The Antarctic Sun

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

January 4, 2004

Photo, Poetry and Prose Festival

Blue-Eyed Shags, Cormorant Island
First place wildlife

Photo by Cara Sucher
Laboratory supervisor
Palmer Station

The Antarctic Sun Photo, Poetry and Prose Festival received more than 100 entries this year. The winning photos and writings start on page 7, but to fully appreciate the winning photos, view them in color at www.polar.org/antsun. There you can also download and print a calendar created from the winning entries. It's the Antarctic Sun*'s way of wishing our readers a Happy New Year.*

In time with the tides

By Kris Kuenning
Sun staff

Like women and werewolves, ice streams flowing from the West Antarctic Ice Sheet are at the mercy of the moon. A few years ago, researchers accidentally discovered a correlation between ice stream movement and ocean tides.

Ice streams are rivers of fast-flowing ice that form within a larger body of ice. Because the West Antarctic ice streams transport ice from the large expanse of the ice sheet to the floating Ross Ice Shelf, they hold the key to determining the stability of the West Antarctic Ice Sheet. Since the 1960s scientists have been studying the factors that influence these ice streams.

They knew the tide affected the ice streams where the ice streams go afloat. But researchers weren't expecting to find tidal variations 10 km and even 86 km upstream from the shore.

In 2001, Sridar Anandakrishnan of Pennsylvania State University led a group of researchers to put seismic recorders and Global Positioning System (GPS) receivers on one of the ice streams. They wanted to document the reaction of the ice to local earthquakes. GPS recorders measured

See Icetides on page 4

Measuring the cleanest air in the world

By Kris Kuenning
Sun staff

It takes the cleanest air in the world to tell us just how dirty our planet is.

Once a week at the National Oceanic and Atmospheric Administration's (NOAA) South Pole research site, Station Chief Jason Seifert or technician Glen Kinoshita walk into an area called the Clean Air Sector with a suitcase of glass bottles. Extending a black rod into the sky, they fish for the cleanest air in the world.

Inside the nearby research facility, instruments are continuously recording the levels of carbon dioxide and a range of other chemicals in the air.

The South Pole observatory is one of four baseline observatories operated by NOAA's worldwide Climate Measuring and Diagnostic Laboratory. Combined with information from Hawaii, Samoa, Alaska and the South Pole, it provides comparison points for the network of air sampling sites around the world.

"It's like checking a person's blood pressure. We are measuring the health of the world on a daily basis," said Russell Schnell, director of observatory operations for the laboratory.

Schnell describes the South Pole observatory as the "baseline of baselines."

"You've got to set standards from somewhere and we set ours from the South Pole," he said.

See Air on page 13

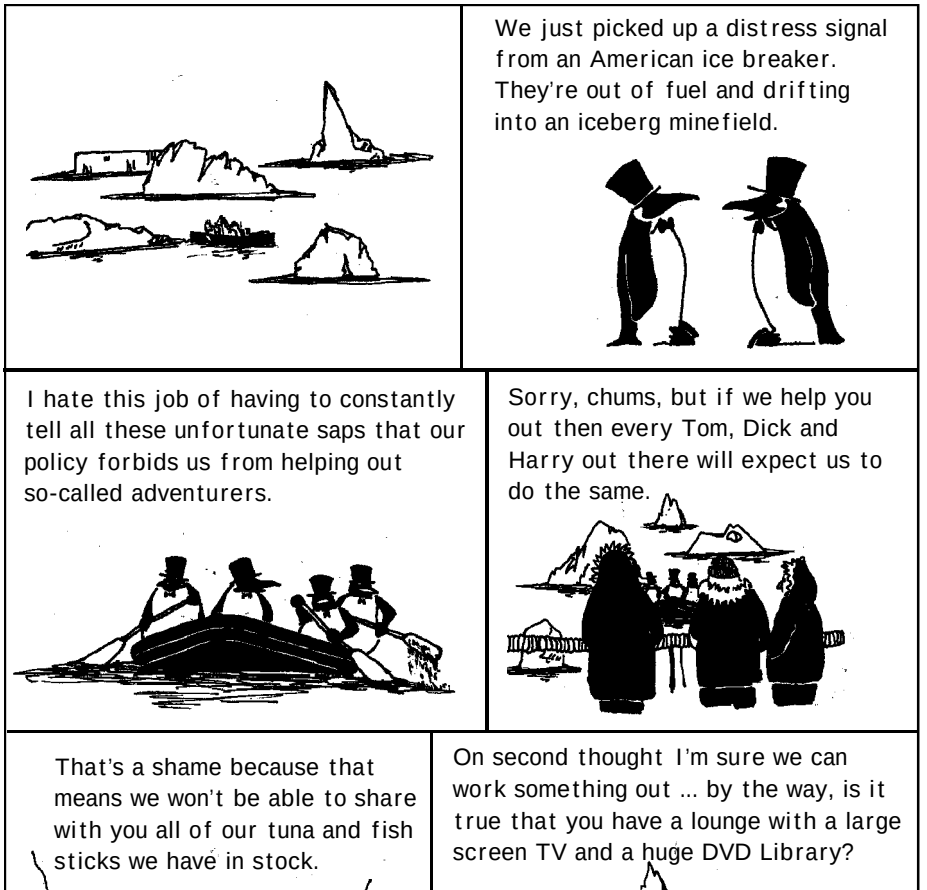
QUOTE OF THE WEEK

"The roommates that hang out together in their off time, stay together."

- Overheard in the hallway

INSIDE

Ross Island Chronicles By Chico



Cold, hard facts

Deactivated USAP stations and camps

Total: **22**
Stations with FOOD available: **12**
Stations with COOKING UTENSILS present: **4**
Stations with FUEL stocked: **14**
Stations with stored EXPLOSIVES: **1**

Total months per person of stored provisions at all deactivated stations or camps: **At least 162**

Of these stations, number operated/visited in the
1950s: **2**
1960s: **14**
1970s: **4**
1980s: **5**
1990s: **2**

Longest running of these stations: **Hallett Station near McMurdo Station was operated from January 1957 – February 1973**

Source: 2002-2003 Antarctic Treaty Report plans, report written Nov. 2002.

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Matt Davidson

Skuas survive on a harsh continent

By Kristan Hutchison
Sun staff

Seldom seen on postcards, skuas are the one Antarctic animal people try to shoo away. The tough birds know that on a harsh continent, sometimes you have to steal to survive. A skua will snatch the hat from your head or the bagel from your hand. Around McMurdo Station, the south polar skua are said to recognize blue dining trays and dive bomb anyone carrying one outside in hopes that the contents will spill.

"Evil skua," said David Stylianou, one of the dining attendants who has had skuas coming at him from above and behind when he tries to throw away the kitchen trash. "I've had them taunt me."

Melanie Conner / National Science Foundation

People loathe and admire the scavengers in equal measure.

"They're real smart, real sneaky and I think they're also pretty majestic in their own right," said Chico Perales, who draws skua characters into his Ross Island Chronicles comics occasionally. "I definitely would have one on my shoulder."

The skuas' brown and white coloring blends into the patches of dirt found along the coast of Antarctica, where the bird is usually found. Though they look like overgrown gulls, skuas are more muscular, with strongly hooked claws and powerful hooked beaks. The females are larger than the males.

According to The Antarctic Dictionary by Bernadette Hince, the word skua was adapted from the Old Norse "skufr" and has been used for northern predatory gulls of the genus *Stercorarius* since 1678. It was later applied to their southern cousins in the Antarctic, of the genus *Catharacta*.

From there the word has worked its way into the Antarctic vernacular. The scavenging seabird's name has become a verb, meaning to find something someone else has cast off, usually from the "skua" bins or the small building called Skua Central, where second-hand items wait to be retrieved.

The name skua also was adopted by a British fighter jet in the early years of World War II and, more recently, by a Swedish rock band.

Skuas have explored more of the continent than any other animal besides man. This season a couple of skuas flew to Beardmore Camp, several hundred miles inland, and last year a skua landed at the South Pole. Carolyn Doe recalls staring in amazement to see a bird fly over the flat, white landscape.

"It just blew me away," she said. "I like them because they remind me of ravens in that they're survivors."

It wasn't the first time a skua flew inland. Even Shackleton in his 1908 journal noted that when two members of his party were scouting the crevasses ahead on the Beardmore Glacier, "a bird, brown in colour with a white line under each wing, flew just over their heads and disappeared to the south. It is, indeed, strange to hear of such an incident in latitude 83 (degrees) 40 South."

The misguided skuas typically die, since they have no inland food source. The Antarctic treaty forbids disturbing or interacting with the wildlife, including feeding scraps to skuas.

Usually skuas live on fish, often stolen from other birds. They'll chase a bird until it regurgitates, then devour the half-digested meal. Skuas also eat the afterbirth of seals, along with the pups that die.

"They're just surviving," said Sal Consalvi who monitors environmental issues on station. "They serve a great purpose. Just imagine how many piles of dead seals there would be without skua."

Skuas also steal eggs and chicks from penguins for dinner, so penguin researchers end up knowing the predators' habits well.

"They definitely are very smart birds," said Susan Trivelpiece, who has studied them as part of penguin research on King George Island. "The ones at the penguin colony, some of them have learned to work as a team."

One skua will peck at the backside of a penguin until it turns around, then the second skua will dash in and grab the penguin egg. The Trivelpieces watched a pair of skuas use that technique to wipe out a colony of gentoo penguins in one year.

Pairs of skua will stake out a colony as their personal hunting ground.

"They're the ones that control the penguin territory," Trivelpiece said. "They divide up and defend it from other skua. It's a very desirable food source for them."

Any food source can become a territory. Several pairs of skuas took up residence at the Polish Arctowski Station, where they've been given names, Trivelpiece said. One skua pair controls the front door and another the kitchen door. A third couple keeps an eye on the generator building.

A skua dubbed Loki has been returning to the McMurdo runway for at least five years, stealing ballcaps.

"He comes every year and he comes right up to you," said Ann Pappas. "What he does with them, nobody knows."

Skua occasionally drag found items to their nests, made of clumps of lichen and grass lining bowls dug into the ground, Trivelpiece said. They nest from November to December. Some rookeries are tightly-packed with nests 2 to 3 meters apart on hillsides. Others spread out with about 150 meters between their nests. The nests are always situated with a view of the skua's territory.

"If they see someone coming into their territory, they just tear off to attack," Trivelpiece said.

Consalvi was attacked repeatedly when he went to Cape Crozier to plan the clean up of an old camp overlapping a skua rookery there.

"They would come down to eye level and just start coming in at you," he said. "It was eerie because you didn't know when one was going to come from behind."

The cleanup crews working at Crozier since then have faced the skuas' continued attacks, often with stinking liquid bombs from above.

Unlike penguins, skuas are faithful to a single mate, finding a new one only if their first mate dies.

"We've had the same pairs and same territories for many, many years," Trivelpiece said.

The skuas lifespan is thought to be 65 to 70 years. In the 1980s a skua was found with an old British leg band. The letters were worn off, but from the style of band the Trivelpieces could tell it had been put on at least 25 years before, and they continued to see the same skua around for another 15 years.

When the south polar skuas leave in April or May, they set out on a long circuit of the Atlantic or Pacific basins, depending on where they are starting. Trivelpiece has received reports of skuas she banded spotted in West Africa, Scotland, Japan and the California coast. South polar skuas also have been spotted at sea off the coasts of Alaska and Greenland.

Icetides From page 1

glacial movement every 15 seconds. Before that, glacial movement had only been checked on a monthly or yearly basis.

"When we got the data back, we noticed these stop-start events," said research assistant Don Voigt.

They thought the strange behavior might be attributed to Earth tides.

"The Earth does bulge with the moon but GPS takes that into account," Voigt said.

The connection was hidden by Antarctica's unusual tide pattern. It wasn't the Earth, but the sea that was causing the movement. Ocean tides are controlled by the position of the sun and the moon, and in the Ross Sea and beneath the Ross Ice Shelf there is one strong tide per day. The "normal" twice-a-day tide is also present, but it is much weaker. The GPS motion data of the ice stream showed a striking link to the rising and falling of the sea.

"That was a fun moment," Voigt said of the discovery.

The initial data was enough for Anandakrishnan to publish his findings, which sparked the interest of Bob Bindschadler, a glaciologist and senior fellow at NASA Goddard Space Flight Center, who had noticed a slowing down and speeding up on the Whillans Ice Stream.

"We were astonished that a one meter tide variation can bring the ice stream to a halt in such a short period of time and that it can accelerate to full throttle in about one minute," says Bindschadler in a Penn State press release. "It underscores the sensitivity of the system to extremely modest forcing."

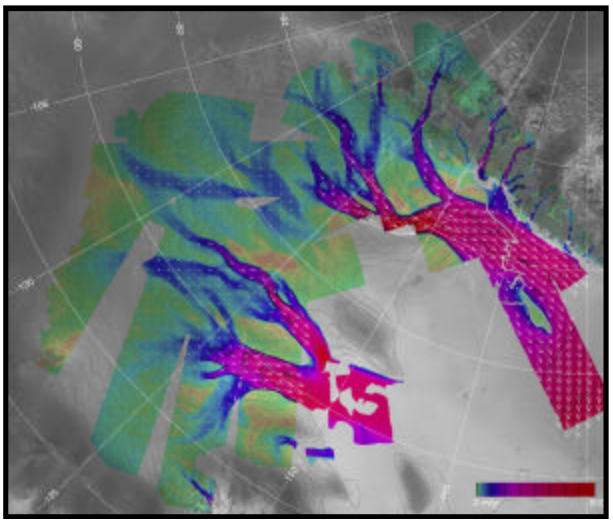
The researchers have now joined forces, with a new National Science Foundation grant, to learn more about this unexpected tidal force.

Some ice streams are moving rapidly, some are slowing down and others have stopped completely. Researchers have looked at a number of ice streams flowing from the West Antarctic Ice Sheet and discovered that Whillans Ice Stream exhibits the most bizarre behavior because it actually stops dead and then slips for a short time, moving large distances, before it stops again.

Anandakrishnan and Bindschadler, working with others, combined data from various ice streams and produced a model of how the tides control the slip-stick motion. If there were no tides at all, they predict the slip events would occur every 12 hours.

Instead, the ice stream remains still for 18 hours and then slips for 10 to 30 minutes. Six hours later, it slips again and halts again. The first slip is just short of high tide and the second slip happens when the tide is falling.

Photo by Ginny Catania / Special to The Antarctic Sun



Satellite image provided by Ian Joughin / Special to The Antarctic Sun

At left, the movement of the ice stream leaves a dark, heavily crevassed area called a margin. At right, satellite technology was used to compile this image, which shows the speed at which ice streams flow from the West Antarctic Ice Sheet.

"The tide rises and puts pressure upward on the ice stream," Anandakrishnan said. "Somewhere in the middle, the ice stream sticks."

Ice moves in three ways. Internal deformation happens when the ice spreads under its own weight like pancake batter. This is happening on the West Antarctic Ice Sheet. Internal deformation is very slow, a few meters per year. Warmer, thicker ice moves faster.

Another way ice moves is through basal sliding, where the ice literally slides over water or a wet sedimentary layer at its base. The pressure of the thick ice lowers the ice's melting point, creating a slippery layer of water at the base of the glacier.

Sediment, or rock debris under the ice sheet, can also cause sliding. A soft sediment bed can work just like water to carry the ice forward.

The researchers suspect that something in the bed of the Whillans Ice Stream is catching the ice and holding it still until the tide is low enough for the ice stream to fall forward with a jump, while the Bindschadler ice stream is better lubricated. They are trying to determine if the tides are pushing through the watery base of the streams. The water pressure below Whillans Ice Stream fluctuates as far as 400 km upstream.

This year, 21 GPS receivers on the ice streams will document two 28-day lunar cycles. Researchers want to see how the movement is varied with the smallest, or neap tides and the largest, or spring tides, in the monthly cycle.

"We want to see how the effect varies with the strength of the tide," Voigt said.

To provide a reference for the work, some of the GPS receivers have been placed in areas that aren't moving at all and four have been placed on floating ice to record the vertical movements of the tide.

"We can model that," Voigt said, "But it's nice to have the record."

The other receivers have been placed 10 km upstream from the point where the ice crosses the shore.

New satellite imaging technology gives the researchers a better overall picture of the way the ice streams form and move, draining the polar plateau of its accumulated ice stores. The brightly colored images separate the still ice from the moving, revealing how the ice sheet flows out in a series of branches to feed the ice streams.

The discovery of the tidal effect on the ice streams reinforces the connection between the ocean and the larger ice sheet.

On the Antarctic Peninsula, the recent collapse of the Larsen ice shelves caused glaciers farther up the system to accelerate. This example shows how the ice shelves hold back the stream of downward flowing ice. If the Ross Ice Shelf were to collapse, researchers predict the West Antarctic Ice Sheet would drain quickly into the sea.

"We've always been concerned about the stability of the Ross Ice Shelf," Voigt said. "It has the potential to change the climate or change the sea level."

NSF funded research featured in this story:
Sridhar Anandakrishnan, Pennyslvania State University, www.geosc.psu.edu/~sak/Tides

around the continent

SOUTH POLE

Polies race around world

By Peter Rejcek
South Pole Correspondent

One way or another, about a hundred Polies made it around the world for Christmas.

They biked. They skied. They ran. They sat on several living rooms worth of couches and recliners hauled behind a tractor.

The annual Race Around the World, a two-mile trek circling the geographic pole at 10:30 a.m. on a crisp Christmas morning, drew both serious contenders and the light-hearted.

Some participants, for instance, while running hard in air chilled to -34 C, took the race to surreal heights. One bearded runner seemed a step out of fashion in his powder-blue flower dress. A masked avenger apparently got the wrong instructions and ran the race in the opposite direction of most of the field.

A group of wishful-thinking Polies had high hopes of taking the trip a few miles farther in a balloon attached to the back of a sled. "Destination Christchurch" was written on a sign on the basket. Aside from the humor, there was some serious racing going on.

Photo by Andrea Dixon / Special to The Antarctic Sun
A tractor pulls a sled full of people past the dome.

Ryan Myhr led the pack with a time of 14:15, about 13 seconds ahead of his nearest competition, Bill Holzapfel. Coming in third overall was Dave Tashner.

In the women's race, Molly Hutsinpiller kept Liesl Schernthanner one second behind her to finish in 16:14. Adrianne Gass finished third in 16:50. Schernthanner was last year's fastest female Polie.

Hutsinpiller, who summered at Palmer in 2000-01, has run four marathons, but said the South Pole race presented some tough challenges.

"The toughest part was breathing hard in the dry, cold air," Hutsinpiller said. "I think a lot of us were coughing and sneezing for several hours after finishing from the shock of that cold air to our airways.

"It was great to be running outside with a bunch of other people," she added. "I liked the combination of runners, skiers [and] costumes."

Dana Hrubes was the top finisher in the 50- to 60-year-old category, with a time of 17:45, while venerable veteran South Pole resident Neil Conant didn't show any signs of slowing down in the 60-plus age bracket, clocking in at 19:20.

By virtue of their victories, Myhr and Hutsinpiller have the option of running in one of two races held in McMurdo this month, according to Bill Meyer, recreation supervisor in McMurdo. There's either the Scott's Hut 8 km on Jan. 11 or a full marathon on Jan. 25.

"The choice is up to the runners," he wrote in an e-mail. The 8 km run is held in town, while the marathon follows the ice roads, which "depending on snow/ice conditions, can be like running in mashed potatoes," Meyer wrote.

All South Pole participants received T-shirts during a ceremony in the new dining hall.

Photo by Troy Wiles / Special to The Antarctic Sun
People at South Pole Station make their way along a path going "around the world."

PALMER

Christmas, Hanukkah

By Kerry Kells
Palmer Station correspondent

The holidays at Palmer included decorations around station, ornaments for the Christmas Tree, a Hanukkah dinner, cookie decorating, Christmas dinner and the last-minute completion of gifts for the annual gift exchange.

For the Hanukkah celebration, a few of our community members got together as guest chefs to prepare a traditional dinner which included matzo ball soup, brisket, potato latkes (pancakes) and kugel.

Our chef even prepared jelly doughnuts for the celebration, which recalls a miracle in 164 B.C. when a one-day supply of oil

See Continent on page 6

the week in weather

McMurdo Station
High: 45 F / 7 C Low:25 F / -4 C
Wind: 28 mph / 45 kph
Windchill: -4 F / -20 C

Palmer Station
High: 43 F / 6 C Low: 32 F / 0 C
Wind: 40 mph / 65 kph
Windchill: 19 F / -7 C

South Pole Station
High:-4 F / -20 C Low: -14 F / -25 C
Wind: 26 mph / 42 kph
Highest physio-altitude: 3,141 m

Continent

From page 5

in the temple in Jerusalem burned for eight days.

The dinner was a tasty success.

The gift exchange included an assortment of items made on station or brought down, wrapped and put under the tree, the contents a mystery. A few gifts included a handmade box with hinged lid, a handmade knife with leather case, a framed photograph of two blue-eyed shags, a framed poster of an historic map of Antarctica, a humidor box for cigars, a hand knitted wool hat and a small box containing a wooden puzzle. Participating in the gift exchange was a fun exercise of holiday spirit.

The scientists have continued their sampling and research and the support personnel have returned to work. A week ago we gave a tour of station to visitors from the yacht *S/Y Sarah W. Vorwerk.* Eight passengers and the owners from the 54-foot yacht toured the station. The passengers included people from Poland, the Netherlands, Germany, United States, United Kingdom and Switzerland. After New Year's, the *Vavilov* cruise ship arrives for a tour of station. On Jan. 4 the *Laurence M. Gould* will arrive, then depart to begin the month-long Long Term Ecological Research cruise. We at Palmer send our wishes for a Happy New Year to McMurdo and South Pole Stations and to everyone in the Antarctic program.

SHIPS

Polar Star, Polar Sea

By LCDR April Brown
Mac Ship Ops/Coast Guard Liaison

Polar Star has been backing and ramming, over and over, making big ice in McMurdo Sound into little ice in the turning basin. She is doing a fabulous job of it! The crew is working hard to keep the "Big Red Tub" in stealth mode.

What you don't see yet is *Polar Sea* whittling away at the channel entrance to bring herself and the whales, penguins and such closer to Mactown. *Polar Sea*'s crew is of course working just as hard as the *Star*'s in typical Team Coast Guard mode.

With the *Nathaniel B. Palmer* at the ice edge last week for logistics and to swap out science parties, the sea ice has become a busy place.

The Coast Guard Aviation Detachment, supporting the Dolphin helicopters, is ashore here in McMurdo and is off to a running start. We thank all for the wonderful support we've received to get those operations going.

The plan for now is that *Polar Star* will pull into the ice pier Jan. 6 to take on about 1.9 million liters of JP-5 fuel, and take a couple days reprieve from the shaking.

They will get underway Thursday morning sometime.

Polar Sea's first portcall date is still in a throw of the chicken bones.

Ship Ops out.

The U.S. Coast Guard icebreaker Polar Star *takes a pause from crunching ice at the far side of the turning basin near Winter Quarters Bay within view of McMurdo Station. The breaker's sister ship, the* Polar Sea *is at the ice edge, about 30 km northwest of the station and is preparing to begin operations this week.*

Photo by Brien Barnett / The Antarctic Sun

Nathaniel B. Palmer

Compiled from ship reports

The *Nathaniel B. Palmer* continued south through quite a bit of ice Dec. 26, but there was very little pressure and enough open water to make decent time. The ship reached the Ross Sea polynya, an area kept ice-free by wind and currents, making it easier to progress south to the study area. There, the crew took water and other samples.

The ship continued south in the polynya to a rendezvous with the US Coast Guard helicopters near Cape Crozier, where a needed battery was transferred. The science work continued in calm weather.

Laurence M. Gould

Compiled from ship reports
by Skip Owen

The *Laurence M. Gould* enjoyed calm weather and a smooth ride north to Punta Arenas, arriving Dec. 29. The ship remained in port, refueling and preparing for the Long Term Ecological Research Cruise starting Jan. 2.

Continental Drift

What's your strangest Antarctic dream?

"I had a dream that I was in Tomales Bay and the migrating penguins came flying in to nest. They were flying beautifully, but they had a hard time landing."

Kristin van Konynenburg, *Palmer doctor from Port Costa, California, third season*

"I came at Winfly and I kept having a series of dreams involving strawberries…I would get to the store and they would all be gone or moldy."

Megan Whitmore, *Pole heavy equipment operator from Leavenworth, Washington, 9 seasons*

"I dream about the night and stars all the time."

Marianne Okal, *research assistant at McMurdo from Chicago, Ill., first season*

Photo, Poetry and Prose Festival

Room with a view
First place scenic

Photo by Eric Kees,
worked in McMurdo medical 1993 to 1997,
now a medical microbiologist in Oregon

First place haiku

Lingering iceberg
South wind cleaves her snowy breast
Girl becomes woman

By Doug MacAyeal
glaciologist, McMurdo Station

Second place haiku

Last Flight. Pups find life.
Tania Caspa Oden live.
Winter's bright delight.

By Kay Lawson
1983 and 1985, McMurdo Station

Photography judges

Joan Myers is a fine-arts photographer and was a National Science Foundation artist grantee during the 2002-2003 season. Many of her photos can be seen at www.joanmyers.com.

"It was a wonderful pleasure to see the work and I congratulate everyone!"

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

"The pictures were all great and it was a challenging job to select the best ones. I spent a couple hours looking carefully at each image. Kudos to all who entered. Seeing all the shots really makes me want to come back."

Windy City from Castle Rock
Third place scenic

Photo by Bill Yates,
Chaplain,
McMurdo Station

Photo, Poetry and Prose Festival

Third place poetry

The snow falls ...
in your arms I lay
wrapped in your warmth
my mind drifting away

Thinking of memories
times of the past
relishing in our love
knowing it will last

Through all the storms
mother nature calls
knowing I'll be in your arms
when the snow falls...

By Danielle Raymond
materials person
McMurdo Station

Iceberg, Loudwater Cover
Second place scenic

Photo by Cara Sucher,
Laboratory supervisor,
Palmer Station

A Storm Calling
First place poetry

Today the wind is a wolf at the door
that runs wildly from place to place
herding icebergs like huge frightened sheep
across the roughed-up water
toward their final abuse

Wavering seabirds hang on to their wings
but cannot resist the offer of the wind
flying just above
the brash ice as it rails
against the rocks

Across the harbor
the glacier severs its calves
to crash mercilessly
like stampeding bison
over the edge

Hanging on with all its strength to the pole,
the high, exposed flag of Antarctica
unravels its edges
and begins to fly away
thread by thread

We put up our best defense
and huddle
against the rioters
though I admit
only to you
that I am willing
to exchange my body's heat
to become one of the
wild ones.

By Cherie Wilson
environmental assessment technician
McMurdo Station

Antarctic Interlude
Second place poetry

Pierced is my mind
Oh so wondrous the sight
Of the torture of ice
Of the stark snowness of white

The blue hue of far mountains
Of the infinite scene
Of the frozen life fountain
And my smallness of being

Of the staggering stillness
No movement to see
Of the plunge of snow past
For its taste of the sea

Of the weathered rust rock
Of its volume and form
Of its birth and destruction
So the mighty shall fall

Of the innocence of emperors
No war and no green
Of their cry for my answer
Of a sense of between

Of the skua and seal
Of my time in their space
Of the things we do bring them
Along with our haste

In the cheek slashing chill
I ponder our nurture
I dwelt of the past
Should I weep for the future?

By Murray Smith
Helicopters NZ, Scott Base

Photo, Poetry and Prose Festival

C-17 at Sunset, Pegasus Field
First place other

Photo by John Weaver,
heavy equipment mechanic,
McMurdo Station

Return of the Skua

First place nonfiction

A migratory breed returns to Ross Island each austral summer. Characterized by their transient existence, part of the year here, part spent in warmer climes, and part spent traveling the world. Associations are formed within the flock that take on the appearance of permanence. But it is an illusion. Individuals that disappear are missed only transiently. Associations shift within the flock to accommodate. The migration pattern continues unaffected by individual losses.

Skua are tough, ruthless, and highly skilled. Ideally suited for the harsh, unforgiving environs of Antarctica. Self-sufficient survivors, parents produce two eggs each season, although only the stronger progeny is nurtured. Weakness is not tolerated.

The migratory human population mirrors these same traits, or at least the ones that thrive here do. A breed of survivors themselves, they return to Antarctica for reasons as varied as their skills. The ability to put themselves ahead of all other concerns is an overriding trait.

As a second season member of the migrating flock, I felt ready to take on the challenge of living and working on the 7th Continent. Felt ready to greet other members of the flock as they cycled through McMurdo Station headed to or from distant parts of the globe. Felt as if I'd know the place since spending 5 months here last season.

Instead I find myself walking with ghosts. The setting is familiar, but the feel of the place has changed. Friends made last season, really good friends, are now just acquaintances or worse yet, strangers. The perceived closeness diminished or perhaps never was.

What happens on the Ice stays on the Ice. That means that whatever happens here doesn't matter. I'll be one of the individuals that disappears from the flock. No one will notice. The migration will continue unaffected.

By Susan MacGregor,
senior analytical chemist, McMurdo Station

Eclipse
Second place other

Photo by Tom Cohenour,
construction coordinator,
McMurdo Station

Mac at night
Third place other

Photo by James Pappas,
flight mechanic, McMurdo Station

Photo, Poetry and Prose Festival

Solitude
First place people

Photo by David Schutt, electrician apprentice, McMurdo Station

Windy Day, Old Palmer
Second place people

Photo by Cara Sucher, Laboratory supervisor, Palmer Station

The Things I Left Behind

Second place nonfiction

Doing laundry every three days can be worse than the pain in the butt that comes along with a short supply of panties. After having moved four times in the last eight months, I now know that underwear, in all shapes and sizes, isn't the item to skimp on—even when you're trying to travel light.

When I started packing for my move to Antarctica, some things were cast aside quickly, like the Carhartts I slough off after a long day of shoveling snow. Other things, however, have required a slow pulling away. Still attached to me like rubber bands stretched from the continental U.S. to McMurdo, I know that these, too, will eventually brittle and break away.

I've got a 1970 Volkswagen bus with a flat tire stashed in a friend's central LA carport, and my parents in Louisville, Kentucky have turned their driveway into a parking strip for my Toyota. Their basement now houses an assortment of other abandoned items like my sewing machine, a beach mat, and my favorite red dress coat.

On the first of every month, I send a check for $73 to Garden of the Gods Self Storage in Colorado Springs, where the bulk of my possessions are stacked to the ceiling of an insulated unit. A jigsaw puzzle of couches, chairs, pots and pans, the bulk of my belongings remain here. A few miles away, the house I used to own sits on a quiet street across from a park. The man that I used to own it with likely still smokes his cigarette first thing each morning on the front porch that peers over purple irises I planted there.

By the time I left Christchurch, I was teetering closely to my 75-pound cargo limit. But, I'd left a lot of baggage behind.

By T.J. Fisher
general assistant
McMurdo Station

Some things I forget when I am here where human footsteps have not tread

Third place nonfiction

I'm not the first to come here, of course, but with every walk I take in the endless expanse comes an overwhelming sense of raw newness… I feel like the ice I traverse has never been walked upon, and the air is so fresh that no human lungs have ever inhaled such purity. Everywhere is white – the icy ocean, snow covered hills and peaks white and the seals are white – the whole landscape is like an empty canvas devoid of humanistic impressions. Everything is dead and empty, falling prey to the cold and the wind – man has not defeated nature here – pure silence. Here it is, as it was, before humans and machines.

The ice calls the shots, and pays no mind to anyone's wishes – not even those of governments, who are forced to all but shut down operations here for over half of each year. It's an awesome thing to see firsthand – the power of Mother Nature's fiercest tools, wind and cold – the majesty of time sculpting landscapes. I am witnessing something special, something that has not changed much since prehistoric times, something very life affirming and earth-affirming.

By Jeff Khurgel
dining attendant
McMurdo Station

Photo, Poetry and Prose Festival

Everyday
Third place people

Photo by Kaneen Christensen, environmental remediation, McMurdo Station

The Culture of Mac Town
Second place microfiction

Superficial, shallow meaningless couplings. . . that delicious build up of tension, the dance of getting to know a stranger, the sparring and flirting and parting with no obligation to ever repeat the act. That's Mac Town culture.

There can be no other place on the planet with such a high concentration of these couplings on any given day. Breakfast with FNGs just in town for one week, lunch with the geo-physicists scheduled to traverse the Polar Plateau, supper with just yourself to indulge in people-watching over soup and hearty home-made bread. Everyday and every night potential interactions shuffle.

Southern Exposure, the last true testosterone zone in Antarctica, is a perfect spot to observe or perhaps arrange these couplings. I go there to watch the boys play. Burly men with long, soft tresses lean and stretch to line up the perfect shot, stroking the stick with a practiced hand or thrusting with the release of frustration. I could watch them endlessly. And often do until last call.

The hard part is the conversation. Tiresome introductions, names to try to remember, people sorting and filing you according to what you do and how many seasons you've deployed. I'd much rather just watch.

But there is that one young man with beautiful manners and such expressive eyes. I watch him like a cat eyeing a bowl of cream. The way his hair falls as he moves, his gait and stance and sad expressions. He has a habit of resting his chin on his crossed forearms as he sits at the bar and looks up into my eyes. A seasoned veteran, he fits the culture here. Which is a shame. I wouldn't mind actually getting to know that one.

By Susan MacGregor
senior analytical chemist, McMurdo Station

The Box
First place microfiction

The flag's up. I'm on the list. I got a package!

Her name graces the return address label. I wait a moment to open it, cherishing the parcel that her soft hands caressed only a few weeks ago. I cut the packing tape and a ray of light pierces through the slit, causing me to blink from its intensity. Cautiously, I open the flaps and before me lies the complete embodiment of inspiration, a sight I could see only in the vision of slumber for the past four months.

A mountain, the storybook type, mighty and bold fills the background with a perfect peak on top and a crown of snow. A sunset paints the pallet behind, orange and red, purple and gold, bleeding into the deep deep blue of a retreating sky.

The earthy aroma of autumn foliage permeates the air around me, encouraging me to look deeper into the box. A stream bubbles alongside a dewy meadow and a cluster of grazing deer. A grove of yellow aspen quakes lightly in the warm breeze, surrounded by a forest of spruce as far as I can see. A movement in the foreground draws my attention to her face. With an inviting smile and eyes of emeralds, my wife appears.

By David Schutt
electrician apprentice
McMurdo Station

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 masters in English literature with a creative writing emphasis.

Prose judges

Guy Guthridge is the NSF program manager in charge of the programs bringing artists, writers and teachers to the Antarctic. He also oversees publication of NSF materials about the Antarctic program.

Karen Joyce coordinates computer support for the Crary Lab by day and writes at night. She's completed a comic novel about life in McMurdo and repeatedly won the writing contest in past years.

Photo, Poetry and Prose Festival

An Ice Tale
Third place microfiction

Casey pulls on her balaclava and I'm regretting I haven't brought mine. The breeze nips my ears and sometime after they go numb my mind shifts from our rambling conversation to frostbite.

What is she saying?

Chocolate brown stones crunch under our boots. Wind presses my clothes against my body, trying to find a way in.

"What do you think?" she says, finishing a thought I've lost.

And I think I say, "It's incredible," but really, I don't know.

Because I can't stop Casey's eyes from looking like God made light only for them, and the rest of us see as an afterthought.

"Stop looking at me that way, or..." she says. The wind takes her voice and wraps it around Ob Hill.

We are here. We are nowhere because we chose to be here. And neither of us can explain why. Coming was impossible but simple, as natural and necessary as breakfast.

"Or you'll what?" I say, forgetting myself around the curve her neck makes under the fleece.

"Come here."

She leads me into the wind shadow of the Discovery Hut, says, "What do you think?"

I think I'll forget to breathe if she smiles again.

"This is sort of my whole life," I say, looking from Vince's cross to the hut, Arrival Heights, McMurdo across Winter Quarters Bay. "All I ever wanted was to be here, where they stood. In the story."

She has to stand on tiptoe when she kisses me and her lips, first cold, warm to my breath.

It takes seconds to put my thoughts back into my head so when she says, "That didn't happen," I don't know what she means.

"Still a frog?" she adds.

I think, "Part of history," but can't say it.

I'm history, now.

By Joe Mastroianni
Comms/IT Mgr on 0-314-M
McMurdo Station

Adelies on the run
Second place wildlife

Photo by Eric Kees,
worked in McMurdo medical 1993 to 1997,
now a medical microbiologist in Oregon

Nursing pup
Third place wildlife

Photo by David Schutt,
electrician apprentice,
McMurdo Station

A lifetime of atmospheric research

By Kris Kuenning
Sun staff

Like many scientific discoveries, collecting air samples from the South Pole has had as much to do with luck as foresight. As a graduate student, Charles Keeling began bringing flasks to sample South Pole air in 1957.

In 2002, the president awarded Keeling the National Medal of Science, the country's highest award for lifetime achievement in scientific research for his role in discovering carbon dioxide accumulation in the atmosphere.

His work started with atmospheric testing at the South Pole and Mauna Loa observatory in Hawaii and has developed the longest continuous record in the world of atmospheric carbon dioxide concentrations. This record is considered to be a reliable indicator of increased concentrations of carbon dioxide in the middle layers of the troposphere. This trend is widely recognized as the "Keeling Curve." Keeling also was the first to determine how much of the carbon dioxide from fossil fuel combustion is accumulating in the atmosphere.

The methods and equipment Keeling used to obtain these measurements have remained essentially unchanged during the 45-year monitoring program.

Photo by Kris Kuenning / The Antarctic Sun

Jason Seifert walks into the clean air sector to collect samples.

Photo by Kris Kuenning / The Antarctic Sun

NOAA station chief Jason Seifert fills a glass container on the roof of the Atmospheric Research Observatory at the South Pole. The samples are shipped to research institutes around the world for analysis.

Air

From page 1

Air sampling has been done at the South Pole since 1957, when the International Geophysical Year kicked off the modern era of Antarctic research.

The current observatory, first occupied in 1997, is about 500 meters upwind of Amundsen-Scott South Pole Station at the edge of the clean air sector, an area kept free from human activities. Even foot access to the clean air sector is strictly limited. Aircraft flight paths traversing the sector are discouraged and a 100-meter vehicle exclusion zone exists even downwind of the building.

A tourist flight over the South Pole during November's eclipse strayed into the sector and spikes in carbon dioxide were almost immediately noticed by NOAA's Boulder, Colo. monitoring center. The first floor, part of the second floor and much of the roof of the building are used for the NOAA climate monitoring.

The data collected by NOAA's network of observatories is used to assess climate change, ozone depletion, and helps to develop and test diagnostic and predictive models.

The records show how the atmosphere has been affected by industrial emissions over the past 50 years, revealing general trends, like the 30 percent increase in carbon dioxide. The data also help explain specifics about the transportation of emissions around the globe. For example, particles from burning in the Northern hemisphere are detected at the Pole about a year later. Scientists believe carbon dioxide generated by the burning of fossil fuels contributes to the greenhouse effect, which traps the sun's heat in our atmosphere. The atmosphere acts like the glass in a greenhouse, allowing the energy from the sunlight in, but trapping the heat that reflects back into the atmosphere.

The South Pole observatory also looks at solar radiation. Instruments on the roof measure the energy received from the sun as well as the energy emitted from the surface.

Atmospheric studies at the South Pole have also been important for understanding the factors that create a hole in the ozone layer above Antarctica each spring.

Using balloons and ground-based equipment, NOAA measures ozone at the surface and up through the atmosphere. Equipment also monitors ozone-depleting chemicals, called halocarbons, on an hourly basis. Production of many of these halocarbons has been banned by international agreement and the growth rates are decreasing.

From the roof of the Atmospheric Research Observatory, technicians fill containers of different shapes and sizes to send to research institutions around the world.

Recently, new sampling techniques have extended NOAA's atmospheric record back to the early 1900's.

"By drilling down into the snow, we can collect large volumes of trapped air at different depths to 120 meters, where the snow turns to ice. These air samples are analyzed in Boulder and also kept as an archive for future analysis," Schnell said.

The South Pole data record has contributed to a comprehensive catalogue. The operations are expected to continue for at least the next 100 years, Schnell said.

NSF funded research featured in this story:
Dave Hofmann, National Oceanic and Atmospheric Administration, www.cmdl.noaa.gov.

Profile

Physicist takes her science with a cup of tea

By Brien Barnett
Sun staff

Techno-laced vampires, the Lindy Hop and ghostly space particles converge in the mind of Anna Davour.

In November, the 27-year-old researcher from Sweden, sipped a glass of red wine at McMurdo's coffee house, where she'd been hanging out during delays caused by bad weather.

She's in Antarctica to help calibrate electronics for the international team that studies high-energy particles using the Antarctic Muon And Neutrino Detector Array (AMANDA) telescope at the Pole.

But particles are only part of her life. Davour said her spare time includes reading and buying books, writing for a science fiction fanzine, organizing sci-fi conventions, dancing the Lindy Hop and Tango, and singing haunting vocals about vampires for a dark electronica band based in Uppsala, Sweden.

While at McMurdo she was passing around a CD by her band, Elektrubador. A few barristas played it over the coffee house P.A. during their shifts. The MOOG-like sounds from the keyboard melded with Davour's airy vocals to form a subcurrent beneath the chatter. The band is a project, but it seems books are her passion.

"I know that some people say scientists shouldn't have spare time. I couldn't live without it," she said. "I read books and collect books with my husband. I write a lot."

Science fiction is her serious hobby. She met her husband Andreas at a monthly science fiction club meeting. They bonded over their mutual love of author Michael Moorcock.

"(Andreas) just turned up at a monthly club meeting and it was just like he was one of the first that really knew things about science fiction," she says with an emphasis on "knew."

The conventions she attends and helps organize are not those Klingon-speaking affairs. She prefers ones with serious literary focus. Her favorite author at the moment is Kim Stanley Robinson, whose recent work includes a novel called "Antarctica," but is probably best known for the "Red Mars", "Green Mars," "Blue Mars" series.

She writes for and edits a personal fanzine and avidly follows the science fiction genre's current trends.

"The big thing now is not called anything, but it's a wave of British authors doing space opera in a more serious way, a hard, technological way," she said.

Back in her non-fiction life, Davour is one of a small, but growing number of women in the field of astroparticle physics. It's not easy to explain what the field is all about, but Davour seems to do an excellent job of it, beginning with what the field is and isn't.

Photo by Kris Kuenning / The Antarctic Sun

Anna Davour kicks up her heels at the South Pole.

"It's not astrophysics. It's called high-energy physics," she clarified. "High-energy's about very small particles and astrophysics is about stars. They are connected, they are related, but formally I'm a member of the high-energy physics group."

Davour is now pursuing a doctorate from Uppsala University, but is approaching her future career one move at a time.

"What's difficult in science is it's really easy to feel inferior because there are a lot of really bright brains to compare yourself to," she said.Her faith in her chosen career actually stemmed from a failure in the field, an experience she calls "the year I tried to be an accelerator engineer."

After she finished her undergraduate studies, she went to work on an accelerator, which is a large-scale device that generates particles to learn more about them and to test scientific instruments.

"They gave me a computer, a room at the end of the corridor and told me to work," she said. "Basically, it was difficult to find the right angle without any experience. I felt that I couldn't really contribute anything."

She hammered away at it, but eventually frustrated, she walked up to her boss and said she no longer was interested in the job.

"I stood there without a job. I thought 'I need more experience, I can't go on like this. I have to be part of a group, not all alone.' that's why I applied for a PhD position," she said.

"Working all alone with something I didn't know how to do. I didn't feel good at it at all. I don't say that I feel really good at what I do now, but it's different."

Her adviser at Uppsala University, Professor Allen Hallgren, said Davour's interest in AMANDA, work with a previous experiment and colleagues' recommendations gave her the edge in being accepted into the doctoral program. She competed against students from Sweden and other parts of the world for the one open position.

"I think that in Anna's favor was that she had a great interest, in particular for the AMANDA telescope, interest that covered also the experimental part," Hallgren noted.

Now she works with the other members of the AMANDA team to check the time it takes detectors in the ice to sense a laser beam sent into the ice and return a signal to computers back on the surface. The test allows for precise timing that is used to reconstruct the direction of the track of incoming particles.

"That's how we separate the signal from background (noise)," she said explaining the purpose of the tests.

The AMANDA telescope is composed of an intricate network of detectors, a roomful of hardware and kilometers and kilometers of wiring. The more precise the measurements, the more accurate are the data that help scientists determine the characteristics of a given particle. Davour's interest in all this is a type of particle called a neutralino.

The neutralino is a hypothetical particle, foreseen by "supersymmetry", an extension of the standard model of particle physics. Researchers are looking for the neutralino but do not yet know that it exists. Davour said some believe that this particle could be the missing mass of the universe called "dark matter." Cosmologists have results that seem to mean that the universe contains much more mass than we can see. It's a quest for a sort of astronomical holy grail.

"Most days I like the position I'm in now," she said. "Half of the time it's not that fun. No job is fun everyday. You have to do these boring things like writing shell scripts and debug programs that don't work."

Antarctica is a new experience as well. She compares the atmosphere at McMurdo to summer school, a youth choir camp or a rock festival with people coming and going and sharing stories from all over. It's the natural things that made the most impression.

"It's a very beautiful landscape, but it's warmer than I expected," Davour said.

As for the next step after she obtains her doctorate in the next few years, Davour isn't thinking about it and prefers to keep her life simple.

"I can see myself drinking tea with my friends, things like that."