though. Work at Terra Nova goes seven days a week, from 8 a.m. breakfast to 8 p.m. dinner, with a few meal breaks between. Only Sunday afternoon is left free, for doing laundry or going on a "ticketed Sunday" field trip to Cape Washington or one of the nearby penguin rookeries.

"It's not bad," said Campiotti. "It's everything we need."

Adelie penguins jump from one ice floe to another to catch up with some others of their flock in Terra Nova Bay shortly after the sea ice broke up.

Photo by Kristan Hutchison/The Antarctic Sun

Science

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Holey rock, sodden ground

Scientists disagree about what blew the holes through some of the granite around Terra Nova Bay, sanded others round and carved a few into gargoyle-like shapes. Some American researches say the area was eroded by glaciers, ice and blowing snow.

"I don't believe this, at least in some places," said Italian geologist Guguelmin Mauro. "In some places you can find different kinds of weathering, like taffoni and honeycomb weathering."

Some of the weathering, such as narrow channels worn into the surface of Mt. Keinath, may be signs that the terrain predates the ice, Mauro said. He believes the channels were caused by running water and has found matching wear patterns in Seichelles, Venezuela and Malaysia.

"Science also is nice for this reason, that many minds have different ideas," Mauro said.

Mauro studies the weathering causes with a Canadian colleague, but his primary research is permafrost. He compares the permafrost features to ones in the Arctic. The Antarctic heave mounds, wedges and ice veins are smaller, possibly because the Antarctic is a dryer area, Mauro said. The ice wedges in the Canadian arctic average 6.5 to 10 feet (2 to 3 m). In the Antarctic the wedges Mauro has found are all 8 to 12 inches (20 to 30 cm).

"Only in the sub-antarctic islands have we found features you can compare to the high arctic," Mauro said.

Mauro's major work involves measuring the permafrost and the layer of ground subject to freeze thaw cycles above it, called the active layer. He is also working with the British Antarctic Survey in the South Shetland Islands and several New Zealand colleagues are doing similar work at Marble Point, Bull Pass and in the Wright Valley.

"All these are the starting of a major project, which until now we have only in mind," Mauro said. "We want to monitor all the active layer changes around Antarctica."

Already he's discovered dramatic changes in the active layer in the sub-Antarctic islands. Since the 1960s the active layer there has grown 16 to 24 inches (40 to 60 cm), almost doubling. As the active layer deepens, it allows the water to drain lower rather than flooding the ground. That makes it easier for lichens, but not for mosses, which need a higher moisture regime, and may determine changes in the composition of vegetation communities, said Mauro's wife, botanist Nicoletta Cannone.

"It seems that moisture is one of the most important factors," Cannone said.

She was startled by the amount of vegetation she found on the Antarctic Peninsula, where the active layer was sometimes 6.5 feet (2 m) deep.

"You see from the ship green cover and you say 'My God, that couldn't be vegetation, and it is,'" Cannone said.

The distribution of vegetation increased on the Antarctic Peninsula over the last 20 years, particularly of the two native species of vascular plants. The changes may be evidence of global change, Cannone said.

The vegetation is less obvious around Terra Nova, where the active layer is 2 to 12 inches (5 to 30 cm) deep. Some of the mosses grow 1.5 to 2.4 inches (4 to 6 cm) and the lichens grow from 0.4 to 2 inches (1 to 5 cm). Botanists have identified 14 species of moss and more than 50 species of lichen around Terra Nova, Cannone said.

"If you consider all the continental Antarctica the number is more," Cannone said.

A few species of lichen grow in both the Arctic and Antarctic. Others are very localized, growing on only one island or in a specific territory.

Antarctica is the ideal area to study how the active layer and vegetation interact.

"Here you can see the starting point without the influence of human activity," Cannone said. "After, you can make comparisons with other systems you study."

Looking past the stars

Sunlight and clouds obscure the sky above, but Lorenzo Martinis can still see the stars.

"This is the sky you can see if we were in winter," Martinis said, pointing to the pinpricks of colored light on his otherwise dark computer monitor. "It's strange to see stars during the day."

He uses the stars only to calibrate the 8.5- foot (2.6-m) cosmic background infrared radiation telescope in a dome above Terra Nova Bay. What he really wants to see is beyond the stars, outside our galaxy.

"We are looking at the end of the beginning, the big bang, when the matter became transparent," Martinis said.

The telescope uses a photometer, which must be kept at 0.3 Kelvin (-458F, -273C). To keep it that low, Martinis designed a refrigerator without any moving parts, since a slight movement could jar the sensitive instruments.

He pours liquid helium around the photometer, dropping its temperature to 4 degrees absolute, then uses the refrigerator to cool it the final few degrees.

The Center for Astrophysical Research in Antarctica does similar science at the South Pole. The South Pole is a more ideal location, because it is significantly dryer than Terra Nova's coastal atmosphere, Martinis said. He hopes to move his work to the new Concordia Station the Italian and French Antarctic programs are building together at Dome C on the high plateau.

"We are always finding dry places for getting measurements," Martinis said.

Taking the quest a step further, in a few years Italy will send up a satellite with instruments collecting similar data, Martinis said.

"By satellite it's much better, because they are outside the atmosphere," Martinis said, "but the price is very, very high."

So is the time commitment. Data collected by a satellite would take 10 years to get back, Martinis said.

Workers lay the Long Duration Balloon into position with the science load on the front. The vehicle is used to pull the balloon once it is released to prevent it from falling to the ground.

Photo by Melanie Conner/The Antarctic Sun

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of rare matter in the rays for the first time.

"We probably won't get a definitive answer from this experiment … but what we're exploring is these particles that get acceleration, where do they come from before that acceleration," said Jason Link, a senior graduate student from Washington University in St. Louis. Determining if they come from gas or some form of solid matter is a priority.

The Trans-Iron Galactic Element Recorder (TIGER) was launched Dec. 21 at McMurdo Station. It is the only Long-Duration Balloon (LDB) project this year in Antarctica.

The continent is considered ideal for such projects because continual summer daylight prevents balloons from losing altitude due to cooling night air. Also, the upper-altitude winds will carry the balloon in a circle around the continent, about 50 percent larger in area than the U.S., in roughly two to three weeks.

The balloon may need to complete its first circuit in about 15 days if a second orbit of the continent is to be attempted, Link said. Too much of a delay could mean having the balloon aloft in the wrong position when summer personnel are flown out in February.

"Right now I'd say it's somewhere between 15 and 20 days," he said when asked about the expected time of the first orbit. But wind speeds have varied greatly - between 3 and 36 knots, he estimated - with an average of at least 20 knots needed for a 15-day orbit.

Participants will also be noting if the winds are blowing the balloon inland or toward the sea, and will probably capture the balloon after one orbit if it is heading out "because you don't want to risk dropping your experiment in the water," he said.

TIGER measures the amount of 25 elements in the galactic rays, according to a statement released by the university. The elements are classified by a "Z" number from 16 (sulfur) to 40 (zirconium), with larger numbers being heavier and rarer. The amount of three elements - bromine (35), rubidium (37) and yttrium (39) - has not been measured before.

"We really want to measure nuclei all the way up to uranium (Z=92) and beyond," said Robert Binns, a research professor who is the project's principle investigator, in the university's statement. "But the higher the atomic number, the more rare the elements are. To collect much above atomic number 40, we need a bigger instrument and longer time aloft. TIGER is a prototype of an instrument we are proposing for a three-year mission on a spacecraft in Earth orbit."

Participants hoped to launch the balloon earlier in December, but upper atmosphere winds weren't in the proper circular pattern, said Phil Austin, LDB camp manager for Raytheon Polar Services Company.

"A big high-pressure system sets up with anticlockwise circulation around the Pole," he said. "Until that is set up, you have no predictability of recovery."

Conditions are right about Dec. 12 on average, Austin said, but he noted the date can vary widely and there isn't a lot of data on which to base historical observations.

There were also numerous delays lasting several hours the day of the launch due to constant changes in wind speed and direction, he said. Launch crews needed to wait for consistent conditions up to 900 feet in altitude - and even with the delay went ahead with the launch in less than perfect conditions.

The balloon, technology to track it by satellite and equipment other than the TIGER recorder is provided by the National Scientific Balloon Facility (NSBF), an agency of the National Aeronautics and Space Administration (NASA). The TIGER recorder will be recovered by having an aircraft fly close to the balloon and sending a command that detonates a small explosive bolt on the balloon, releasing the instrument payload onto a 125-foot diameter parachute.

The aircraft tracks the payload to the ground, at which time the parachute is released by another explosive bolt. The instrument and recorder are then recovered and returned to the U.S. for analysis.

If all goes well, the next TIGER mission in Antarctica is scheduled in two years.

Profile

Bill Robertson: The home stretch

By Melanie Conner
Sun staff

Bill Robertson, 73, is possibly the oldest man the continent.

Robertson, or Ol' Bill, will retire this year after his 11th austral summer working with satellite and high frequency radio communication systems on Black Island, 23 miles south of McMurdo Station.

He said he looks forward to spending next Christmas with his wife, Donna, of 50 years, at his home in South Carolina. It will be their first Christmas together since 1995.

"I'm planning to change that," said Robertson, his eyes lit up as he spoke with anticipation of decorating his house in Christmas lights next year. "I used to hate all that, but now I'm just dying to do it."

Robertson can spend next Christmas at home and rest assured that his Antarctic imprint will last through the Robertson Buttress, named after him for his time spent on the Ice and contributions to the station's communications.

Robertson was on the survey crew in 1990 that planned and installed the high-tech, remote-controlled satellite communications systems on Black Island, making it the communications hub for McMurdo Station.

"All your telephone calls, e-mails, everything - goes through Black Island to the outside world," said Robertson, who found employment in Antarctica after becoming tired of his "super-secret" electrical engineer work with the U.S. Navy. He has been involved in upgrades and maintenance of communications on Black Island ever since.

As Robertson bids farewell to Antarctica, his colleagues on the Ice will miss his anecdotal office poems, humor and thoughtful reasoning.

"He just has great home-spun wisdom," said office-mate Nicole Bonham. "Everything he does, he does it with flare, humor, good grace and in flawless form."

Photos by Melanie Conner/The Antarctic Sun

Bill "Ol' Bill" Robertson stands next to a portion of the remote Satellite Earth Station on Black Island near McMurdo Station. He says he enjoys being at Black Island because of its peaceful and quiet atmosphere.

His love for life and learning has propelled his career, education and technical skills.

In the '70s, during the early years of computers, he and his son built one in their basement. Every evening the two planned, engineered, brainstormed and experimented to build, rebuild and revise the early 8-bit PC. They used an old television set for a monitor that, among other flaws, was unable to distinguish the letter B from an 8.

"Back then there weren't any instruction magazines or books, so you had to write people who had done it before or figure it out yourself," said Robertson. "We went through so many versions of keyboards."

They saved their money and in 1977 bought a floppy disk drive for $600. Around that same time Microsoft Founder Bill Gates offered a free 4K BASIC program in a magazine, which became their primary building tool.

"My work was in radio frequency operations, but this was fun computer stuff," said Robertson. "My son would come home from school with what he learned and we'd go to the basement every night and try it out."

As for living off the Ice, Robertson will have little time for reminiscing about his southern summers, with three sons and five grandchildren to visit, who live in Oregon, Florida and Texas. He also has a long list of plans and projects waiting for him. One of his favorite past times is volunteering one day a week with medical technicians and veterinarians at the Birds of Prey Center in South Carolina.

"Sometimes they call me when there is an injured bird and I go and collect it," said Robertson. "They patch 'em up there and set them free."

Robertson said he names all the birds that pass through the center and even had a favorite who he called Henrietta Hawk. As he remembered her, Robertson's wide grin revealed a gold tooth on his bottom jaw. He then recalled a story about a gray horned owl that once grabbed so tightly onto his welding gloves that it frightened him senseless. "That owl whooped me," he said. "His wings seemed like they were 10-foot wide."

In-between rare owl attacks at the center, Robertson finds time for his daily exercises: 25 push-ups, 50 sit-ups and a one-mile run.

"It takes me about 12 minutes to run a mile," said Robertson. "It takes the wind out of me."

Off the Ice, Robertson stays mentally fit by learning new skills during the off-season from gardening to building or repairing.

"Last year I learned to tile and did both the bathrooms," said Robertson. "This year I am going to learn to redo the kitchen…I like to learn new things."

Robertson is excited about his future at home, but first must say good-bye to the Ice.

"There is nothing else," Robertson said, "This will be my sunset tour."