some other body with an international board "would make the funding situation a little bit easier," Morse says.

Some scientists picture an even bigger role for an international coordinating body: overseeing the entire South Pole science operations by serving as an NSF contractor. The International South Pole Science Consortium, as its backers are calling it, could also serve as a powerful voice for science early next decade when construction on the new station is expected to be going full swing. Such a voice may be sorely needed. "It looks like we don't have enough airlift capability to modernize the station and do all the science we can do," says NSF Antarctica Representative Dwight Fisher.

If an international board does assume control of antarctic astrophysics, the South Pole may face some competition as a telescope site. Some scientists argue that Dome Concordia (Dome C), a site about 2000 kilometers from the pole, may offer the best viewing on the continent. France and Italy are building an international base at Dome C—Concordia station, which will open for limited operations in 2001—and may seek to have at least one major telescope under IAO located there. "It's a very, very interesting site," says Meyer. In addition to having a thinner atmosphere, Dome C is less windy and sits at a higher elevation than the pole and is visible to geostationary satellites, giving it 24-hour communications. (South Pole station has satellite contact only 6 hours a day.)

For now, however, "spending any time at Dome C is hero's work," says Meyer. "There's a heck of a lot of infrastructure at the South Pole not reproduced there." And there may soon be more: If Congress appropriates funding to continue the upgrades to South Pole station, three new lab and living modules could replace the 23-year-old geodesic dome by 2005.

Still, cozy quarters isn't the main force dragging astrophysicists far from home—it's the sky. "As far as getting more scientists," says Jackson, "we don't have to go out and pimp for the South Pole." CARA's success over the next couple of seasons at doing astronomy—and lobbying for its successor—could ensure that the polar sky draws admirers for years to come.

–Richard Stone

MARINE BIOLOGY

First Glimpse at Hidden Life of Seals

MCMURDO SOUND—From an observation tube suspended in the frigid waters here, the sea ice's fleecy underside looks like the tormented skies of an El Greco painting: a stormy expanse of umber clouds tinged with green. All is eerily still—except for the jellyfish, ghostly white, that drift with the current—until an oblong shape thrusts up from the murky depths, toward a hole in the algae-discolored ice. The faint light near the surface transforms the blob into a female seal, which disappears up into the hole.

R. STONE

Star of the show. New seal cam is revealing secrets of seal behavior.

Researchers have been waiting for days for this particular Weddell seal to haul herself onto the ice so they can retrieve a tiny $50,000 camera mounted on her head. As the seal bobs in the breathing hole, the device glints tantalizingly in the brilliant sunlight. But after a few minutes, she sinks back into the El Greco–like world below. "She's bored," says physiologist Terrie Williams of the University of California, Santa Cruz. The delay is only a minor irritation in a gratifying field season: Williams and her colleagues have, for the first time, filmed Weddells plying the pitch-black waters of McMurdo Sound—images that are offering new insights into how the seals dive and forage.

To marine biologists, the astounding athleticism of Weddells made them stars long before these flicks. Some can hold their breath for 80 minutes while swimming—a feat that "is the equivalent of a lion pursuing its prey while holding its breath," says team leader Randy Davis of Texas A&M University in Galveston. Navigating with few visual cues, Weddells can range up to 5 kilometers from a lone breathing hole and still find their way back. And they efficiently locate fish—they consume about 200 or so a day—in the inky waters.

But researchers know little about how seals manage these feats or what else they do down deep. "These behaviors are more or less invisible to us," says Davis. To study the secret lives of diving animals, his team for a decade has been developing progressively smaller and more sophisticated cameras. So far, they have chronicled the comings and goings of sea turtles, dolphins, and elephant seals, and now they are breaking new ground with Weddells. "The camera will help us understand just what kind of hunter these critters are," says Williams.

In a talk that wowed fellow scientists last November at McMurdo Station, the main U.S. base in Antarctica, Davis and Williams detailed their findings from the first field season of their 3-year project. One video showed a seal blowing air bubbles into the underside of the sea ice. Suddenly, a fish darted out from a cranny in the ice, the seal lunging after it. "Our hypothesis is that the animal is using great backlighting to look at a silhouette of a fish" before exhaling to flush it out of its nook, explains Davis—a foraging behavior never seen before, he says.

They also learned more about how the seals dive. "We wanted to know if we would see a real exercise bout or just lazing around," says Williams. Turning the "head cam" into a "butt cam," she says, the researchers saw that the seals sank like rocks while hardly twitching a flipper. Williams speculates that the seals somehow alter their buoyancy to take advantage of pressure changes.

To do their snooping, the scientists employed the "isolated hole paradigm" pioneered by penguin specialist Gerald Kooyman of the Scripps Institution of Oceanography in La Jolla, California. Davis's team found a spot on McMurdo Sound surrounded by at least 5 kilometers of unbroken ice. They drilled a hole big enough for seals to get out and breathe. Next, they captured a seal, brought it to the site, slapped on a neoprene rubber patch, and attached the camera setup. Because the seal had to return to the breathing hole, the researchers could always recover their camera.

Filming in near-infrared light—invisible to the seal's eye and to its prey, which suggests it won't alter either one's behavior—emitted from the camera like a flashlight, the researchers taped 23 dives by four animals. The results leave Davis feeling vindicated. "For quite a few years, people have been telling us this is not possible," he says. Indeed, the seal grant proposal was rejected five times, Davis says, before reviewers for the National Science Foundation deemed the technology workable.

Next, Davis's team plans to turn a mass of data on the precise locations of seals during a dive—information gleaned from a seal's recorded depth, speed, and bearing—into three-dimensional graphs that reveal the intricacies of the dives. This is a step, Davis says, toward scientists tagging along in a virtual environment with an animal as a satellite tracks its movement, feeding data to a computer in real time. Davis envisions ever tinier instruments that will someday turn marine creatures into autonomous vehicles for remote-sensing the oceans. When that day comes, he says, "it will open up a whole new world to us."

–Richard Stone