

# The Antarctic Sun



Published during the austral summer at McMurdo Station, Antarctica, for the United States Antarctic Program

January 2, 2005



Photo, poetry and prose festival

## Bye-bye biplane

By Kristan Hutchison  
*Sun staff*

After three winters parked on a snow berm at the South Pole, a Russian biplane is expected to fly to McMurdo next week.

A dozen Russian aircraft mechanics have been working around the clock since Dec. 27 to get the plane ready for its return to the air. Meanwhile, other airplane specialists and Russian journalists stand by at McMurdo Station for the expected arrival of the Antonov 3T biplane on Jan. 5.

So far the effort is going extremely well and the repairs are being made more quickly than expected, said National Science Foundation representative George Blaisdell.

"They found almost no

**See Biplane on page 13**

### QUOTE OF THE WEEK

"I ain't no mathemagician."

— A manager trying to convert tire pressure from metric to pounds per square inch

### INSIDE

JoJo-of-all-trades: science to surf  
page 14

End of an EPICA ice core  
page 7

### Ventifact and Erebus

*Scenic first place*  
Lake Fryxell, Dry Valleys, October 2004, 11 pm

### Deborah Roth

Field Coordinator, Berg Field Center  
McMurdo Station

*The photographer of this winning entry in The Antarctic Sun Photo, Poetry and Prose Festival modestly claimed that "the scenery did all the work." In that way, everyone shares the same advantage, with Antarctica's stunning views inspiring us all. This year more than 80 photos and almost 40 pieces of writing were entered in the annual contest. One judge commented: "I must say that the entries get better every year." See the other winners starting on Page 9. For the best view, look at the photos in full color online at [www.polar.org/antsun](http://www.polar.org/antsun), where you can also download and print a calendar created from the winning entries.*

## Dome C: Where the sun's rays bounce back better

By Kristan Hutchison  
*Sun staff*

Upon reflection, Dome C is as good as it gets for studying what happens when sunlight strikes snow.

It's not just that Concordia, the new French-Italian station there, has chefs from Paris and Milan with a friendly rivalry to produce the best dish each day. It's not the fresh bread and croissants in the morning, the wine on the table at dinner, or the eleven-course Christmas feast that lasts four hours.

The food makes life pleasant for Americans researching at Dome C. But what they like about Dome C is that it is flatter and has less wind than the South Pole.

"It looks like the area around Dome C is the most stable, unchanging surface on our planet," said Rich Brandt, a University of Washington

researcher returning for a third and final season at the 3,200m rise in Wilkes Land, East Antarctica.

The regularity of the surface allows Brandt and his fellow researchers to measure precisely how much sunlight is reflecting off the snow at a given location and time.

The climate is affected by how much sunlight is reflected and how much is absorbed. If more sunlight is reflected and lost to space, the world could cool, while retaining more would warm the world. That is one reason the researchers want accurate measurements of the fraction of light reflected, known as the albedo, off the Antarctic Plateau. The plateau represents an area the size of the United States.

They also want to know the albedo so they can

**See Reflections on page 8**

Ross Island Chronicles

By Chico



# Cold, hard facts

**Why waste your time**  
(or, mining potential in Antarctica)

Treaty covering mining: **Madrid Protocol** on Environmental Protection (effective 1998)  
Mining activity banned by treaty: **for 50 years**  
Difficult factor: **2.5km-thick ice sheet**  
Diamonds, gold, silver, etc.: **Not known** how much, if any. **Buried deep** under ice.  
Oil and gas: **Mostly offshore** (Deep Sea Drilling Project in the early 1970s encountered traces of gas in the Ross Sea.)  
Estimated cost per barrel of extracting Antarctic oil and gas: at least **\$65-\$80**  
Current price of oil per barrel: **\$43**  
Coal found in: **Transantarctic Mountains and Prince Charles Mountains**, but is of lower quality than elsewhere  
Noted South Pole explorer who found and gathered coal: **Robert F. Scott**  
Iron: **Boulders of banded iron formation** are common, but mainly under ice.  
Chromium: **Thought to be in the Dufek Massif** region, but is plentiful across Earth.  
Fresh water: **Glaciers**, if cheaply tapped

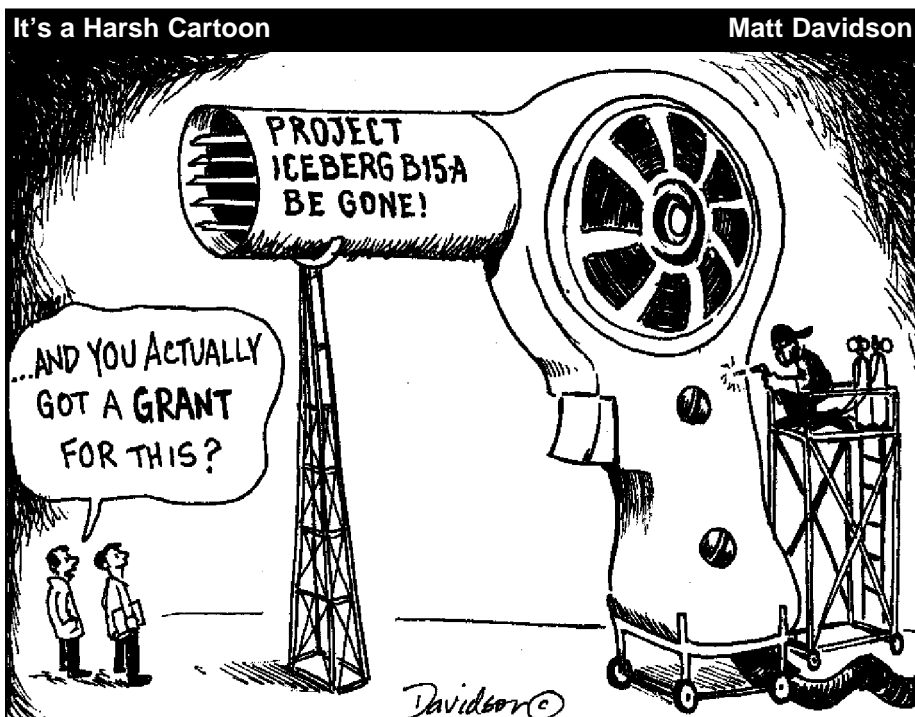
Primary source: Australian Antarctic Division  
<http://www.aad.gov.au>

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# McMurdo plugs in to a new building

By Emily Stone  
*Sun staff*

The task can be likened to running two gigantic extension cords through town, and it is now complete. McMurdo's computer network and telephone wires are now connected to their new home in the Joint Space Operations Center, commonly called JSOC and pronounced "Jay-sock."

The building's purpose is to consolidate the station's computer and telephone systems into one hub, explained network engineer Joe Harrigan. JSOC was specifically designed for this, so it is bigger, better laid out and better ventilated than the systems' previous homes.

JSOC's upstairs houses the station's computer data center and future telephone network. NASA will use the downstairs for computer equipment to track polar-orbiting scientific satellites. NASA also will operate high-quality weather satellite equipment for the U.S. Air Force out of the building, explained field engineer Nikolas Sinkola.

Construction on the 445-square-meter building began in 2001. It was paid for jointly by the National Science Foundation, NASA and the U.S. Air Force.

The computer data center began operating out of JSOC on Dec. 6, Harrigan said. The telephone wires connect to the new building, but the phone system still operates out of its old home in the telecommunications office in the fire station. No date has been set to switch over the phone operations to JSOC.

The computer data center was previously located in a cramped room in building 165.

"It was just a rat's nest of fiber and cop-

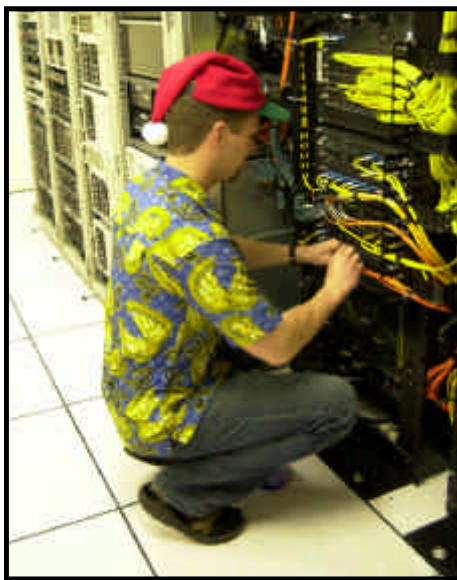


Photo by Emily Stone / *The Antarctic Sun*

*Network engineer Joe Harrigan checks some equipment in the data center of the new JSOC building.*

per cables," Harrigan said. This was the result of years of trying to keep up with the station's fast-growing computer needs inside a small space.

All of the computer network connections throughout town still run into building 165 and the telephone lines run to the firehouse. But those buildings now have the equivalent of a giant extension cord running to JSOC, Harrigan explained, so that the systems can be managed from there.

Computer data centers generate a lot of heat. JSOC was designed so that the computers heat the building, with backup heat from the power plant if needed. The tem-

perature in the data center room can rise by 11 degrees Celsius in 15 minutes if the cooling mechanisms fail, Harrigan said. The computers themselves are cooled by outside air that's piped inside and comes up through small holes in the floor tiles.

A dry-chemical fire extinguishing system runs through the data centers so the computers won't be damaged by water if there's a fire. Building rules also state that you must take your shoes off at the entrance to protect the data center from volcanic rock dust that gets tracked in from outside and can ruin machines.

The data centers are built with multiple layers of redundancy so that no data will be lost if any part of the system fails, Harrigan said. The building also has back-up power so it won't be affected by any outages in town.

"The major concern is not so much being down, but being down and not planning for it," Harrigan said.

NASA will start moving out of its small office in the Cray Lab and into JSOC on Jan. 5 in preparation for two new, large projects, explained Sinkola, who is employed by Honeywell, a NASA subcontractor. The additional space in JSOC will make it easier to handle the extra work generated by the test launch of a new satellite and an ozone-mapping project.

The two-person NASA team at McMurdo sends instructions to and receives data from about 25 satellites, Sinkola said. NASA's computer system will be down for about two weeks while the move is completed, he said.

*If you're interested in a tour of the building, contact Joe Harrigan or Cleve Cleavelin.*

## Recent earthquakes could budge big icebergs

*Sun staff*

Two recent earthquakes could influence large icebergs lurking near the entrance to McMurdo Sound.

"The icebergs are influenced by the arrival of both tsunamis and, more interestingly, the Rayleigh and Love waves," wrote iceberg expert Doug MacAyeal of the University of Chicago.

Rayleigh and Love waves are types of surface wave that travel on the solid boundary of the earth, vibrating the ocean floor at the same frequency as the iceberg bobs. MacAyeal said similar waves from a Peruvian earthquake in 2002 triggered oscillations of the iceberg that caused greater motion. At the moment, the largest remaining berg, B15A, is sitting about 8km from the Drygalski Ice Tongue.

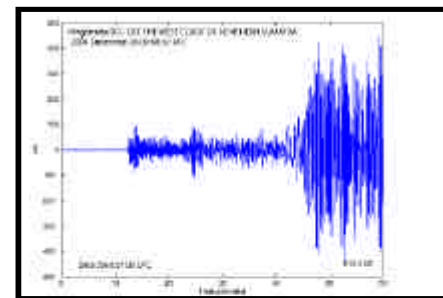
The first quake struck the area around Macquarie Island in Antarctica, about

1,500km southeast of Tasmania, on Dec. 24. It registered 8.2 on the Richter scale and was reported by the French monitoring station in Antarctica. The Macquarie archipelago is an island group composed of oceanic crust and rocks. Its colony of king penguins, numbering around 850,000, is one of the largest in the world. The last earthquake of similar magnitude in the Macquarie Rise region was in 1924.

The second quake, which has had a devastating death toll, struck in the Indian Ocean off the coast of Indonesia on Dec. 26. It was a magnitude 9 quake, the most powerful in the world in four decades.

People working at McMurdo Station didn't feel the quakes, and the research vessel *Nathaniel B. Palmer* didn't notice any large waves. However, the earthquakes did show up on seismometers operated by the Mount Erebus Volcano Observatory. The

Dec. 26 earthquake registered on the Erebus seismometers with the first seismic wave arriving 13 minutes after the earthquake occurred and the signal continuing for eight hours.



*The Dec. 26 earthquake shows up on seismic equipment from Mount Erebus. To see the seismic records from Erebus, go to <http://www.ees.nmt.edu/Geop/erescream/welcome.html>.*



## Perspectives Perspectives

# The Santafication of McMurdo

By Allison "Sandwich" Barden

My mother wrote me last week about how her purse was stolen at a department store while she was Christmas shopping. My mother is an honest, sweet, retired elementary school lunch lady. Man. What a bummer.

Then I thought about that whole "Christmas craze" that goes on back in the States. Rabid, foaming consumers in a rush to claw their way to the front of checkout lines, parking lots full of cars, credit-card-limits-a-maxing, garbage cans full of wrapping paper, ad infinitum, ad nauseam. We don't have that here, and even though I miss my family at Christmas, I don't miss the rest of it. For me, there's only one thing I couldn't live without on Christmas.

Santa.

Santa, to me, is not a holiday decoration, or a cookie shape, or some made-up figure we hope my 8-year-old niece still believes in. Santa is real. Santa is so real that every year, he/she replicates him/herself and makes more Santas.

In San Francisco, where my storage facility is, there is a Santa Convention if you will, an army of over a hundred Santas who congregate during the holiday season and Ho-Ho-Ho it up around town: riding cable cars, interacting with tourists, going to a watering hole or two. People expect and even demand this kind of silliness from San Francisco. It's what makes San Francisco San Francisco.

When I was applying for jobs on the Ice a couple years ago, I realized I would most likely be in Antarctica for the holidays. There was no doubt in my mind that if I was in Antarctica for Christmas, well, Santa would have to come with me. "Santarctica: The Biggest Congregation of Santas Furthest from the North Pole." How could it not happen? It's silly to witness a gaggle of Santas barreling down a busy San Francisco street. But in Antarctica? Everything is funnier when you add "...in Antarctica" to the end of the sentence.

October 2003 brought me to McMurdo Station as a dining attendant. November 2003 brought me three oversized boxes with red and white tape. Rob and Dave, a couple of the Santas from home, posted 40 Santa costumes to me. Dave's conversation at the post office was as follows:

Mail Room Guy: "What on EARTH do you have in those three huge boxes?"

Dave: "Forty Santa Suits"

MRG: "WHAT are you going to do with FORTY Santa suits???"

Dave: "Ship them to Antarctica."

MRG: "Why are you shipping them to Antarctica???"

Dave: "Well it would be ridiculous to ship them to the NORTH pole, now wouldn't it? It's not like the real Santa doesn't already have plenty..."

Dave walks off smirking.

I received the Santa suits around Thanksgiving. There were so many instances that called for mass Santafication before



Photo courtesy of Allison Barden / Special to *The Antarctic Sun*

*Some of McMurdo's 2004 Santa brigade. Barden, a prep cook in her second season, is in the middle with the double-pointed hat.*

Christmas, but I fought the urge to destroy the surprise. Since we worked in the dining hall, we had to debut them at Christmas dinner. I distributed the costumes to my coworkers and we spread the joy of Santa to the 1,000-plus members of the community.

The look of shock and perhaps confusion on our guests' faces was priceless, as no one expected to be served and cleaned up after and cooked for by 40 Santas. Santas making coffee. Santas sweeping. Santas carving the tenderloin. Santas washing dishes with smiles peeking through their beards. Santas refilling the food in the hot lines, etc.

In keeping with the holiday spirit, we decided to give the Santas another run in 2004. This time, they broke loose a day early, because they couldn't miss the Town Holiday Party at the Heavy Shop on Christmas Eve. The Santas assembled in the back of the dining hall and set off on a photo-op jaunt around town, visiting the McMurdo sign behind Dorm 209, spreading cheer at the gym to those working off the gingerbread, to Southern Exposure for games of poker, darts, and shuffleboard. Finally we made a grand entrance to the Heavy Shop as a lunatic parade of Santas chanting, "Ho. Ho. Ho. Ho. Ho. Ho. Ho...."

Upon retiring to my dorm, I hung my stocking with care, left milk (powdered skim) and cookies and a note for the real St. Nick outside my room, and even stayed up late to see if I could hear him leave me presents. I didn't have a tree, but I think he understands. The excitement and magic are still there.

This year, I hope Santa has brought you as much joy and fun as he/she has for me, and I hope to see you all next year, bringing your own special part of the holidays to McMurdo.

By the way, there are 36 elf costumes sitting in Christchurch, awaiting the next package mail flight.

# around the continent

## SOUTH POLE

### Science and Santa

Compiled from reports by Katie Hess, Brenda Everitt and other sources

The ambient temperature climbed just above zero Fahrenheit this week as hot water drillers working on the IceCube project prepared to drill the first hole for the massive neutrino detector. But the station took time out to celebrate the Christmas holiday.

Christmas Eve began with the annual Gift Exchange/Yankee Swap held in the Quiet Reading Room. About a dozen people showed up in a festive spirit to exchange and filch wrapped gifts. Afterward, the South Pole band Squeaky Meat performed at the summer camp lounge in front of a fabulous group of dancing Polies.

Residents of the South Pole Station enjoyed a large Christmas feast on Saturday featuring "Cookie" Jon Emanuel's famous beef Wellington.

The Country Whine Roses serenaded guests with seasonal carols during hors d'oeuvres for all three of the seatings required to feed the station's 240 people. Festivities lasted into the wee hours in what became a sort of impromptu coffee house.

Christmas morning, people got out of bed with unusual verve to participate in the Snow Sculpture Contest that was held just before the annual Race Around the World. When the judges were unable to decide on a first place sculpture, all participants were awarded gift certificates to restaurants in Christchurch.

Next, the Race Around the World took runners on a 3km course that circled the South Pole three times. The race resulted

*Polies run past the ceremonial South Pole marker and flags during the annual Race Around the World Christmas Day*

Photo by Mark Eisinger / Special to *The Antarctic Sun*



Photo by Brenda Everitt / Special to *The Antarctic Sun*  
*The South Pole music group The Country Whine Roses performs during Christmas festivities.*

in a dining hall sweep as prep cook Philip Clark won first place among the men and dining assistant Catherine Graciano took first place for the women.

Twelve Russians arrived at the South Pole this week. Their mission is to repair the Antonov 3T plane and fly it to McMurdo. The Antonov has been stuck at the South Pole since it landed in 2002. The friendly members of the Antonov recovery expedition have made for an exciting week.

In another international polar event, a British Antarctic Survey plane has been flying missions out of Pole this week to service geophysical monitoring instruments at field sites. Pilot Ant Tuson and scientist Shane Rodwell will be in and out of Pole as weather permits landings at worksites between 85 and 88 degrees south.

Larry Hothem from the USGS visited the South Pole Station this week. Using GPS, Hothem mapped and staked out the new South Pole location as of January 1, 2005.

The 2005 pole marker will be unveiled in a ceremony to be held on New Year's Day.

## PALMER

### Gifts and visitors

By Kerry Kells  
*Palmer correspondent*

The sea ice broke apart on Dec. 22 with slight winds at a steady 18 kph. Some of the scientists were able to take Zodiacs out to two testing sites on the water not far from station. The researchers studying birds planned to go to Torgersen, Humble and Litchfield islands to the north of Palmer. Recent satellite photos show that the sea ice has drifted away from the station. We had a science lecture on Wednesday, presented by the science research associate and titled "Teleseismic Earthquake Detection."

A favorite tradition at Palmer Station is the holiday gift exchange. Gifts this year included a framed photograph of Palmer Station, a hand-carved wooden boat plaque, a photograph near Poland's Henryk Arctowski Station, a copy of John Evans' photo from the first ascent of Vinson Massif, two hand-knitted hats, wine glasses with champagne-colored stems and a colorful quilt sewn on station.

The Christmas dinner was complete with turkey, ham, stuffing, sweet potatoes and cranberry sauce. We also had peanut soup, prepared by a Palmer resident who wanted to share a family tradition. Stockings were stuffed on Christmas Eve with small presents of mini water guns, toy baseballs and footballs, nail polish, glow sticks, mini carabiners, cards and candy.

After the holiday, we welcomed the private sailing yacht the *Sarah W. Vorwerk* with Captain Henk Boersma. Boersma is a seasoned sailor with many trips to Palmer Station. The *Sarah* is the first yacht to arrive this year in fairly strong winds. The *Sarah* is a 54-foot steel yacht, a Skorpion IV, built in 1998 in Hamburg. Boersma and Jacqueline Haas, the co-skipper, and eight guests (a group from Switzerland traveling together) toured Palmer Station. Boersma regularly sails the *Sarah* to Antarctica, Patagonia, Cape Horn, South Georgia and Brazil and has sailed to many countries in Europe,

See Continent on page 6

### the week in weather

#### McMurdo Station

High: 39F / 4C  
Low: 16F / -9C  
Max. sustained wind: 30mph / 48kph  
Windchill: 6F / -21C

#### Palmer Station

High: 50F / 10C  
Low: 28F / -2C  
Max. sustained wind: 42mph / 68kph  
Precipitation: 6mm

#### South Pole Station

High: 0F / -18C  
Low: -11F / -24C  
Peak wind: 33mph / 53kph  
Max. Physio-altitude: 3143m

## Continent From page 5

Africa, South America and the Falkland Islands. He and Jacqueline are welcomed adventurers and brought a surprise to station — Palmer's youngest visitor, their two-and-a-half-month old baby girl, Marisol. Apparently, Marisol fared much better crossing the Drake Passage than the other passengers.

### SHIPS

#### Polar Star, Krasin

By LTJG Collin R. Bronson, USCGC  
*Polar Star (WAGB 10)*

U.S. Coast Guard Cutter *Polar Star* has made its way into Winter Quarters Bay for the annual break-in to McMurdo in support of Operation Deep Freeze. The *Star* was hard at work early last week making the initial cut to the ice pier through nearly 130km of fast ice. After some initial heavy ice-breaking near Beaufort Island, the *Star* made close to 65km in one day of icebreaking in first-year ice and docked at the ice pier at McMurdo Station Thursday.

The *Star's* sister ship *Polar Sea* is unavailable this year because of major maintenance. The *Polar Sea* participated in an unprecedented four consecutive Antarctic missions.

The Russian icebreaker *Krasin* has been contracted by the National Science Foundation to assist the *Star* this season and is expected to arrive in mid-January. The *Star's* first task may be to escort the tanker through the sea ice of the Ross Sea if required.

This season will mark the first time since the Cold War that the U.S. and Russia have worked together on icebreaking operations. The *Star* and *Krasin* will be responsible for widening and grooming the *Star's* initial cut and escorting the tanker *Paul Buck* and



Photo by Kerry Kells / Special to *The Antarctic Sun*  
Henk Boersma, captain of the private yacht Sarah W. Vorwerk, co-skipper Jacqueline Haas and their baby girl, Marisol.

cargo vessel *American Tern* to the pier.

The previous longest break-in in Deep Freeze history was in 1963 when the initial cut was started just west of Beaufort Island. This year, with B-15A and B-15K nearby, the *Star* entered McMurdo Sound east of Beaufort Island, adding several kilometers to the *Star's* initial cut and making it the longest in Deep Freeze history.

### NBP

Compiled from reports by Alice Doyle

The day after the *Nathaniel B. Palmer* entered the sea ice, the research vessel was joined by two fishing vessels. On Dec. 25 the commercial fishing boat *Jana* and its sister ship began following the path opened by the *NBP* through the ice north of Cape Adare, even stopping when the research vessel stopped to collect scientific samples. After a month at sea, the fishing boats hold are half-full of mawsoni, commonly known as Patagonian toothfish or Chilean seabass. The fishing captains said they had all the necessary fishing permits and observers on board from the Convention on the Conservation of Antarctic Marine Living Resources.

"It was strange to see boats off the

stern," wrote marine projects coordinator Alice Doyle.

The weather was mostly good, with calm winds and sunshine until the ships hit a polyna where a small storm kicked up the winds and seas enough to make for a bumpy ride. Luckily, the storm was short-lived and all was calm again by morning.

On Dec. 27 the *NBP* arrived at a highly productive area in the Ross Sea that the scientists on board had targeted from the ocean color images. The ship will remain there for six days before heading to the next area of interest.

### LMG

The *Laurence M. Gould* had a port call in Punta Arenas, Chile, Dec. 22-29.

### BALLOONS

#### CREAM circles again

Compiled by Sun staff

The CREAM (Cosmic Ray Energetics And Mass) instrument aboard a long duration balloon is making a second trip around the Antarctic continent. Since the winds were favorable, mission controllers and scientists decided to send the balloon around again so it could gather more data.

To keep things fun, CREAM's principal investigator Eun-Suk Seo said the team was holding a contest to see who could find the neatest cosmic ray event.

Another balloon project, BESS (Balloon-borne Experiment with Superconducting Spectrometer), was terminated last week and parachuted to the ice near Siple Dome. A recovery team has collected the data disks (about 2 Terabytes worth) and recovered the instrument.

## Continental Drift

### What surprised you when you arrived in Antarctica?



"The recreational opportunities and social scene."

Mike Cragen,  
*South Pole*  
cargo,  
from Alaska,  
fourth season



"The quality of light and the vastness of space. Photographs couldn't prepare me for the sensory impact of the landscape."

Marnie Valenta  
*McMurdo Station*  
cook  
from Seattle, Wash.,  
first season



"How much people at Palmer don't suck!"

Austen Thomas,  
*Palmer Station*  
scientist  
from Olympia, Wash.,  
first season

# Longest-ever ice core bottoms out at Dome C

By Gabrielle Walker

*Special to the Antarctic Sun*

With a practised swipe of a large knife, Laurent Augustin knocked off the head of a 3-liter bottle of champagne, and the assembled crowd cheered.

As the head driller of the European Program for Ice Coring at Dome C in Antarctica, he had much to celebrate. On Dec. 21 he and his team officially reached the bottom of an ice core that extends more than 3,270m into the East Antarctic ice sheet. The ice at the bottom of the core — the oldest ever taken — is estimated to have fallen as snow more than 900,000 years ago.

The eight-year effort was a joint project of the European Science Foundation and the European Commission scientific programme, funded by the European Commission with national contributions from Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom. At times more than 20 scientists and drillers were working on the project but this year only a handful returned to Dome C to try to collect the remaining 70m that had eluded them in the previous seasons.

It was a difficult task. The ice near the bedrock was so much warmer than ice near the surface that ice chips were melting and then refreezing on the drill, which risked blocking the whole enterprise. The heat flow from the bedrock under the ice is enough to keep the bottom layer melted, wrote Dorthe Dahl-Jensen, a Dane who was the chief scientist for the final drilling period.

In 1999 the team had been forced to abandon a previous hole and begin again when the 10m-long drill became irrevocably stuck. This year they were forced to use ingenious solutions, such as attaching a plastic bag of antifreeze to the drillhead. When the drill finally reached its destination, more than 3km inside the ice, the bag burst and delivered its load exactly where it was needed.

Even so, they had a few nasty moments. Just before the decision to finish the drilling on December 21, the electro-mechanical drill got stuck for several hours.

The team dropped pellets of glycol into the hole and waited anxiously until the drill head finally floated free. It was then that they decided to stop, some 5m above the bedrock. Near the bottom of the core, the drillers observed inclusions of reddish brown material, between extremely large ice crystals. As yet, nobody knows what caused these inclusions. Though Augustin



Photo courtesy of EPICA / Special to *The Antarctic Sun*

*The EPICA drill team from left to right - Sergio Nucci, Italy, Inger Seierstad, Denmark, Saverio Panichi, Italy, Dorthe Dahl-Jensen, Denmark (chief scientist during this period), Laurent Augustin (chief driller)*

was frustrated not to reach the very end of the ice, he pointed out that they have thereby avoided contaminating a layer of water just above the bedrock, which may contain some forms of life.

As soon as the ice coring was declared over, congratulations poured in by e-mail from researchers around the world. The entire Dome C camp of 51 people crowded into the drillers' workshop for the party. Into each glass of champagne, one of the drillers dropped a spare chip of the deepest ice, which crackled as it melted and released the ancient air trapped inside.

Though EPICA is a European project, American researchers will make use of the data it provides through workshops, symposiums and papers published in scientific journals.

"We're really excited and happy for our colleagues over there, because we think they've done a great job of getting this long, long record," said Ken Taylor, research professor for the division of hydrologic sciences at the Desert Research Institute in Nevada.

"Having this very long record really allows us to get a better understanding of just how the atmosphere influenced climate in the past for such a long time."

Taylor is also the chief scientist for an American drilling project beginning next season in West Antarctica that will complement the Dome C ice core. The West Antarctic ice core should provide 40,000 years of annual core data. While the Dome

C core goes far into the past, it doesn't provide a clear delineation between years.

"The Dome C core is really fantastic because it extends so far back in time," Taylor said. "The price you pay there, is it doesn't have real high time resolution."

The Dome C ice core will be compared with younger cores taken in Antarctica and Greenland and one drilled in Dronning Maud Land on the Atlantic sector of Antarctica. Researchers hope that its chemical composition and samples of air trapped in the ice will yield new information about the Earth's climate and atmosphere extending back to a time when modern humans did not exist.

Understanding the past climate will help researchers understand what could happen to the climate in the future, Dahl-Jensen wrote.

"As always we expect that there will develop joint research project between European and American scientists to get as much science and knowledge out of the ice cores," wrote Dahl-Jensen. "In general, on a scientist level, we really enjoy collaborating."

The ice core will be flown by Twin Otter to the Italian base at Terra Nova, then shipped to Europe. It should arrive in April 2005 in Grenoble, where it will be stored.

*Gabrielle Walker is an NSF writing grantee this season. Kristan Hutchison from The Antarctic Sun also contributed.*

# Reflections

From page 1

calibrate instruments on satellites by pointing them at the Antarctic plateau, said Stephen Warren, the lead investigator for the University of Washington project.

Most of the satellites are designed to monitor the Earth's surface and atmosphere, looking for changes in the climate. The filters, windows and instrumentation on the satellites slowly degrade and need to be adjusted every few months to stay accurate. The quality of data from one satellite appeared to decrease by six percent a year.

Other parts of the world have been used to calibrate satellites in the past. They have to be places with dry air and no vegetation. The eastern Sahara has been used, but the clouds there aren't always detectable and may distort the results. Snow is so bright that a slight cloud cover doesn't matter, Warren said.

When astronauts look at the Earth from space, they see the light being bounced back. About 30 percent of the sunlight directed at the Earth is reflected, almost half of it by clouds. Snow-covered surfaces like Antarctica reflect 70 percent of the light that hits them, but the polar regions don't have a large impact on the overall albedo of the Earth because the high latitudes get little sunlight to start with.

Snow covering North America and Eurasia in the springtime, as the sun returns in full force, has a much greater effect on the climate, Warren said. In periods when the Earth is thought to have been covered in snow, the planetary albedo may have been as high as 60 percent, Warren said.

"That was a huge change, and that was what allowed the climate to be so cold, even at the equator," Warren said. "Back then albedo was the dominant control on climate."

On the other end of the scale, the lowest albedo may have been during the warm Cretaceous period, about 100 million years ago, when lush forests grew over most of the landmasses and if there was any ice left it was a small amount in the interior of Antarctica.

Before going to Dome C, Warren's research group worked at the South Pole for many years and at Vostok, the Russian station. The snow quality was nearly identical at all three, but the South Pole and Vostok had more sastrugi formed by the winds.

"Much like looking at farmer's fields once they're plowed, if you move your head back and forth the brightness changes," Brandt said.

The smoother surface at Dome C made it easier for the researchers to take precise measurements.

"We're getting a lot more data at Dome C,"

Warren said.

"Much more

variety of angles and also we're covering the whole wavelength spectrum, so we're doing a pretty thorough study."

They take the measurements from a 32m-tall tower Brandt built with his French colleague, Delphine Six, two years ago. The tower is little more than an open metal staircase, 2m square. From the top of the tower they have a 230-degree view of pristine snow stretching to the horizon, with Concordia Station blocking the view behind them. It's a no-drive zone, to keep the snow pure so they can take accurate measurements of the sunlight reflecting off 80 points radiating out from the tower to the horizon.

Last season the researchers had clear weather and ended up with very good measurements. This year they will be repeating the same measurements to corroborate the results, as well as extending the angular range.

"We had a spectacular season last year," Brandt said. "The more times you measure, it gives you a sense you've got it."

After working at the South Pole, where the sun remains at the same level in the sky day and night, Warren was surprised by the changes in temperature, and the associated formation and evaporation of fog through the day at Dome C. Though the sun never sets, it does move higher and lower on the horizon, changing the slant of light hitting the snow. The temperature varied by 20 degrees, peaking in the afternoon and becoming coldest around midnight. Measuring the reflections at different times of day and seasons is important, because the albedo changes with the slant of the light.

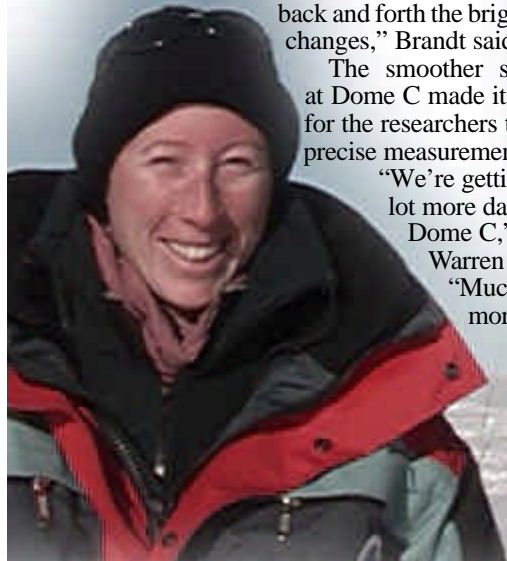
## Out to sea

The snow cover over the Antarctic continent remains year-round, and is unlikely to change very much or very fast, Warren said. Sea ice surrounding the continent is another story completely, shrinking and growing each year. As it does so, the amount of solar energy being absorbed or reflected changes too. A paper Brandt and Warren submitted to the *Journal of Climate* reports the results of three voyages members of his research team took aboard Australian ships in the Antarctic. They combined data from those voyages with data from satellites and other ships to create a map of the albedo of the sea ice for each season.

When the sea ice starts forming, it is still fairly dark and absorbs most of the sunlight. As it thickens and grows it generally reflects more. Through the year, the sea ice albedo can range from as low as 7 percent reflected to as high as 87 percent.

"It's much more involved in climate change than the snow surface of the Antarctic," Warren said. "The sea ice regionally is very susceptible to climate change. In fact, it melts away every summer."

Though this is the last year for the project, the tower will stay at Dome C as an American contribution to Concordia station. Already, three new projects will use it this year.



Delphine Six, left, and Richard Brandt at Dome C in front of the tower they assembled for measuring reflections off the snow.







**Southern Giant Petrels, Humble Island**

*Wildlife first place*

Canon EOS 10D and 24-70mm Sigma zoom lens,  
February 2, 2004

**Cara Sucher**

Lab supervisor  
Palmer Station

## And the winners are...

These pages feature the winning entries from *The Antarctic Sun* Photo, Poetry and Prose Festival. Congratulations to all the winners and thanks to all who entered the fifth annual contest.

*Haiku first place*

**Sweeping equal area  
for equal time —  
bamboo pole shadow.**

(Meditation on Kepler, Antarctica 2004)  
By *Stefan Pashov*, supply, McMurdo Station

## The missing winners:

Literature often delves into areas that are controversial or inappropriate for children and government-sponsored publications. After being selected by independent judges, five of the winning pieces of writing were deemed by the National Science Foundation as unsuitable for publishing in the original format because of something in the content of the story. Two of these are being run with some editing, and are marked as such. The other three winners could not be published, but are available through the authors at the private Web site [www.elementarypenguin.com](http://www.elementarypenguin.com).

The missing stories are:

### **Microfiction first place — “Ice Fishing”**

By Bill Jirsa, computer trainer, McMurdo Station

### **Microfiction second place — “White Out”**

By Joe Mastroianni, telescience technologist, McMurdo Station

### **Microfiction third place — “E-Bay Auction”**

By Karen Joyce, Crary computer support supervisor, McMurdo Station

The altered stories are:

### **Nonfiction first place tie “Behind Every Tree In Antarctica” on page 10**

### **Nonfiction third place “Two Way Radio” on page 11**



**Skuas**

*Wildlife second place*

Canon Powershot S45, Dec. 2003, Cape Crozier

**Jeff Miller**

Remediation technician  
McMurdo Station

#### **PHOTOGRAPHY JUDGES:**

**Joan Myers** is a fine arts photographer and was an NSF artist grantee during the 2002-2003 season. Her photos can be seen at [www.joanmyers.com](http://www.joanmyers.com).

**Ernie Mastroianni** is a photographer for *The Milwaukee Journal Sentinel* and came to Antarctica on a media grant during the 2000-2001 summer season.

#### **PROSE JUDGES:**

**Chris Cokinos** is editor of *Isotope* magazine and teaches at Utah State University. He was an NSF writing grantee in 2003-2004.

**Susan Fox Rogers** is the editor of 10 anthologies and teaches at Bard College. She is an NSF writing grantee this year.

**Photo tie-breaker: Steve Alexander** is Crary Lab manager. He was an assignment photographer for *Skin Diver Magazine* and has had photos in *National Geographic*.

#### **POETRY JUDGES:**

**Bill Fox** is author of five nonfiction books and was an NSF writing grantee in 2001.

**Nevada Hanners** is a meteorologist technician in the Dry Valleys and a poet. She holds a master's in English literature with a creative writing emphasis.

Photo, poetry and prose festival

*Nonfiction first place tie*

**My Life as a Rock**

I've been coming down here so long, I'm weathering geologically. My face is thatched by the sun into a thousand woven lines, like the fractured soil of the Dry Valleys. A deep fissure has formed between my eyebrows from having faced a thousand floods of managers who took out everything in their paths before they retreated, smiling. And always, eventually, the land and I have recovered.

I think of myself as a dense rock, tough stuff: basaltic, not friable. Except for my teeth. The front two are capped, lopped off ten years ago when someone decided the Haz Yard needed to be kept locked in the middle of winter so that nobody would wander in and do what? Drink the glycol? I stood there in the dark, fingers waxy with cold, trying to open this big padlock that wouldn't budge. Frustrated, I used my teeth to pull off my glove. Snap!

But that's the hardened crust on my outside. Inside I'm a molten mess, an inchoate chamber of passionate magma forever churning around some ephemeral love object, pouring myself out in endless sills, reacting, overreacting, never cooling off enough to mineralize. Driven around by chemistry. Dumb, it seems, as a box of rocks.

On my way home last night, I held a favorite ventifact in my pocket. It was warmed by my body and smooth as skin, buffed by how many million years of blowing dust? As I bent into the wind, assailed by the sandy grit of this volcanic island, I thought of the infinite grains that had smoothed my fine rock so. And I wondered as I turned my face straight into that same wind, how many years I would have to stay here before I too would be polished smooth again.

*By Karen Joyce, Crary computer support supervisor, McMurdo Station*



**The Duel**

*Wildlife third place*

Elephant seals fighting on the beach at the Argentine station Jubany on King George Island, during a visit by the *Laurence M. Gould* in November 2004.

**Heidi Lim**

Physician assistant  
LMG/South Pole



**Minus55ambient**

*People first place*

**Attila Agoston**

Fuels operator  
McMurdo Station

*Nonfiction first place tie*

**Behind Every Tree in Antarctica**

Behind every tree in Antarctica are truths found nowhere else. I deployed unaware I was on a quest to find them. I took the job to support science, envisioning a season of hard work in primitive isolation.

I quickly discovered that survival in McMurdo required more than simply hard work. Active participation is required in periodic, primitive rituals invoking extreme exhaustion to induce a trance-like state conducive to revelation. In McMurdo this is called recreation.

You stagger through long work days and often longer nights in a kaleidoscope of frenzied activities, interspersed with freeze-frame shots of poignant clarity. Like the night I climbed up into the dance cage at the SSC, unable to ignore the masked stranger who beckoned. We pulsed and slithered with each hypnotic movement punctuated by that beat. An uncharacteristic feeling of reckless abandon was my first glimpse behind the tree.

Of course, there are no real trees in Antarctica. If the ritualistic frenzy provides insight, it was there when you deployed. Your withdrawal to Antarctica simply freed it from obscuring clutter, distilled it into its essence.

I sip periodically from my Antarctic essence, remembering 50-year-old single malt shared over 10,000-year-old glacier ice during yet another ritual in 203B. The essence I took from Antarctica continually fortifies me in my quest to craft a simpler life, alone.

"It's a dangerous business, Frodo, going out your door....there is no knowing where you might be swept off to."

You might be swept from behind that non-existent tree in Antarctica to the high desert of Utah, over the Rocky Mountains to the headwaters of the Chesapeake Bay, as I was.

On a solitary sojourn, you might discover a yearning to once again be part of the tribe.

*By Susan MacGregor, senior analytical chemist at McMurdo Station 2003-2004 season, now principal research scientist at Battelle Memorial Institute, drsmacgregor@netzero.com*

**This story was edited for a general audience. The original is available through the author at [www.elementarypenguin.com](http://www.elementarypenguin.com).**



**Goodbye LMG**  
*People second place*  
 Canon EOS 10D and 24-70mm  
 Sigma zoom lens, Feb. 18, 2004.

**Cara Sucher**  
 Lab supervisor  
 Palmer Station

*Nonfiction third place*

**Two-Way Radio**

“\$#@!&\*#\$%!” She struggled to keep the ski-doo under control. It was drivable but there was no way to steer it.

When he left with the only radio, they’d seemed close enough to camp. Traveling together, they’d never expected to need a second one, but when the call came in about a possible aircraft divert, he’d decided he’d better split off and go straight to check the runway. Even before he was out of sight, her ski broke and now she was alone, searching for a way out. Again.

Five miles is a long way especially on blue ice, so she figured she might as well keep going, as far as she could, in the right direction. Standing up, she tried using her weight to force the ski-doo to obey. Bracing against the wind and jagged sastrugi, she remembered other times she’d had to tough it out while he was needed elsewhere. It wasn’t that she couldn’t look out for herself, she was just.... tired.

The tiny camp was concealed in the low gully that ran along the glacier’s side where it veered around the Allan Hills. As she traveled down-glacier, the sloped edge carelessly steered the ski-doo sideways and down. “Like a toilet bowl,” she tried joking to herself, “everything ends up there eventually.” At the bottom, the gully sides sent her bobsledding directly back to their shoebox hut.

Legs stiff from fear and exertion, she lurched inside and curled up on their sagging army cot; burrowing into the sleeping bag and waiting for the adrenaline-spiked nausea to subside.

Then she went back outside and changed the ski.

“Runway OK?”

“Fine. Found your way back?”

She shrugged. “Yeah. Might wanna take two radios next time.”

*By Tina Green, Long Duration Balloon camp supervisor, McMurdo Station*

**This story was edited for a general audience. The original is available through the author at [www.elementarypenguin.com](http://www.elementarypenguin.com).**

*Haiku second place tie*

**my hobart slicer  
 visual workout mantra  
 ham ham turkey ham**

*By Allison “Sandwich” Barden  
 Sandwich maker/prep cook, McMurdo  
 Station*

**Shot my first ugruk\*  
 Then harpoon hard in the neck  
 Gut, bleed, drag, hard work**

\*seal

*By Adrian Adams, 14, Kenneth Dewey, 13,  
 and Robert Hawley, 14, all students at  
 McQueen School in Kivalina, Alaska*



**Dome Entrance**  
*People third place*  
 Canon G3  
 early January, about 3 a.m.

**Emma Fuller**  
 Materials Sr.  
 South Pole

**Poetry first place****The Light and the Weather**

when I was someone else I wished I could stand with it in the shadow  
of Erebus and feel nothing like cold

ran until south became north  
then it was a river, the sun made sparks upon the ripples  
when it was the sky, the propellers turned  
clouds outside in.  
when it was rock and gravity bit hard  
it had to be climbed anyway

then it said, "live", and I was engulfed in the noise of idling V8's  
and television screams

ran until south became west  
when it was red, it melted the canyon in twilight  
when it was black, it salted the heaven with stars  
when it was yellow, it sang like children sliding  
in the wind to the sand  
when it was blue it became ice  
that had to be crossed

anyway

when it drowned me in love it beat like the tide against my chest

then hurricane storms changed the coast  
when it was death, it pressed until I couldn't breathe  
when it was birth I saw what it could do  
with bits of mud and bone.  
when it was mine it burned my hands to hold it  
until it turned blue to ice  
to a walk in Erebus' shadow  
to me here now, and you there

because it was something  
it's always something

*By Joe Mastroianni, telescience technologist, McMurdo Station*



**SunDog and Dome**  
*Scenic third place*

**Emma Fuller**  
Materials Sr.  
South Pole



**Obhill Moon**  
*Scenic second place*  
Sony DSC-f8/28  
Aug. 27, 2004 at 7:20am

**Holly Troy**  
Sr. computer tech. for  
science support  
McMurdo Station

**Poetry second place****Whiteness**

Day  
Day,  
Night,  
Night,  
Day,  
Hours uncounted.  
Madness seeps in  
Like a paper towel  
Dropped on spilled tea  
Spreading like the whiteness  
Of the horizon.  
Whiteness.  
Melville's whiteness.  
Swallowed by the whale  
Of Whiteness.

*By anonymous, found in the  
Skylab lounge at the South  
Pole, written about 1997  
Discovered and submitted by  
Tom Piwowarski*

**Poetry third place****Icescape**

Icescape...  
the same wind —  
erasing and engraving  
memories.

Let it blow through,  
ripping the clouds,  
leaving nothing;  
just the mountains —  
There!

*By Stefan Pashov  
supply  
McMurdo Station*



**Goggles, South Pole**  
*Other first place*  
Olympus camera  
mid-November

**Alison Van Dusen**  
General assistant  
South Pole



**Bubbly Ice** **Andy Young**  
*Other third place* Science support lead  
Olympus C-750 McMurdo Station  
digital, summer  
2003-2004 at  
Beardmore  
Glacier



**Iceberg detail** **Cara Sucher**  
*Other second place* Lab supervisor  
Canon EOS D30 Palmer Station  
and 28-300mm  
Sigma zoom lens  
Nov. 11, 2002.

Photo, poetry and prose festival

*Haiku third place*

**Oh so perfect she.  
Tear froze deep in time eternal.  
O Maiden O Ice.**

*By Brendan "Lucky" Stamp, plumber, McMurdo Station*

## **Biplane** From page 1

corrosion," Blaisdell said.

The biplane originally flew to the South Pole from Patriot Hills, where it had been assembled, in January 2002. The biplane carried a 14-member multinational expedition led by Artur Chilingarov, deputy chairman of the Russian State Duma. Chilingarov is also a polar explorer and entrepreneur.

After landing at the South Pole, the biplane had an as-yet-undetermined problem when the pilot attempted to restart it, said Alexander Larkor, an engineer who was on the original flight. The plane was left behind.

The Russian Antarctic Expedition is leading the effort to repatriate the plane.

"They feel that's their obligation to the Antarctic Treaty to clean up," Blaisdell said.

So far the mechanics have replaced the plane's engine, broken windshield, and shock absorbers. They also are clearing the plane of snow and heating it up. All the work is done outside in temperatures averaging -20C.

"They think it's wonderful weather," Blaisdell said. "Many of them are from Siberia."

The aircraft repair team is very well prepared, Blaisdell said. They arrived with two sets of tools and parts, one to use at the South Pole and one to keep at McMurdo as



Photo by Scot Jackson / Special to *The Antarctic Sun*

*Russian mechanics prepare the Antonov 3T biplane for flight at the South Pole.*

backup. The mechanics knew what to expect because last February two engineers from the aircraft's manufacturer, Polyot, spent several days at the Pole surveying the plane.

Larkor was one of the engineers, and during the February 2004 trip he and fellow engineer Vladimir Bolnykh drained the oil and fuel from the plane to prevent possible leaks. They also made an inventory of work the plane needed before it flies. The engineers carried an oil sample, two tapes from the plane's black box and photos back to the manufacturers' headquarters in Omsk, Russia, to diagnose the problems.

Larkor pocketed one other item he found

in the plane. His watch was still hanging on the interior wall. The glass had broken out, but when he wound it, it began ticking. He hopes they'll have similar luck with the plane.

While the mechanics work at Pole, specialists and media waiting at McMurdo are learning about the U.S. Antarctic Program. They've visited Crary Lab and the Chapel of the Snows.

"They thought it was a real hoot there was a taxi here. They asked if there was a meter in it," Blaisdell said.

The Russians are interested in how the U.S. operation works, particularly on the sea ice, Blaisdell said. Russia operates a floating ice station near the North Pole called Borneo, which is used by both tourists and researchers.

If a test flight on Jan. 4 is successful, the biplane is expected to fly from South Pole to McMurdo on Jan. 5. It will either refuel in the air from three fuel drums it will be carrying or land near the base of the Beardmore Glacier. The biplane will be dismantled at Pegasus Runway, with some assistance from the U.S. Antarctic Program.

The Russian IL76 cargo plane that delivered the team to McMurdo on Dec. 27 will return for them and the biplane. They are expected to leave McMurdo Jan. 6.

# Profile Scientist defies geek stereotype

Boyle surfs, spins and, oh yeah, works on million-dollar astrophysics projects.

By Brien Barnett  
*Sun staff*

JoJo Boyle is a self-described hired gun of astrophysics.

As a faculty member at the University of Chicago, Boyle can manage a multi-million dollar project or can be called upon to fine-tune one instrument. Last year he served as project manager of the long duration balloon project called TRACER (Transition Radiation Array for Cosmic Energetic Radiation) and this year as a scientist with another balloon project called CREAM (Cosmic Ray Energetics and Mass).

Where others may be consumed by their work, Boyle's seemingly easy grasp of high-energy particle physics is but one part of his life.

Boyle will tell you his home in County Donegal, Ireland is a long way from anywhere, much less Antarctica.

Located in the northwest corner of the country, near the United Kingdom's troubled region of Northern Ireland, County Donegal was left to itself. The county was as remote as one could get on the island nation, Boyle said. Even so, travel was not abnormal.

"Growing up in Donegal, you have to travel," he said. "Even getting to Dublin was an adventure."

He grew up playing in the hills, rock climbing and bodysurfing on the waves along the coast, signs of his many interests in adulthood. He called Donegal a great place for boys to play and said he thinks of it often.

"My heart's very much there," he said.

But his choice of career and difficult economics at home led him to the U.S. When he left Ireland in 1999, the unemployment rate was near 25 percent.

"I said I can't do this stuff in my country," Boyle said. "The U.S. is the only place you can do it."

Boyle, who has his Ph.D in physics from University College, Dublin, now has visited many remote parts of the world including Antarctica. Natural curiosity and adventure took him to Africa and elsewhere in the world, but his role as a scientist for the last two years with long duration balloon projects brought him to Antarctica.

This year he served as a mission specialist, working with CREAM's cosmic ray detector. As soon as the balloon was launched he was free to leave. But until then, he had to know his part thoroughly as well as other parts in case of problems.

Last year Boyle wrapped up several years of managing the TRACER balloon project. That role was wide-ranging, from working on the science of the mission to creating budgets, from managing people to driving the van carrying the instrument and equipment. He had a part in all of it.

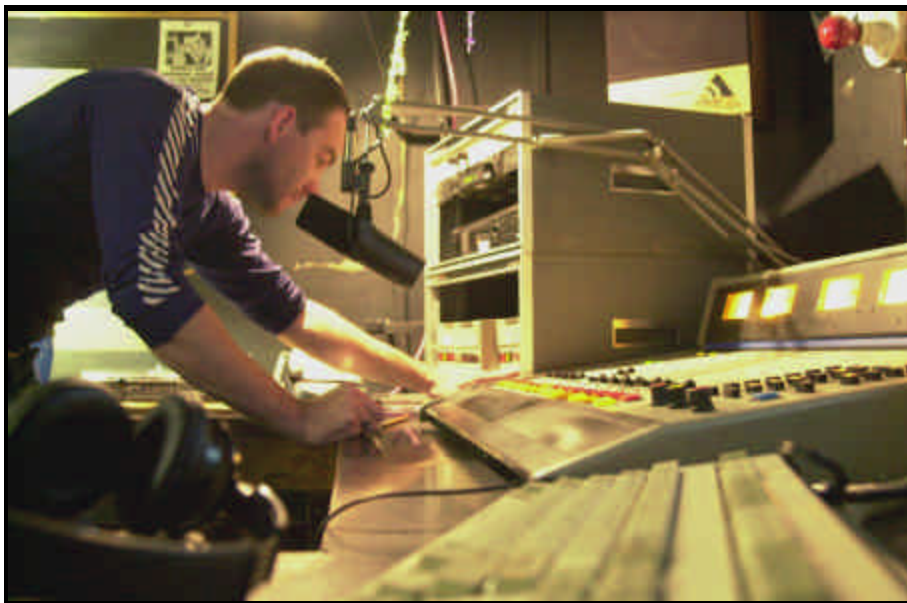


Photo by Brien Barnett / The Antarctic Sun

Scientist JoJo Boyle spins some late-night tunes on McMurdo's Ice Radio 104.5. Though he DJs in clubs in Chicago, Boyle said this was his first time "on the air," and he loved the feeling of playing music without knowing who was listening.

His career and his lifestyle have taken him around the world. His family and friends back home at first made a bit of a fuss over his world travels.

"They all used to think I was nuts," Boyle said. "I was the one person who ended up in places (they) hadn't been before."

A few years ago Boyle took 18 months off his highly focused work to travel in the East — places such as the Philippines, Hong Kong, China, Tibet, Laos and Thailand. He made his way to Australia and New Zealand before returning to work. Surfing was a key part of his travels.

"There's nowhere you feel more alive than when you're sitting on a surfboard," he said. "One of the most natural things you can do is sit out there on the ocean."

Boyle said he first learned to surf in 1993 and even then had his mind on his post-Ice surfing trip to Australia.

Back home in Chicago, there's not much surfing outside of some waves

on Lake Michigan. But another hobby keeps him occupied: he moonlights as a DJ.

Boyle and his two flatmates like to mix music in clubs. Boyle said the group, called "P, B and J" after the initial of their first names, are regulars at small clubs in the city. While on the Ice, Boyle guest-DJed at the radio station, keeping the late-night workers moving to his grooves.

From the frantic pace of the DJ booth to scuba diving to sitting on his surfboard on the swells, Boyle likes to keep active and find new things to hold his interest. And he can't be pigeonholed in the science world.

"I'm me," he said. "What you see is what you get. I like to have fun."

Check out Boyle's Web site: <http://donegal.uchicago.edu/>

***"I said I can't do this stuff in my country. The U.S. is the only place you can do it."***

— Astrophysicist JoJo Boyle on leaving his native Ireland