Researchers building biologically fueled microfuel cells

Some of tomorrow's microelectronics may be powered by glucose obtained from living biological systems

By Chris Burroughs

Tomorrow's sensors, communication devices, and other microelectronics technology may be powered by life. That is, powered by glucose obtained from living biological systems, ranging from human skin to plant tissues.

Doug Loy (6245) and Kent Schubert (1763) are leading a three-year internally funded Laboratory Directed Research and Development (LDRD) Grand Challenge to develop new compact power sources for devices fueled by biological hosts such as plants or animals. The project, Bio-MicroFuel Cell Grand Challenge, could fill a need for uninterrupted autonomous power for applications where batteries are too large and/or too short-lived.

"We are initially looking at 'harvesting' glucose from living plants to serve as the power source for sensors," Kent says.

A fuel cell is an electrochemical energy conversion device that converts a fuel, typically hydrogen and oxygen, into electricity. Instead of hydrogen, the fuel for the bio-microfuel cell will be glucose from a living system. But like a hydrogen/oxygen fuel cell, the primary emission is water. The biofuel cell will also create a small amount of carbon dioxide.

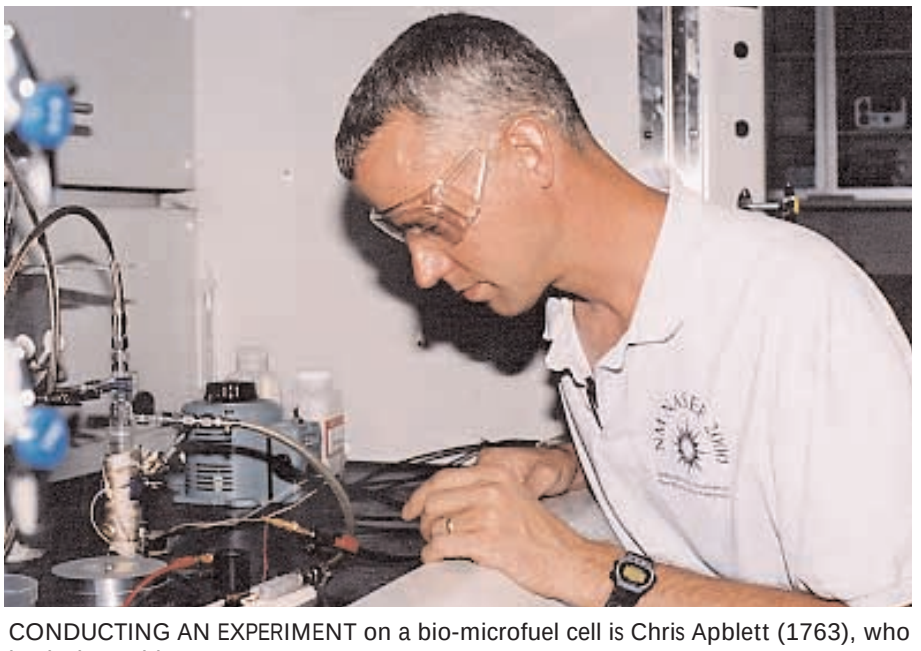
But unlike a hydrogen fuel cell, which has to be refueled with hydrogen periodically, the bio-microfuel cell will continue to produce electricity as long as the plant or other biological host remains alive.

The grand challenge is divided into six research teams:

• Bio-MicroFuel Cell Architecture Team, led by Chris Apblett (1763), designing a microfuel cell compatible with biofuels.

• Membrane Materials, Fabrication and Testing Team, led by Chris Cornelius (6245), making membranes more robust and more compatible with microfabrication techniques.

• Bio-Microsystem Interfaces & Surface Compatibilization Team, led by Susan Brozik (1744), engineering the interface for harvesting the fuel.



CONDUCTING AN EXPERIMENT on a bio-microfuel cell is Chris Apblett (1763), who leads the architecture team.

• Electrodes/Electrochemistry Team, led by David Ingersoll (2521), focusing on the oxidation of the fuel and incorporating the electrode structures into the micro-architecture.

• Biological Materials Team, led by Andy Walker (8130), working on integrating new bio-selective membranes and engineered enzymes for selective transport and oxidation.

• Systems Integration Team, led by David Peterson (1738), integrating all components into one system.

To date the researchers have built several operational microfuel cells. They separately demonstrated the feasibility of converting glucose to electricity, but have not yet powered a micro fuel cell with glucose.

The Sandia researchers are simultaneously developing two types of catalysts — one made from enzymes and one from a precious metal, probably platinum alloyed with other materials. (See "How it works" on page 5.)

In its final form, the fully integrated system is expected to be the size of a small matchbox with a "harvester" tail protruding. The harvester will be a simple input device that could be a short

(Continued on page 5)

Sandia LabNews

Vol. 54, No. 16 August 9, 2002

Sandia National Laboratories

Managed by Lockheed Martin for the National Nuclear Security Administration

Bldg. 810 Energy Nag goads coworkers into miserly energy habits

With it well into summer, the Bldg. 810 Energy Nag is, well, nagging everyone to conserve energy. Irritable, maybe. Rational, certainly. Read all about this man of mystery in John German's story on **page 8**.

Center for Integrated Nanotechnologies gets $75 million DOE go-ahead

CINT user facility to serve as gateway to Sandia and Los Alamos

By Neal Singer

Los Alamos and Sandia national laboratories will jointly receive more than $75 million for design and construction of the practical yet visionary joint Center for Integrated Nanotechnologies (CINT).

DOE's Office of Science approved funding in July for the national user facility that will permit university, industry, and government researchers to explore and develop the rapidly emerging field of nanotechnology.

Nanotechnology is used to build materials and devices on the scale of atoms and molecules. Among its advantages are smaller components, more precise functionality, lower energy requirements, and reduced waste and exploitation of natural resources. Innovations from this field are expected by many scientists to expedite improvements in drug discovery and health, computing, transportation, and manufacturing.

Two new buildings will include a joint core facility in Albuquerque just north of Sandia. A smaller building will be built in Los Alamos to serve as a gateway. Sandia, for its gateway — distinct from the core facility — will use space in Bldg. 897. Through these facilities, researchers from industry and universities will enjoy access not only to the equipment of CINT but also to the resources of the two huge labs.

ARTIST'S RENDERING of the core structure for the Center for Integrated Nanotechnologies (CINT).

(Continued on page 4)

Sandia breaks ground for $28 million JCEL computational facility

'It will be home to science and computing at the highest level in history'

By Neal Singer

On an overcast day last week, in a tent surprisingly inconspicuous at one end of the large bare field that one day will be MESA, approximately 100 Sandians and outside workers celebrated with balloons, cookies, and brief speeches the ceremonial groundbreaking for Sandia's long-awaited computational nerve center, the JCEL building.

JCEL — for Joint Computational Engineering Laboratory — will house 175 people, stand three stories high, contain 61,000 square feet of working space, and (from artist's renderings) have glassed-in staircases at each end that give the pleasant impression the building has wings.

(Continued on page 5)

What's What

Retiree Bill Busby, who's been enjoying that job description since 1982, e-mailed to point out pleasantly that I must have a warped gastronomic sense since I complained about e-mail spam, comparing it to kudzu along Southern highways (What's What, *Lab News*, June 14) and wrote that Spam is an "otherwise good staple."

"Anyone who can say [that] has never 'enjoyed' diced Spam with reconstituted dehydrated eggs or Spam fried in lard and served with dehydrated potatoes," he wrote. "Or any of the many delicacies the American Army devised to use up the stuff and feed it to poor, hungry GIs during WWII. You couldn't even give the stuff away to Italian civilians in the winter of 1944-45.

"In my opinion," he continued, tongue firmly in cheek (or, was it?) "there should be a law that the manufacture, distribution, sale, or advertising-for-sale of Spam is a felony calling for a public hanging. I think your comparison of Spam to kudzu is apt."

* * *

Oh, and while we're on e-mail, I was happy to get an e-note from The Gatoson (Holdings) Ltd., 18th Floor, One International Finance Centre, 1 Harbour View Street, Central, Hong Kong, recently. They wanted me to know that they have an impressive inventory of vessels for sale, including tourism submarines, underwater tour boats (one of those seats 120), several yachts, a 285-foot high-speed passenger ship (capable of 28 knots), and a variety of tugboats, cargo ships, ferries, and the like. Since so much information gets passed around on the Internet, I figured the folks at The Gatoson gleaned my name from some list of sailors. But I have a modest little sailboat and I wondered why they might think I'd be interested in a tourism submarine, or passenger ferry, or anything of that size.

Then it hit me: Hard as it is to believe, we're into August and closing fast on the end of the fiscal year, and consequently, the buzz about compensation is picking up. They must know that I'd like to have a bigger boat, and also know something about the pay raise I'm going to get.

* * *

The tip arrived too late for us to get a photo, but Mick Jones (3133) e-mailed about mid-morning July 25 to point out "something amazing for a national lab." It was two guys marking the ground and pavement in front of Medical where underground utility lines run, in advance of construction work. "These guys," Mick wrote, "are using technology we can be proud of: divining rods. No kidding, they are using witchcraft to locate water lines in the street!"

Dousing may be low-tech — "no-tech," says one skeptic in our group — but it's certainly time-honored, and the guys Mick saw must have been right-on, because we haven't heard anything about punctured water lines or broken gas lines.

* * *

And, finally, with all the gate and street construction we've muttered through lately, you might ask: Why is that time when traffic creeps along in exhaust-choked bumper-to-bumper lines called "rush hour?"

— Howard Kercheval (844-7842, MS 0165, hckerch@sandia.gov)

What would you do if put in charge of a Sept. 11 first anniversary event?

There's still time to offer 'Your Thoughts, Please'

The web-based employee comment program "Your Thoughts, Please," is receiving lots of input these days to its currently posed question *"If you were put in charge of a Sept. 11, 2002, Sandia National Laboratories program to commemorate the first anniversary of the attack on America a year earlier, what would you do?"*

Although comments to this question are being accepted through Aug. 23 and will be posted on the internal web shortly thereafter, here are excerpts of what some Sandians have already submitted.

"I think each Division should hold a one- to two-hour All Hands devoted to recalling how that day has affected our lives as employees of a National Defense Laboratory…."

"In all honesty, I do not believe that there should be any anniversary program. Lest the tragic patriot harangue me, I shall explain. This is truly a serious occasion and should not be marred by the inevitable politics that will accompany any such commemorative event. My father worked in WTC-1, and was in the building at the moment of impact. If not for some problem, he would have been outside for his morning smoke when the first plane hit, and standing in the path of falling debris. Fortunately, he was able to escape unharmed; however, the same cannot be said for three former classmates of mine…."

"If any taxpayer money is spent on this at all, it should be some kind of memorial in remembrance of those who lost their lives. Perhaps a memorial could be constructed and placed in the Building 810 patio area…."

"At a designated time, perhaps the time of the first attack on the WTC, I would ask every Sandian if at all possible, to observe a moment of silence…."

Reach "Your Thoughts, Please" by going to the News Center (http://www-irn.sandia.gov/ newscenter/news-frames.html), clicking on the "Your Thoughts, Please" icon near the top left of the page, and using the user-friendly interface, which includes the "how to" and important participation guidelines.

And read now what Sandians had to say in response to the previously posed question, which was concerned with "the major impediments" that "block you from getting your Sandia work done."

Sandia LabNews

Sandia National Laboratories

Sandia National Laboratories

http://www.sandia.gov/LabNews
Albuquerque, New Mexico 87185-0165
Livermore, California 94550-0969
Tonopah, Nevada • Nevada Test Site • Amarillo, Texas • Carlsbad, New Mexico • Washington, D.C.

Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corporation, a subsidiary of Lockheed Martin Corporation and a prime contractor to the US Department of Energy.

Ken Frazier, Editor 505/844-6210
Bill Murphy, Writer. 505/845-0845
Chris Burroughs, Writer. 505/844-0948
Randy Montoya, Photographer 505/844-5605
Nancy Garcia, California site contact. 925/294-2932

Contributors: Janet Carpenter (844-7841), John German (844-5199), Neal Singer (845-7078), Larry Perrine (845-8511), Howard Kercheval (columnist, 844-7842), Will Keener (844-1690), Iris Aboytes (Milepost photos, 844-2282), Rod Geer (844-6601), Mike Lanigan (844-2297), Michelle Fleming (Ads, 844-4902)

Lab News fax 505/844-0645
Classified ads 505/844-4902

Published on alternate Fridays by Media Relations and Communications Dept. 12640, MS 0165

LOCKHEED MARTIN

MTC and OPEIU memberships ratify new three-year contracts

Members of both the Metal Trades Council (MTC) and the Office & Professional Employees International Union (OPEIU) voted in separate meetings last week to accept new three-year contracts with Sandia.

Both previous contracts expired at midnight July 31.

The MTC has approximately 490 Sandia employees who work various jobs throughout the Labs, including custodians, electricians, machinists, mechanics, materials handlers, dock workers, receiving clerks, and truck drivers.

Some 435 Sandia office administrative assistants and other clerical employees are represented by the OPEIU.

"We are pleased that the Sandia employees represented by the MTC and the OPEIU have voted to accept their contracts, which offer wages and benefits competitive with those in comparable private industry and other DOE facilities," says Julian Sanchez, manager of Employee and Labor Relations Dept. 3061.

2002 President's Quality Award nominations now being accepted

Applications for the 2002 President's Quality Award (PQA) to be presented in January 2003 are being accepted now through Oct. 1. All employees and contractors and their teams are eligible to apply and compete for the awards. Also, applicant training and examiner training is underway through Sept. 30.

The PQA program promotes quality awareness, performance excellence, effective strategies, and methods to facilitate continuous improvement. Winning teams must have followed the PQA criteria to plan, manage, self-assess, and improve their work throughout the year.

Each team applying for the PQA must complete a detailed application outlining specifics how it follows the PQA criteria. These applications are reviewed by examiners. The examiner team may interview applicants to understand processes used to achieve results, clarify information not understood, and collect information necessary to complete the scoring of the applications. In some instances the examiner team may request additional documentation.

Applications may be submitted in hard copy form or by e-mail. If submitting by hard copy, applicants must provide the original and three copies. Fax copies are not acceptable.

New Mexico applications should be sent to Mary Nation, Dept. 12142, MS 0355 or e-mail at mcnatio@sandia.gov. California applications go to Theo Pope, Dept. 8816, MS 9055 or e-mail at tmpope@sandia.gov.

Official forms are available on Sandia's internal Web at www-irn.sandia.gov/corpdata/pqa/pqa.2002.htm. Applicants can also click on the PQA teaser, or enter 2002 PQA on the internal web at www-irn.sandia.gov/corpdata/pqa/httoc/htm. Applicants can also consult the booklet "2002 Sandia's President Quality Award Criteria, Application Form."

Genomes to Life funds research in California

Research efforts will focus on metal/radionuclide-reducing bacteria and identifying protein complexes

By Nancy Garcia

Two California-site Sandians are among the collaborators in newly announced DOE genomic research grants. Sandia/New Mexico leads another winning genomics proposal described last month (*Lab News*, July 26).

The awards are part of the department's new "Genomes to Life" program that plans to take advantage of solutions that nature has already devised to help solve problems in energy production, environmental cleanup, and carbon cycling. Through biological, physical, and computational sciences, the program seeks to understand entire living organisms and their interactions with the environment.

"The fact that Sandia is participating in three of these laboratory awards validates and legitimizes Sandia's emerging capabilities in biotechnology," says Deputy Director Len Napolitano (8130).

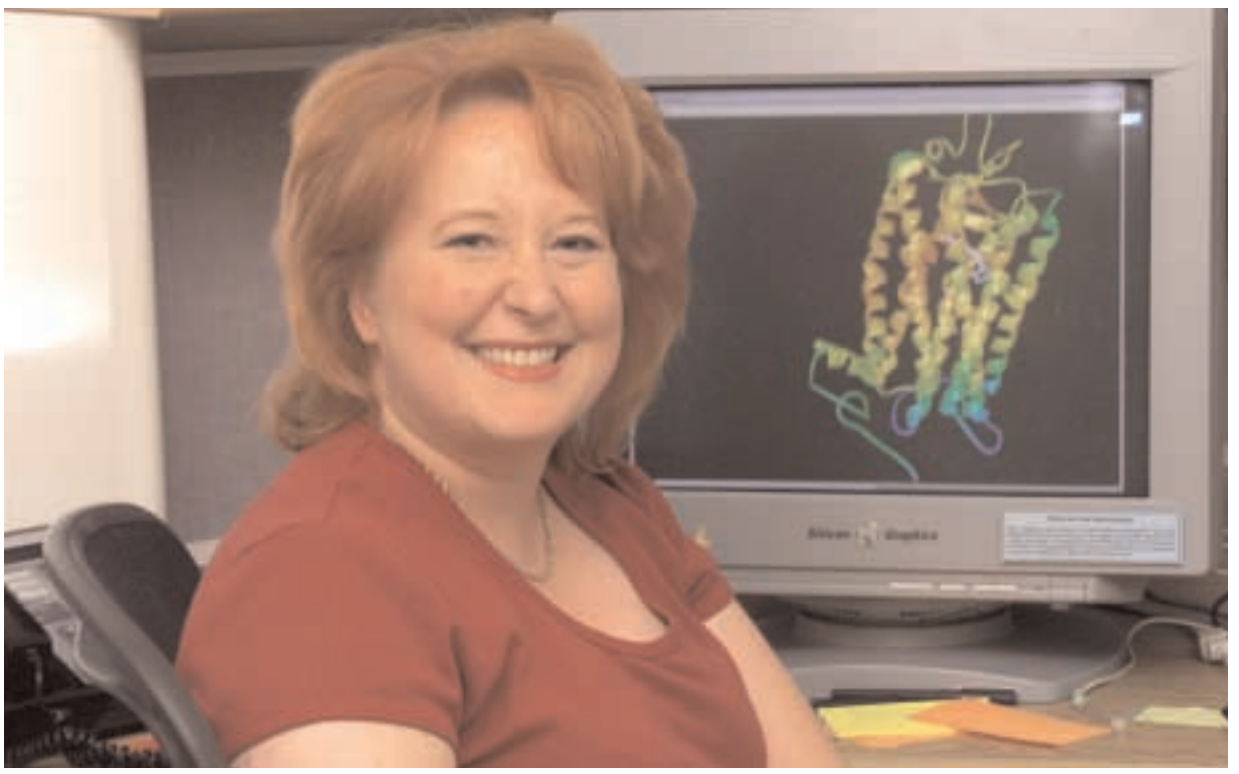
Metal/radionuclide-reducing bacteria

Sandia is a partner in the $36.6 million, five-year grant to Lawrence Berkeley National Laboratory to study "Rapid Deduction of Stress Response Pathways in Metal/Radionuclide-Reducing Bacteria." The team, including Anup Singh (8130), will develop computational models to describe and predict the behavior of gene regulatory networks in microbes in response to the environmental conditions found in waste sites contaminated with metals and radionuclides.

To deduce how soil bacteria may aid site remediation, the team will compare types with varying levels of activity to see which cellular machinery (proteins and their assemblies, called complexes) is involved.

"Bacteria either convert the soluble, easily transportable metal compounds into insoluble compounds or immobilize them," Anup says. "Most of the sites are heavily contaminated so the bacteria need to survive in an environment that is very different from their natural environment."

To deduce how soil bacteria may aid site remediation, the team will compare types with varying levels of activity to see which cellular machinery (proteins and their assemblies, called complexes) is involved.



CHEERFULLY 'SEEING RED' — Malin Young (8130) is using Sandia's unique MS3D capability to study the structure and function of rhodopsin, a red photosensitive pigment/protein that aids vision in dim light. On her screen is a ribbon representation of this membrane protein's three-dimensional structure in its unactivated form. Activated by light, the complex changes form and sends an electrical signal to the brain, which decodes the information into a visual image. The activated structure remains unknown for now. (Photo by Bud Pelletier)

Sandia will focus on analyzing the proteins and protein complexes that act like molecular machines, Anup says, while most of the bioremediation-related microbial research will be done at LBNL. Other research partners are Oak Ridge National Laboratory; the University of California, Berkeley; the University of Missouri, Columbia; the University of Washington, Seattle; and Diversa Corp. in San Diego.

The individual microbes being studied under the grants have all had their genetic sequence determined through DOE's Microbial Genome program (http://microbialcellproject.org/). Since it is the proteins that carry out almost all cellular functions, Sandia, LBNL, and Diversa will try to identify the relevant protein complexes in various bacteria, both "wild types" and mutant forms. When bacteria are exposed to stressful conditions, some alter their metabolism to ensure survival. Sandia will try to help identify and quantify proteins and complexes involved in bacterial stress-response pathways, examining large number of proteins at a time using its unique expertise and infrastructure in microseparations and mass spectrometry to determine the nature and composition of complexes.

LBNL will then use these data for computational models of how the genes controlling these pathways are turned on and off.

Identifying protein complexes

A second grant, to Oak Ridge National Laboratory for $23.3 million over three years, also targets proteins through a proposal entitled, "A Research Program for Indentification and Characterization of Protein Complexes." Malin Young (8130) brings to the collaboration a unique in-house capability, MS3D. This method to probe structure uses mass spectrometry to identify complexes embedded, like raisins in bread, in outer bacteria membranes. The complexes act as a "gatekeeper" for surrounding interactions. To gain structural clues, the complexes have been hooked chemically to their immediate spot in the membrane. This gives researchers a picture of how the assemblies nest there and function in their native state.

Other research partners are Pacific Northwest National Laboratory, Argonne National Laboratory, the University of North Carolina at Chapel Hill, and the University of Utah. The group will examine two microbes: *Shewanella oenidensis*, known for its ability to transform metals and toxic materials into harmless forms; and *Rhodopseudomonos palustris*, which absorbs carbon dioxide from the atmosphere and converts it into biomass.

"Success," Malin said, "will result in a knowledge base that can provide insight into the relationship between protein complexes and their biological function."

Sandia CaliforniaNews

Employee death

Lee Bertram, of Fluid/Thermal Modeling Dept. 8728, died of stomach cancer June 21.

He was 60 years old.

LEE BERTRAM

Lee was a distinguished member of the technical staff and had been at Sandia, serving at both the Albuquerque and Livermore sites, since 1974. He was most recently responsible for computational modeling of solidification phenomena.

He is survived by his wife, Mary Beth Acuff, daughters Anne and Lynne, and two brothers and three sisters.

Recent Patents

Joseph Cesarano III (1843) and Paul Calvert: Method for Free Forming Objects with Low-Binder Slurry.

Raymond Byrne (15211), John Harrington (15252), Steven Eskridge (15212), and John Hurtado (15211): Cooperative System and Method Using Mobile Robots for Testing a Cooperative Search Controller.

Donald King (6424): Thermionic Modules.

Patrick Xavier (15211): Method and Apparatus for Modeling Interactions.

Jeremy Walraven and Edward Cole (both 1739): Thermally Induced Voltage Alteration for Analysis of Microelectromechanical Devices.

Eric Lindgren and James Phelan (both 6131): Method and Apparatus for Optimized Sampling of Volatilizable Target Substances.

Jeffrey Figiel (1126) and Jung Han: Structural Tuning of Residual Conductivity in Highly Mismatched III-V Layers.

Donald King (6424), Bernard Wernsman, and Laurence Sadwick: Chemical Vapor Deposition Techniques and Related Methods for Manufacturing Microminiature Thermionic Converters.

Lothar Bieg and Gilbert Benavides (both 14184): Large Displacement Spherical Joint.

Timothy Boyle (1846): Tin(II) Alkoxide Hydrolysis Products for Use as Base Catalysts.

Steven Goldsmith (6517): Alpha-Beta Coordination Method for Collective Search.

Shawn-Yu Lin (1743) and James Fleming (1749): Media for Control of Thermal Emission and Methods of Applications Thereof.

David Haaland (1812): Classical Least Squares Multivariate Spectral Analysis.

Robert Moore (6849): In Situ Formation of Phosphate Barriers in Soil.

CINT

(Continued from page 1)

Among the Center's distinctive features:

• Half the researchers will come from industry and universities, chosen on the basis of scientific review of proposed projects.

• There will be no charges for visitors to use this facility.

• Core facility will be located outside the classified boundary to promote open access and scientific collaboration.

• Research scientists in chemistry, physics, biology, and computers will work together under one roof.

• A vast array of scientific equipment, some available nowhere else in the world, will be made available to researchers. Examples include an atom tracker that records the movement of atoms in realtime and provides videos of atoms distributing themselves on a surface, and a Magnetic Resonance Force Microscope that performs the equivalent of a medical Magnetic Resonance Imager on the scale of individual molecules.

Terry Michalske (1040) of Sandia and Don Parkin of Los Alamos will serve as founding Director and Associate Director, respectively, for CINT.

Both laboratories have a large amount of work already ongoing in the micron realm, which is about a thousand times larger than nano. (A length of 70 microns is the approximate diameter of a human hair.) Already ongoing work at the micron level is expected to help leverage work at the nanoscale by providing both tools and goals for nanostructures.

Benefit of nanostructured materials

Nanostructured materials can increase the efficiency of energy conversion with enhanced magnetic, light emission, or wear-resistant properties. Energy generation using nanostructured photovoltaics or nanocluster-driven photocatalysis could fundamentally change the economic viability of renewable energy sources. In addition, the ability to imitate molecular processes found in living organisms may be key to developing highly sensitive and discriminating chemical and biological sensors. Such sensors could greatly expand the range of medical home testing as well as provide new technologies to counter the spread of chemical and biological weapons. Even the production of chemicals and materials could be revolutionized though the development of molecular reactors that can promote low-energy chemical pathways for materials synthesis.

One of five Nanoscale Science Research Centers

CINT will be part of the DOE's network of Nanoscale Science Research Centers. DOE's Office of Science, under whose rubric this project falls, is the world's largest supporter of scientific user facilities. These facilities include synchrotrons and neutron sources, as well as specialized facilities focused on topics such as combustion research. DOE is adding five nanoscience centers to its portfolio with a total investment more than $300 million. This is the largest current national investment into the US nanoscience infrastructure. Funds spent on CINT include $375,000 for initial conceptual design during 2001. Project engineering and design will budget $4.2 million. Of 26 architectural firms that entered bids to design the core facility, a short list of five has been selected to compete, with a goal of early August for firm selection and beginning of design. Target date for breaking ground of the Los Alamos gateway is April 2004; for the core facility in Albuquerque it is June 2004, says CINT core facility project manager Bill Hendrick (10824).

Domenici, Bingaman, labs leaders comment on the value of CINT

U.S. Sen. Pete Domenici, R-N.M.: "Los Alamos and Sandia national laboratories have taken a significant step together to make New Mexico one of the world's premier centers for the emerging field of nanotechnology. The CINT collaboration represents the ultimate in materials science and should usher in an exciting new age of high technology."

U.S. Sen. Jeff Bingaman, D-N.M., who chairs the Senate Energy and Natural Resources Committee: "This funding will help emerge technology that will serve as an engine of growth and innovation. I will continue to work to ensure that this Center continues to get strong DOE support."

Sandia President C. Paul Robinson: "Creation of the Center for Integrated Nanotechnologies is not just a welcome new initiative in our research and development programs, it is the kick-off of what is likely to be an enduring quest. For several years our scientists and engineers have seen the possibility for 'atoms-up engineering' — where we will be able to design and fabricate new materials beginning at the atomic level. At the nanometer level one can now 'see' individual atoms using new microscopic techniques, and watch the effect of mixing various atoms together, building block style, to achieve very specific properties and functions. Thus the CINT represents the ultimate in materials science and should usher in an exciting age of high tech applications."

Los Alamos Director John Browne: "A revolution has begun in science and technology based upon the ability to organize, manipulate, and measure the properties of matter on the nanometer-length scale. It is natural for Los Alamos and Sandia to pursue this new field because of the labs' long traditions of multidisiciplinary research to benefit society. In the short term, the new facility should offer new ways to develop sensors, satellites, and security measures to support our nuclear deterrent. In the long term, it could change our lives in ways people can't even begin to imagine."

Sandia VP for Science and Technology Al Romig (1000): "While scientific resources around the world are focused on marvels of this incredibly small world, the question of how nanotechnology will impact the world around us remains unsolved. This is where CINT comes in. The New Mexico center has a unique focus on the integration of nanotechnology with the microscale world of computer chips and even the macroscale where we live."

Center Director Terry Michalske (1040) explains why CINT is of interest to two laboratories: "CINT will attract some of the brightest scientists from our own laboratories and from around the world. We hope many of them will stay to be part of our exciting community.We also believe that new science will be the seed corn for technology that benefits the labs and stimulates high-tech businesses in New Mexico and elsewhere."

Center Associate Director Don Parkin: "Nanoscience is breaking down traditional barriers in science. The cross-pollenation between physical sciences and biosciences in CINT is likely to produce some of the most dramatic new advances."

New Mexico Nanoscience Alliance spokesperson Steve Brueck (who is also head of the University of New Mexico's Center for High Technology Materials): "The CINT goal of integrating the unique properties of nanotechnology into the macroscopic world is critically important if we are to realize the full benefit of nanoscale physics, chemistry, and biology. This new program will be the centerpiece of New Mexico's increasingly important nanotechnology activities. These include strong efforts at New Mexico's graduate degree-granting universities (Univerity of New Mexico, New Mexico State University, and New Mexico Tech) as well as at the national laboratories and the Air Force Research Laboratory."

***

An outside evaluation of the project comes from **Jean-Charles Guibert,** head of strategic programs and partnerships for France's Minatec, that country's corresponding nano-micro effort at Grenoble: "The key feature is the strong relation to be established between CINT and Sandia's/Los Alamos' laboratories and clean rooms. All around the world, you have academic labs working on nano but without application capability, or industrial research sites without strong links to academia. The deliberate inclusion of these links is one basis of the uniqueness of the CINT project."

New financial reporting system to be implemented in October

A major revamp of Sandia's corporate financial reporting system is under way. Scheduled for implementation in October, the initiative is intended to dramatically improve internal customer satisfaction by making it much easier for most people within the Labs to access the financial information they need to perform their jobs.

The driving desire behind this initiative is that customers will be able to devote less time and energy creating, distributing, and scheduling financial reports and more time on other, more value-added activities. The initiative is a joint effort of the Chief Financial Officer organization and Integrated Information Services, comprising several centers managed by Chief Information Officer Pace VanDevender (9400).

Customer feedback after the Oracle implementation in 1999 clearly indicated the need for a better financial reporting solution. Numerous problems were identified with the current reporting system, and a team was assembled to build an entirely new system from the ground up. The team's goal is to build a user-friendly financial reporting system that satisfies the common reporting needs of most customers and facilitates meeting any remaining unique reporting needs.

Current system users should be aware that the way they get financial information will likely change in October. Business Objects, the cornerstone of the current financial reporting model, will continue to be available as a reporting tool for those who enjoy the power it delivers. However, the current reporting templates that most customers use today will not work with the new system.

A suite of new standard reports designed with extensive customer input will be automatically refreshed each weekend for every Sandia organization, project, subprogram, program, and SBU. These new reports are intended to replace the capability provided by the current Business Objects templates. These reports will be generated as PDF (Portable Document Format) files for easy viewing via a web-based customer interface. In addition, each report will have an accompanying data file containing the data behind the

(Continued on page 10)

JCEL

(Continued from page 1)

"It's a very architecturally pleasing office facility," says project manager Jim Dawson (10824), "designed to attract and retain top researchers."

The $28.8 million building — the figure includes design, user equipment and project management — will consist of three towers composed of eight 20-person suites and a director's suite, all access-controlled and sound-attenuated for top-secret work. The project, west of Bldg. 897, is funded by NNSA through the ASCI program.

Said Sandia President Paul Robinson, opening the ceremony, "Ten years ago, the US conducted its last nuclear test, and we were challenged: can you guarantee performance, reliability, and safety of US weapons without testing?" referring to the Stockpile Stewardship program. "This facility is a key oasis on that journey."

Glorying in "living in interesting times" — a condition generally mentioned as a problem — Paul said that "JCEL will involve science and computing at the highest level ever done in history, and raise the level of computing worldwide in the process."

Modeling and simulation codes will enable researchers "to fly like gnats" through mechanisms still in the design state, examining all the parts. When the supercomputers of NNSA are linked, he said, "JCEL will be a big node of that connection."

NNSA's Bill Reed was "delighted we're doing so much good for hardworking ASCI and stockpile people." He described — as an example of Sandia work ethic — how Nuclear Weapons Senior VP Tom Hunter (who missed the groundbreaking because of prior commitments) had cut short his July 4 vacation to travel to Washington to speak for the ASCI program. "On with the journey," Reed said.

Mike Zamorski, DOE's Kirtland Site Area Director representing local federal staff, said, "It's nice to be associated with a vibrant enterprise. I look forward, in not too long a time, to be present at the ribbon-cutting [at the opening of the building]."

Construction, by Hensel-Phelps out of Austin, is expected to be completed in 18 months.

Tom Bickel (9100) said he "looked forward to the opportunity to fundamentally change the way engineering design is done at Sandia and in the US."

Paul Yarrington (9230) praised the "shoulder-to-shoulder interactions that the JCEL facility will provide" among researchers.

Mike Vahle (9900) said that "great infrastructure enables talented people to do important work."

GOLDEN CHAIN GANG shows muscle at JCEL groundbreaking, from left, Mike Vahle, John Zepper, Tom Bickel, Bill Reed, Paul Robinson, Mike Zamorski, and Paul Yarrington. (Photo by Bill Doty)

The architectural plan, by Atkins Benham Inc. out of Oklahoma City, is designed to meet DoD's Antiterrorism Force Protection Construction Standard. Cynthia Figueroa-McInteer (10853) serves as planning and project development contact.

In accordance with DOE's environmental awareness programs, the building is constructed of environmentally friendly materials. Some of the design features include semiporous pavers to absorb water instead of encouraging run-off, light-colored brick to decrease heat gain, the use of easily replenishable woods, and mastics that demonstrate low out-gassing.

John Zepper (9143), manager of production computing and host of the ceremony, says the modeling and simulation work in the ASCI program will be further enabled by JCEL. "It will pull together 9200 [computing science] and 9100 [engineering science], enable closer collaboration, and faster development of ASCI codes."

JCEL: a keystone of Sandia's future

"JCEL is a keystone in the foundation of Sandia's future. We have committed the Laboratory to lead the transformation of engineering in the 21st century. We will reshape the Laboratory into one in which design and modeling & simulation are not only integrated, but enabled beyond anything imaginable in the recent past. JCEL is a step in that direction and when coupled with the DISL facility and our largest initiative, MESA, will help define the Sandia of tomorrow. It is a point of pride for the nation and the envy of the world."

— Words from Sandia Nuclear Weapons Senior VP Tom Hunter, read at the ceremony by Mike Vahle

Bio fuel cell

(Continued from page 1)

needle penetrating into a living biological source, like a plant or a tree. Whatever the source, glucose-containing fluid will be drawn from the biological host.

Then, using a membrane, the glucose will be separated from the fluid and oxidized in an electrochemical cell, producing electricity and water. The goal of the project is to produce a 100 mW bio-microfuel cell in as small a package as possible, sufficient to power small devices. With breakthroughs in a few key technical areas, it may be possib le to achieve 100 mW/cm^2 of output power.

"The results of this work will have a profound impact on our nation's security and potentially our economic prosperity."

VP 1000 Al Romig says the Bio-MicroFuel Cell work is a "classic example of Sandia expertise in engineering and physical sciences being applied to a biological system problem."

"The results of this work will have a profound impact on our nation's security and potentially our economic prosperity," he says. "Without the interdisciplinary collaboration between physical and biological disciplines, these results would not be possible."

Doug sees a lot of potential uses for the bio-microfuel cell.

"We anticipate the bio-microfuel cell will have a number of spin-off markets, particularly in the health care arena," Doug says. "Such devices could be used, for example, to power pacemakers, using glucose in a patient's blood as the fuel source."

The project comes with several "grand challenges" to overcome, Kent says.

"Although many people and a lot of money have been devoted for many years to the development of microfuel cells that burn hydrogen gas, it is noteworthy that such devices are not yet commercially available," Kent says. "Micro-sized direct methanol fuel cells are under development for consumer electronics such as laptop computers and cell phones. Though some may be close, none are on the market yet. In attempting to work with glucose or other bio fuels, the Sandia project is attempting to go even further."

For example, an issue researchers must overcome centers on the fluid carrying the glucose, which has the potential for poisoning the catalyst. To overcome this, they are using two tactics — coming up with a way to purify the fuel before going to the catalyst and developing catalysts that are resistant to the poison.

"This is only one of many major technical challenges facing the Bio-MicroFuel Cell team," Kent says. "I'm sure there are some we don't even realize yet, but the payoff for developing the capability will be enormous."

How the bio-microfuel cell works

The bio-microfuel Cell works similarly to a battery. The main difference is that a battery is a "closed" system; its lifetime is fixed by the amount of reactants packaged inside it. The fuel cell is an "open" system, which means that its fuel is supplied on a semi-continuous basis and can be renewed by changing or refilling the fuel tank. By tapping into a plant or animal, the Bio-MicroFuel Cell seeks to incorporate a "fuel tank" that refills itself.

The heart of the fuel cell is made up of the anode/proton exchange membrane/cathode stack. Fuel oxidation and oxygen reduction take place at the anode and cathode respectively with the aid of catalysts incorporated into the electrodes to facilitate the reactions.

The proton exchange membrane separates the oxidation and reduction reactions and allows using the electrons released at the anode during the oxidation reaction in an external circuit, while the protons are transported through the membrane to complete the circuit inside the fuel cell. Electrons are received back again from the external circuit at the cathode, where they react with the protons and oxygen atoms to produce water.

In the case of the Bio-MicroFuel Cell, the fuel is glucose. When a glucose molecule comes in contact with the catalyst, it splits into two by-product molecules, releasing two protons and two electrons. Sandia researchers are looking at using two different types of catalysts for oxidizing glucose— one made of the enzyme glucose oxidase and one made of a precious metal, such as platinum or an alloy of it.

The researchers would also like to develop catalysts that would allow harvesting more protons and electrons from the by-products produced in the first oxidation reaction. In principle, one should be able to harvest 24 electrons from glucose by using the appropriate catalysts.

After two years, Bldg. 807 investigation provides no new scientific leads

Studies fail to find a current health hazard; no new studies planned

By John German

A two-year-long investigation of Bldg. 807 has provided no scientific validation that a current health hazard exists in the building.

Results of three independent studies completed in recent months echo the results of earlier evaluations of the building by Sandia's industrial hygiene staff, which also uncovered no scientific evidence of a current health hazard.

The examination of Bldg. 807 has been the largest building health investigation ever conducted at Sandia, says Lynn Jones, VP-7000, who has led the investigation from the beginning.

"The investigation team, with guidance from a group of concerned employees, took all prudent steps to look for clues that would suggest that something in the building might have been contributing to employees' symptoms," she says. "We are confident that there is nothing currently in the building that would contribute to these symptoms."

"It is much more difficult to be confident about the past," she adds. "These results are no doubt frustrating to some people. But frankly, there isn't anything about the building's condition today that makes sense to pursue further, from a scientific standpoint."

Decisions based on the investigation

Based on the results of the three latest studies — an independent building health assessment by private consulting firm IHI Environmental, an epidemiological study by the University of New Mexico's Health Sciences Center, and an epidemiological study of DOE sickness-absence data by the Center for Epidemiological Research at the Oak Ridge Institute for Science and Education — as well as the earlier studies, the Management Action Team (MAT) leading the Bldg. 807 investigation has made some decisions, says Lynn:

First, several rooms on the building's first floor will remain vacant for the time being. The remainder of the first floor will be reoccupied following some renovation. The second and third floors will continue to be occupied.

DR. LARRY CLEVENGER, Director of Benefits and Health Services Center 3300, reviews Bldg. 807 investigation findings during an employee briefing this week in the Bldg. 962 auditorium. About 75 Sandians attended the briefing. (Photo by Bill Doty)

"The studies we've conducted were appropriate, have been well conducted, and provide a firm basis for continued occupancy of the building," says Lynn.

(Long-term plans are to vacate and demolish the Bldg. 805/806/807 complex as the planned MESA complex comes on line.)

Second, no further studies of the building will be initiated at this time.

"The results of the completed studies do not point to any further investigative work that would add value," she says.

Although the scientific investigation of the building has concluded, Sandia's medical staff continues to work with concerned employees and retirees on an individual basis, adds Dr. Larry Clevenger, Director of Benefits & Health Services Center 3300.

Summary of the investigation

The Bldg. 807 investigation began in late 1999 when some 50 current and former residents of the building expressed concerns about health symptoms they were experiencing (*Lab News*, May 5, 2000). The majority of those people who expressed concerns are current or former Center 15400 employees, and many of those had worked on the first floor's northwest quadrant.

At the time the symptoms seemed to be grouped in two general categories — neurological and respiratory problems. The concerns were first reported to employees in the Jan. 28, 2000, *Sandia Daily News*.

The concerns prompted a series of studies of the health problems of the individuals and the environmental health of the building, all part of an investigation overseen by the MAT and advised by an Employee Advisory Team that included concerned employees and their managers.

A summary of these studies follows. More information, including raw data from the studies, is available at the Bldg. 807 Health Advisory web site available on Sandia's external web (www.sandia.gov/health/advisory/index.html).

Voluntary medical evaluations: In early 2000, Sandia's medical staff conducted individual voluntary health screenings of about 22 current and former Bldg. 807 occupants. A local medical toxicologist advising Sandia's medical team noted that the exams indicated a wide variety of diagnoses with no pattern of health symptoms suggesting specific occupational or toxicological origins, and no unusual diagnosis or cluster of diagnoses were identified. As part of the exams some employees were tested for mercury; results were normal for all tested. These findings set the stage for the epidemiology studies conducted

(Continued on next page)

Impact ***video magazine debuts on Sandia's internal TV network***

Everyone wants to make an impact. And Sandians now have a new way to do just that. Video Services Department 12610 has launched its new video newsmagazine, *Impact*, designed to showcase the broad scope of Sandia's work — in the laboratory and in the community. And *Impact* producer Dave Sparks is looking for new stories to tell.

The first edition of *Impact*, featuring several three-to-four-minute magazine-style stories, is being broadcast on internal Sandia TV monitors around the Labs throughout the month of August. And you can watch it directly at your own desktop by visiting the Video Services web site at www-irn.sandia.gov/organization/div12000/ctr12600/ 12610.html and clicking on the "Preview *Impact*" link.

Subjects include:

• The unprecedented post-9/11 cooperation between Sandia's security forces and Kirtland AFB security.

• The Labs' patented work on an explosives detection portal that might be deployed soon in airports nationwide. (Technology licensee Barringer Instruments has just announced deployment of the portals at CN Tower in Toronto [*Lab News*, July 26].)

• A new transparent personnel security barrier based on polycarbonate (Lexan) materials in a heavy steel frame. The barrier design offers flexibility to be used in a wide range of applications where a containment barrier is needed.

• An examination of Labs' work with water utilities to assure safety of the nation's water supplies.

• And, an overview of Sandia's Hands On/Minds On Technologies educational outreach program.

Dave began developing the *Impact* magazine concept about a year ago. He says the genesis for the idea came out of a Division 5000 employee council meeting, during which people said they often didn't know what folks just down the hall from them were working on. Executive VP Joan Woodard heard the concern, but reasoned that the issue was larger than Division 5000. She asked Communications Center 12600 Director Don Carson for ideas on how to address the issue Labs-wide. *Impact* is one response to that concern.

Keith Snyder (2955), whose polycarbonate-panel-based safety shield was featured in the first *Impact* program, was more than pleased with the way his story was told. He says: "I believe *Impact* is a tremendous avenue for Sandians to showcase new technologies, and working with Dave Sparks has always been enjoyable. I'm excited about this first showing of *Impact* and am hoping that it helps me spread the word on the personnel shielding system that I designed."

Kevin Linker (5848), who is featured in the *Impact* program discussing the explosives detection portal, says of the new video newsmagazine, "The *Impact* feature I think is an exciting way to present the great work being done at Sandia. I feel honored that Dave Sparks chose our technology for the inaugural program. We plan to use the *Impact* story in our efforts to promote our technologies."

Dave says his ultimate goal is to produce a new *Impact* program each month. To meet that goal, he's asking project managers and researchers with a story to tell to contact him at 844-2337 or via email at despark@sandia.gov.

IMPACT magazine producer Dave Sparks tapes program anchor Lisa Polito (12640) in front of Bldg. 800 during production of the inaugural edition of the Video Services Department's new *Impact* video newsmagazine. (Photo by Randy Montoya)

Here's how to find out more about the subjects of the first* Impact *program:

- Security cooperation between Sandia and KAFB: Capt. Willie Johns, 3114, 844-1497
- Protecting Water Utilities: Jeff Danneels, 5862, 284-3897
- Explosives detection portal: Kevin Linker, 5848, 844-0011
- Security/Safety Barrier: Keith Snyder, 2955, 844-6892
- Outreach Programs: Margaret Harvey, 3053, 844-4262

Bldg. 807 study

(Continued from preceding page)

later in the investigation.

Sampling and analysis: Also in early 2000, Sandia's industrial hygiene staff took more than 200 air, dust, breathing zone, and drinking water samples from offices, labs, common areas, and the building's HVAC system and analyzed them for metals, inorganic materials, volatile organic compounds, and other chemicals. Nothing in the sampling data suggested the presence of a current health hazard. As a precautionary measure occupants of the first floor's northwest quadrant were moved and the wing was converted to storage space by Center 15400 management.

CENTER 15400 DIRECTOR Jerry McDowell talks to employees during the Aug. 5 investigation briefing.

Building history examination: In January 2000 a fact-gathering team began studying the building's history, relying on facility upkeep paperwork, word-of-mouth anecdotal evidence, and interviews of employees and retirees who had occupied the building since its construction in 1966. The study examined chemicals used in labs, pesticide use in and near the building, vehicle exhaust, drinking water quality, and many other issues. Findings helped focus other portions of the investigation, including industrial hygiene sampling.

Radiological survey: In March 2000 a separate review of radiological records was performed by Sandia's radiation protection staff. The study indicated that all sources of radiation in the building had been well controlled over the years, and radiation doses received by workers were well within regulatory limits.

Voluntary urinalyses: Following reports by several employees that tests conducted by their private physicians indicated the presence of thallium in blood samples, Sandia offered voluntary urinalyses to current and former 807 occupants in December 2000. The urinalyses sought the presence of thallium, manganese, lead, mercury, and arsenic. Bioassays of all 72 participants, analyzed by a private toxicology lab, were normal to low except for those of two employees who had moderate levels of arsenic in their systems. Those readings were determined later to have dietary origins.

Thallium records review: A November 2000 records review found no evidence that past uses of thallium-containing solutions in Bldg. 807 labs had resulted in reports of laboratory contamination or significant human exposures to the metal. Current uses of small amounts of thallium-containing materials are controlled with standard laboratory practices, the review concluded.

Independent building health evaluation: In February 2001 Sandia selected IHI Environmental, a private environmental consulting firm, to perform an independent indoor environmental quality assessment of Bldg. 807. IHI's analysis revealed no current hazards that would prevent any portion of the building from being occupied. (See "Private firm finds nothing unusual in its Bldg. 807 assessment" at left for more about the IHI study.)

HVAC videotaping: Video camera inspections of the insides of several of the building's HVAC ducts were conducted by Sandia's industrial hygiene staff and IHI personnel; the video inspections revealed nothing unusual.

Filter bank renovation: Sandia's facilities organization renovated and upgraded the building's induction ventilation air-intake system. Removed filters were preserved and sampled as part of the IHI study.

Follow-up sampling and analysis: Sandia's industrial hygiene staff collected a series of follow-up samples from the building based on direction provided by the external IHI study and the MAT. For instance, samples were collected from discolored portions of the concrete walls and pipes above ceiling tiles in the northwest quadrant of the first floor to address lingering concerns about mold growth; the sampling indicated that very few spores were present, and mold varieties that were detected were of low toxicity.

UNM epidemiological study: The University of New Mexico's Health Sciences Center conducted an epidemiological study beginning in summer 2001 to compare prevalence rates of selected symptoms experienced by groups of individuals who now occupy Bldg. 807, who previously occupied Bldg. 807, and who have never occupied the building. (For more, see "UNM study finds no 'cluster' of symptoms among current or former 807 occupants" above.)

DOE epidemiological study: Using de-personalized data collected from Physician Certificates of Disability (coded forms submitted to DOE whenever any employee misses five or more consecutive days of work due to illness), the Center for Epidemiological Research at the Oak Ridge Institute for Science and Education examined the prevalence rates of reported neurological and respiratory illnesses of current and former Bldg. 807 occupants compared to a control group of Sandia employees who did not occupy Bldg. 807 from 1991 to 2000, based on Labs rosters. The study concludes that current and former Bldg. 807 occupants had similar rates of absence from all causes, from neurological disorders, and from respiratory disorders compared to employees who did not work in Bldg. 807 during the ten-year time period. The study's final report is available at www.sandia.gov/health/advisory/index.html.

UNM study finds no 'cluster' of symptoms among current or former 807 occupants

An epidemiological study by doctors at the University of New Mexico's Health Sciences Center completed in December suggests that current occupants of Bldg. 807 experience certain "symptoms of concern" no more frequently than Sandians who never occupied the building. Former occupants of the building as a group seem to experience some symptoms more frequently than members of the current or never occupant groups.

UNM's final report is available at www.sandia.gov/health/advisory/index.html

Dr. Karen Mulloy, principal investigator, and Dr. William Lambert led the study for UNM's Program in Occupational and Environmental Health.

To design the study, the UNM team hosted focus group discussions with concerned employees and managers and members of Sandia's health and safety staff. Four "symptom groups of concern" were identified via the focus groups and medical literature reviews: peripheral neuropathies, fatigue, cognitive impairment, and respiratory complaints. Within each symptom group were numerous individual symptoms.

Three population groups were then compiled from Sandia rosters: current 807 occupants, former 807 occupants, and current and former Sandia employees who never worked in Bldg. 807.

Randomly selected members of each group were surveyed — a total of 715 people. The mailed questionnaires asked each responder to answer questions regarding symptoms he or she had experienced, as well as demographic information. UNM kept all responses confidential. Trained UNM questioners attempted to reach by phone those who did not respond to the mailed questionnaire.

Less than half of those selected (49.2 percent) participated, limiting UNM's ability to draw meaningful statistical conclusions. Nevertheless, the study does add to the body of information about Bldg. 807, says Dr. Mulloy.

According to UNM's analysis of the survey data, statistically significant differences were not observed between current occupants and never occupants for prevalences of any of the symptoms of concern. In addition, the survey findings rule out several symptoms of concern for former occupants.

Prevalence was higher, however, in former occupants versus never occupants for a few symptoms, says Mulloy.

For example, slightly significant differences were observed in the data for dizziness and numbness or tingling in hands or numbness or tingling in feet.

The higher prevalences of these symptoms among former occupants do not correlate well with prevalences of other reported symptoms typical of peripheral neuropathies, however, says Mulloy.

"With peripheral neuropathies you typically see numbness in all the extremities along with other red flag symptoms, not just numbness in the hands or numbness in the feet or in just one hand or foot," she says.

In addition, the prevalences of symptoms associated with cognitive impairment do not fit well with models of high solvent or heavy metal exposure, she says, which usually include fatigue, peripheral neuropathy, and mood disorders.

Mulloy's team concludes that a clear case definition (clusters or constellations of symptoms that would support a more detailed epidemiological study) that is "biologically plausible" did not emerge from the study. It also concludes that the data do not provide a clear enough picture of a pattern of disorders to warrant more rigorous statistical studies of respiratory symptoms or neurological symptoms among former occupants.

"The epidemiology studies were necessary to determine whether the rates of symptoms were different among different groups of employees," says Dr. Larry Clevenger (3300). "These studies suggest that the neurological and respiratory symptom experience was similar in all groups."

Private firm finds nothing unusual in its Bldg. 807 assessment

IHI Environmental, the private industrial hygiene firm hired by Sandia to conduct an independent assessment of Bldg. 807, reported to Sandia in November that its analysis of air and surface samples from the building revealed no current hazards that would prevent the building from being occupied.

IHI's final report is available at www.sandia.gov/health/advisory/index.html.

IHI conducted a literature search to identify suspect toxins that might trigger the health symptoms of concern, then sampled air, carpets, walls, internal surfaces of HVAC ducts, and other building materials for metals, inorganics, organics, and biotoxins (such as active and latent molds, fungi, and allergens). The analysis focused on toxins that are associated with long-term health consequences.

The vast majority of measurements for all contaminants were well below occupational exposure limits and published guidelines.

Samples from a few rooms on the first floor indicated the presence of surface and airborne latent (non-viable) mold spores in elevated concentrations, but none were of mold varieties considered to be toxigenic. Although no good mold dose-response rate medical data exist, IHI found no evidence in the medical literature that inhalation of spores had resulted in long-term neurological damage in a patient.

The IHI study also sought forensic evidence, such as settled dust samples that might provide clues about past human exposures to toxins. Although the availability of telling historical evidence was limited because of past cleaning and renovation, the sampling turned up nothing that IHI considered unusual or unhealthy for a building of comparable age, background, and building materials.

Bldg. 810 Nag goads coworkers into miserly energy habits, thinks we can save gazillions of kilowatt hours

Who is this Energy Nag guy anyway, and what's his problem?

By John German

John:

The Nag wants to know if we are going to proceed with a Sandia energy article before the cold weather hits? Summer is, clearly, our peak energy usage and The Nag believes we can save several gazillion kilowatt hours if awareness is raised in the near term.

Respectfully,

The Nag

Sheesh! What is it with this guy? You suggest to him, offhand, that his project to save energy by encouraging (a charitable term for what The Energy Nag does) his neighbors in Bldg. 810 to adopt a few miserly habits might make a nice feature in the *Lab News* that would possibly encourage people in other buildings to do the same.

Next thing you know, The Nag is, well, beginning to irritate you.

I first became aware of The Nag several months ago when he appeared at my office door in Bldg. 811 and said, and I quote, "Hmm! Incandescent lights," apparently in reference to my two 60-watt desk lamps, and walked away.

I turned around, and he was gone. But I recognized that voice. The voice of reason. It got me thinking.

30 percent wasted

The United States is an energy-gluttonous country. We consume 20-25 million barrels of oil a day, more than half of that imported. That's not including the energy we use that is generated from coal, natural gas, nuclear, hydro, and other renewables.

The average individual American uses 350 million BTUs of energy per year (his or her share of total US energy usage) — the equivalent of a family of three running their home furnace continuously 24 hours a day all year long. The average Japanese, British, or French citizen uses roughly half that.

Energy analysts guess that 30 percent or more of our energy consumption in the US is wasted as motorists idle in cars behind empty buses, wear shorts inside in the winter, overcool buildings in the summer, leave lights and TVs on 24 hours a day, and engage in other nonsensical behavior.

So next thing you know, I'm buying two new desk lamps with 10-watt halogen bulbs. They're just as bright, and I like the color of the light better.

I wrote The Nag an e-mail, telling him what I had done, confessing that I also had begun to replace some of my 40- to 100-watt incandescent light bulbs at home with 13-watt compact fluorescents.

The Nag informed me that I was behind the curve. Hundreds of people in Bldg. 810 had already been affected by The Nag's brand of derision.

Carping for kilowatts

You see, The Nag has been rankling his 250 Bldg. 810 neighbors since last summer — via mass e-mailings, an online newsletter aptly named "The Nag Rag," and uninvited office visits. If they adopt some simple and painless habits, he pleads, they could make a huge difference in the amount of energy the Labs uses. (See "The seven habits of those who want The Nag to stop bothering them" at right.)

Working with 810 building operator Bob Washington (10844-5) and Sandia site-wide energy manager Ralph Wrons (10823), The Nag has eked kilowatts where no one has eked before, and compiled statistics on the building's energy usage since he began his eking campaign. Here are some results:

• During June 2002, Bldg. 810 saved 65,000 kW-hours of electricity, a 20 percent decrease from the previous June, enough to power about 100 Albuquerque homes. That's about $3,500 in savings for one month from one building, says Ralph.

Illustration by David Smith

THE ENERGY NAG

• During July 2002, the building saved 80,000 kW-hours, a 20 percent decrease from the previous July.

"With very minimal squealing and no perceptible pain, we've cut back by about 41,000 kW-hours per month."

"With very minimal squealing and no perceptible pain, we've cut back by about 41,000 kW-hours per month (on average) since The Energy Nag started nagging," says The Nag. "Not bad, but there is much more nagging yet to come."

A national security issue, yes

The Nag, who has other important work to do, doesn't annoy his neighbors for glory or money. He thinks it's the right thing to do, for the well being of the nation, our environment, and the Labs, he explains.

"It is a national security issue, yes!" he says. The US spends $90 billion a year defending the Persian Gulf waterways, and more than one-third of US oil comes from there, he says.

"It is highly unlikely that terrorists originating in the Middle East would attack America directly if, somehow, oil wasn't involved," he adds. "They know that our responses — political, military, and economic — are severely limited by our dependence on that part of the world."

In addition, electricity generation pumps carbon dioxide, a greenhouse gas, into the atmosphere at alarming rates, not to mention "sulfur dioxides and nitrogen oxides of various flavors to tarnish the chrome off trailer hitches," he says. "If global warming is real, the costs to the US population's health will be enormous. Asthma, heart failure, etc. are much less tolerable when it's hot."

Saving energy is good for the Labs, too, he says. He estimates conservatively that if everyone at Sandia would conserve whenever possible, the Labs' monthly power bill would drop at least $70,000 per month on average.

Huge (with sarcasm) sacrifices

The ingredients of The Nag's campaign include information, frequent and timely (often condescending) reminders, a cup of sarcasm, a pinch of guilt, and a reward system paid for by Div. 5000 management (a periodic burrito breakfast for Bldg. 810 residents called "The Energy Nag Feed Bag").

He's a bit like Dr. Seuss's character The Lorax (come to think of it, he looks a bit like The Lorax), mixing his info-minders with warnings about the future.

Here's an example of a recent reminder from The Nag to Bldg. 810 residents:

"PLEASE turn off your computer and other peripherals at the end of the day. THE POWER STRIP on-off switch is the best way to do this. Yes, The Nag knows that it will require the MASSIVE effort of bending down (using your knees, not your back) and throwing the switch. My goodness, what HUGE sacrifices we are asked to make for our country!"

And another:

"Late last Friday on his appointed rounds, The Nag de-electrified some 30 kW of lights, computer screens, copiers, two boiling coffee pots (day-old burned coffee provides such a pleasant aroma), and one space heater, apparently in use because the local thermostat setting was low enough to freeze the building resident to his/her chair. All of this on a summer evening when both sides of Bldg. 810 were occupied only by a rare human and occasional cockroaches. The Nag estimates that something like 2,000 kW-hours of electricity (and a metric ton or two of atmospheric CO_2) were forgone (or is it 'forwent'?) by the simple expedient of turning these damned things off for the weekend."

Wouldn't you like to be a nag, too?

Annoying? Yes. And The Nag wants you to join him in one of the few ways you can intentionally irritate your coworkers and get away with it.

"The idea is to get lots of other little Nags to germinate around the lab and do the same thing," he says. "The Nag estimates that we could EASILY save $100,000 per month at Sandia on energy (only 8 percent of our total energy consumption — YIKES!), and maybe twice that."

The Nag's online newsletter is available at http://www-irn.sandia.gov/esh/p2/nag.htm. It is updated when he has time or is particularly peeved at his coworkers' energy habits.

The *Lab News* promises, with help from Ralph Wrons, to provide information and numbers (with any luck, diminishing numbers) about energy consumption at Sandia during the coming months.

The Nag will make sure of it.

Next issue: The Nag on saving energy at home, plus "Dear Nag" (letters to The Energy Nag).

The seven habits of those who want The Nag to stop bothering them

Please, before you leave each evening or weekend:

• Turn off your desktop computer, monitor, and printer — preferably via the power strip. (Some desktop computers are intentionally left on at night; check with your CSU if you are unsure.)

• Look all around you for other glowing green, red, or orange lights.

• Turn off all other office equipment and powered appliances you don't need.

• Turn up the office thermostat a few degrees so the AC doesn't turn on.

• Lower your blinds if you have them.

• Turn off office lights, hallway lights, and bathroom lights in your region.

• Leave a polite but sufficiently naggy note, or a copy of this list, for coworkers who haven't taken these measures in their own offices.

Signed: The Energy Nag

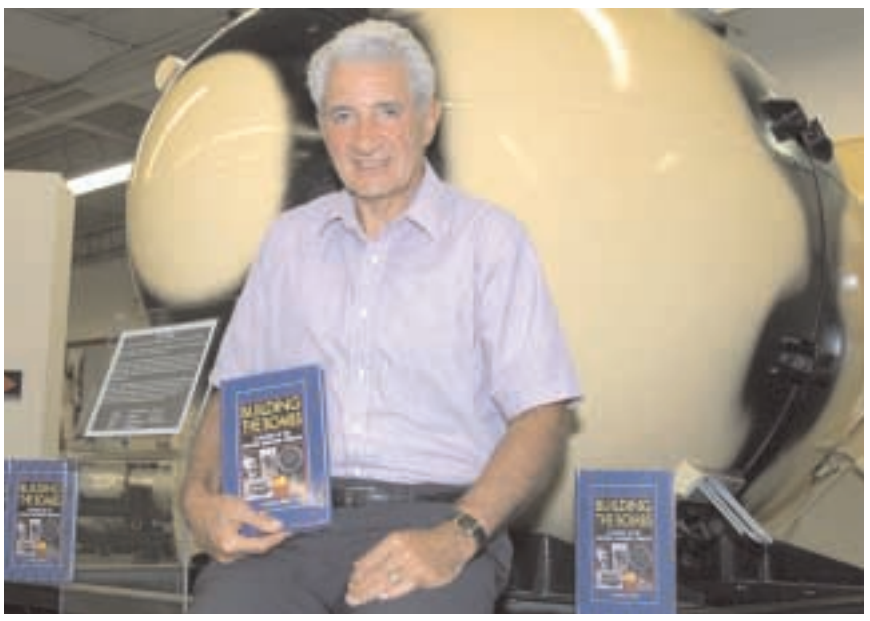
Cut me out — annoy your neighbor ✂

Chuck Loeber's history of the nuclear weapons complex, ***Building the Bombs***, is his gift back to the system

By Ken Frazier

It started as a natural outgrowth of his job responsibilities as an engineer helping to manage the sprawling DOE nuclear weapons complex — newly hired employees needed to know some history. But what began as a job soon became a hobby and a passion, and now it has resulted in publication of a book, *Building the Bombs: A History of the Nuclear Weapons Complex*.

Its author, Sandian Charles Loeber of Weapon Knowledge Management Dept. 2911, says he has had a "wonderful" 37-year career, and the book is his "gift back to the system."



CHUCK LOEBER with his book about the nuclear weapons complex. (Photo by Bill Doty)

On Friday, July 26, Sandia received 2,400 copies of the book, and by the following week every Sandia manager and above had a copy. Most of the remaining copies will be used in Sandia's training activities such as the New Hire Orientation Program, the Weapon Intern Program, and Military Liaison's classes. In addition, 2,600 copies were sent to the other seven sites in the nuclear weapons complex and to DOE. A few hundred of Sandia's copies are now available for sale at the National Atomic Museum.

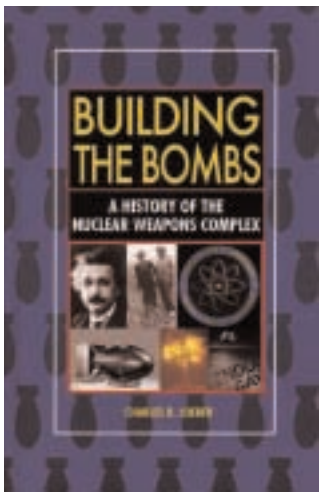
Although officially a Sandia "SAND" report, Building the Bombs isn't a technical monograph. It is an attractive hardback book, published on high-quality enameled paper, filled with interesting color illustrations and historical photographs. But it's the content and approach that make it special. This book is written to be read.

Although it *is* comprehensive — Chuck starts with Albert Einstein's theory of relativity and ends with the current post-Cold War era of maintaining deterrence without nuclear testing — it's not exhaustive. Chuck directs those having a deeper interest in any of the topics to the references at the end of each chapter and his 10-page bibliography.

Instead, in a brisk 198 pages of main text, Chuck offers a series of short sections, some only a few paragraphs long, quickly covering the most important highlights of the history of the nation's nuclear weapons complex — a much understudied and perhaps under-appreciated aspect of the nation's technological and political history.

"There are many 800- or 1,000-page books on each of the [nuclear weapons production and laboratory] sites," Chuck says. Unfortunately, few people have the time or interest to wade through so much detail. "My book is brief enough that, hopefully, people will read it." He says he "tried to take the essence" out of each topic of importance and present it in readable form.

In addition to the abundant illustrations, every couple of pages there is a short boxed vignette, some interesting detail or anecdote. Example: About the rivalry that developed in the 1950s between Los Alamos and Lawrence Livermore labs: "A Los Alamos scientist once joked that the levels of classification were 'confidential,' 'secret,' 'top secret,' and strictest of all, 'hide from Livermore.'"



The succinct form and style is a natural outgrowth of the book's origins: an evolving series of live presentations about the nuclear weapons complex that Chuck began giving in the mid-1980s as part of a week-long orientation program for new employees from the various DOE sites. People coming out of college knew little of the nation's nuclear history, let alone the workings of the complex.

"Because of my role as head of production management [at DOE's Albuquerque Operations office], I pulled together the story," he says. He says new employees were deeply interested and full of questions about the history. "The story grew into a three-hour presentation," he says. Long after DOE's orientation program ended, he would still get requests for this presentation.

Chuck retired from DOE in September 1994, and after a few months, he became restless. So in 1995 when Gary Beeler, then Sandia's VP for production, who knew Chuck well, asked if he wanted to come back to work, this time at Sandia, Chuck jumped at the chance. It was a natural. "I knew all the DOE production requirements," he notes.

And Chuck kept getting requests for his history briefings, which Sandia supported him in fulfilling. "I am very thankful to Sandia for allowing me to go to the other sites to share this story," Chuck says.

The story was on viewgraphs "and mostly in my head," he says. Then while recovering from surgery for prostate cancer in August 1998, "I decided to start committing the story to paper." Over the next three years, in the evenings or on weekends as his time and energy allowed, he continued writing at home. "It was a labor of love, a hobby." It began to take shape as a book.

"John Stichman [VP of Weapons Systems Div. 2000] was my primary champion in getting it published," Chuck says. But there were many others as well including Kathleen McCaughey (14400), Ron Detry (9800), and Melissa Murphy (2900). By the summer of 2001 he had the book complete in manuscript form. Jan Gaunce (12620) then designed it into an attractive format. Michael Townsend, a contractor, did special illustrations. (Chuck's acknowledgements section thanks more than a dozen other Sandians.)

Some essence and flavor of the book can be gained just from the chapter titles: Einstein Opens the Door, The Manhattan Project, German Atomic Bomb Program, Espionage During the Manhattan Project, Creating the Cold War, Two Scorpions in a Bottle (on fusion, McCarthyism, and Oppenheimer's security clearance), Tests and Test Sites, Performance Improvements (wooden bombs, sealed pits, neutron generators, limited-life components), To the Brink, Safety and Security Improvements, Ending the Cold War, and Maintaining Deterrence.

He then presents an epilogue that gives his personal answers to "twelve of the most interesting and challenging questions" he often got at the end of his presentations. Examples: "What was the greatest danger during the Cold War?" "Was the US justified in dropping atomic bombs on Japan during World War II?" "All things considered, have nuclear weapons been a force for good or evil?" He handles all these questions as he does everything else in the book: clearly, candidly, directly, succinctly.

Chuck ends his book as he says he always ended his presentations. When he would state this, he says he often could see in employees' faces a fresh sense of seldom-expressed pride. It is this:

The nuclear weapons complex, he points out, built the weapons that ended World War II, built a stockpile that served as a deterrent to the Soviet Union during the Cold War, safely downsized the stockpile after the Cold War, and ensured that the remaining stockpile is safe and reliable. "The NWC has done a wonderful job for over 50 years. . . . All past and present members of the NWC have good reason to be proud of their service to the nation. New members should recognize that they are standing on the shoulders of giants."

MentorNet comes to Sandia: You can be an online mentor to women science students

Sandia has signed up as a participant in the MentorNet online program for the upcoming academic year (open enrollment for mentors started Aug. 1).

MentorNet is a six-year-old online mentoring program that pairs community college, undergraduate, and graduate women in engineering, chemistry, and physics (and related technologies like computer science or math) with engineers and scientists working in industry or US national labs. MentorNet mentors (men and women alike) involved with last year's program reported spending an average of 20 minutes a week communicating with their protégés (only contact was via e-mail), while gaining personal satisfaction and insight from guiding future colleagues.

"If you are interested in encouraging more women to pursue their interests in scientific and technical studies and careers — let's help change the trend of smaller numbers of female degree-seeking students in technical degree programs! — please consider serving as an online mentor through MentorNet," says Diane Kozelka (9615), Sandia's MentorNet coordinator.

"Participating in this mentoring program is also a great way to increase the awareness of national labs to college students, and would help in recruiting students to come work at Sandia for the student Summer Intern Program, or after they've graduated. Remember what your first year in college was like, and how helpful it would have been for you to have a mentor that worked in the field you were interested in?"

Some of the corporations, associations, and labs already participating in the MentorNet effort are 3M, Alcoa, AT&T, Cisco Systems, DuPont, Ford Motor Co., Hewlett Packard, IBM, Intel, Microsoft, Motorola, National Science Foundation, Optical Society of America, Oracle, Plantronics, SAP Labs, Schlumberger, SPIE (The International Society for Optical Engineering), Texaco, and Lawrence Berkeley, Lawrence Livermore, and Los Alamos national labs, as well as NASA's Ames Research Center.

Applications for the 2002-03 program year opened Aug. 1. For more information or to register, go to www.MentorNet.net or contact Diane at dmkozel@sandia.gov 284-3280, if you have any questions.

Atomic anchors to quicken computer boot-up

Simple method may improve catalysts, nanodevices

By Neal Singer

A way to help next-generation computers boot up instantly, making entire memories immediately available for use, has been developed by researchers at Sandia and Pacific Northwest National Laboratory (PNNL).

The patented technique is able to deposit flat, ultrathin metallic layers on very thin oxide layers. The thinness of the deposition reduces material cost and requires less electricity to produce more rapid magnetic effects in the service of computer memory.

The inexpensive innovation also may produce better, less expensive catalysts for chemical reactions, better ceramic/metal seals, and lead to improved nanodevices.

The method, reported in the Aug. 2 *Science*, was discovered at PNNL and understood and generalized by theoretical scientists in Sandia's Surface and Interface Sciences Department (1114).

The technique eliminates the present-day hurdle of metal atoms clustering together into three-dimensional islands when deposited on oxide surfaces. These thick bumps of metal — similar to water beads on a waxed car — are a problem because they produce poorly crystallized metal films. These are relatively weak, require inefficiently large amounts of material, and produce more heat because more electricity is needed to produce variations in magnetic signals.

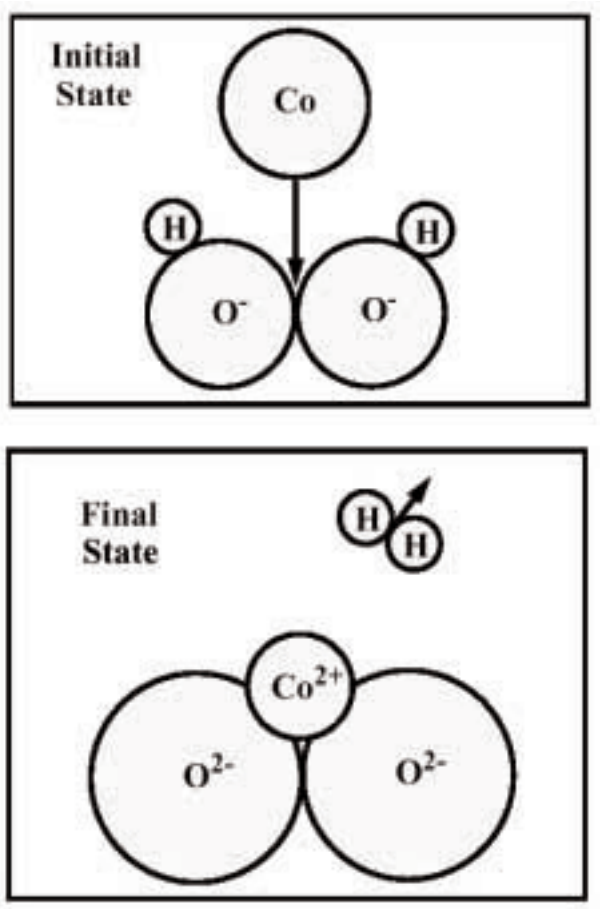
The new method achieves crystallinity with only a few atomic layers. Its inherent structural strength should also produce greater durability in electronic devices.

Of less interest, perhaps, to Sandians but of great interest worldwide, catalysts are involved in approximately two-thirds of the gross domestic product of the United States, particularly with regard to oil. Their wide applications allow chemists to turn one molecule into another. The new discovery should enable the production of catalysts where the reactive metal on an oxide support is only one atomic layer thick, thereby saving considerable cost in materials.

How does the process work?

The findings may have the most immediate bearing on magnetic tunnel junctions, slated for use in magnetoresistive random access memory, or MRAM. MRAM will allow computers to store information in a nonvolatile fashion, meaning the information is not lost when the computer is turned off. As a result, MRAM promises a day when computers would boot up instantly once turned on, rather than comparatively slowly while retrieving information from the hard drive. Major corporations have begun developing MRAM modules in hopes of generating robust nonvolatile memory in the next few years.

But growing an atomically flat, ultrathin film of metal on top of any insulator material is a difficult feat. In a magnetic tunnel junction, an ultrathin layer of insulator, typically aluminum oxide with a thickness of less than or about one nanometer, is sandwiched between layers of magnetic metal, such as cobalt or nickel-iron. When current flows through the device, the magnetic orientation of the two metal layers can be switched, resulting in different values of the tunneling current. This creates an environment in which "bits" of computer memory can be stored.



THE ESSENTIAL REACTION — The transition occurs when the impacting cobalt atom is close to where two oxygen atoms, part of two OH groups, touch.

To achieve ferromagnetism, it was thought that thick layers of the top metal must be made. Obviously, thinner layers that require lower currents to switch the direction of magnetic fields would be more desirable.

In 2000, Sandia solid-state theorist Dwight Jennison (1114) approached Scott Chambers, a chief scientist at PNNL, with a theory that the presence of hydroxyls — in effect, water fragments — would enhance the binding of metals to oxide surfaces. Dwight calculated that under those conditions, certain metals would form flat films on sapphire (a phase of aluminum oxide).

Using a special synthesis technique he created, Chambers and postdoctoral fellow Tim Droubay produced an atomically flat film of cobalt on hydroxylated sapphire. They found, as Dwight had suspected, that the cobalt accumulated in layer-by-layer fashion, rather than clustering to form islands.

"Cobalt's interaction with oxide is so weak that it would normally ball up when deposited," says Dwight. "However, by changing the surface of the oxide, Scott discovered that cobalt atoms can cause the release of a hydrogen gas molecule and the cobalt atoms then become oxidized themselves — that is, they link up with the newly available oxygens and end up strongly bound within the top layer of the oxide. These are the anchors."

These metal atoms, embedded at scattered points within the top layer of the oxide, amount to about one anchor for every ten oxygen atoms in the top layer. These anchoring atoms bind other metallic atoms to themselves and to each other just above the oxide surface, forming a crystalline metallic layer.

"Many advanced technologies rely on strong interfaces between metals and oxides," said Chambers, lead author of the Science paper. "These findings may provide the molecular insight industry needs to create better materials for microelectronics and sensors."

The new technique uses equipment already in place in chip manufacturing plants.

"For industry, a solution may be as simple as exposing the thin aluminum oxide films to a low pressure of water vapor before adding a final cobalt layer," said Chambers. The entire process may be done at room temperature, while it is often important to avoid high temperatures in manufacturing.

PNNL postdoc Tim Droubay helped Chambers with the experiments. Dwight, who first found which chemical reactions would be energetically favorable, collaborated at Sandia with Thomas Mattsson (1114), who has long experience in first-principle-based diffusion and reaction studies, and in computing critical reaction barriers. Their theoretical calculations predicted some and validated other experimental results. Some of these calculations required work on Sandia's most powerful computers.

The calculations provided insight into what reaction is taking place, where it occurs, the energy barrier for it to happen, and the time needed for completion vs. the time for arriving cobalt atoms to lose energy while in contact with the surface. If the reaction occurred slowly, the rapidly diffusing cobalt atoms would first find a growing island. However, because hydrogen molecules are being made, the reaction can be on the order of tenths of a picosecond. This is well before the arriving cobalt atoms can assume the temperature of the substrate.

Says Dwight, "Otherwise the experimental result would be impossible to explain. However, here we have a wonderful joining of theory and experiment."

Although the experiment was conducted using cobalt, Dwight's calculations predict the method also would be effective for iron and nickel, two other metals under consideration for MRAM, as well as metals such as copper, ruthenium, and rhodium. The latter two have applications in catalysis.

Staci Maloof of PNNL contributed to this article.

Financial reporting

(Continued from page 4)

report. If desired, this data file can be downloaded into Microsoft Excel and Access, as well as Business Objects, for more extensive data analysis and manipulation.

A communications effort aimed at providing a smooth transition to this new reporting system began in May and is scheduled to continue through November. Public information sessions and group presentations are being offered. A series of e-mail notifications providing more details about the new system are being sent to all Business Objects license holders. Everyone who uses financial-related information in his or her job is strongly encouraged to attend an information session and learn about the benefits provided by this new reporting system.

Requests for group presentations, suggestions, or questions about this project should be submitted to the Management Reporting Support Office (e-mail "MRSO") at 845-8180. More information on this project is available at http://cfo.sandia.gov/finan/mr/frs/FRS.htm.

This item was provided by Gwen Pullen and Duane Garrison of Project Accounting & Reporting Dept. 10511.

Key benefits of new financial reporting system

- Customer input is driving design of a new suite of standard reports.
- Report requirements are driving design of the new financial data warehouse.
- Standard reports will be automatically generated off-hours.
- Technical managers and financial analysts will be able to view standard reports in a web-based friendly environment without having to use Business Objects.
- A data file that can be easily downloaded into Microsoft Excel and Access, as well as Business Objects, will accompany standard reports.
- Financial analysts will be able to devote more time to providing value-added analysis and less time to creating, distributing, and scheduling reports.
- Purchase Order commitment reporting will include a fiscal year split for purchase orders that have a limitation-of-obligation placed on them.

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

GOLF CLUBS, Titleist 962 irons, PW through 3 iron, brand new grips, nice clubs, buying new ones, must sell, $200. Chavez, 831-3193.

QUEEN BEDROOM SET, cream-colored Formica, divided dresser w/mirror, door chest, nightstand, full/queen headboard, $400 OBO. Nestle, 798-9641.

VIDEO CAPTURE, ADS USB instant DVD, Mpeg-1/2, 1-5 Mb/s, manual, cables, software, paid $200, asking $100. Ennis, 301-6228.

QUEEN BED, plus two 4-drawer chests, hand-painted, Southwest design in greens & coral. Hubbard, 291-8463, after 4:30 p.m.

METAL LATHE, South Bend, 9-in. swing, 32-in. bed, very good shape. Van De Valde, 869-2600.

WOODEN IRONING BOARD, old wooden chairs, 1 w/casters & tilts, other w/slats & folds. Schwerkoske, 821-0835.

ELECTRIC DRYER, Hotpoint, w/instructions, $35. Moll, 299-6497.

ROCK SAW, w/10-in. diamond blade & automatic feed, $250. Smith, 299-6873.

LOVE SEAT, peach/white, light blue w/wicker accents, very clean, $35. Locher, 266-2021.

MICROTEC SCANMAKER 4800, NIB, w/35mm slide/filmstrip adapter, scan 8-1/2 x 11, ScanWizard 5, Photoshop-LE5.0, PhotoDeluxe & more, $75. Suderman, 265-1786.

PET CRATE, large, terrific for training pet(s), place inside or outside home, paid $350. Torres, 352-9342.

FUTON BUNK BED, white metal, full/twin, w/mattresses, 4 yrs. old, excellent condition, $250. Griego, 299-3894.

FIREPLACE INSERT, Colony, 27" x 27" x 19", $325; electric pipe threader, $350; box trailer, 3x5, $250; steel door, $50. Trollinger, 268-3414.

ROCKER/RECLINER, grandma-size, blue brocade, good condition, $100. Wilson, 293-2228.

RIDE-IN PEDAL TRACTOR, moveable scoop, very safe & fun, for 3+ yrs. old, $25. Phelan, 869-6094.

UPRIGHT PIANO, beautiful, great condition, original ivory keys, $200. Ohlhausen, 271-1240.

MOVING BOXES, 2 wardrobe boxes included, you carry away, South Valley, free. Montoya, 833-0815.

LIVING ROOM SET: sofa, love seat, end tables, & coffee table, excellent condition, $700; lamps, $20 ea., 3 sets to choose from. Archuleta, 565-9481.

ENTERTAINMENT CENTER, wood front, w/TV/stereo sections, 5' 5"W x 4' 7"H x 22"D, you provide transportation, $30. Maish, 898-8027.

SOUTHWEST AIRLINE TICKET, good anywhere Southwest flies, expires 9/28/02, $300 cash. Bendure, 332-5053.

DESK, 4-drawer, 60-in. wide, $20; hutch, 60-in wide, $30; computer desk, keyboard tray, drawer, $50. Hale, 298-1545.

COTTAGE PLAYHOUSE, Fisher Price, excellent condition, kept inside, $250. Garcia, 836-2827.

HALF PIPE, for skateboarding, all wood construction, 4'H x 8'W x 20'L, very good condition. Hertel, 345-1088.

TREADMILL, ProForm GP5 EKG pulse, $500; American Furniture wood-top kitchen island, drawers & wheels, $200. Couto, 765-9047.

MICROWAVE, Sharp 700W, white, turntable, used 6 mos., $50; Nambé shallow dish, 11-in diameter, $50. Treml, 275-5477.

GRAND PIANO, Chickering, 5'6", $5,500. Sides, 293-4171.

FISH, convict cichlids, gray w/black stripes, free. Leisker, 293-3075.

KITCHENAID MIXER, 325W, white, professional Hobart Model, still very powerful, w/all attachments, $65 OBO. Schaub, 821-7242.

CAMPER SHELL, fiberglass, white, for long-bed, full-size pickup, $375 OBO. Dixson, 298-5617.

CAMPER SHELL, aluminum, for 8-ft. bed, used on '90 Ford F150, slideside windows, w/screens, $90. Mendel, 265-3840.

STOVE TOP & GRILL, electric, Jenn-Air, little used, $100 OBO. Tolman, 296-8239.

HOT TUB, Cal-Spa, 4 person, redwood skirt, 18 jets, ozonator, insulated cover, excellent condition, under warranty, $1,800. Cummings, 797-3036.

IGUANA TERRARIUM, 40-gal., complete w/lights, includes large 3' x 3' x 4' outside cage, $45. Sansone, 296-7945.

OUTDOOR PATIO SET, 5-pc., metal, glass-top, excellent condition, $200. Quiroz, 792-4444.

STEINWAY GRAND PIANO, walnut, w/artist's bench, beautiful, excellent condition, 5'6", $15,000. Epperson, 271-9880.

FOUR TRAVEL CAMERAS: Canon Elph APS (2), $80; Elph zoom, $90; Olympus-XA, 35mm & flash, $140. Ginn, 286-4425.

X-BOX, 3 games, 2 controllers, only 2 wks. old, $300. Herrera, 298-8439, ask for Javier.

MOTORCYCLE SADDLE, Corbin Gunfighter & Lady, for '00 Honda VFR 800, excellent condition, $200. Levenhagen, 821-7055.

CHILD'S TWIN BED, w/wood headboard/footboard, & mattress, excellent condition, $150. Greear, 294-5339.

BASS GUITAR, Hondo, $200 new, asking $150. Douglas, 281-9843.

METAL DESK, silver, old, lockable drawers, 30" x 60", good condition, $35. Hesch, 350-9903.

BUNK BEDS, student loft style, oak, desk, drawers & shelves, very good condition, $350 OBO. Ghanbari, 883-3819.

WOMEN'S MOTORCYCLE BOOTS, like new condition, size 8-1/2, $100. Zamora, 899-6330.

LAWN MOWER, Black & Decker, electric, w/catcher, & flip-over handle, hardly used. Marsh, 256-3228.

DASH COVER, gray, '98-'02, Blazer, Jimmy Bravada, $15; timeshare, Hawaii, $750/wk. Varoz, 831-6093.

SAXOPHONE, Bundy, 6 yrs. old, student used for 4 yrs., excellent condition, $500. Fitzpatrick, 292-1630.

SANTA FE OPERA, 3 standing tickets, Aug. 24, "Traviata," can be sold separately, $10 ea. Kalinina, 507-8765, ask for Alex.

CRIB & CHANGING TABLE, matching, solid oak, both in great condition, $250 OBO. Appel, 792-4707.

TREADMILL, trekking poles, w/videotape, hand weights, roller shoes, beginner exercise video, beginner yoga video, best offer. Wanya, 294-2050.

STEEL TUBING & POSTS: 9-1/2" x 10', sq. tubing, $1 ea.; four, 1" x 6' sq. tubing, $1 ea.; two, 3-1/2" diameter steel posts, 80-1/2" long, $10 ea.; 250-ft roll, electrical wiring, $15. Brannon, 296-6674.

BABY FURNITURE, white, 3-drawer Armoire, w/interchangeable knobs, 30 x 16 x 58, excellent condition, $150. Velasquez, 889-3596.

SKI MACHINE, Precor 515e, like new, $150. Bell, 268-2744.

SOLAR EQUIPMENT, 80-gal. tank, phase-change storage, flex-duct; 8 x 10 beams; blocks (8x8x8, 8x8x16, 2x8x16); hanging fireplace; windows. Talbert, 298-9036.

TEAK FURNITURE: desk, $150; 3 bookshelves, $50-$75; stand, $50; entire set, $350. Lininger, 856-0422.

AMD 700 MHZ CPU & FAN, $35; DVD drive, $20; 32MB/4X-AGP graphics card, $30; Naturally Speaking, v6.0, never used, $95. Cocain, 281-2282.

AM/FM/CASSETTE STEREO, Zenith, $30; GE vintage AM/FM radio, $15; lamp shades, burgundy, $10 ea. Kiro, 255-0890.

BASS GUITAR, Fender jazz bass copy, fretless, w/fret line markers, black, like new, $175. Kureczko, 286-4426.

'79 TWO-HORSE, extended tack room & saddle rack, $1,500; crib/toddler bed, 5-drawer dresser combo, $100. Wells, 869-6039.

JAMES HARRELL POSTERS, 2, custom framed in white metal, $30 ea.; 1 on poster board, $15. Fromm-Lewis, 291-8181.

RECLINER, rocks/reclines, light tan upholstery, like new, $95. Sullivan, 298-4880.

CD CHANGER, Pioneer, 12 disc, w/remote, for vehicle, plays perfectly, $100. Archuletta, 450-9058.

TIMESHARE CONDO EXCHANGES, 2, each: sleeps 4-6, use by 12/31/02, one week/$675, plus handle exchange process. Kelly, 299-3527.

NOAH'S ARK CRIB BEDDING, picture, valance, night-light, more, like new; MS Office 97 Professional. Mounho, 299-0883.

LAWN MOWER, Toro, self-propelled, rear bag, 21-in. cut, reluctant to start, free. Keck, 237-0392.

SOFA & LOVE SEAT, w/recliners, Berkline, $850; 2 end & coffee tables, $50; sofa w/chase, $500. Vigil, 798-0322.

DIAMOND RING, Marquise cut, .58 carat, size 6, beautiful, appraised at $2,495, asking $700. Poulter, 291-0607.

BAND/DJ EQUIPMENT: speakers, amps, equalizers, mics, mixing board, monitors, crossover, etc., $3,000 OBO. Forslund, 293-6135.

DETROIT LIONS TICKETS, Lions vs. Cardinals, 12/8/02 in Tempe, AZ, $49.50 ea. Kazensky, 362-2624.

SWING SET, 16-ft. long w/center supports, used, $25. Hooper, 332-3366.

ETHAN ALLEN CHEST, $450; couch, $150; oak table/chairs, $175; Casio piano, $60. Conrad, 299-2649, email for pictures, edcon98@yahoo.com.

ANTIQUES, mainly furniture, call for descriptions. Ross, 332-0659, evenings & weekends.

POOL TABLE, Connely, 4' x 8', standard size, perfect condition, like new. Padilla, 873-3251.

ENTERTAINMENT CENTER, dark wood, 56"W x 68"L, $130 OBO. Chacon, 266-9126, ask for Alice.

SOUTHWEST AIRLINE TICKET, expires 11/27/02, $325. Smith, 256-0562.

WASHER & DRYER, Kenmore, excellent condition, $350; Stihl gas grass line trimmer, $100. Gluvna, 884-5251.

CAMPER SHELL, Brahma, for short-bed compact truck, blue, tinted sliding windows, $200 OBO. Ashcraft, 281-9676.

BREAKFAST NOOK TABLE, oak grain top w/solid oak trim, w/leaf & 4 cushioned chairs, $100. Williams, 797-8912.

NOTEBOOK COMPUTER, Compaq, 1.0Ghz, 20GB, 589MB, DVD/CD-RW, SXGA, new $2,400, asking $1,400. Clement, 265-0688.

DRUMSET, CB-brand, 5-pc., green, bass, 2 rack toms, floor tom, snare, all hardware, great for beginners. Cancilla, 480-6730.

COMPUTER, 800Mhz, 786MB, 30GB, 64MB video, DVD, CD-RW, 6 USB ports, 2 printer ports, Windows 2000, MS office, full Adobe software, $1,100. Dybwad, 296-9047.

CINDER BLOCK, used, 33 pcs., 8" x 8" x 16", raised face pattern; sliding patio door, used, 108" x 80", free. Kulju, 299-8182.

METAL BED, single, folds upright, on wheels, excellent mattress, $55. Moss, 298-2643.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:

- **E-MAIL: Michelle Fleming (classads@sandia. gov)**
- **FAX: 844-0645**
- **MAIL: MS 0165 (Dept. 12640)**
- **DELIVER: Bldg. 811 Lobby**
- **INTERNAL WEB: On Internal Web homepage, click on News Center, then on Lab News frame, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Michelle at 844-4902. Because of space constraints, ads will be printed on a first-come basis.**

Ad rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. Submit the ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. **One ad per issue.**
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active and retired Sandians and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. **We reserve the right not to publish an ad.**

REFRIGERATOR, Kenmore, side-by-side, w/thru-the-door ice & water, almond, excellent condition, 7 yrs. old, $600. Lauer, 286-8977.

HITCH, receiver type for '97-'02 Jeep Wrangler, Mopar brand, complete w/wiring, like new, $50. Peterson, 856-9629.

TABLE, 4 chrome/upholstered chairs, $60; rocking chair, dark wood, $75; 8' x 10' rug, Afghan, $100. Pena, 271-5222.

VIOLIN, full-size Maestro, w/case, perfect for student, $175; guitar, Giannini classical, $100. Rhodes, 899-5444.

BOW, Martin Compound, right hand, w/extras $180; water pump, 5-hp, B&S engine, horizontal shaft, $200. Schroeder, 869-2243.

TIRES, wheels, 33x12.5x15, BFG tires, 10x15, aluminum rims, $400; Igloo doghouse, $25; curio cabinet, $100. Garcia, 798-0322.

SOUTHWEST AIRLINE VOUCHER, 1 roundtrip, expires July 2003, $320. Benjamin, 869-9922.

BUNK BEDS, custom made, $75; rubber raft, seats 2, $50 OBO; '91 Dodge front bumper, fair condition, $25 OBO. Chavez, 842-6374.

TRANSPORTATION

'87 GMC PICKUP, 4x4, 4-spd., 305 V8, 8-in. lift, large tires, runs well, $3,300. Vigil, 232-2180.

'82 FORD BRONCO, 4WD, 5L engine, AT, red, has always passed emissions, $1,200. Stanley, 296-4333.

'93 CHEVROLET SUBURBAN, 1/2-ton, 4WD, tow package, bucket seats, loaded, rear heat/air, 93K miles, $11,300. Thompson, 991-2597.

'00 TOYOTA 4RUNNER SR5, 4WD, AC, AM/FM/CD/cassette, cruise, hitch, rack, garaged, 16K miles, $25,900. Hardy, 897-9032.

'95 VOLVO 940, sedan, AT, dual air bags, ABS, cloth interior, 104K miles, $7,495 OBO. Fernandez, 822-0377.

'91 AUDI 100, PW, PL, PS, cruise, sunroof, Bose AM/FM/cassette, complete maintenance records, $5,300. Harrison, 897-0658.

'91 FORD TEMPO, AT, AC, Sony AM/FM cassette, tinted windows, runs great, retails $2,100, asking, $1,500. Sanchez, 897-4514.

'97 GMC SUBURBAN 1500 SLE, 6.5L turbo diesel, 2/4WD, receiver hitch, custom roof rack, white/blue pinstripe trim, 73K miles, $16,000. Larson, 281-6979.

'88 SAAB 900S, 5-spd., white, sunroof, PW, 137K miles, $2,500. Cochran, 842-1528, ask for John.

'66 FORD BRONCO, 289 V8, positive-traction, all original, uncut, new paint, 107K miles, runs great, $6,600. Gutierrez, 239-7059.

'91 NISSAN STANZA, 5-spd., AC, PW, PL, one owner, 108K miles, good condition, $2,000. Hudgens, 856-2694.

'87 TOYOTA CAMRY LE, 4-dr., AT, AC, very clean, 107K miles, excellent condition, $2,300. Burns, 345-5836.

'96 FORD RANGER XLT, ext. cab, new tires, brakes, clutch, 91K miles, excellent condition, $6,500. Montano, 821-1235.

'92 PLYMOUTH VOYAGER SE, loaded, lots of new stuff, 133K miles, $2,800. Willmas, 832-1909.

'76 TOYOTA CELICA, runs, needs rear end work, good for parts, $150 OBO. Smith, 291-9094.

'87 HONDA CIVIC HATCHBACK, fair condition, strong engine, new clutch/battery, dependable, 147K miles, 35 mpg, $1,100. Rogers, 323-3615.

'88 DODGE RAM CHARGER, 2WD, 130K original adult driven miles, good condition, $2,600 OBO. Boone, 284-2843.

'94 FORD EXPLORER, Eddie Bauer, 4x4, 5-spd., all power, 10-disc CD, moon roof, alarm, keyless entry, 92K miles, $5,800. Suo-Anttila, 275-8373, ask for Jill.

'72 INTERNATIONAL TRAVELALL, 4x4, 392 V8, PTO winch, 4 fuel tanks, air compressor, limited slip, hitch, $2,500. Miller, 281-5502.

'86 MAZDA 626 LX, 4-dr. sedan, sunroof, 150K miles, $2,000 OBO. Magee, 453-7805.

'90 HONDA CIVIC, 2-dr., hatchback, 4-spd., AM/FM/cassette, new brakes/drums, 122K miles, $2,000 OBO. Wolfe, 821-2684.

'86 CHEVY SUBURBAN, 3/4-ton, front/rear AC, CD, new tires, $3,500; '90 Ford Taurus SW, AC, AT, CD, $2,500. Rockwell, 934-7383.

'97 PONTIAC TRANSPORT, Montana Trim, power everything, dual sliding doors, 62K miles, excellent condition, $13,000 OBO. Vasquez, 284-4378.

'95 CHEVROLET G20 CONVERSION VAN, loaded, 76K miles, below book, must see, $8,200. Stevens, 292-1437.

'99 FORD F150 LIGHTNING, white, all options, 29K miles, $29,999; '99 Honda CBR 600F3, white/red, under 17K miles, runs perfect, $4,499. Adcock, 254-2494 (leave message).

'95 JEEP CHEROKEE, 4x4, PW, PB, PS, AC, AT, 4-dr., new rear end, in great shape, good school car, $6,500. Zender, 294-8210.

'90 HONDA ACCORD, 4-dr., AT, AC, power everything, needs work on exterior, as is $3,000, fix up $3,500. Sanchez, 730-6009.

'01 HONDA CIVIC, 5-spd. AC, PL, PW, tint, CD changer, floor mats, warranty, take over payments, $264/mo. Sanchez, 720-9078.

'91 CADILLAC SEDAN DE VILLE, excellent condition, 78K miles, under NADA, $4,800. Larsen, 292-7896.

'98 SUBARU FORESTER AWD, 4-dr. wagon, white, loaded, 80K miles, excellent condition, $13,000 OBO. Keyworth, 281-2362.

'94 TOYOTA CAMRY LE, 4-dr., AT, PL, PW, tilt steering, tint, 118K miles, $5,200. Abyeta, 379-1520, ask for Brian.

'76 CHEVY 4-DR. PICKUP, 454 V8, low mileage, w/Mitchel 10-ft. camper, consider trades, $4,000 OBO. Martin, 869-1212.

'98 DODGE RAM 1500, V6, AT, mag wheels, tilt, AC, AM/FM/cassette, bed liner, approx. 58,175 miles, bids accepted through Aug. 16, right to refuse bids, sold as is. Sandia Labs FCU, 237-7384.

'95 DODGE CONVERSION VAN, Sherrod conversion package, loaded, can be seen at base car lot, $9,000. Rembold, 281-3469.

'96 DODGE RAM 2500, 4x4, AT, single cab, long bed, American Racing rims, 69K miles, $13,800 OBO. Chavez, 379-6526.

'90 MAZDA 626LX, extras, 157K miles, good condition, $2,000 OBO. Charles, 275-2090.

'97 FORD MUSTANG COUPE, V6 engine, 5-spd., AC, spoiler, green, $6,700 OBO. Yoshimura, 798-0322.

'94 CHEVY 1500, Z71, 4x4, xtra-cab, AT, AC, CD, cruise, 90K miles, excellent condition, $12,500. Marchi, 271-7610.

RECREATIONAL

'01 KAWASKI SUPER SHERPA, 250 dual sport, black, 4050 miles, great on-road & off-road, 3-yr. free maintenance contract, $2,795 OBO. Field, 332-0996.

'95 KAWASAKI VULCAN, 500 cc, less than 6K miles, great condition, $2,600 OBO. Baca, 839-5151.

'99 HOLIDAY RAMBLER, 35-ft. motor home, lots of extras, tow dolly included, 15K miles, excellent condition, $67,000. Colson, 864-4308.

'96 HONDA CBR1000F, new in '99, Two Brothers racing exhaust, tank bag, 19K miles, never raced, $5,300. Jacobs, 301-6440.

'02 HONDA CBR600Fi, yellow/black, 250 miles, great condition, 4-yr. warranty, must sell, $8,000. Maestas, 228-0636.

'99 HONDA REBEL 250, mint condition, 2,700 miles, ready to ride, $2,000. Wells, 292-0179.

'99 SANDPIPER 5TH WHEEL, 25-ft., fully loaded, excellent condition, includes hitch, $10,500. Baca, 865-0067.

'00 HARLEY-DAVIDSON, Electra Glide Classic, very nice w/extras, 7K miles, $19,000. Tarango, 232-9543.

'71 HARLEY-DAVIDSON, custom, must see to appreciate, $7,000 OBO. Cordova, 243-7534 or 315-6079, ask for John.

TENT TRAILER, sleeps 6, 4-burner propane range, icebox, ideal for family camping, fishing, hunting, $600. Blewer, 268-9019.

'84 ROCKWOOD MOTOR HOME, generator, blender, lots of extra options, 94K miles, good condition. Argo, 865-9305.

'94 LARSON LXI 214, 235-hp, fuel-injected V8, open bow, bimini top, 248.8 hours, $12,000. Tyhurst, 281-1417.

'88 JAYCO 806, Deluxe Pop-up trailer, 8-ft., sleeps 6, furnace, awning, battery, great condition, $1,700. Whiston, 292-1541.

'81 KZ440 LTD, motorcycle, well maintained, 32K miles, extras, $800 firm. Gallegos, 293-8885.

'86 ALLEGRO MOTOR HOME, 21-ft., self-contained, Chevy Astro chassis, 97K miles on original 4.3L V6, good condition, good gas mileage, $4,900. Reese, 281-3498, email for pictures, rpreese@concentric.net.

SAILBOAT, J24, large sail inventory, outboard & trailer, excellent condition, $11,000 OBO. Bentz, 232-2558.

REAL ESTATE

1-BDR. CONDO, off Juan Tabo on Mountain Road, next to Summer Hills Park, hacienda environment, gated community, $34,500, 10% down, REC the rest at 6%, Shahinpoor, 228-7077.

WEST-SIDE CITY VIEW LOT, million dollar views & more, 1010 Vista Grande NW, $85,000 FSBO. Trujillo, 899-4881.

3-BDR. HOME, 3 baths, den, great room, 2,440 sq. ft., porches, 1,800-sq. ft. garage, pitched room, wood/tile floors, 5 acres, views, landscaped. Andersen, 286-1751.

5-BDR. MOUTAIN HOME, 3-car garage, office, 10 acres, FP, country chef's kitchen, 1,600-sq. ft. barn, w/living quarters, MBR suite w/garden tub, $329,000. Rowe, 286-5432.

3-BDR. HOME, 1,850 sq. ft., gorgeous private back yard, RV access, 2-car garage w/workspace, beautiful, updated. Nutt, 856-8267.

3-BDR. HOME, 2-1/2 baths, 1,791 sq. ft., 2-car garage, landscaped, sunroom, near La Cueva HS, $169,900. Mascarenas, 856-7198.

4-BDR. HOME, 2-3/4 baths, 2,000 sq. ft., w/guest room, great Mt. View, partly furnished, SLFCU mortgage, shown by appointment to pre-qualified buyers, $165,000 Chavez, 294-4184.

3-BDR, HOME, 2 baths, 2-car garage, 1,680 sq. ft., oversize lot, quiet street near Unser & 98th, $139,000. Duckett, 836-5310.

3 BDR. HOME, 1-3/4 baths, 2-car garage, 1,600 sq. ft., Juan Tabo & Menaul, newly remodeled, $149,000. Charles, 275-2090.

WANTED

HOUSEMATE, for apartment in private home, nice residential area, private entrance, convenient to Sandia, $350/mo. Smith, 298-7365 or 292-1976.

RIDING MOWER, or small garden tractor, 8-20 hp, must run, under $400. Swahlan, 286-2808.

GENERATOR, small, quiet. Moreno, 294-4268.

RECLINER, Geriatric (Gerry), reclining chair, good condition. Stavros, 281-8206.

GOOD HOME, for kittens, adorable, 7 wks. old, 2 orange tabbies, 2 calicos, 2 gray tabbies. Roehrig, 281-2695.

ROOMMATE, single, non-smoking, professional male, no pets, $400/mo., utilities included. Jojola, 332-2720, after 5 p.m.

ELECTRIC BASS GUITAR, w/ or w/o amp. Ballard, 797-3871.

ENCLOSED TRAILER, Wells Cargo-type, 10-ft., good condition; 15-17-in. monitor. Horton, 883-7504.

MUSICAL INSTRUMENTS, any condition, for donation to 21st Century Public Academy, tax deductible. De Marquis, 286-1616.

BABYSITTER, steady weekend, for young married couple, must be reliable & trustworthy. Podsednik, 898-7436.

WORK WANTED

HOUSESITTING, former Sandia Labs employee, 23-yr.-old male, UNM grad student, conscientious, good w/pets, references. Balthrop, 332-8763.

Follow a map to create a healthier you

¡SALUD! programs tailored to helping Sandians be healthy, stay healthy all year long

By Iris Aboytes

An apple a day keeps the doctor away. If you eat sweets, you can get diabetes. If it tastes bad, it's good for you. These statements are common misconceptions, or are they? For Sandians, the facts are readily available. Call ¡SALUD!, Sandia's program dedicated to helping people be healthy.

Recently employees in three departments at Sandia turned losing body fat into a competition. They wanted to lose body fat, not just weight. Their work environment includes those wonderful vending machines. According to one participant, "Those vending machines call your name as you go by." They notified ¡SALUD! of their intentions, and the competition officially began.

Each person's body fat was measured by caliper. According to ¡SALUD!, body fat is lost when a caloric deficit is created, which means you need to take in fewer calories than you expend. There are two ways to do this: dieting and exercising. Unfortunately, when one loses weight it's often not just body fat; muscle is lost as well. By engaging in resistance exercise, you can help spare the muscle loss.

Their ultimate goal was to get a little healthier. Coworkers began riding their bikes at noon, some were walking, others were making it a point to eat healthier. When the vending machines called, they were certain they had called their opponent's name and not theirs.

For three months, they heckled each other in their attempt to gain the upper hand (more energy and weight loss). Little by little the results were obvious. Higher energy levels were especially noticeable. One participant was especially successful. The physical change was especially impressive: a much smaller person with a beaming and energetic attitude emerged.

BODY FAT COMPETITION — In left photo Phillip Block (3335) uses a caliper to measure the body fat of someone who took the body-fat-loss competition to extremes. In right photo, Phillip measures the body fat of student intern Matt Stackpole (12640), who has quizzical look on his furrowed brow. Which one are you? (Photos by Bill Doty)

By the way, the competition with the three departments was so successful that another competition among the three departments began Aug. 1 with different participants.

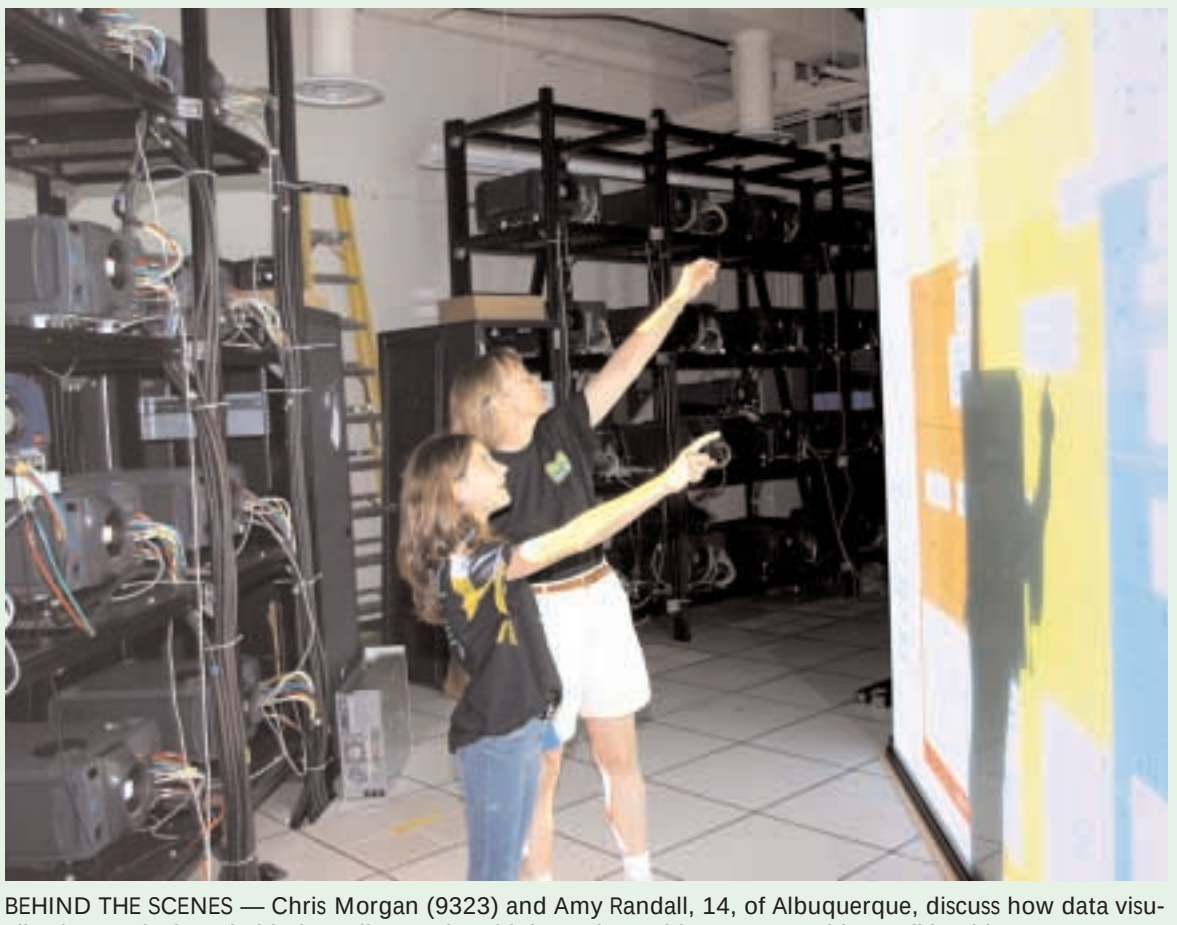
Why not set up a body fat competition in your own group? ¡SALUD! can help you with the logistics.

¡SALUD! also offers a number of other health-related programs. For example, Sept. 11 brought an elevated level of stress to the workplace. ¡SALUD! has provided a variety of stress management programs for several organizations. Initial stress map assessments (15 minutes) are offered to explain the map and its purpose. When the maps are completed and returned, a report is compiled identifying strengths and areas of possible improvement. ¡SALUD! follows up monthly with interventions to meet your needs.

For a complete list and descriptions of the programs offered check out http://www-irn.sandia.gov/HR/health. Whether you prefer to fly solo or with a group, ¡SALUD! is there to help tailor your needs.

Remember! A healthier you not only increases your quality of life and productivity, but lowers your disease risk factors. Author William Temple simply states, "Health is the soul that animates all the enjoyments of life, which fade and are tasteless without it."

Twenty girls visit Sandia as part of Girl Scout Fair Play Science Program



BEHIND THE SCENES — Chris Morgan (9323) and Amy Randall, 14, of Albuquerque, discuss how data visualization works from behind Sandia's 10-foot-high, 13-foot-wide VIEWS Corridor Wall in Bldg.880. Amy was among about 20 girls who visited Sandia as a part of the Girl Scouts' Fair Play Science Program. The visit was hosted by Sandia's Corporate Outreach Dept. 12650. The program's goal is to encourage girls to develop knowledge and interest in science and technology fields. (Photo by Bill Doty)

Sandia News Briefs

Sandia receives national award from the Secretary of the Treasury

Sandia has been recognized by Treasury Secretary Paul O'Neil for its support of the US Savings Bond program. Sandia is one of only seven companies in the nation with more than 5,000 employees to receive the Treasury Department's National Honor Roll award.

Seventy percent of Sandia employees signed up to buy Savings Bonds, well above the 50 percent required to be included on the national honor roll. This is the 18th year Sandia has been recognized for its exceptional support of the Savings Bond program.

The award was presented to Don Carson, Director of Center 12600, by Jerry Chavez, area director for the Department of Treasury Savings Bond Office, during a 12600 Center Savings Bond celebration.

Feedback

Q: *As I pull flawlessly through the Eubank gate this morning and head south, only to wait in line due to the delay in vehicle searches at Gate 10, I wonder if there is a possibility to address these searches as was done with the base gates. I would think an acceptable solution would be to double up the security staff at Gate 10 and have two teams searching two vehicles at the same time, just as what was implemented at the base gates.*

A: Thank you for your inquiry regarding traffic delays at Gate 10. Vehicles testing positive for explosives caused the delay. Since the end of May, the ProForce procedures have been revised to help address the traffic congestion for the future. In addition, modifications to the gate are being evaluated and changes are made as necessary. While increasing staffing at the gates would be an option, we are not currently staffed with sufficient Security Police to allow this. However, please keep in mind, that if a vehicle does test positive for explosives, traffic through Gate 10 will be redirected to ensure the safety of employees and customers. — *Al West (3100)*