The Antarctican Society

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"BY AND FOR ALL ANTARCTICANS"
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IN ANTARCTICA FOR THE LONG HAUL

Scientists long ago recognized the flaws in doing Antarctic research by means of discrete expeditions that began and ended, leaving gaps between. Still, it is impressive to watch some of the continuing national programs as they design and install permanent installations with a verve and an efficiency that you'd envy anywhere, not just on the polar frontier.

Antarctic (Issue 246, 2018), our Society's sister publication in New Zealand, summarizes what the Australians are up to. In addition to building a 525-foot icebreaker for science and resupply, they are replacing the Macquarie Island station, setting up long-haul tracked vehicles for deep field work, developing a drill for 3,000-meter-deep ice cores, and making a year-round ice-free paved runway near Davis Station.

China's notable advances are described in the October 2017 issue; an innovation this season will be to start on a runway for wheeled planes. India has two modern, low-footprint research stations with fiber-optic and wireless connections and more than a decade of failure-free field operations.

While each of the countries extends its national cultural signature to Antarctica, international collaboration is more and more common in science and logistics. Many projects these days are more than a single nation could handle. Think International Polar Year (2007-2009), when discoveries were made that otherwise wouldn't have happened.

We Americans remain preeminent in the Antarctic, but others are giving us a run for the money. From 1981 to 2007 our fraction of Antarctic research publications dropped from more than a third to less than a quarter: not because our output went down, but because other nations ramped up.

Our field program is among those beefing up. South Pole Station is up to date, a new Palmer Station pier is on the books, and McMurdo is beginning a multiyear modernization. We may yet see a new icebreaker by 2023.

Guy Guthridge

Next Antarctic Gathering(s)

Mark your calendar: 16-18 July 2021.

Mystic, Connecticut, is where members have told us they are enthusiastic about holding an Antarctican Society gathering in the summer of 2021. Mystic Seaport Museum then will be displaying a major Antarctic exhibition celebrating the 200th anniversary of first sightings of the ice continent and exhibiting Antarctic developments up to the present.

Charles W. Morgan, built 1841, is the world's last remaining wood whaleship.It is the central attraction of Mystic Seaport Museum

The exhibition is to open in November 2020 and be open through most of 2021.

Nearby Stonington, Connecticut, has the Palmer House museum commemorating Nathaniel B. Palmer's historic 1820 sealing voyage to the Antarctic.

Fewer Society members say they would plan to attend a Gathering at the University of Maine, Orono, in the 2020 summer.

As a result of articles in the last (October 2018) newsletter, we heard from 30 members about these options. All but one who responded to our request for comments gave an enthusiastic yes to the Mystic gathering.

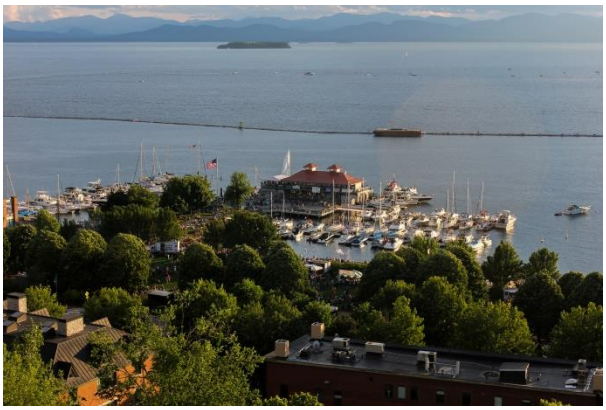
Just 20 said yes to the Orono gathering. Eleven members either said no to the Orono meeting or were not enthusiastic about it. The sense was that if we decide to do both some may come to both even though they are not so keen on Orono.

Most who responded said spouses would attend, too. So we potentially have more than 50 people already planning to come to the 2021 Mystic gathering, but fewer to the 2020 Orono one, if we hold it.

Attendance at whichever place is bound to be much higher than these early numbers suggest. This assertion is based on the pattern that emerged as the date for the recent 20-22 July 2018 Antarctic Gathering (in Port Clyde, Maine) approached. As late as May 2018, only about 50 people had said they would come. Then, in the following weeks, more and more told us they would be there. The actual attendance – as reported by Paul Dalrymple in the last newsletter – was 127.

Again, at this time the Society's next planned Antarctic Gathering will be 16-18 July 2021. We may be able to secure block arrangements with one or more hotels. The Whaler's Inn, 20 East Main Street in Mystic, is a 12-minute walk to the Mystic Seaport Museum. Many more hotels are nearby, also. It's not too early to reserve a room!

Burlington, Vermont, 2022 or 2023?



Burlington Waterfront. Proposed venue for a gathering is in the lower left corner.

Another future Antarctic Gathering venue is on the table: Burlington, Vermont. After the October newsletter was published, our wise webmaster Tom Henderson – ear to the ground as always – proposed the location for a future year (2022 or later).

Here's what Tom says:

"I would like to throw the Burlington, Vermont, hat into the ring for the future. We have lived here for almost 2 years now, and we love it.

"A meeting place on the Lake Champlain waterfront has two theaters and lobby space for socializing. The larger theater seats 200, which I think would be ideal for our group. Across the street are Marriott and Hilton hotels. Other hotels or motels are within walking distance or a short drive.

"Pay parking near the venue is ample and reasonably priced. The nearby Church Street pedestrian mall has restaurants and shopping and is active year around.

"Camping is available about a mile north of the harbor, and it connects to the venue by a beautiful bike and walking path. A tour boat at the harbor takes people and groups out on the lake between April and November; it could be reserved exclusively for our group. You can rent a canoe or a kayak at the new Sailing Center, which is two blocks north of the venue. "The Leahy ECHO Center is adjacent to the venue. This environmental museum focuses on the history and the ecology of Lake Champlain as well as on Vermont wildlife conservation.

"We would need at least 2 years lead time to make arrangements. Burlington is not Port Clyde, but it is a worthy second!"

This note from Tom brings to mind the flaw in the University of Maine Orono proposition for a 2020 Gathering: it has no champion amongst our members. For the Port Clyde meetings we had the tireless, and vitally important, onsite support from Paul Dalrymple and Gracie Machemer.

Burlington, Vermont, has Tom. He writes, "I fully realize what I am getting into. In my working days, I coordinated a national conference attended by over 400 people, so I know what details need to be attended to. I am also currently the Reunion Coordinator for the Old Antarctic Explorers Association and created a Reunion Planning Guide for them which details what a local organizer needs to do. I have no misconceptions about the work involved, and I am happy to do it."

If you don't drive, you can get there by public transportation. Amtrak stops at Port Kent across the lake; the Vermonter's Essex Junction is a cab ride away. Ferries cross the lake from Essex and Plattsburgh.

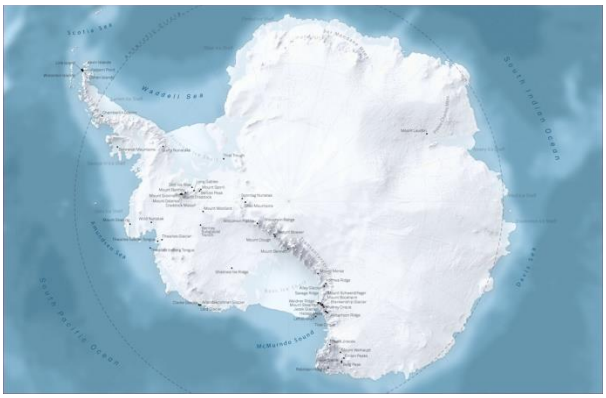
Burlington airport connects to many major cities. Montreal's Pierre Trudeau airport serves many airlines and is a 2-hour drive from Burlington. Or one can take a train from Montreal to Plattsburgh and then the ferry to Burlington. The ferry docks about two blocks from the potential venue.

Arriving on your own boat? Use the Hudson River and Champlain locks, and rent a slip a block away.

Tom adds, "Burlington has a dozen or so microbreweries and – not coincidentally – five colleges or universities."

A hill and a hole

A map with a caption in *On Wisconsin*, the University of Wisconsin alumni magazine, came to our attention. The university's cartography lab and its geology and geophysics library collaborated to create the feature, "58 Frozen Landmarks" – the centerfold of the Winter 2017 issue.



The 58 places in Antarctica named for University of Wisconsin personnel.

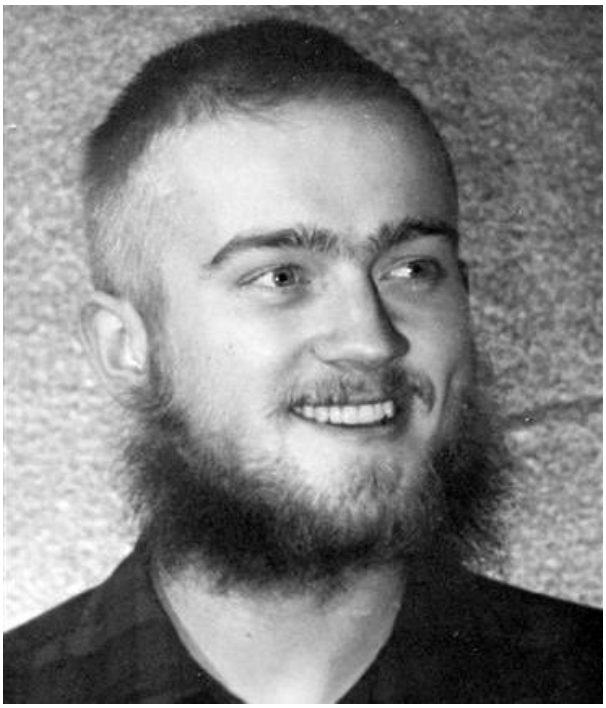
"Badgers have made their mark on Antarctica," it reads, "thanks to the UW's long history of research and exploration of the continent." The two-page map plots 58

natural features in Antarctica named for UW-Madison faculty, staff, and students.

Charles R. Bentley, who died in 2017 (see our Society's October 2017 newsletter), gets special mention. The *On Wisconsin* spread says he spent 25 consecutive months in Antarctica beginning in 1957 and made at least 15 trips to the Ice over seven decades. Mount Bentley and Bentley Subglacial Trench are named in his honor. In a 2008 interview Charlie said, "I claim to be the only person with a hill and a hole named after him."

Eighteen crazy men and a dog

Society member Bob Benson, who reminisces in our July 2016 newsletter about the first Midwinter spent by humans (he was one) at the South Pole, wrote to our treasurer Paul Dalrymple that he and his wife Marilyn have moved to an independent-living retirement community, but remain near NASA's Goddard Space Flight Center in Maryland.



Bob just out of college and at South Pole.

Bob is still an emeritus astrophysicist with Goddard's Geospace Physics Laboratory. NASA has kept him busy since 1964, and his most recent paper was published in *Radio Science* in December 2018. His main research interests are in plasma wave phenomena, ionospheric and magnetospheric physics, and planetary radio emissions. He uses the terrestrial ionosphere and magnetosphere as a space plasma laboratory. These research interests were stimulated in 1957 while at Pole, age 21 and straight out of the University of Minnesota geophysics department.

We thought about asking Bob to write a reminiscence about his long career with its Antarctic start for this newsletter. A brief look at NASA's web site showed we didn't have to; Bob had already done that. Read *Science in a Dark Freezer: a tale of icy beards, frozen tools, and wintering over at the South Pole*, by Joel Shurkin, on the space agency's Earth Observatory web page, https://earthobservatory.nasa.gov/features/Benson/page1.php

Bob was one of the youngest of the 18 "crazy men and a dog" who did the science and ran the station back in the 1957 winter. He took pictures, too. The National Geographic published one of them – a long exposure of the Moon's path through the sky over several winter nights – as a two-page spread in its magazine.

Bob used a pinhole camera at Pole to make this long-exposure shot of the Moon over several nights.

Bob says the winter at Pole is a high point of his life, but he's never been back. Even crazy men, concludes Joel Shurkin in his writeup, become wiser with age.

2018 Amundsen Memorial Lectures

by Tom Henderson

I attended the 2018 Amundsen Memorial Lectures annual meeting in Oslo, Norway. This event is held on the first weekend in December at the Fram Museum to commemorate Roald Amundsen's expedition to the geographic South Pole in 1911. This memorable and enjoyable experience was well worth the $220 registration fee.

The Fram Museum has been voted the best museum in Norway for 5 years running. Director Gier Klover's dedication to preserving and presenting history in an accurate and accessible way is evident in the layout and displays in the museum. Fridtjof Nansen's famous polar ice ship *Fram*, the ship that Amundsen borrowed and used for his South Pole expedition, is at the heart of the museum – literally. The entire ship is housed beneath an A-frame building where visitors can view it at all levels and walk through it. A recent addition is the ship *Gjoa*, which Amundsen sailed through the Northwest Passage in 1904-06, becoming the first to do so. Both ships have been meticulously restored to their original condition using the shipbuilding techniques of their day.

A third attraction is the reed raft *Kontiki* constructed and sailed across the Pacific Ocean to Polynesia from South America by Thor Heyerdahl in the 1950s. Heyerdahl thus proved that Polynesia could have been populated from the east rather than the west. Interspersed among these major exhibits are many smaller but very informative exhibits.

The reception and registration on Friday evening, 30 November, featured the opening of a new exhibit on the Swedish polar balloonist S.A. Andree, who perished on an attempted flight over the North Pole in 1897. The reception was attended by descendants of Andree. It was followed by screening of a 1954 documentary on the life of Roald Amundsen.

The next day featured presentations (in English) by five excellent speakers in the museum's modern and spacious theater, primarily on Arctic topics. One was a sneak preview of a new film on the life of Amundsen. Both the director and lead actor participated in a Q&A session about the making of the movie. The film is produced by Norwegians to Hollywood standards. If the excerpts shown are an indication, this film will be popular among Antarctic enthusiasts and general audiences. Amundsen's life story is heroic and, in hindsight, it begs the question as to why it wasn't redone until now. "Amundsen" will be released in Norway later this year, and syndication in the U.S. is being negotiated.

Amundsen Memorial Dinner in the *Gjoa* Building

The highlight of the Memorial Lectures was the dinner on Saturday night. Each year, a historical dinner is recreated accurately from the menu to the speeches given. The 2018 dinner was a recreation of the state dinner given for Amundsen and his crew upon returning to Oslo from the 1911-12 expedition to conquer the South Pole. Guests at that time included King Haakon VII of Norway. Following a reception on the deck of the *Fram*, each course of the original nine-course dinner was faithfully recreated and served with fine wine in the *Gjoa* building.

Each dinner attendee was also served a small amount of a superb $800 bottle of 1912 Madeira. Gier Klover confided to me that his cost for the dinner alone exceeded the cost of registration. Several of the speeches over the 5-hour dinner were given by descendants of the original speakers from 1912. At the end of the night, everyone was sated, and perhaps a bit tipsy, but also appreciative of a very memorable experience.

I highly recommend the Amundsen Memorial Lectures. The quality of the presentations, the social interactions, the food, and the venue were beyond my expectations. For the 2019 version, keep watch on the Fram Museum website: http://frammuseum.no/. They should begin registration in September 2019. Be diligent: seating is limited to 180, and this event is becoming understandably popular!

Memorable passage aboard R/V *Hero*

by Richard Wolak

Hero at Palmer Station. Photo by Dick Wolak.

The 2018 Antarctic Gathering at Port Clyde, Maine, evoked memories of research vessel *Hero*, the 125-foot wooden side trawler launched 50 years ago at nearby South Bristol, Maine. Upon her retirement from the U.S. Antarctic Program in 1984, she closed the era of wooden working ships in Antarctic waters.

With her small size and ice-friendly rounded hull, *Hero* was not designed for the tempestuous waters south of Cape Horn. In heavy seas, she had the disquieting ability to incorporate all three motions of rolling, pitching, and yawing with little to no predictability (and at times, she'd go altogether still – a bewildering variation).

I've crossed the Drake Passage on ten other ships in varying conditions, but none of those crossings compares to those experienced aboard *Hero*. One in particular stands out. Its memory is 40 years old, but I found the deck log entries and summary for Cruise 78-1C, signed and submitted by legendary Captain Pieter Lenie.

Hero under sail. Photo by Dick Wolak.

The story begins in late summer at Palmer Station. I was the summer station manager, then leaving with 12 other summer residents upon the start of winter. *Hero*'s crossing to Ushuaia, Argentina, was expected to take the usual 69 to 72 hours. We departed Tuesday, 28 March 1978, notably the 10th anniversary of *Hero*'s launching. We hoped to be in the United States by the upcoming weekend.

Hero was typically the last ship to depart the Peninsula each summer. Accordingly, Captain Lenie enjoyed short calls at wintering stations to wish them well. After a brief stop at the nearby Almirante Brown Station (operated by Argentina), we set out to cross Bransfield Strait to the South Shetlands.

LOG: *29 Mar – 0130 Enter Bransfield Strait – short choppy swells – pitching sharply*

LOG: *29 Mar – 0600 Switched to lower bridge – Rolling and pitching violently*

These observations did not bode well; Bransfield Strait is reasonably well protected and rarely difficult. We were in heavy weather, and more ice than usual was slowing our navigation at night. We ran for shelter, choosing Whalers Bay at Deception Island. That anchorage is perhaps the best in Antarctica; we encountered gale force winds, the vessel was "icing from spray whipping aboard," and *Hero* was dragging anchor. A day later "with moderating weather," *Hero* set course for King George Island to visit the wintering crew at Poland's Arctowski Station.

It was 2½ days since leaving Palmer. The serious business of crossing the Drake was at hand.

LOG: *31 Mar – 0210 Set course for Tierra del Fuego – 320 true – vessel pitching sharply in headseas*

LOG: *31 Mar – 1612 Engineer reports the starboard engine off line until alongside a dock – No head gasket, and the turbocharger aftercooler is leaking*

Fourteen hours into the Drake, the starboard engine had a serious problem. The engineer suspected a bad head gasket, but we later learned it was failure of the turbocharger aftercooler core. This heat exchanger recently had been replaced at drydock – with a core designed for fresh water! Running on the port engine alone reduced our ability to make headway. The log entries became alarming:

LOG: *31 Mar – 1900 Winds increasing – vessel starting to leak badly*

LOG: *31 Mar – 2345 No relief from the weather – Rolling and pitching heavily in headwinds*

LOG: *01 Apr – 2300 All day tacked all over the ocean trying to make some headway – most personnel in bad shape from the constant violent motion*

LOG: *02 Apr – 2300 All day trying to get the best course for easier riding, but getting set gradually to the East – salt water entering galley at rapid rate endangering the stove and other wiring*

LOG: *03 Apr – 0300 Heavy squalls continue without break – Vessel almost at standstill and getting set Eastward at great rate – best guess ahead is 2 knots.*

LOG: *03 Apr – 0930 Engineer reports that the Port engine has the same problem as the Starboard with a leaking turbocharger aftercooler – they are now making a bypass line for the cooling water*

The aftercooler core in the port engine also had failed, and the cooling seawater was rerouted around the aftercooler – consequently, the engine was operable, but at much reduced efficiency. Our powerless drift was later described in the captain's report:

"…vessel was stopped and hove to in center of Drake Passage while temporary repairs were made. After drifting for more than two hours, resumed course…at slow speed…barely making headway"

Wanting to know more about our progress, I went to the satellite navigator, knowing that a midnight printout would detail the last 24 hours. I was taken aback at one line:

SatNav Log - 2400: Distance made good - 25 Nautical Miles

If I could get off the ship, I thought, I could walk faster! As we started into day 8, we had been pushed well east of our intended course, and *Hero* needed to turn northwest to enter the Beagle Channel. Conditions severely limited our options.

LOG: *04 Apr – 0400 Due to violent seas, unable to change course for the Beagle Canal – Swly winds setting vessel to the North towards Staten Island (Isla de Los Estados)*

LOG: *04 Apr – 0915 Giving up – winds 45 to 50 knots – seas 35 to 40 feet and breaking – cannot keep control and vessel setting towards Staten Island – Change course and make for shelter*

With few options, we ran for Staten Island, finding entry to the fjord-like Bahia Capitan Canepa. There, *Hero* tucked as far into protection as possible, and the engineers began work on our powertrain. After a day's relief, *Hero* set out across the Lemaire Strait for Tierra del Fuego. Though we managed only 3 to 4 knots, progress was steady. The Beagle Canal (Channel) was a welcome sight as day 10 unfolded. With relief we read the ultimate log entry at Ushuaia:

LOG: *06 Apr – 1400 All secure at dock….*

Sunken *Hero* at Bay Center, Washington. Photo by Bill Spindler.

This article summarizes Dick's talk at the Garage Theater during the July 2018 Antarctic Gathering. – Ed.

Prestigious award for *Ice Eagles*

Webmaster Tom Henderson's documentary *Ice Eagles: American Aviation in Antarctica* has won a 2018 Award of Merit from *The Impact DOCS Awards Competition*.

This excellent 2017 film recounts U.S. aviation in Antarctica from the 1928 start to the present. It has archival film and photos plus interviews of people, some dating back to the 1939-41 U.S. Antarctic Service Expedition, who made the history.

Tom produced and directed the film.

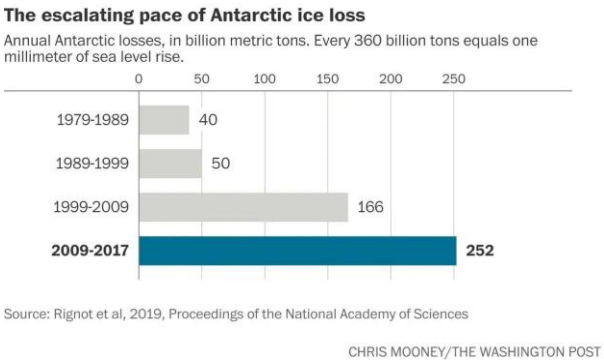
Impact DOCS recognizes film, television, videography and new media professionals who demonstrate exceptional achievement and produce standout entertainment or contribute to profound social change. Entries for the 2018 competition, received from 30 countries, were judged by professionals in the film and television industry.

For more about *Ice Eagles* or to get a copy, call Tom at 518-888-0387 or visit his Graceful Willow Productions website, www.gwillow.com.

Antarctic ice has new attention

"Antarctic ice loss is up sixfold since the 1970s" headlines a story in the 19 January 2019 *Washington Post*. It's among recent articles in popular media acknowledging that glaciologists are onto something affecting nearly everybody.

The headlines are coming out because new research is being published. The new studies exist because *new data* are resulting from both existing and new observational tools.



The research paper behind the *Post*'s report is "Four decades of Antarctic Ice Sheet mass balance from 1979 to 2017," by Eric Rignot and others, issued 14 January in *Proceedings of the National Academy of Sciences*.

This paper uses a comprehensive, precise satellite record and a regional atmospheric climate model to document Antarctic ice loss and its impact on sea-level rise. The ice loss is dominated by "enhanced glacier flow in areas closest to warm, salty, subsurface circumpolar deep water."

West Antarctica contains many of these areas, as known for some time. The paper asserts that East Antarctica, thought for so long to be stable, has been a major

contributor over the entire period. These coastal areas are likely to dominate sea-level rise from Antarctica in decades to come, the authors state, as polar westerlies push more circumpolar deep water toward the outlet glaciers.

"The places undergoing changes in Antarctica are not limited to just a couple places," Rignot told the *Post*. "They seem to be more extensive than what we thought. That, to me, seems to be reason for concern."

It's hard to be an optimist when nearly every new study seems to make things look worse. Temperatures during the Eemian, 125,000 years ago, were barely higher that today, but sea levels were 6 to 9 meters higher than now. The source of all that water was a collapse of the West Antarctic Ice Sheet, Anders Carlson of Oregon State told the AGU Fall Meeting in December. The discovery was "teased out of a sediment core," reports the 21 December 2018 *Science*.

As an analogy for the present, the Eemian is "probably the best there is, but it's not great," says Jacqueline Austermann of Columbia University.

Nevertheless, the big uptick in mass loss that Rignot and others have documented in the last few decades is perhaps the start of the West Antarctic collapse "rather than a short-term blip," says Jeremy Shakun, Boston College.

More certainty is on the way, regarding the Eemian, anyway. *Joides Resolution*, the deep sea drilling ship, is on IODP Expedition 379 (18 January to 20 March 2019) taking at least five ocean bottom cores off West Antarctica. "That's going to be a great test," Carlson says.

Back to Eric Rignot and the present, that warm, salty ocean water causing much of the melting of the bottoms of outlet glaciers is not so much because the whole ocean is warmer, although it is, but because the wind is nudging existing warm currents closer to Antarctica.

Now, Lijing Cheng, Chinese Academy of Sciences, and others in the 11 January 2019 *Science* confirm that warming of the whole ocean is accelerating. If global warming keeps going at its present rate, we'll get a 0.78 K rise in ocean temperature by 2100, yielding thermal expansion equal to a sea level rise of 30 centimeters. Cheng *et al.* write, "This is in addition to increased sea level rise caused by land ice melt."

And here's another new angle. A paper in the 14 January 2019 *Nature Geoscience* examines the link over geologic time between Earth's axial tilt – the angle between the planet's axis of rotation and the Sun – and the presence or absence of sea ice around Antarctica.

"Linking those cycles to a detailed chemical record," notes the online *Science-Daily*, "suggests that elevated carbon dioxide in the atmosphere and the resulting loss of sea ice around the Antarctic played a big role in amplifying the effect of changes in the Earth's astronomical motions on the durability and stability of the Antarctic Ice Sheet."

The authors of the *Nature Geoscience* paper note that 2017 and 2018 saw reduced Antarctic sea ice after decades of growth.

High-energy-neutrino source found

Most of what we write about in these newsletters has to do with something going on in Antarctica. The most expensive experiment ($280-million) ever fielded there – the IceCube neutrino detector built on, and deep within, the ice sheet at South Pole Station – is investigating things about as far away from the Antarctic as you can imagine.

The IceCube project, using a hot water drill, has hung 5,160 light detectors in a cubic kilometer of the extremely clear and deep ice that's typical throughout the Antarctic interior. The array was completed in 2010.

Almost since then, the detectors have been seeing Cherenkov radiation, blue light that results, once in a while, from a neutrino hitting the nucleus of an ice molecule.

Neutrinos go almost as fast as light and have almost no mass. A few million of them passed through the end of your nose as you read this sentence. Notice that you didn't feel them. That's the problem with detecting neutrinos. They're so small that nearly all of them fly by without hitting anything.

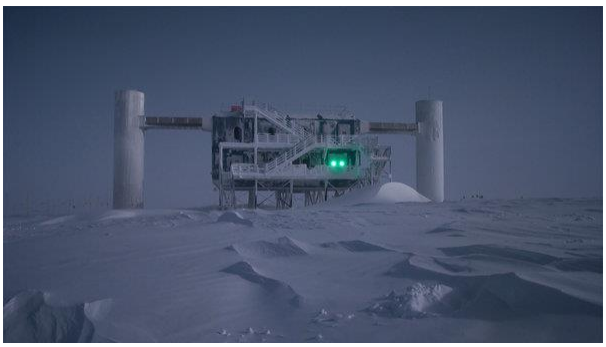
IceCube Neutrino Observatory on cover of 13 July 2018 *Science*. The 5,160 spherical digital optical modules are each 35 cm in diameter and as deep as 2.5 km in the ice. Image: Jamie Yang and Savannah Guthrie, IceCube, NSF.

Garden-variety neutrinos, and that's nearly all of them, are spawned by cosmic rays hitting Earth's upper atmosphere. IceCube researchers have figured out how to distinguish them. But what they're looking for in particular are very high energy neutrinos: above 30 trillion electron volts.

They've found a few: a dozen or so a year. When one of those rare hits leaves a clean track with a well-defined direction, other telescopes scramble to look for an obvious cosmic source.

On 22 September 2017, IceCube plotted a neutrino that, working backward, the orbiting Fermi Gamma-Ray Space Telescope figured came from a far off blazar, a hugely bright source of radiation powered by a supermassive black hole. The blazar is 4 billion light-years out; it happens to shoot a relativistic jet of plasma in the direction of Earth.

Daniel Clery, a *Science* staff writer, says in the 13 July 2018 issue that, if the astronomers are right, the finding "could mark the founding event of neutrino astronomy." His "In Depth" article introduces two research papers. The cover shows a painting of four detectors suspended in the ice; "Neutrinos from a Blazar" is the issue's cover story.



IceCube surface lab at South Pole Station.

Why are we spending $280-million trying to find neutrinos, and why did this discovery make the cover of America's most prestigious scientific journal?

The Antarctic parallel is poignant. When Captain James Cook almost saw the continent in the 1770s and doubted anyone would find a use for it, he kicked off a couple centuries of investigation that is not over yet. Neutrinos are "high-energy astronomical messengers," says the IceCube web site. They provide information to probe "the most violent astrophysical sources: events like exploding stars, gamma-ray bursts, and cataclysmic phenomena involving black holes and neutron stars."

After the new finding sunk in, IceCube researchers went back through the data to see if high-energy neutrinos had come from the same location before. They found 150 days in 2014-2015 when the in-ice detectors saw more

neutrinos than normal from the spot. Whether or not the blazar was flaring at the time, "the archival event was much more interesting" than the 2017 detection, says PI Francis Halzen of the University of Wisconsin – Madison.

U.S. Antarctic Program upgrades

On 17 December, NSF issued a "sources sought" notice seeking firms that could replace the 50-year-old pier at Palmer, the U.S. year-round research station by the Antarctic Peninsula. The notice is not a request for proposals; it asks for information about organizations that could demolish the old sheet-pile bulkhead pier and replace it with a larger one.

Information Technology and Communications building going up at McMurdo. Photo by Ferraro Choi.

Across the continent, the first step in upgrading the whole of McMurdo Station – the coastal logistics hub for much of America's field program in the Antarctic – will begin in February 2019 with construction of an 11,000-square-foot information technology and communications building. Work, over two austral summers, is scheduled to be finished in 2020.

USCG new-icebreaker update

Coast Guard news in the 15 January *Washington Post* about possible new polar icebreakers is discouraging: "Funding is no longer a certainty." A Senate appropriations bill passed last year had $750-million for the first of three ships, but the House version did not include the money.

A design contract is under way for what's now designated a Polar Security Cutter. Read a 78-page Congressional Research Service update at https://fas.org/sgp/crs/weapons/RL34391.pdf

RSV *Nuyina* icebreaker under construction. Image: Damen/DMS Maritime/Knud E Hansen A/S.

"The U.S. Coast Guard's funding for a polar icebreaker is set to be postponed yet again," wrote the U.S. Naval Institute on 19 December 2018, "after Congress and President Donald Trump again failed to reach an agreement on fiscal 2019 funding for the Department of Homeland Security.

A Homeland Security budget expert is confident the Coast Guard will be able to start the icebreaker program without lasting damage due to wide support on Capitol Hill.

The need for new polar icebreakers is National, with operational and security implications in both polar regions. For the U.S. Antarctic Program, as you likely know, annual breakout of the channel to McMurdo is a critical requirement for resupply. We rely on the Coast Guard's *Polar Star* for this task now, and the ship is 40 years old.

Australian Antarctic infrastructure

Antarctic, publication of the New Zealand Antarctic Society, reports in Issue 246 (2018) that the Australian Antarctic Division is expanding its activities and

capabilities and developing Hobart as an Antarctic hub and gateway.

A 2016 strategy and action plan is driving the developments.

Chief among them is a new 160-meter (525-foot) icebreaker being built for Australia at Damen Shipyards on the Danube River in Galati, Romania. (U.S. icebreaker *Healy* is 420 feet. USCGC *Polar Star*, which breaks open the McMurdo channel, is 399 feet.)

The Australian 'breaker, RSV *Nuyina* (a Tasmanian Aboriginal word meaning Southern Lights), has been launched and is to arrive in Hobart in 2020. The once-in-a-generation commitment – $1.9-billion Australian to design, build, and operate the ship for 30 years – is the single biggest investment in the history of Australia's Antarctic program.

The new ship, to replace the aging *Aurora Australis*, will be the main lifeline to Australia's Antarctic stations as well as the central platform of the nation's Antarctic and Southern Ocean science.

The new paved runway at Davis Station mentioned on page 1 of this newsletter will be 2,700 meters (8,900 feet) in length, capable of landing large commercial planes, and able to operate year-round. The site is in the Vestfold Hills, 6 kilometers from the station. Construction is to start subject to completion of environmental approval.

The heavy tractor capability with construction of a deep corer is intended to reach million-year-old ice.

New Society members in 2018

With pleasure the Antarctican Society welcomes 23 new members who joined in 2018. Some have been attentive to the Antarctic for some time. For others the Ice is a fresh experience. Members receive the Society's newsletters and get full access to the information-rich web site.

You'll find more information about our new members, and existing ones, too, on the Members list on the web site.

An unfortunately underused feature is the "Bio" section for each of us. We hope more members (new and existing) will choose to take advantage of this feature by posting biographical information about themselves. A guide on how to do this appears at the top of the "Members List" section of the site. Hearty welcomes to:

- Joanna Kafrowski of Ontario.
- Kenneth Solomon of LaCrosse, Florida.
- Richard Smith of Haymarket, Virginia.
- Morgan Seag of Nyack, New York.
- William Highlands of Shrewsbury, Massachusetts.
- Merlyn Paine of Carson City, Nev.
- E. Susan Bartlett of Bloomington, Indiana (deceased).
- Dorcas DenHartog* of Hanover, New Hampshire.
- Charles Jos Biviano of Richmond, Virginia.
- Irma Hale of West Palm Beach, Fla.
- Albert Lozano of Dallas, Pennsylvania.
- Carlo Facchino of San Jose, Calif.
- Philip Kyle* of Santa Fe, New Mexico.
- Ruth and David Kraner of Palmetto, Florida.
- Henry Hamilton of Otisfield, Maine.
- Russell White of West Boylston, Massachusetts.
- Kenneth G. Russell of Montpelier, Vermont.
- Jack Long[1] of Livermore, California.
- Ian Howatt of Worthington, Ohio.
- Haofeng Tang of Washington, D.C.
- Eric Dietrich-Berryman of Virginia Beach, Virginia.
- Robert Taylor of East Millinocket, Maine.
- Tina King of Mount Juliet, Tennessee.

[1] Especially long Antarctic involvement.