

The Antarctic Sun

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

Tracking the creation of space

By Melanie Conner

Sun staff

In the beginning a fist-sized, dense, hot ball of gasses erupted and flung matter in all directions forming energy, time, stars and galaxies in an instant. Fourteen billion years later, scientists at the South Pole collect and analyze traces of that original explosion to help unravel the cosmic past.

Like a book, some believe space and time must have a beginning, middle and an end. Scientists, too, are reading ahead to the final chapter to learn the future of the universe.

Will the edges of space curve in and implode into the nothingness from which it began? Continue to expand? Or remain forever balanced?

These are the questions researchers at the South Pole are asking themselves.

This month a team of astronomers from the University of Chicago concluded their second of four years of cosmic research on data obtained by a cosmic microwave detector telescope or the Degree Angular



Photo by Melanie Conner/The Antarctic Sun

Allen Day, science grantee, and Eric Sandberg, science technician, work on one of DASI's telescope receivers.

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Getting a safe high in Antarctica

By Mark Sabbatini

Sun staff

Those on the Ice suffering from altitude sickness after getting off a flight may one day be able to take refuge by getting back into an airplane's pressurized cabin - with no flight required.

The never-before-tried tactic of using a disabled aircraft's fuselage at one or more remote high-elevation camps is one of the improvements being considered by officials hoping to reduce the number and severity of altitude sickness cases in Antarctica. The fuselage would be an alternative to heavy and expensive hyperbaric chambers that control air pressure, which are also being

considered, said Steve Dunbar, field support manager for Raytheon Polar Services Company.

"At this point it's just in the preliminary phases, but we realize at the big camps there's a need to provide treatment beyond a Gamow Bag," Dunbar said, referring to a portable bivy-like bag that is pumped full of pressured air, temporarily simulating a lower environment for the person inside.

Dunbar said he is also hoping to produce a video or come up with another way to provide more information to research teams before they reach the Ice, and make sure their physicians are

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Chef juggles studies and stews

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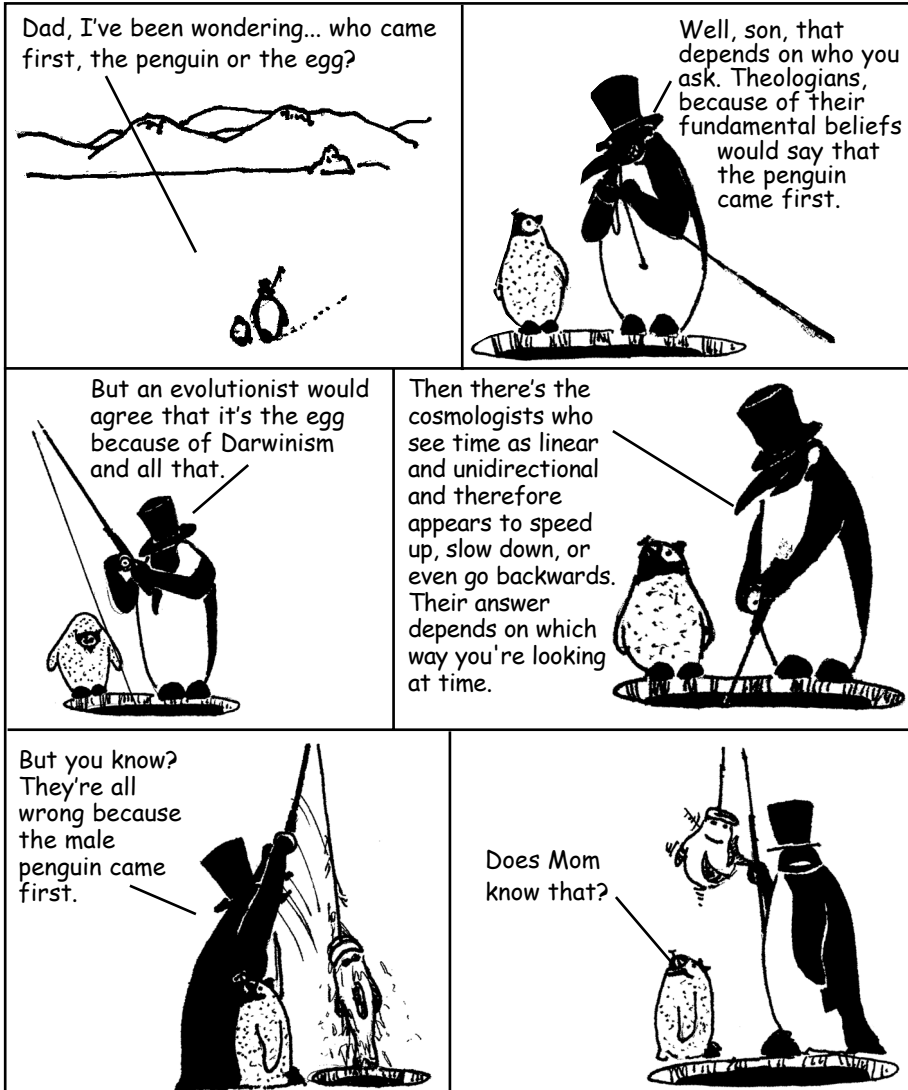
Quote of the Week

"If I could just see a penguin I could quit."

- Dining assistant at McMurdo Station

Ross Island Chronicles

By Chico



Cold, hard facts

Antarctic geology

Total area of Antarctica: About 8.7 million square miles (14 million sq. km) about 1.5 times the size of the U.S.

Total ice-covered area: About 8.5 million square miles (13.72 million sq. km) 98 percent, about 11 percent of which is made up of floating ice shelves.

Total barren-rock area: 2 percent

Average elevation: About 6,500 ft. to 13,000 ft. (2,000-4,000 m)

Highest point: Vinson Massif 16,863 ft. (5,140 m)

Lowest point: Bentley Subglacial Trench -8,333 ft. (-2540 m) The lowest known point is hidden in the Bentley Trench, where the deepest ice was recorded and the world's lowest elevation not under sea water is located.

Average thickness of the Antarctic ice sheet: 7,000 (2,160 m) or 1.34 miles

Source: Central Intelligence Agency World Fact Book Web Site and NSF Web Site

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Antarctic animals

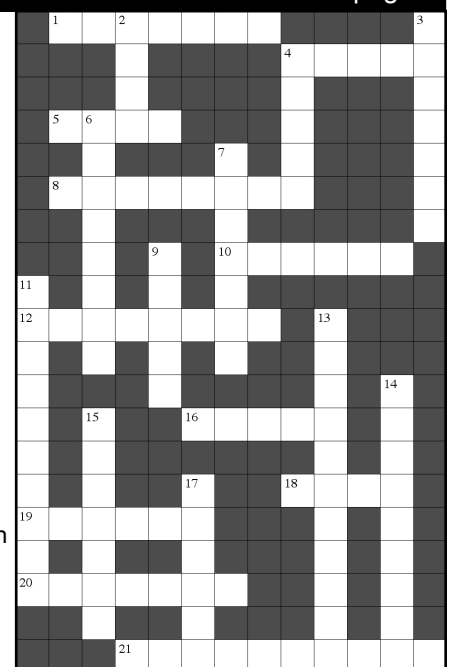
ACROSS

- 1) First to South Pole; on continent until 1994
- 4) The largest (1/2") year-round land "animal"
- 5) More like giant slugs than circus performers
- 8) When they can't see the sky, divers still see these
- 10) Feed on zooplankton; served with sauce
- 12) Waddle, waddle; no quack, quack
- 16) Bottom of the food chain
- 18) A favorite dish of seals and people
- 19) Antarctica's most common penguin
- 20) Seals with teeth, not spots, of namesake.
- 21) North Pole natives seen with penguins in Coke commercials

DOWN

- 2) Scavengers with wings
- 3) Brit-named seals love the nightlife
- 4) Most common and southerly land animal
- 6) A large seal that packs its own trunk
- 7) Big fish can survive subzero temperatures
- 9) Splice these with fish and create Squish
- 11) "Lion" of the Ice; half the size of a rice grain
- 13) Not a fish, but a big catch
- 14) No need to ask what these seals dine on
- 15) They ruled Rome, and now the Ice
- 17) Wingspans can be longer than you are tall

Answer on page 9



Game on



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Photo courtesy unknown photographer/McMurdo Common Drive

A player on the McMurdo Station rugby team, far right, prepares to place the ball in play during a match with New Zealand employees at Scott Base on Dec. 2. The Kiwi team won the match by a score of 9-3.

By Mark Sabbatini
Sun staff

They lost the rugby match, but scored style points by keeping the game close and making it to the barbecue afterward without any serious injuries.

Seventeen workers at McMurdo Station took on employees at Scott Base last Sunday, losing by a score of 9-3, said Rick Morlock, a safety consultant who "caught hell" because of his job for being one of McMurdo's two coaches. He said the New Zealand team scored three "tries" compared to one for the Americans, a marked improvement over last year's 21-3 tally.

"It was very competitive," he said. "It wasn't a blowout by any means."

Chet Riley, base services manager at Scott Base, offered a mostly similar assessment.

"It was a pretty close match because the snow's a great leveler," he said.

Playing what's already a brutally tough sport on a field of snow and ice resulted in the expected assortment of bumps and bruises, but no serious injuries, Morlock said. The worst injury was suffered by Jennifer Wilson, a dining attendant who got a severely bruised eye after wrestling the ball away from a Kiwi and passing it to a teammate.

"It was the one play I could be

proud of," said Wilson, who was playing her first rugby game.

Only five members of the McMurdo team had played rugby before, with the remainder of the 14 men and three women learning the rules during eight practices before the game, Morlock said.

"I was trying to convert football players to rugby players," he said, adding the Kiwis "grow up playing rugby like we play football or baseball."

McMurdo E-mail Administrator Lee Parker said learning to play rugby for the first time wasn't too difficult "especially if you get out there and try to play it." The finer points of the game take more time, she said, but it's an addictive sport.

"I like it better than football because it's faster - it keeps moving - and better than soccer because you can pick up the ball," she said.

The 18-member Kiwi team, consisting of most of the employees at Scott Base, didn't practice, Riley said.

"We named the team at 3 o'clock and then we played at half past 3," he said.

The game was scoreless during the first of three 15-minute periods, but the New Zealand team took a 2-1 lead at the end of the second period. The Kiwis scored once more in the final period, but Morlock said the U.S. team was about to make its second try

when the game ended.

"If the game had gone on much longer we would have kicked Kiwi ass," Wilson said.

Morlock, a resident of Big Lake, Alaska, said he has been playing rugby since 1975 because he wants to be among the "one-percenters" in life.

"Either you're in a motorcycle gang or you play rugby," he said.

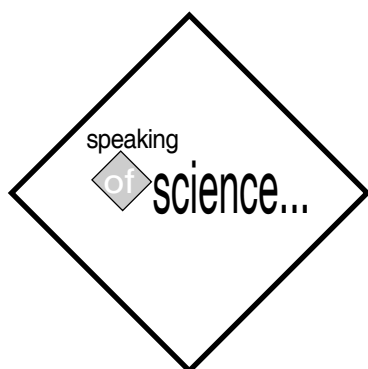
For those who missed out or are craving more punishment, Morlock said the Kiwis want to play a rematch in January.

"I think they wanted to play a game of American football, too," he said.

Riley said a beach volleyball game at Scott Base in January is also a possibility. In the meantime, he said the Americans should expect a tougher challenge during the rugby rematch.

"We'll be looking at doing a little bit of practice for the next game now that both teams have played," Riley said.

Besides Morlock, Wilson and Parker, members of the McMurdo team included Philip Mitchell, Dean Jarosh, Dan McCloskey, Chris Morris, Kanari, Brent Rosato, Tad Hoening, Shane Coffelt, Mark Owen, Jay Gilder, Ben Murray, Matthew Charnetski, John Hughes, Charlie Langfeld and Health Woolfe. The team also featured one New Zealand player, Shane Pretty, who works for Kiwi Cargo at McMurdo.



Chemical warfare in the animal world

By Chuck Amsler

Our project (BO-022-O) studies how marine organisms use chemicals to defend themselves from predators.

The organisms we study are macroalgae (seaweeds) and a variety of immobile and sluggish invertebrate animals that can't get up and run or swim away when something is trying to eat them. So their alternative is to make themselves unattractive as a food. Some do that by physically making themselves too tough to eat while others produce chemical compounds to make themselves taste bad to potential consumers (and some organisms do a bit of both). Our group is here in Antarctica to study the function and evolution of those chemical defenses. The project is a collaboration between three Principal Investigators at two institutions, Jim McClintock and Chuck Amsler, biologists from the University of Alabama at Birmingham, and Bill Baker, a natural products chemist from the University of South Florida.

Our work here at Palmer Station is in many ways an extension of work our project did in the late 1980's and the 1990's on the chemical ecology of Antarctic marine organisms in McMurdo Sound. We are focusing our present efforts on questions concerning the evolution of chemical defenses that share underlying assumptions concerning the costs and benefits of producing these compounds. The marine environment of the Antarctic Peninsula is, in many respects, uniquely suited for our studies. Macroalgae are exceptionally abundant along the western side of the Peninsula, with biomass levels that rival the giant kelp forests off the west coast of the United States. Also, nitrogen and other nutrients rarely, if ever, are the limiting factor for growth in Antarctic macroalgae (light usually is). Although this can be true locally in other parts of the world, it is true in coastal waters all around the Antarctic continent and probably has been true for millions of years. Therefore, unlike other places in the



Photo by Margaret Amsler/Special to The Antarctic Sun

The organisms we study ... can't get up and run or swim away when something is trying to eat them. So, their alternative is to make themselves unattractive as a food.

Above, Katrin Iken, left, and Chuck Amsler dive through brash ice off the Palmer Station boat dock. Below, divers return to Palmer Station. Bill Baker sits on the far right beside Jim McClintock, who is driving the zodiac



Photo by Charles Amsler/Special to The Antarctic Sun

world, nitrogen limitation should not have constrained the evolution of chemical defenses (or other physiological processes) in Antarctic marine plants.

We are taking advantage of the rich peninsular macroalgal flora and the distinctive nutrient environment of coastal Antarctica to help separate and understand the effects of carbon and nitrogen limitation on the production of defensive compounds in macroalgae and, by analogy, in other plants as well. The results from our first Palmer season (March through May 2000) have helped cast doubt on some long-standing theories about why plants make differing but specific kinds of defensive compounds in contrasting environments.

Another goal of the project is to understand the evolutionary and physiological trade-offs that organisms make in allocating their resources between growth, reproduction, and chemical defense. This aspect of the work includes invertebrate animals and their larvae in addition to macroalgae. Palmer Station is ideal for all these studies not only because macroalgae are abundant but also because invertebrate larvae can be more accessible here than at McMurdo.

Scuba diving is a major research tool for our group. Although we do a lot of laboratory based work to isolate defensive chemicals and to bioassay their effects on potential predators of macroalgae or animals, first we must put a great deal of effort into collecting both predators and prey from the ocean. Like virtually all of the diving at McMurdo, when we were working from there we would routinely dive through holes drilled, blasted, or chipped from the land-fast sea ice. But here at Palmer we normally dive in open water using zodiacs, much like divers operate with small boats in other parts of the world. When we first arrived in early November the waters adjacent to the station were still covered with fast ice. So we spent a week

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around the continent

PALMER

Making room for foreigners

By Tom Cohenour

Palmer Station correspondent

The call came in unexpectedly. "Palmer Station, Palmer Station, this is the *James Clark Ross*. Do you copy?"

It was Chris Elliot, the captain of the 325 foot (100 m) British research vessel RRS *James Clark Ross* (JCR) requesting permission to make an early port call at Palmer Station. The JCR wasn't expected for another 10 days. Because of heavy sea ice in the southern part of the Lemaire Channel a change in schedule was needed.

"We can make that work," responded Station Manager, Bob Farrell. "We'll be happy to see you again."

An influx of visitors to a small station requires careful planning and a well-coordinated effort for it to go smoothly. After years of such activity, Palmer has it down to a science. The entire station pulls together to make it happen. Each summer they host approximately 1,400 visitors over a 10-week period; on average, 140 visitors per week. Keep in mind that Palmer reaches maximum population at only 46. Now imagine adding 140 new faces.

The arrival of the JCR marked the beginning of the visitor season.

"They'll be here in five hours," announced Farrell over the intercom.

Immediately the call went out for volunteers to act as tour guides, set up the galley, bake brownies, make coffee and work



Photo by Tom Cohenour/Special to The Antarctic Sun

The British ship James Clark Ross approaches Palmer Station on Nov. 30.

the station store.

The visit was reciprocal. During the four and a half hour visit, crew members as well as British Antarctic Survey (BAS) scientists from the ship enjoyed tours of the Palmer facilities. And station personnel and scientists had the opportunity to visit and tour the JCR. Pizza and drinks were enjoyed in the station lounge, shoppers enjoyed PalMart (station store) and a British film crew had a chance to conduct interviews with some Palmer scientists.

The BBC (British Broadcasting Corporation) crew traveling on the JCR is doing a program about science in Antarctica. They were pleased to be able to interview Dan Martin with the prey component of the Long Term Ecological Research (LTER) (BP-028-O), and Dr Charles Amsler and Dr Bill Baker. Both Amsler and Baker are part of a team of seven conducting research on the Chemical Ecology of Shallow-Water Marine Macroalgae and Invertebrates (BO-022-O).

Even on such a short notice, the visit by the JCR was a huge success and marked another milestone in the long standing cooperative relationship the USAP enjoys with the British Antarctic Survey.

SOUTH POLE

Space ships, an exorcism and Polar tourists

By Judy Spanberger

South Pole correspondent

The weather this past week at Pole has been clear, sunny and warm. Temps in the minus 20s, which feels like a heat wave to us. Perhaps it's due to the measly 4 percent humidity here, but if you stand in the sun and out of the wind, the effect of the radiant heat is intense. Many people are walking around with slight sunburns on their faces.

Thanks to the clear weather we've been getting up to five flights a day and the cargo people have been quite busy. Material is coming in and construction continues to make visible progress on the elevated station.

The tunnel crew continues with their



Photo by Kevin Culin/Special to The Antarctic Sun

Bill McCormick and John Penney exorcise a broken tunneling machine.

progress, sometimes with the tunneler machine, sometimes by hand. They say they can do at least as much by hand as with the machine, but the machine is easier on the body. So when the machine breaks down, we do what we can to get it back online. We'll even go to extremes. Like hold an exorcism for the poor thing. People brought amulets, drums and cowbells. There was dancing, chanting, preaching, bagpipes, violins and Korean exorcism music. Offerings were made to appease the tunneler machine gods (don't ask). Our prayers and wishes for future tunneler machine good health went up and we're hopeful for success.

The Operations department is pushing the last of the snow mountains away from the station and out past the cargo berms, which are on the very edge of our little village. It takes a while to move these long piles of snow. A dozer pushes the snow into a pile and then starts at the end of the pile and pushes the snow over the top of the pile in the direction that the snow will eventually end up. It's like watching a very slow caterpillar make it's way out to the edge of the berms.

We've had a couple visits from the Twin Otter crew this week. The ATRS (Advanced Technology for Radar Sounding of Polar Ice-formerly known as SOAR) project came through and spent the night. ATRS is the under-the-ice radar

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the week in weather

McMurdo Station

High: 37F/2.5C Low:13F/-10C
Wind: 58 mph/93 kph
Windchill: -29F/-24C

Palmer Station

High: 42F/5.5C Low:25F/-4C
Wind: 62 mph/100 kph
Precipitation: 1.67 inches/40mm

South Pole Station

High: -21F/-29C Low:-32F/-35.4C
Wind: 26mph/42kph
Windchill: N/A

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mapping project that looks for lakes and other anomalies under the polar ice cap. Last year they mapped Lake Vostok. I had a chance to talk with one of the scientists on that project while they were here and asked about the rumor of a space ship being the cause of the heat that keeps Lake Vostok liquid. Not true, according to their data. There's a small magnetic influence, but that could easily be caused by many of the rocks found on the continent. They believe that there's a small somewhat active volcano at one end of the lake that might be providing the warmth. Oh well, there goes a great story. The other Twin Otter took out the AGO group for a two week camping trip.

We had our first tourist plane of the season this past Sunday morning. A DC3 operated by Adventure Network flew over from Patriot Hills. Six tourists from Taiwan, two field guides and three crew members spent three hours at Pole. They gathered for pictures at the Pole and were given a small tour of the station. That's right, it was a three-hour tour.

Henry Kaiser, a participant of the NSF-sponsored Antarctic Artists and Writers Program, was here for the weekend. Henry travels all over the world and creates guitar music to remind people of a particular place. On Saturday night he played with our own band, ThunderJug, in the summer camp lounge Jamesway. We have a remarkably good band here at Pole, but when Henry played with them, the music rose to a level that you might see in a cool seedy jazz bar in Chicago (if you were lucky, and had gotten there on a good night). It was great, and by their grins it seemed the band was having as much fun as we were. It was hard not to stand there, maybe swaying with the beat, grinning and reminding yourself that you were standing in a large insulated tent at the South Pole. It was delicious fun, and one of those things that makes being down here a special experience.

Science From page 4

"reliving" McMurdo-style diving until a strong storm broke up the fast ice. Now on some days we have open water suitable for boat diving in the diverse and beautiful communities that surround the Palmer-area islands. Other days the winds and/or currents bring pack and smaller brash ice into the harbor that is too dense for zodiacs to pass through. So those are days for the lab or for diving through the packed ice bits right off the station boat dock.

Fortunately, even the marine communities right beside the station are rich and diverse so we have been able to

make a great start at collecting for laboratory assays. The lab work is now well underway and we are looking forward to another great season in Antarctica!

Dr. Chuck Amsler is Associate Professor of Biology at the University of Alabama at Birmingham.

Read more about the day to day diving and other research activities on an interactive Web site designed and operated by the UAB media relations department for K-12 school and general community outreach. The URL is www.wow.uab.edu.

Needed: A dose of original thinking



Get your best work published in the
Prose, Poetry and Photography Contest
sponsored by The Antarctic Sun

Photos: Categories for wildlife, scenic, people and other. One entry per category.

Prose: A complete fiction or nonfiction story in 300 words or less.

Poetry: Whatever inspires you.

E-mail entries by Dec. 31 to sabbatkr@mcmurdo.gov, or bring them by The Sun office in building 155. Call x2407 for more information.

Continental Drift

What would you put in
a time capsule at the
South Pole?



"A CD of photos of Palmer Station or a bag of Cheetos."

Jennifer Tabor
Food Service
Supervisor Assistant
at Palmer Station,
from Sterling, Alaska



"How about a picture of our LC-130s?"

Rich Fabio,
109th Crew Chief at
McMurdo Station, from
Saratoga Springs, N.Y.



"I'd put a piece of the World Trade Center in there and I'd put a note in there saying 'This is the day the world changed.'"

David Ricks
Avionics Systems Specialist
at McMurdo Station from
Albany, N.Y.



Photo by Melanie Conner/The Antarctic Sun

Eric Sandberg, science technician for the DASI project, climbs up the ladder into the DASI telescope to check the instruments.

University of Chicago's Degree Angular Scale Interferometer (DASI) at the South Pole records slight temperature variations in the afterglow of the Big Bang. The latest results from DASI substantiate the predictions of the leading theory regarding the origins of the universe.

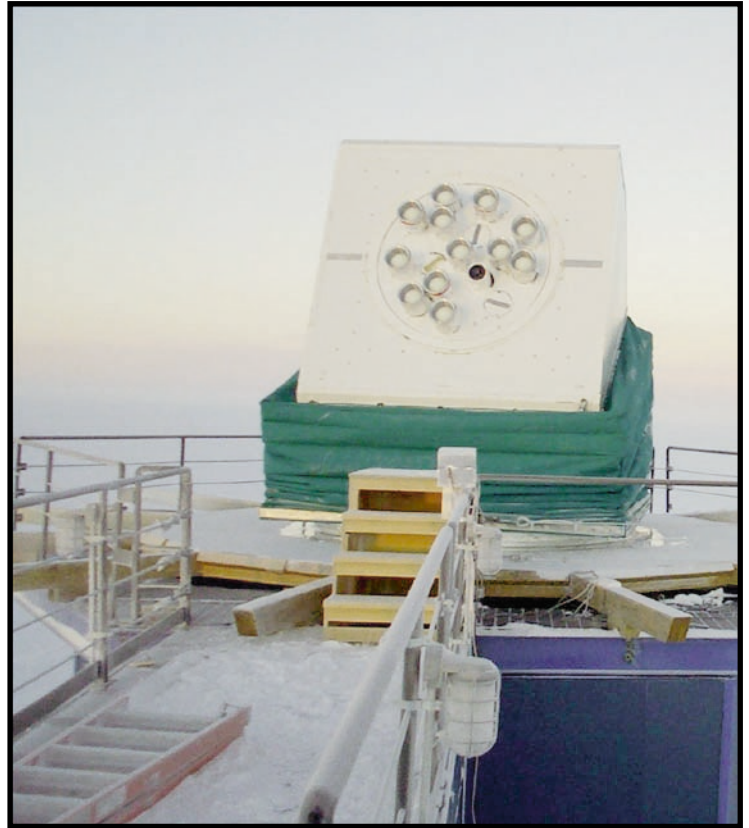


Photo by John Yamasaki/Special to The Antarctic Sun

DASI From page 1

Scale Interferometer (DASI). Only nine months ago, the team made headlines in newspapers and science magazines across the U.S. by revealing evidence of a decades-old inflation theory that states hot gasses expanded to ignite the Big Bang.

"I would not say inflation was confirmed, but it is certainly looking good," wrote astrophysicist and project leader John Calstrom in an e-mail. "Most known alternate theories can be ruled out."

This was the second year in a row astronomers at the South Pole made front page headlines for their discoveries.

In April 2000, a team from the California Institute of Technology stunned the world when it revealed the images from a balloon-borne experiment that provided evidence of the inflation theory, as well as evidence that the universe is flat. Flat, meaning that space is not curved or warped.

"(It's) not flat like a pancake," Calstrom wrote. "Rather this means that light rays travel in a straight line."

Scientists from the University of Chicago later obtained more conclusive data from the DASI (pronounced daisy) experiment at the South Pole. That provided the best evidence yet for a flat universe by measuring the temperature fluctuations

in the leftover radiation of the Big Bang.

The DASI telescope records data from temperature fluctuations of the Big Bang afterglow or microwave emissions, which were first discovered in 1965. In turn, this data allows scientists to study the details of the universe.

The data allowed the team to make one of its biggest discoveries to date - the matter that make up the universe.

"We found that ordinary matter - the stuff that you and I and the stars are made out of only accounts for about 4.5 percent of the universe," wrote Calstrom.

For the first time ever, scientists determined the universe is made up of about 4.5 percent regular matter, 30 percent dark or unseen matter and about 65 percent "dark energy." This energy does not interact with light and "appears to cause the expansion of the universe to accelerate," according to Calstrom.

These discoveries are all a result of DASI - the highly-sensitive Cosmic Microwave Background radiation detector telescope.

"The telescope is a time machine," said Eric Sandberg, South Pole science technician, "It is looking back into time and seeing leftover energy."

Viewing the afterglow radiation of the

Big Bang means working with the most state-of-the-art instruments in the most space-like atmosphere on Earth - the South Pole.

Astronomers at the Amundsen-Scott South Pole Station work in a sky lab observatory located on the 9,300-foot (2,835 m) Polar Plateau near the geodesic dome. The lab is in the Dark Sector - an area free of artificial light or other electromagnetic radiation that could interfere with science activities. The Dark Sector is home to the Center for Astrophysical Research in Antarctica (CARA) founded by the University of Chicago.

The most active time for telescopic data collection at the South Pole is during the austral winter months and in the fall, before the sun makes an extended stay high above the horizon.

"The telescope does not have value in the summer because there is too much sun and ambient noise," said Sandberg, who spent the winter at South Pole station operating the telescope, "In the winter, we can get a clear, stable shot at the sky."

For now, scientists return home and prepare for further studies on the Ice. Thus, allowing them test the inflation theory and "learn more about its underlying physical cause."

The three types of altitude sickness

■ **Acute Mountain Sickness (AMS).** This is typically the most common and least severe, with those afflicted suffering flu-like symptoms such as headaches, dizziness and nausea. It usually occurs within 12 to 24 hours of being at high altitude. Chris Simmons, a field and safety instructor at McMurdo Station, said rest with light exercise is better than staying in bed because the body's oxygen intake decreases during sleep. A person suffering from mild effects can acclimatize, but those developing more severe symptoms of AMS such as decreased coordination and shortness of breath while at rest generally need to descend at least temporarily.

■ **High Altitude Pulmonary Edema (HAPE).** A buildup of fluid in the lungs prevents effective oxygen exchange, with symptoms including fatigue, shortness of breath even at rest, a feeling of suffocation, a persistent cough, a gurgling sound in the lungs and a tight feeling in the chest. HAPE usually occurs 24 to 72 hours after a rapid gain in altitude. Immediate descent of at least a couple thousand feet and evacuation to a medical facility are generally considered necessary. U.S. Antarctic Program policy forbids anyone who has suffered HAPE from going above 3,000 meters (about 9,800 feet) without medical approval.

■ **High Altitude Cerebral Edema (HACE).** Caused by a swelling of brain tissue from fluid leakage, symptoms include headaches, altered vision, loss of coordination, weakness and decreasing levels of consciousness. It generally occurs after a week or more at high altitude and can be fatal within eight hours of its initial onset. Those suffering from it must be evacuated and receive medical treatment. USAP policy states "individuals who have experienced a prior episode of HACE shall not be allowed to ascend to altitudes in excess of 3,000 meters."

The only cure for altitude sickness is acclimation or descent, with the latter usually being the only option in more severe cases. A Gamow bag, bottled oxygen or other temporary pressurization can prevent a person with severe sickness from getting worse until evacuation or descent is possible, but generally won't cure a person.

The drug acetazolamide is often used for prevention and treatment of AMS symptoms. Support for it is strong, but not universal. The drug can cause side effects such as tingling in the fingers and blurring of vision, and some worry that the pill merely masks symptoms and a person may therefore be unaware they are at an unsafe altitude.

USAP policy requires field teams to spend at least 24 hours of restful acclimatization every 1,000 to 1,500 feet if they are ascending above 8,200 feet (2,500 meters). If deploying immediately to altitudes above 12,300 feet (3,750 meters), a 72-hour rest period between 8,200 and 10,000 feet is required. Short deployments of less than eight hours do not require acclimatization and "in certain instances, generic ascent plans may be developed for a particular location (e.g., Mount Erebus, polar plateau)."



Pat Plaia, left, Philip Kyle, center, and Henry Kaiser inspect a Gamow Bag during a training class at McMurdo Station.

Photo by Mark Sabbatini/The Antarctic Sun

Altitude From page 1

involved in the screening process. Once people reach the Ice, he said, it's vital to ensure they follow guidelines requiring them to rest and acclimatize upon arriving at high elevations.

Three people were evacuated from East Camp near Lake Vostok last season due to altitude sickness or other problems complicated by being 11,500 feet above sea level, Dunbar said.

"In some cases there were people who went to work (prematurely)," he said. "I think that as big an issue is when people have early altitude sickness symptoms they need to make the person in charge at the camp aware. I think everybody is in a bit of denial, especially when the person next to you is performing well."

Altitude sickness is common in Antarctica - about three-fourths of people at the South Pole experience symptoms during their first week at 9,300 feet - with potential effects ranging from fatigue to death. Safety instructors note that being at 10,000 feet on the Ice is harder than the same altitude elsewhere because the Earth's rotation flattens the atmosphere at the poles, resulting in a loss of air pressure. The South Pole's effective altitude is about 10,500 feet, for example, while East Camp's is about 12,800 feet.

The continent's dry, cold climate can also play a role. Dehydration slows people's ability to acclimatize and common illnesses such as the flu can be confused with altitude sickness. But often the greatest problem is people misjudging their abilities or ignoring symptoms.

Most cases at the Amundsen-Scott South Pole Station aren't severe, said Will Silva, lead physician at McMurdo Station and a former South Pole doctor. He estimates 5 to 12 percent of the station's total population might seek a doctor's treatment.

Silva said the only case he saw at the South Pole of High Altitude Pulmonary Edema - one of the most severe forms of altitude sickness - "was in a healthy young marathoner who hit the ground running."

Short stays at high altitude, such as working an eight-hour shift at a high mountain camp, generally are considered safe if those making the trip drink lots of water and don't overexert themselves. More serious concerns arise if one or more overnight stays are involved.

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Sun-soaked ice softens

Both icebreakers are on their way to slice ice channel to McMurdo Station

By Kristan Hutchison
Sun staff

As both Coast Guard icebreakers head south to break a channel to McMurdo Station, the sun is doing its part.

The McMurdo Sound sea ice still extends north of Beaufort Island, about 50 miles farther than normal, but those first 50 miles have softened.

"It's just baking in the sun," said Ted Dettmar, lead instructor for the Field Safety Training Program. "The ice, for the most part, is slush."

The last week of November, Dettmar checked 10 of the 15 monitoring stations set up along the possible path of the icebreakers. The ice averages about 1.5 meters thick and has warmed to just below thawing, Dettmar said. It is saturated with water to the point that holes he drilled in the sea ice filled with water before he broke through the bottom of the ice.

"I think the breakers won't even have to slow down for the first 50 miles," Dettmar said. "They'll hit the ice and it should just disintegrate."

Though the ice formed this winter is melting, last year's ice is still insulated under a layer of snow, Dettmar said. The question remains whether it will break away easily, or become spongy and simply bounce back when the Coast Guard icebreakers hit it in a month.

Both Coast Guard icebreakers are heading toward McMurdo Station this year because the sea ice is much farther out than usual. The iceberg B15 blocked the currents that generally help carry out the sea ice.

The *Polar Sea* embarked from Seattle on Dec. 3, though she was slowed by heavy seas outside the Straits of Juan de Fuca, Coast Guard Commander April Brown wrote in an e-mail. The Sea will make a beeline for the Ross Sea, where she will catch up with her sister ship, the *Polar Star*.

The *Polar Star* is already on its way and was expected to stop in Hobart, Australia, on Dec. 7. The *Star* is still on schedule to reach the sea ice edge Dec. 28.

"The fast ice is still holding tight. Looking at the satellite shots today, I don't think it's going to disintegrate that easily," Brown wrote. "Time will tell."

The width of the channel will depend on the prevailing winds, Brown wrote. A good southerly wind could help blow ice out of the channel.

The difficult ice may change the path of the channel as well.

"This year there will probably be a dogleg in the channel because of severe ice conditions, which may muck up the works a bit because it introduces a bend," Brown wrote. "This may be avoidable, but we won't know until a little later."

Sunny days have also warmed the sea ice runway, which was moved Saturday. When it was checked Nov. 30 the ice averaged 11 feet 10 inches and 20.9 F. The ice runway was actually 11 inches thinner when the first measurements were taken in September, but colder at -4.8 F.

Recreational trips on the sea ice ended this week, but the Armitage Trail on the sea ice to Scott Base remains open for a little longer.

Altitude From page 8

U.S. Antarctic Program policies require people deploying to high-altitude sites to make interim stops and/or take rest days upon arriving. At East Camp last year, for example, no work was supposed to be performed during a person's first two days, with light duty the following two days and monitoring of the person's response to an increased workload afterward.

Experience and physique play a role in a person's risk of getting altitude sickness, experts said, but being strong in both won't necessarily help someone who fails to take precautions. Philip Kyle, a New Mexico Tech researcher who has spent 29 seasons doing research at 11,000 feet and above on Mount Erebus, said sometimes the strongest people are the ones who get sick first.

"They tend to run around and bust a gut," he said.

Similarly, past experience isn't always an indicator of how a person will react in the future.

John Schutt, a former mountaineering guide who scaled the 27,800-foot Himalayan peak of Makalu about 10 years

ago, said his worst case of altitude sickness occurred years earlier on the 14,410-foot summit of Mount Rainier. He said such altitudes can still give him problems.

"I tend to get good cases of altitude sickness at 10,000 feet unless I take it slowly and acclimatize the way I'm supposed to," said Schutt, who is working as a field safety officer for a research project near McMurdo Station.

Placing a pressurized facility at East Camp before researchers begin drilling the frozen lake - a project sure to boost the camp's population - is one of the goals of field officials, Dunbar said. He noted the camp has significant resources already, including a paramedic, an EKG machine, oxygen, medicine and a Gamow Bag.

"That's pretty much the level of service they get at the Pole," he said.

Many of the same items are also available on Erebus, where about one person a year has to be brought down, said Bill McIntosh, who has spent 14 seasons doing research on the mountain. He said most are suffering from a complicating factor such as asthma or bronchitis.

Even for the most experienced person,

acclimatization is never more than temporary. Chris Simmons, a field and safety instructor at McMurdo, said the rate of declimatization is the same as acclimatization.

"If it takes you a week to get used to the South Pole, then by the time you get to McMurdo it will take about a week to lose all the acclimatization you gained," he said.





Profile

By Kristan Hutchison
Sun staff

Cooking up a degree

Chef studies geography by the book and in person

Cooking and books come together in Osvaldo Torres' life. Not the cookbooks found on other chefs' shelves, but college textbooks.

Torres worked his way through college in kitchens. The only difference now is that the kitchen is in Antarctica and his graduate school classes are online.

From 5 a.m. to 3 p.m. Torres' job description sounds like an ad for Gingsu knives - chopping, slicing, dicing, frying, sautéing and flambéing. And there's more. More soups to make. More fish to grill. After all the more is done, Torres strips off his white coat, showers away the layered smells of breakfast, lunch and dinner, and finds a spot in a lounge to study for his masters in geography.

"Not the galley, because I work there," Torres said. "So you will never see me there with a book."

Torres is taking classes in urban and regional geography through New Mexico State University in Las Cruces. He also has a paper due on Antarctic geography and another professor asked him to report on how people interact with the Antarctic environment.

When Torres told his advisor and professors he was considering a job in Antarctica they encouraged him to take it, but not to stop his studies.

"As a group of geographers, we love to see our students travel and learn anywhere around the globe," wrote his graduate advisor, Bob Czerniak, in an e-mail. "We have never had a student in Antarctica and we saw this as a special opportunity for Osvaldo and NMSU."

Czerniak has posted pictures Torres sent from Antarctica in the NMSU geography department and sent copies to the dean of the college.

When Torres returns he will give a presentation to the department and probably be interviewed by the student newspaper or university communications department, Czerniak wrote.

Torres' girlfriend in Chihuahua, Mexico, was not so pleased with his decision to go to Antarctica.

"She was O.K. when I said I was going just for the summer, but when I sent an e-mail that I was staying the winter she didn't like that," Torres said.

Antarctica is about as far as Torres can get from the tropical heat of Puerto Rico, where he was born 29 years ago and grew up. His home was in a small town called



Photo by Melanie Conner/The Antarctic Sun

Osvaldo Torres works on a paper required for his masters degree in geography from New Mexico State University. He writes all his notes in Spanish, then translates to English.

Las Piedras, or The Stones, on the south-east side of the island. Torres' grandmother raised him because his parents were in the military. She died while he was at Iowa State University earning a Bachelor of Science in soils. Torres said he has no interest in moving back to the Spanish-speaking commonwealth.

"I don't think that I can live there anymore," he said.

At Iowa State, Torres got a job working for the college food service to pay for his classes. He started as a dishwasher.

"Since I didn't speak English, nobody else would hire me," Torres said.

By the time he graduated, Torres had worked his way up to cook, working 20 hours a week while studying.

Degree in hand, Torres went to work for Pioneer Hi-Bred International, a seed company, as a research assistant. He worked in Mexico and Honduras, eventually moving into a sales position. Then Dupont bought Pioneer and Torres lost his job in the takeover. He decided to go back to school for a masters. Tired of agriculture, he switched to geography after enrolling at New Mexico State University.

"Osvaldo has always been a very good student with tremendous enthusiasm for learning," wrote his advisor, Czerniak. "He is a risk taker, a personable young man and willing to help other students."

After he graduates, Torres plans to look for a job doing urban development in Mexico.

"In Mexico, so long as you have money you can build anything you want anywhere you want," Torres said. "For example, a bar

right next to an elementary school."

Torres wants to bring in development standards so Mexican buildings are planned with more attention to their neighbors. Building practices also need to change in Mexico, such as the common use of asbestos, he said.

"You can buy it at the lumber store," Torres said. "They use it because, for one thing, it's cheap for them."

While in graduate school Torres went back to work in the kitchen to pay his way, cooking at a steak house and a deli. Still, his student loans mounted up.

In July he met a neighbor, Salvador Rascon, who was coming to McMurdo Station to work as executive sous-chef. The idea of working in Antarctica and saving up money in the process drew Torres' interest, so he applied as well.

"I got to know him pretty good," Rascon said. "He's a good worker, fast learner, follows direction real good and everything."

Though Torres' has cooked in larger kitchens - at Iowa State the kitchen served 4,000 students - Antarctica presents more challenges. If a needed ingredient runs out, he can't just go to the store.

"Sometimes we have to do miracles, really," Torres said. "because we run out of so much stuff every day."

Torres will see a few more miracles before he returns to New Mexico University, since he signed on for the winter.

"This is for me the easiest way to pay off my student loans," said Torres, who will now graduate in 2002.



Women's Soiree benefits Christchurch Salvation Army Hope Centre

By Ann Dalvera
Special to the Sun

The 8th Annual Women's Soiree, an evening of performances by women, will raise money for the Salvation Army Hope Centre in Christchurch, New Zealand.

The center provides food for approximately 60-70 people per week and an advocacy service, which helps clients receive entitlements from Work and Income and other government agencies. They also offer counselling services and budget empowering for low-income clients. In addition, the center provides a community meal once a week for about 40 people who come regularly and have developed strong friendships and helped each other beyond the meals.

Groups offered by the center address

other needs, such as "Looking forward to Christmas."

Center manager Karen Whittaker says "The purpose of the group was to show women how to have fun at Christmas that did not cost any money. Making decorations, baking, presents and how to prepare a meal that can be made from a Christmas Hamper.

"A woman who was 25 years old came and talked about how life was different for her now that she did not work in a parlor. That Christmas used to be about lonely men wanting sex and her life has changed, now Christmas is about knowing she was loved by her family," Whittaker continued.

"A number of young mothers wanted to talk to her and it seems that they have been in a similar place as her. She was coura-

geous and this encouraged others to be the same and talk about their experiences."

At Christmas the center gives out 300 Christmas Hampers and toys for about 230 families.

Peggy Malloy, one of the Soiree organizers, explained why she supports the Salvation Army Hope Centre in Christchurch.

"It turns *no one* away, does not receive any government assistance, and is run by a small staff of seven and many volunteers," Malloy said, "All qualities that win my vote."

Please enjoy an evening of gala performances by women and give generously to support the Salvation Army Hope Centre of Christchurch at 8 p.m. Dec. 15 at the dining hall.

As Kiwi C-130 Flights Near Completion, new airlift squadron begins its first Ice tour

By Colonel Max Della Pia and Flight Lieutenant Michelle Goulden-Fowler
Support Forces Antarctica

We have arrived at a point of transition in the Antarctic summer season. The Royal New Zealand Air Force (RNZAF) has concluded a very successful early season. At the same time, there are several paradigm-changing developments in the United States Antarctic Program (USAP).

Each Antarctic season the No. 40 Squadron of the RNZAF fly their wheeled C-130s (Hercules) on about 15 missions from Christchurch to McMurdo and back. Twelve of the missions are usually planned for mid-November to early December, and three are planned for late January. This season is going well, with only three mechanical delays, and one weather turnback.

As of Dec. 4, the RNZAF C-130s had moved 287 passengers and 187,585 lbs of cargo on 10 southbound flights. The 10 return flights carried a total of 180 passengers, and 93,475 lbs of cargo.

This period also marks the beginning for three significant USAP changes: wheeled augmentation during the mid-December through January timeframe, operations on Pegasus runway on compressed snow and the addition of Odell Glacier as an emergency divert landing area.

The 50th Airlift Squadron, an Active Duty unit from Little Rock, Ark., has deployed aircrew, maintenance and support personnel and equipment to Christchurch. They will operate their wheeled C-130s between Christchurch and McMurdo from

Dec. 10 through January. This provides the USAP several advantages. North-south trips will be faster on the C-130s because they have less drag and a higher cruise air-speed than ski birds. Because they have less drag, they can also carry more. Also, using the C-130s leaves more of the ski-equipped LC-130s for on-continent missions supporting science and South Pole construction.

This development is due to significant efforts by many agencies in the USAP. The 109th Airlift Wing (109 AW) provided training and orientation for the 50 EAS crews, and instructors will accompany them on initial missions.

The Raytheon and the airfield management team invested time and energy, while the National Science Foundation provided money and equipment to transform Pegasus. In the past, Pegasus was closed for the majority of the austral summer after WINFLY and before the end-of-summer redeployment from McMurdo. During this period, the surface of the ice at Pegasus had to be protected from the sun and increasing summer temperatures by a layer of snow.

Recently, the thought was to compress the snow and then use it not only for wheeled operations, but also to protect the surface of the ice during this interim period. The Cold Regions Research and Engineering Laboratory (CRREL) was commissioned to conduct an engineering study to determine the feasibility of a compressed snow runway. Air Force Civil Engineering had to be consulted for approval of the concept. The 109 EAS,

CRREL and the airfield management team conducted tests of the surface last week. A team from Air Mobility Command and Tyndall Air Force Base arrived this week to complete the certification. The intention is to further assess the feasibility of operating C-141s (Starlifter), C-5s (Galaxy) and/or C-17s (Globemaster III) on the compressed snow surface, so it will not have to be removed before the end of the summer.

With more wheeled C-130s flying to McMurdo there is a need for a divert runway. The C-130s don't have the range of the C-141s, C-17s or C-5s. They also don't have as many landing options when the weather deteriorates as skied LC-130s, which can land at an outlying camp or in the whiteout area (a surveyed, certified, clear area of ungroomed, open snow on which pilots are trained to land without outside references).

Wheeled C-130s must commit themselves to land several hours out from McMurdo. The NSF, Air National Guard and Air Force agreed finding a clear area on glacial ice outside McMurdo's normal weather pattern would provide an added measure of safety to wheeled C-130s. They chose Odell Glacier, about 120 miles true northwest of McMurdo. A 6,000-by-300-foot landing area has been cleared and marked for emergency use. It is located near the area referred to as Wyandot Ridge, where an LC-130 landed safely on wheels two seasons ago during a period of rapidly deteriorating weather and high winds at McMurdo.



Here for the holidays

By Mark Sabbatini

Sun Staff

Most McMurdo employees will put in a long work week just before the holidays, but there will be lots of time to relax - or party - between Christmas Eve and New Year's Day.

Workers will get Christmas Eve and Christmas Day off - a Monday and a Tuesday - following seven days of work between Dec. 17 and 23, said Area Manager Jim Scott. Another two-day weekend - on Saturday, Dec. 29, and Sunday, Dec. 30 - will follow in observation of the New Year.

Officials shifted the normal day off before Christmas from Sunday to Monday to provide a two-day weekend, Scott said.

"Typically what we try to do is get back-to-back holidays," he said.

There will be no fly-ins either day.

Scott said incoming packages should be in Christchurch, New Zealand, by now if people want them by the holidays. There may still be time to send outgoing mail.

There was some debate about when - and if - there would be a New Year's Day holiday this year because the National Science Foundation is trying to optimize its flight schedule, Scott said. Station officials decided to designate Dec. 29 a holiday while maintaining a full flight schedule, so those working flight-related jobs may be given a different day off.

Holiday events will start with Christmas cookie baking in the galley, which is tentatively scheduled Dec. 21, said Recreation Supervisor Bill Meyer. He said sign-up sheets for volunteers will be posted.

The Zim Brothers Family Christmas Show is scheduled at 8 p.m. Dec. 22 at the Coffeehouse.

"It's just going to be music and laughs," Meyer said.

The annual heavy shop party is scheduled at 8 p.m. Dec. 23, said Lynn Sprowles, a recreation department employee. She said food and live music will be featured.

"The Christmas choir will be performing there and there will be a bunch of live bands," she said.

Gallaghers will be closed Dec. 23, but the Coffeehouse and Southern Exposure will be open, Meyer said. All bars will be open Dec. 24 until 1 a.m. and regular hours Christmas Day.

A special holiday meal will be served in the galley Dec. 24, with seatings at 3, 4:30 and 6 p.m. The menu is still being finalized. A small holiday party featuring music, readings and other activities will follow at 7:30 p.m. at the Coffeehouse.

Brunch will be served from 10 a.m. to 1 p.m. Christmas Day. A series of holiday movies will be shown from 7 to 11 p.m. at the Coffeehouse.

Chapel of the Snows is tentatively planning to reschedule the Catholic Mass service on Dec. 23 at 6 p.m. instead of 9:30 a.m., with the other services as usual. Carols in the Chapel are scheduled at 11:30 p.m. Dec. 24, followed by a midnight Christmas Mass. A Catholic Mass is also scheduled at 9:30 a.m. Christmas Day, with a Protestant service at 11 a.m.

The Ob Hill Uphill race is scheduled at 10 a.m. Dec. 29. A "Nightstock" celebration, scheduled because of night-shift workers who will miss Icestock, is planned that day at Southern at a time to be determined.

The annual Icestock music festival and chili cookoff are scheduled from noon to 6 p.m. Dec. 30.

A New Year's Eve party at planned at Scott Base the night of Dec. 31, Meyer said. Bars at McMurdo will be open New Year's Eve and closed New Year's Day.

Sports

The volleyball champions are Unbridled Carnage.

A volleyball doubles tournament begins Monday at 7 p.m. in the gym.

The Bumblebowl tournament also starts Monday at 7 p.m. in the bowl-

ing alley. The tournament involves costumes and unusual rules.

The bowling alley will be open for bowling Sunday from 7 to 9 p.m. and Wednesday from 6:30 to 8:30 a.m.

our Antarctic week

- 9** Crary lab tour at 2 p.m.
 PLAI theater group, 5 p.m. Library
 Middle Eastern dance class with Sam
 6:30-7:30 p.m. upstairs 155 lounge
 Open bowling, 7-9 p.m.
 "Survivor in Africa" episode 9
 8:30 p.m. Coffeehouse cinema
 Science video "Under Antarctic Ice,"
 8:15 p.m. in the dining hall
- 10** "Heroic Age of Explorers," by Ted Dettmar
 8:15 p.m. in the dining hall
- 11** Old farts stretching
 6:30 p.m. in the laundry room
 PLAI theater group, 5 p.m. Bldg. 155
 upstairs lounge
 Political discussion
 "Guns and the Second Amendment"
 7:30 p.m. dorm 208 first floor lounge
 Dark Side of the Rainbow
 8 p.m. at Southern Exposure
 Polar Education video
 8-9 p.m. Coffeehouse cinema
- 12** Morning coffee
 7 a.m., Coffeehouse
 Open bowling, 6:30-8:30 a.m.
 Photo club
 7:30-9 p.m. in the Coffeehouse
 Holiday Choir practice, 8-9 p.m. in the Chapel
 Birthday bingo with Bumper and Thumper
 8:30 p.m. at Gallaghers
- 13** Middle Eastern dance with Stan
 6:30-7:30 p.m. upstairs 155 lounge
 Tap dancing, 7:15-8 p.m., laundry room
 Salsa lessons, 8-9 p.m.
 followed by dancing at Gallaghers
 American night at Scott base
 Shuttles from 7-10:45 p.m.
- 14** Tap dancing, 6-7 p.m., laundry room
 Movie "Mystery Men,"
 8 p.m. Coffeehouse cinema
 Women's soiree dress rehearsal
 8 p.m., dining hall
 Antarctic Science Club
 7:30 to 9 p.m. in the Crary library
- 15** Women's Soiree, 8 p.m. dining hall