Reflections

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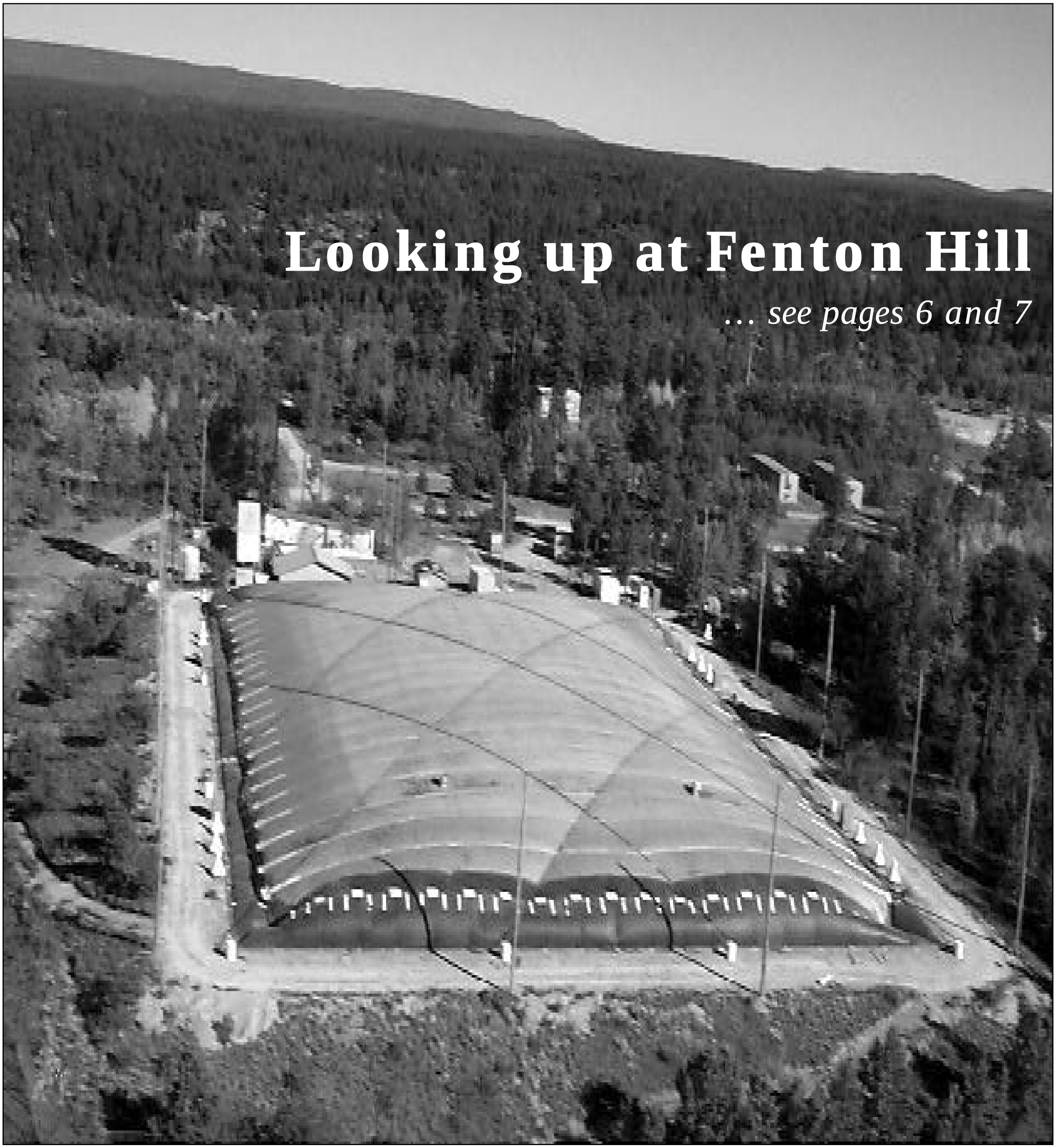

Looking up at Fenton Hill

... see pages 6 and 7

Inside this issue ...

Cover photo courtesy of the Milagro Project

Reflections

Reflections, the Laboratory monthly publication for employees and retirees, is published by the Public Affairs (PA) Office. The staff is located at TA-3, Building 100, and can be reached by e-mail at *newsbulletin@lanl.gov*, by telephone at 7-6103, by fax at 5-5552 or by regular Lab mail at Mail Stop C318. The individual telephone numbers are listed below.

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editor's journal

Mother Nature takes control

"When do the plagues and pestilence start?" someone jokingly remarked when it started to rain a few days after we came back to work after the fire. Since denuding the hillsides, the devastating Cerro Grande fire has forced foresters and ecologists to warn the community and the Lab that flash flooding is a very real and very dangerous possibility. It does seem that we are suffering from tragedies of legendary proportions.

The Cerro Grande fire put your "Reflections" about a month behind schedule. The publication was just about to go to print when the fire became uncontrolled. It's the first time we missed a publication date. "Reflections" is one of the lesser casualties of the fire. Four people in our small office have lost their homes. They, with the four hundred other families, suffered the most when fire ripped the security of their home life away from them.

Fire burned about 8,000 acres of Lab property. Although the Lab did not suffer significant structural damage, some of the transportables that burned were people's offices. One office contained a researcher's notebooks, patent notes and results from experiments that he had conducted for more than eight years, mostly unrecoverable.

The old TV commercial used to exclaim, "It's not nice to fool Mother Nature."

We pride ourselves on the greatness of our science and technology, but there was no science, no machine, no mathematical theory that could put out the flames on Wednesday, May 10. Jim Paxon, the Forest Service spokesman, said firefighters would have needed a bulldozed fire line more than a mile and a half wide to stop the blowing embers in the 50 mph wind gusts.

"Today, Mother Nature is in control," Paxon told reporters. It was humbling to watch the fire rage as Mother Nature took over.

We've demonstrated our intellectual know-how when we tested nuclear weapons. Yet Mother Nature continues to inspire and threaten. A small thunderstorm has the potential energy of 10 atomic bombs. And with the potential of flooding in the next year or so, Mother Nature may not be done with us yet.

For all the destructiveness, the fire brought out heroes and heartwarming stories that are now becoming local legends. There is the story of the local fire battalion chief who held the hose on his neighbor's house, while his house next door burned. Another story of the two police officers who watched their houses go up in flames as they directed traffic. For these heroes, we offer our heartfelt appreciation for their courageous and skilled efforts that helped save the Lab and the community.

Human nature humbled Mother Nature. The kindness and generosity of fellow New Mexicans was awe-inspiring. The local communities rallied to support displaced families by offering food and shelter to folks they didn't know, but empathized with.

I have never witnessed the outpouring of generosity the Red Cross. I have a new appreciation for the breadth and scope of the organization.

It's odd how the fire puts a new perspective on life. What seemed important only a few weeks ago, now is not. The evacuation put new priorities in place: Memories are more important than material goods.

For all the destruction that the Cerro Grande fire did, let's focus on the rebuilding. We can be thankful that no one was killed nor seriously hurt in the fire. Let's focus on the positive experiences and remember the negative ones to learn from them.

The next issue of "Reflections" will focus on the fire. Look for it in August.

Kathy

Safety-checking your workspace

by Steve Sandoval

A windowless, soundproof vault might seem like a safe place to work at the Laboratory. Away from heavy equipment and machinery or even office equipment, it's easy to think that safety isn't a primary concern.

Mabel Grey-Vigil of Computational Science Methods (X-8) thinks otherwise, and because of her heightened awareness of safety, she feels her workspace is safer. Being married to a firefighter also has made her more aware of safety off the job as well.

If an emergency required an evacuation from the vault, Grey-Vigil reasoned, she might not hear warning sirens or see emergency lights. "With the door closed you never know what's going on outside. You feel real isolated in there," she said.

The computer programmer went a step further; she talked to Betty Martinez of Facilities and Waste Operations (FWO), building manager for the Administration Building. Martinez worked with staff from the Lab's Security (S) Division to design and install emergency lights in all vaults and vault-type rooms in the building. The emergency warning lights had to meet security requirements as well as address safety, Martinez said.

"We did not have the mechanisms to ensure that occupants of vaults would evacuate the building because we didn't have access to the vault," Martinez explained.

"This made me feel a lot more comfortable that if something happened I would know that I needed to get out of there," Grey-Vigil said, adding that National Safety Month in June was a perfect time for all employees to take a minute to review safety in their workplace and at home. Or even on the way to work or home.

She recalled coming upon a fatal automobile accident in 1998 while en route home to Española. She was several cars behind the accident. She pulled onto the shoulder of NM 502, got out of her car and noticed both cars were on fire. "We tried to open the car doors and they were locked from the inside or damaged from the accident," she said. "I was trying to find a fire extinguisher from every car that passed by."

Mabel Grey-Vigil, right, of Computational Science Methods (X-8) holds a fire extinguisher as she and Mary Beth Lee of X-8 go through a first aid kit in the back of Grey-Vigil's car. A fire extinguisher should be carried in vehicles, Grey-Vigil said, and can be purchased at hardware stores.
Photo by LeRoy N. Sanchez

Finally someone showed up with water, she said, and the fires in the vehicles were put out. "The lesson I learned from that is not only did the first aid kit and blankets help the people injured, but also to place a small fire extinguisher in the trunk of your car. It will come in handy if something like this happens again."

Grey-Vigil added that fire extinguishers should be checked every six months and the gauge should mark "full/good."

During National Safety Month, the Laboratory conducted a number of safety-related activities to raise awareness of safety.

It ain't easy bein' cool:
A quiz to beat the summer heat

When the mercury rises above 80 F, it's difficult for your body to maintain a temperature balance. This can result in heat fatigue, heat rash, vomiting, nausea and deadly heat stroke. Here's a quiz to test your summer heat knowledge. The answers are at the bottom of the page.

1. Which of the following statements is true?
a. People who tan easily or have darker skin aren't affected by the summer heat.
b. A sunscreen with a high sun-protection factor eliminates the risk of heat-related illness.
c. If you're in good shape, you can handle the heat.
d. None of the above

2. A heat rash is most likely to occur
a. In a dry environment
b. In a humid environment
c. When swimming
d. At high altitudes

3. True or False? Heat stroke is a life-threatening condition.

4. If someone has heat stroke, which of the following should you NOT do?
a. Move the person to a cool place.
b. Sponge off the victim with cold water.
c. Give the victim something to drink.
d. Seek medical attention immediately.

5. True or False? Children can withstand the heat better than adults.

6. When you exercise in the heat, how often should you take breaks?
a. Every 15 minutes
b. Every half hour
c. Every hour
d. Whenever you feel thirsty

7. True or False? Water is the best thirst quencher.

(Reprinted with permission of the National Safety Council.)

Answers to summer heat quiz:
(1) d; (2) b; (3) True; (4) c; (5) False; (6) a; (7) True

Program helps employees navigate the maze

by Judy Goldie

The Laboratory can seem like a maze of organizations and services when you have a concern and aren't sure who can best address it. That's one reason the Ombuds Program Office was created — as a place members of the Lab's workforce can go for guidance.

Since opening its doors for business at the Central Park Square offices in downtown Los Alamos in June 1997, the Ombuds Program Office has seen an increase in business of 280 percent from its first full year of operation. Ombudsman Bruce MacAllister's benchmarking shows that the program "is extremely well-utilized for the size of the organization."

MacAllister observed that the Ombuds Program has, in the past, received high marks for its accessibility. However, he agreed with some observers that the program has been unable to respond quickly enough to some urgent needs. Now, however, the program's utilization has been tracked, and the office staffing level has been increased to improve responsiveness.

Not only has usage and staff increased, the scope of the Ombuds Program itself has expanded. What started as a service strictly for workforce issues has grown. It now includes the Mediation Center, formerly in Human Resources (HR), a telephone hot line and facilitation to organizations with issues such as team or intergroup conflicts. In addition, the Laboratorywide e-mail "suggestion box," future@lanl.gov, has been operated by the program since 1998. Expanding, too, is access to available services, which is not limited to the Laboratory workforce but includes anyone who interacts with the Lab in both business and tech transfer arenas.

"(The Ombuds Office) is extremely well-utilized for the size of the organization."

The services of the Ombuds Program Office have always been available to the entire workforce. The Ombudsman has been tasked from the onset with improving the "hospitality" of the workplace. That extends to everyone who works at the Lab and those who feel affected by Lab actions.

MacAllister emphasized, "It is a natural extension of the concept of hospitality to all those who have a concern under the control of the Laboratory."

The Ombuds Program works from three fundamental principles: independence, neutrality and confidentiality. It adheres to the Code of Ethics and Standards of Practice of the Ombudsman Association, a national professional organization of men and women who serve as ombudsmen.

You can reach the Ombuds Program Office by phone at 5-2837, fax at 5-3119 e-mail at *ombuds@lanl.gov* or anonymously through the Ombuds Hotline at 7-9370. More information about the services offered by the office is available through its Web site at *http://www.lanl.gov/ombuds/*.

The Ombudsman Association Code of Ethics

The ombudsman, as a designated neutral, has the responsibility of maintaining strict confidentiality concerning matters that are brought to his/her attention unless given permission to do otherwise. The only exceptions, at the sole discretion of the ombudsman, are where there appears to be imminent threat of serious harm. The ombudsman must take all reasonable steps to protect any records and files pertaining to confidential discussions from inspection by all other persons, including management. The ombudsman should not testify in any formal judicial or administrative hearing about concerns brought to his/her attention. When making recommendations, the ombudsman has the responsibility to suggest actions or policies that will be equitable to all parties.

Nuclear education project fills need, enhances workforce skills

by John A. Webster

For John Watkin, teaching students, technicians and staff members about actinide chemistry not only fills a knowledge need at the Laboratory and a gap in university curricula, it's enjoyable.

"It takes time, but we feel it's part of our professional job description," said Watkin, a chemist in Actinide, Catalysis and Separation Chemistry (CST-18). "It's really fun to do all this teaching. We're having a blast."

Watkin teams with Web Keogh, also of CST-18, to teach about actinides, a series of radioactive elements that includes uranium and plutonium, under the auspices of the Los Alamos branch of the Glenn T. Seaborg Institute of Transactinium Science. They are now teaching the fully accredited, three-hour course at the University of New Mexico campus in Los Alamos for a second summer.

The institute also coordinates a nuclear and radiochemistry course being taught for the first time this summer by Moses Attrep of the Chemical Science and Technology (CST) Division and Joe Thompson of Nuclear and Radiochemistry (CST-11).

"Universities don't deal with actinide science any more," said David Clark, director of the institute's Los Alamos branch. "The national laboratories are the only places with the facilities and the expertise to deal with the subject, so we should take ownership of this issue. We are not only training students, but supporting the career development of our employees."

Keogh and Watkin first taught their course at the UNM Albuquerque campus in the spring of 1999, but only three students enrolled. Nevertheless, the experience was positive, said Watkin, so they approached UNM-LA officials, who were very supportive about holding the class in Los Alamos that summer.

Web Keogh, standing left, and John Watkin, right, both of Actinide, Catalysis and Separation Chemistry (CST-18), teach a fully accredited course on actinide chemistry at the University of New Mexico, Los Alamos, under the auspices of the Laboratory branch of the Seaborg Institute. Students at other universities in New Mexico take the course through a distance learning network. *Photo courtesy of the Seaborg Institute*

They sent e-mail around the Lab seeking students and also connected with a distance learning network based at New Mexico State University in Las Cruces. By the time the summer class started, there were 28 students sitting in the classroom and another 20 watching on TV at UNM, NMSU, the New Mexico Institute of Mining and Technology in Socorro and the Waste Monitoring Center in Carlsbad.

"In the class evaluations many of the Laboratory techs said the course information was directly related to their work," Watkin said. "That was just great."

The students included four summer research fellows whose work at the Lab will result in papers in five peer-reviewed publications. Eight fellows were selected for this summer — four in actinide chemistry and four in nuclear and radiochemistry.

Clark said the courses are designed to support the mission of the Laboratory and the skills needed to fulfill that mission. They were fully funded by the Department of Energy's Office of Defense Programs last fiscal year. This year, funds from DOE were cut, along with funding for many other educational programs, but the office of William Press, the Lab's deputy director for science, technology and programs, provided support.

The institute has also sponsored workshops and short courses in such areas as actinide molecular science, and it plans classes in actinide environmental science and in plutonium oxides and gas generation.

"When the Laboratory was founded, the technical staff would get together to share what was known about nuclear weapons design," Clark said. "The goal of our nuclear education project is to recapture that philosophy of teaching one another about mission-critical science."

From looking down to looking up

Fenton Hill plans a cosm

by Todd Hanson

High in the Jemez Mountains, at nearly 8,700 feet above sea level and a winding 35 miles from Los Alamos, Fenton Hill stands above the surrounding pine and aspen forest. Nighttime at Fenton Hill, like so many places in New Mexico, is profoundly dark. The spot is shaded from the shine of Santa Fe and Los Alamos lights by the Jemez Mountains and Albuquerque glows dimly in the south.

Fenton Hill, or TA-57 as it was once known on Laboratory maps, is the birthplace of the Hot Dry Rock project — an experiment developed at Los Alamos to test the feasibility of mining the omnipresent heat beneath the surface of the Earth. Today, it is home to Fenton Hill Observatory, which houses a good portion of the astronomical research conducted by the Laboratory.

Home of the Hot Dry Rock project

Hot Dry Rock is an important part of Laboratory history. The land that now cradles delicate telescopes and instruments once was a testbed for scientific attempts to tap nature's warm interior.

In the Hot Dry Rock project, water was pumped down an injection well into hot, crystalline rock reservoirs where it became superheated as it flowed through open joints. Returning back to the surface through production wells, the water carried heat that was extracted using conventional processes. The same water was then recirculated back down to collect more heat. In the closed-loop operation, the injection pump, working like the human heart, provided the entire motive force for the circulation. Nothing, except a small amount of waste heat, was released into the environment.

The first Fenton Hill reservoir was constructed over the course of four years beginning in 1974, and the facility was operated intermittently from 1978 to 1980. Later, Los Alamos researchers created a second, independent reservoir at the site, which was larger, deeper and hotter than the first. A power plant — designed to power industry standards, but used only experimentally — was constructed between 1987 and 1991. The plant released heat that normally would have been used for power generation.

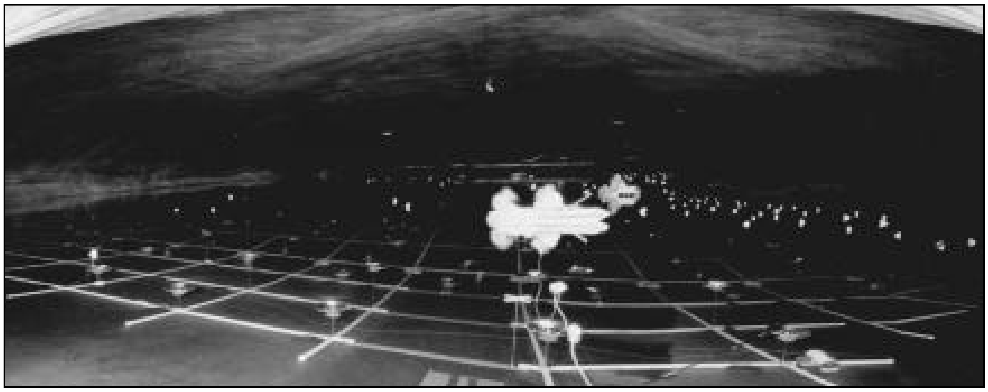
Long-term flow tests of the circulation system and reservoir conducted in 1992 and 1993 proved the Fenton Hill reservoir could produce water with temperatures exceeding 360 degrees Fahrenheit at a rate of 90 to 100 gallons a minute. Generating 4 thermal megawatts from a single production well, the heat mining technologies proved highly successful. However, the project would come to a sputtering end.

In early 1995, researchers re-established production levels after a funding hiatus of two years. During that time, they also demonstrated that the energy production from a Hot Dry Rock plant could be rapidly increased to more than 60 percent above its expected output in order to meet short-term peak power demands. The success of these and previous experiments led the Department of Energy to solicit bids from applicants seeking to deploy the first commercial prototype Hot Dry Rock facility. Although bids were received from commercial organizations, the solicitation was canceled in October 1995.

The Hot Dry Rock experiment at Fenton Hill is gone now, but the ideas hatched there have been incorporated into broader hydrothermal programs. The national geothermal industry is applying the project's technological advances to help solve problems involving commercial geothermal production from natural hydrothermal resources.

Left: The Fenton Hill Observatory sits high in the Jemez mountains. The Milagro pond is to the right.
Photo courtesy of the Milagro Project

ic future



Under the football-field-sized cover of Milagro, researchers raft across the 6-million-gallon pond to check and repair sensitive photomultipliers. Photo by LeRoy N. Sanchez

The Fenton Hill Observatory

Today, things at Fenton Hill are looking up — literally. Fenton Hill is a budding research station, observatory and home to several unique telescopes. Many of these telescopes are used in the research of cosmic transients — short-duration, one-time astrophysical events lasting anywhere from less than a second to as long as few years and including such diverse phenomena as quasars, comets, asteroids and supernovae. Because of the Laboratory's interest in high-energy physics, astrophysics and space science programs, Los Alamos researchers have studied cosmic transients for decades.

One of the most recent additions to Fenton Hill is REACT, or Research and Education Automatically Controlled Telescope, a robotic telescope with a one-half-degree field of view that can be controlled remotely by computer to automatically swing around to take a series of high-resolution photos of the sky. REACT, which was installed in 1997, often reacts to capture any optical signals that might coincide with gamma-ray transients seen by other sky-watching instruments at Fenton Hill. As the name implies, the telescope also is used in educational outreach to bring astronomical study and research closer to New Mexico high school students.

Jim Albright of Geoengineering (EES-4) reads from a memorial plaque commemorating the Fenton Hill birthplace of the first demonstration of Hot Dry Rock geothermal energy technology. The plaque and the drill bit behind it were unveiled earlier this year during a celebration of the achievements of the Lab's Hot Dry Rock Project. Photo by James Rickman

Watching the night sky with REACT at Fenton Hill is Milagro. Milagro is a Cherenkov detector that uses more than 700 photomultipliers — extremely sensitive light detectors — submerged in a six-million-gallon artificial pond of highly purified water. Named for the Russian physicist who made comprehensive studies of this phenomenon, Cherenkov radiation is the faint, bluish light emitted when high-energy charged particles strike and interact with any medium, in this case water. The Milagro pond was once a part of the Hot Dry Rock project. Acting like a gigantic camera with its shutter always open, Milagro continuously records the passages of trillion-volt cosmic rays, day and night, from horizon to horizon. Over 1,500 events are recorded every second. Milagro detects these cosmic emissions as tiny flashes of blue light. Researchers search the data for the hints of emission from gamma-ray bursts and other cosmic sources of energetic gamma rays.

Milagro's predecessor, Milagrito, was an earlier, smaller version of the current experiment. Milagrito collected over 9 billion events in an experiment, which began in February 1997 and lasted for 14 months. Analysis of the data led to the apparent discovery of trillion-volt gamma rays emanating from the direction of one gamma-ray burst that occurred in April 1997. While more than 50 such gamma-ray bursts were examined by the group of researchers, only data from this burst indicated the presence of trillion-volt gamma rays. If this observation is truly due to a gamma-ray burst, then these are the most energetic gamma rays yet observed from such a burst. With the operation of the far more sensitive Milagro detector, more such bursts should be detected in the coming years.

In addition to the numerous optical-based instruments and detectors, the Radio Interferometer Transient Experiment, or RITE, will eventually place a small contingent of surplus satellite television dishes at Fenton Hill to be used in an innovative, low-cost experiment. These ordinary stationary dishes will be aimed at the sky and use the rotation of Earth to repeatedly monitor a narrow region of the sky. By combining the radio wave signals received from all the dishes, an image of radio sources coming from space will be created. Comparing each day's image with the previous day's image will allow the detection of transient radio sources.

Fenton Hill also holds significant potential for other uses as a research station. The surrounding forests and geological terrain offer endless possibilities for research and education in the biological, physical or earth sciences. Some of these uses are currently under consideration; many more await the attention of inspired employees. For now, however, the future of Fenton Hill is looking up.

Two employees elected to Española City Council


J. Patrick Trujillo

Laboratory employees **J. Patrick Trujillo** of the Nuclear Materials Technology (NMT) Division and **Floyd Archuleta** of the Community Relations Office (CRO) have been elected to four-year terms on the Española City Council.

Trujillo is a new councilor on the eight-person governing body, while Archuleta was re-elected to a fifth term on the council. They joined Chris Roybal of Computer and Technical Security (S-5) and Alex Salazar of Geoanalysis (EES-5) on the Española City Council.


Floyd Archuleta

An Española native, Trujillo is chief of staff for NMT and has been at the Laboratory nearly 13 years. He most recently worked in the Human Resources (HR) Division, where he was the leader of the former Employee Relations Group.

Before joining Los Alamos, Trujillo was an aide to former New Mexico Gov. Toney Anaya and former deputy director for administration for the state Department of Alcohol Beverage Control.

Trujillo is chairman of the council's Community Relations Committee and also sits on the Finance and Public Safety committees. He is the council's representative to the Regional Development Council.

Trujillo has a bachelor's degree in political science from the University of New Mexico and a master's degree in organizational management from the University of Phoenix.

Archuleta, who was first elected to the council in 1984, has worked at the Laboratory 37 years. A former group leader in Public Affairs (PA), Archuleta is an acting group leader in CRO. He has a bachelor's degree in business administration from the University of Phoenix.

Archuleta is a former president of the New Mexico Municipal League and has served on numerous statewide and national organizations that interact with municipal government. He also has served on the Finance, Parks and Recreation, Public Works, Public Safety and Economic Development committees for the city.

He currently chairs the council's Youth and Intergovernmental committees.

Archuleta also is on the board of directors of the Energy Communities Alliance, a national organization of elected officials from cities, counties and tribal governments that are impacted by DOE facilities.

Robinson new BUS-8 group leader


Linda Robinson

Linda Robinson is the new group leader for Business Support Services (BUS-8). Robinson takes over the position vacated when Bennie Gonzales became the new Small Business Office Program Manager.

BUS-8 provides business support services to the Laboratory's Strategic and Suporting Research Directorate.

"I look forward to teaming with the BUS-8 distributed business teams to provide efficient and effective financial, property and procurement support for our customers in the SSR directorate," said Robinson.

"Linda brings a considerable amount of experience and technical skill to the job," said BUS Deputy Division Director Jim Herring. "In her past assignments, she has made significant contributions to both BUS and the Laboratory."

Robinson has been deputy group leader of Budgeting (BUS-2) since February. From March 1997 to January 1999 she was a program manager assigned to the Department of Energy's Office of the Chief Financial Officer in Washington, D.C. From March 1994 to March 1997, she was a business team leader for the Chemical Science and Technology (CST) Division and later, for the Nuclear Materials Technology (NMT) Division.

Robinson has a bachelor's degree in accounting from New Mexico State University and a master's degree in business administration from the College of Santa Fe. She also earned a master's certificate in project management from George Washington University.

Johnson named BUS-3 group leader


James "Jay" Johnson

James "Jay" Johnson is the new group leader for Business, Planning and Budgeting (BUS-3).

Johnson had been deputy group leader of BUS-3 since October 1997. He took over the group leader position from Jim Herring, who recently became a deputy division director in the Business Operations Division (BUS) Division. As deputy group leader of BUS-3, Johnson was primarily responsible for coordinating the Laboratory's indirect budgets.

"Jay brings a wealth of knowledge and experience to the job and has made significant contributions to both BUS and the Laboratory," said Herring.

Johnson came to Los Alamos in 1991 as an accountant in the former Financial Division (FIN). He moved to the Laboratory Directed Research and Development program office, and in 1995, became the business team leader for the Los Alamos Neutron Science Center (LANSCE).

A Gallup, N.M., native and 1983 graduate of Gallup High School, Johnson worked for the international accounting firm Arthur Andersen Co. in New York and Albuquerque. He also was a stock broker with Kemper Financial Services.Johnson earned a bachelor's degree in business with a concentration in accounting from the University of New Mexico in 1987, and

continued on Page 9

May employee service anniversaries

40 years
Kathleen Witte, X-9

30 years
Jose Garcia, P-24
Diane Martinez, DX-DO
Jerome Romero, ESA-TSE
Gustavo Roybal, CST-12
Gary Stelzer, NIS-1

25 years
Steven Cocking, BUS-3
Robin Devore, ESH-IEP
John Dienes, T-14
Phillip Duran, ESA-WE
John Flemming Jr., CIC-4
George Hurley, NW-SS
Lynne Johnson, MST-DO
Joe Lopez, ESH-4
Manuel Lovato, MST-8
Clifford Morris, NIS-9
Matthew Murray, P-25
Richard Oldenborg, CST-6
Richard Olivas, DX-5
Frank Ortiz, S-4
Anthony Peratt, NW-EP
Thomas Petersen, ESA-MT
Kenneth Rea, ESH-EIS
Pamela Rogers, E-ET
Lorraine Salazar, ESA-WE
George Sandoval, P-22
Thomas Shankland, EES-4
Zita Svitra, PM-DS
Edith Trujillo, BUS-2
Mary Trujillo, BUS-5
Patricia Ytuarte, CIC-18

20 years
Rudy Archuleta, DX-4
Clay Booker, TSA-13
Barbara Garcia, BUS-4
Lloyd Hunt, LANSCE-3
Robert Hurdle, ESH-3
George Idzorek, P-22
Lucille Jaramillo, DX-1
Carol Lopez, NMT-15
Lauren McGavran, CIC-8
Christine Munk, B-N1
Richard Naranjo, S-6
Richard Nebel, T-15
Martin Pacheco, BUS-4
Carol Rich, HR-7
Joann Sandoval, BUS-5
Larry Ulibarri, NMT-13
Magdalena Vigil, ESH-4

15 years
Moses Attrep Jr., CST-DO
Dorothy Austin, EES-DO
Mark Bayless, ESH-1
Margarett Blake, NW-MM
Leonard Burczyk, NIS-3
Mary Cassidy, HR-7
James Doyle Jr., TSA-4
Annmarie Dyson, CIC-1
Iverson Ebanks, CIC-5
Donald Enemark, NIS-4
Robert Habbersett, B-N2
Karen Haggart, HR-7
Fredrick Hampel, NMT-16
Albert Hsu, DX-7
Teresa Jones, ESH-2
Edward Kober, T-14
Debbie Martinez, STB-DSTBP
Johnny Martinez, BUS-4
Patricia Medvick, CIC-12
Valerie Menke, HR-1
Sharon Mikkelson, CIC-1
Elizabeth Miller, ESH-4
Ross Muenchausen, MST-11
Steven Rivera, ESA-WMM
Donna Robinson, B-N1
Johnny Salazar, EES-15
Mary Salazar, NMT-15
Ricardo Schwarz, MST-8
Ralph Stiglich, NIS-4
Patrick Trujillo, S-2
Barbara Vigil, BUS-2
Steven Wallin, NIS-4

10 years
Amy Anderson, ESH-2
Ann Boland, CIC-14
Adrienne Borrego, BUS-3
Christopher Brink, CST-9
Margaret Burgess, CIC-1
Jennifer Graham, CIC-1
Mary Hoover, LC-BPL
Patrick Kelly, CIC-3
Susan Klein, CIC-1
Tracy Lattin, BUS-3
Allen McPherson, CIC-ACL
Warner Miller, T-6
Paul Ortega, NMT-13
Judyth Prono, CIC-1
William Purtymun, S-8
William Somers, ESH-1
Jeffrey Smith, GR
Stephen Sterbenz, NW-EP
James Tsiagkouris, NMT-13
Scott Volz, LANSCE-9
Jean Whitcomb, HR-5

5 years
Bradley Baas, ESA-WMM
Simon Balkey, NMT-2
Genevieve Barrett, X-8
Rachel Benavidez, BUS-6
Samuel Borkowsky, LC-BPL
Monica Brown, DX-2
Michael Butler, ESA-WE
Terrence Buxton, ESA-WE
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Stephanie Martinez, PA
Mary Medina, BUS-2
Robert Meehan, NMT-15
Kenneth Menefee, BUS-8
George Randall, EES-3
Randy Roberts, X-6
Linda Simon, NIS-2
Carmen Steffen, IBD
Nancy Teague, HR-7
Rosemary Vigil, MST-DO
Jacquita York, HR-7

Johnson named ...

continued from Page 8

a master's degree in business administration with concentration in management information systems from the College of Santa Fe in 1996.

He is a certified public accountant and certified management accountant.

In Memoriam

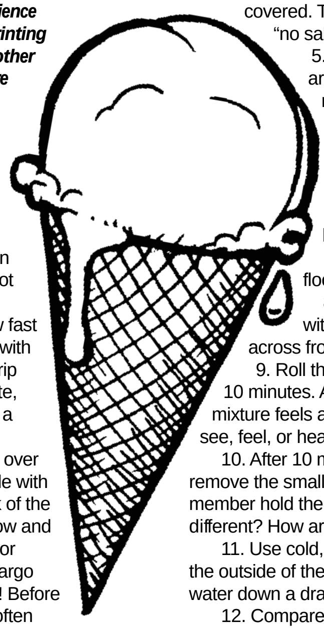
Ann Pendergrass

Laboratory employee Ann Pendergrass died April 24 in Los Alamos. She was working in Integrated Risk Analysis, management (ESH-3) at the time of her death. She was born May 31, 1940. In 1962, Pendergrass received a bachelor's degree in biology from Rice University. In 1969 She received her doctorate in vegetable crops physiology from Cornell University. Pendergrass came to work with the Lab in 1989 with the former Health Safety Environment Division (HSE-8) as a staff member.

science fun

"Science at Home" is a publication developed by Science Education (STB-SE) to interest children, particularly those in grades four through eight, in science through hands-on activities. We are reprinting experiments from the book, along with other scientific activities, for employees to share with their families or just to enjoy themselves.

Hand rolled ice cream



There is probably nothing better than eating a heaping ice cream cone on a hot summer day. But after the first few licks, things start to get messy. No matter how fast you go, it seems that you can't keep up with the melting ice cream. After awhile it's drip city and unless you finish it in one big bite, the rest of the cone usually winds up as a puddle on the floor.

Iced desserts have been around for over 2,000 years. If you think you have trouble with a modern day ice cream cone, just think of the poor slave runners who had to relay snow and ice from the Alps to Rome so the emperor could have a cool snack. If the slaves' cargo melted, they usually paid with their lives! Before the year 1600, ice cream recipes were often kept secret because kings and queens wanted to keep this delicious treat for themselves. In 1660 the first public ice cream shop was opened in Paris. The first American ice cream shop was opened by Philip Linus in New York City in 1774. He started by taking special orders for ice cream but by 1777 was making it every day. The home freezer was invented in 1846 by Nancy Johnson, allowing almost anyone to make ice cream. Today the ice cream industry is a big and busy business. Americans eat about 700 million gallons of ice cream each year!

While the Roman emperor may have planned months ahead to get the snow and ice needed to make his iced desserts, you can make ice cream in your home in about a half hour! In this activity you will observe several physical changes in matter as you make ice cream. You will also discover how adding certain chemicals can lower the temperature of a liquid.

The stuff you'll need

Two large, clean cans with lids (3 lb coffee cans work well); two small, clean cans with lids (1 lb coffee can); masking or duct tape; measuring spoons; measuring cups; mixing spoon; spoons for tasting; about 12 cups of coarsely crushed ice; 2 cups whipping cream; 1/2 cup sugar; 1/2 teaspoon vanilla; 1/2 cup salt; pencil; paper; four clean marbles; timing device

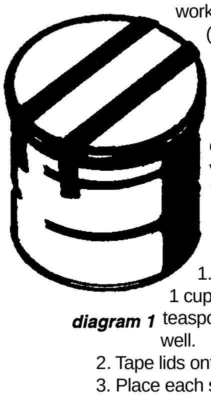


diagram 1

Here's the plan

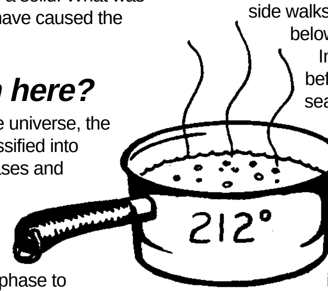
1. In each of the small cans, combine 1 cup whipping cream, 1/4 cup sugar, 1/2 teaspoon vanilla, and two marbles. Stir well.
2. Tape lids onto the small cans (diagram 1).
3. Place each small can inside of a large can.
4. In one of the large cans, pack about 6 cups of ice down and around the small can until it is completely covered. Tape the lid to the large can and label it "no salt."
5. Pack about 3 cups of ice down and around the small can that is in the remaining large can. Sprinkle 1/4 cup of salt on the ice and then add more ice, packing it in until the small container is covered. Sprinkle another 1/4 cup salt on top of the ice.
6. Tape the lid to the large can, and label it "salt".
7. Place both sets of cans on the floor on their sides.
8. Have four people sit on the floor with teams of two sitting about 6 feet across from each other (diagram 2).
9. Roll the cans back and forth continuously for 10 minutes. As you are rolling, talk about how the mixture feels and sounds. What changes can you see, feel, or hear?
10. After 10 minutes, open the large containers and remove the small containers. Have each family member hold the small containers. How are they different? How are they the same?
11. Use cold, clean tap water to rinse and then dry the outside of the small containers. Dispose the salty water down a drain. Open the small containers.
12. Compare the two mixtures side by side. What changes have taken place? Why did these changes take place? Taste and describe the mixtures. How are they alike and how are they different? How do the mixtures compare with the descriptions you made earlier?

Wrap-up

In both cases, you cooled the liquid mixtures but only one was cooled below its freezing point allowing the mixture to change from a liquid to a solid. What was done differently that you think could have caused the physical change?

What's going on here?

All the material that makes up the universe, the stuff scientists call matter, can be classified into four different forms: solids, liquids, gases and plasmas. We commonly call these groups the states or phases of matter. Each phase has its own unique set of properties. To understand how matter changes from one phase to another, we must first consider how matter is put together.



All matter is composed of tiny particles called molecules. If you used a powerful microscope to look inside a solid object like a chunk of ice, you would see molecules packed tightly together in an ordered state slowly vibrating in place. When you heat a solid, the molecules gain energy, start to vibrate faster and begin banging against each other, causing the object to expand. If the molecules in a solid vibrate too much, though, they actually begin breaking up the structure and the solid falls apart. In common terms, we say the object melts. Once the entire structure breaks, the matter changes phase and is now in the liquid state. In liquids, the molecules are packed in a more random, disordered state and they vibrate much faster than in solids. As with solids, there is a limit to how fast the liquid molecules can vibrate, so as heating continues, the liquid structure falls apart and the material changes phase into a gas.

If you were to suddenly take some of this extra energy away by cooling the gas, the molecules would slow down, begin to clump together and reassemble into the liquid structure. By taking away heat energy, you can turn a gas into a liquid and a liquid back into a solid. The temperatures at which matter changes from one phase to another are called the melting/freezing point and vaporization/condensation point.The term you use will depend on which direction the phase change is going.

In this activity, the ice needs energy in the form of heat to make the phase change from solid to liquid. At the same time, the cream needs to lose energy to make the phase change from liquid to solid. Ideally, this heat exchange takes place when ice draws energy from the rolling whipping cream mixture. Unfortunately, there is a problem. Pure water melts at 32 degrees Fahrenheit (0 degrees Celsius) while whipping cream freezes at about the same temperature. Because the cream looses heat rather slowly, the ice melts before the cream actually freezes, so the result is a very cold liquid. When salt is added to ice, however, its melting point is lowered by several degrees. This means that it must draw extra energy away from the cream in order to complete the phase change. This extra energy loss is what makes the cream turn solid.

Where does this happen in real life?

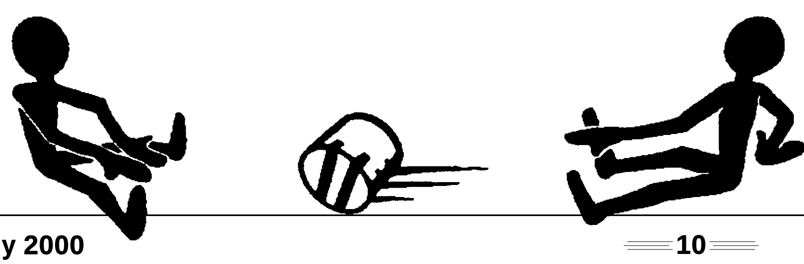
Most people are familiar with the phases of water, since it is one of the few substances that exists as a solid, liquid, and gas. The use of salt to help complete a phase change of water is actually quite common. In northern climates, where ice and snow are common in the winter, rock salt is spread on highways and side walks to melt the ice at temperatures below freezing.

In polar regions, fresh water freezes before salty ocean water and as a result sea water temperature may be several degrees below freezing while still in the liquid phase. This means that fish and other animals living in the water must have special adaptations so that their blood doesn't freeze solid while they are swimming around.

Salt also can affect phase changes in the other direction. Fresh water normally boils at 212 degrees Fahrenheit (100 degrees Celsius). Any good cook will tell you that a pinch of salt in water will bring it to a boil faster. Why? Because the salt not only lowers the freezing point, but it lowers the vaporization point too!

Now try this

Many people like to drink a glass of ice water, but have you ever had an ice glass of water? Get two plastic cups of different diameters so that the smaller one can easily slide inside the larger one. Place the narrow glass inside the wide one and fill the gap between the two with fresh water. Fill the inner cup 1/2 full of crushed ice, 3 tablespoons of salt and cold water. Stir the inner mixture and watch what happens to the water in the gap. If all works well, in about 5 minutes you should be able to slide the two cups apart leaving a glass shaped cylinder of ice. You can fill it with water, but drink fast before your container melts!



Last month in history

June

1752 — Benjamin Franklin files a kite in a thunderstorm, demonstrating that lightning is electricity

1808 — Zebulon Pike reaches his peak

1919 — The Treaty of Versailles is signed, ending World War I and providing for the creation of the League of Nations

1942 — A Tennessee Valley site is selected by the government for a large production plant in support of the Manhattan Project

1946 — Klaus Fuchs leaves Los Alamos

1950 — The US sends 35 military advisers to South Vietnam and agrees to provide military and economic aid

1953 — A five-man softball team called Pierotti's Clowns is formed in Los Alamos

1967 — Reies Lopez Tijerina leads a raid on the Rio Arriba County

Courthouse in Tierra Amarilla during which two people are wounded and two others taken hostage

1972 — The linear accelerator at LAMPF delivers its first beam of 800 million electron volts

1981 — The Centers for Disease Control newsletter Morbidity and Mortality Weekly makes its first reference to AIDS, reporting on five cases of an unusual pneumonia in Los Angeles

1991 — Mount Pinatubo in the Philippines erupts, eventually forcing the United States to abandon Clark Air Base

1999 — The President's Foreign Intelligence Advisory Board releases a report on alleged security problems at DOE's national laboratories

Syndicated materials

Removed at the request of the syndicate

A dream comes true...

Editor's note: Two years ago, "Reflections" reported on the plans of Melissa Cray, now of Experimental Programs (NW-EP), to sail across the Indian Ocean, through the Suez Canal and the Mediterranean Sea, around Europe and then across the Atlantic Ocean. Here is her report on the adventure.

by Melissa Cray

Vagabond Too, the 52-foot catamaran that Melissa Cray and Gerd Marggraff used during the two-year cruise around the world. The picture shows the vessel in the North Sea with the spinnaker sail up. The photo was taken from a nearby vessel. Melissa Cray plays with Keiko, a friend's monkey, on the island of Java in January 1999. *Photos courtesy of Cray*

In May 1998, I took a leave of absence to be a partner in a project to build a 52-foot catamaran in Australia and sail it to the United States. Over the course of the next 21 months, I helped to finish the construction of our yacht, traveled the world experiencing other cultures and enjoyed many a day at sea, coastal cruising and traversing oceans.

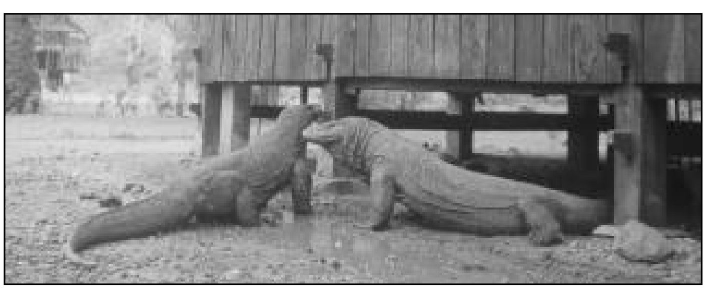
My journey began when I joined my Australian partner and skipper, Gerd Marggraff, in Hobart, Tasmania, to complete the final stage of the boat building — to fit out the interior of our new yacht with electricity, plumbing, electronics, appliances and furniture. (Gerd had built the aluminum hull of the vessel during the previous six months.) It was with a sense of great satisfaction that we set sail in September 1998 on the Vagabond Too, a handsome, seaworthy vessel.

Many people have asked if we experienced "scary" weather at sea. Let me tell you the "roaring forties" (40 degrees south latitude) lived up to the their windy reputation. On our third day out from Hobart, we were hit by a terrific gale with 50-mph winds and 25-foot seas. Our yacht, with highly reduced sails, raced along at 19 mph, and Gerd and I hung on for dear life. Whenever we ventured from the comfort of the interior of the vessel, we were blasted by huge, freezing-cold waves breaking on our bow and soaking us to the skin. Fortunately, our typical day at sea was not so exhausting and usually involved gentle breezes and fantastic sunsets.

Some of our most interesting traveling experiences were in Indonesia. The time we spent on the remote island of Komodo, seeking out its huge dragon-like lizards, was a real highlight. While we were lucky never to meet any of the infamous Indonesian pirates, we did see signs of the building political instability — in fact, we fled Timor as churches were being set on fire.

Sailing across the Atlantic from the Canary Islands to the Caribbean was a humbling experience. We enjoyed the occasional companionship of migrating whales and playful dolphins, but human-made trash was a constant sight across thousands of miles of ocean. We wondered how the oceans could survive with the world taking them for granted.

The trip, during which we sailed some 20,000 miles and spent 110 days at sea, left us with great memories — scuba diving on Australia's Great Barrier Reef, sunbathing on the foredeck of our yacht under an equatorial sun, port hopping in Europe, making new friends in exotic places. I'm happy to be back at the Lab, but I'll always feel lucky I was able to enjoy sailing along with the warm trade winds, feeling the gentle movements of a yacht beneath me and watching the sun set on a distant horizon over a blue ocean.



Two large Komodo dragons wait outside a home on the Island of Komodo. Komodo dragons can grow as large as nine feet in length and can take down a deer in full run.

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