LANL
Los Alamos News Letter
A publication of Los Alamos National Laboratory
Vol. 2, No. 10 • May 17, 2001

Feasting at the online periodic table

by Kevin Roark

When budding scientists in elementary, middle and high school need information about chemistry, they have a myriad of sources online. One very popular source turns out to be the Lab's periodic table site, linked to the Chemistry (C) Division's external home page. How popular is it? Since May 2000 the site has logged nearly two million hits.

The site is maintained and updated by computer technician Nick Degidio and staff member Moses Attrep both of Isotope and Nuclear Chemistry (C-INC).

"We average about 30,000 hits a month," said Degidio. "And that number doubles around finals, term papers and midterm exam time. Its popularity is pretty surprising."

continued on Page 2

Inside

HDTV: To be or not to be

by Todd Hanson

In this simulation of high definition television transmition, an analog television picture would remain the same except for two bars of "static" on the top and bottom of the television screen.

High definition television is coming to a screen near you — at least we hope so. For some television viewers the system is already in place and working well. For many more consumers, however, the technology may be a bit later in coming. The transition has proven troublesome for television broadcasters, television set manufacturers and government officials as technological, economic and even political issues have slowed the process.

The promise of HDTV is worth the wait, but only if you want the benefits of a higher-resolution picture — imagine doubling the resolution of today's analog television — coupled with a wider screen image close to the dimensions of a motion picture image. Add to that Dolby digital sound with six separate audio tracks for detailed and realistic surround sound and you'll probably agree HDTV is a better way to see television.

Many people involved in the transition are beginning to fear that when the federally mandated time comes in 2006 to convert broadcast formats, a large percentage of the population will not be ready.

Anticipating a slowdown, a Laboratory scientist has developed a technology that could make the ongoing transition from current analog television to HDTV easier. The technology is a new transmission algorithm capable of compressing a HDTV data stream to the point where both the HDTV and analog TV signals can be broadcast over the same channel.

The information content in the picture using the algorithm will approximate that of a dedicated HDTV transmission, slightly lowering quality, but still far superior to analog television. The analog television picture would remain the same except for two bars of "static" on the top and bottom of the television screen. These bars are the result of differences in the shape, or format, between the analog and digital pictures. The "static" is actually digital information containing finer details.

A patent application has been filed on this technology and the Laboratory is currently seeking qualified licensees with experience in the fields of television broadcasting or equipment manufacturing to help develop the technology.

Director's News

I recently had the opportunity to testify before the Senate Armed Services Committee's Strategic Subcommittee. I was part of a panel that included the Livermore and Sandia directors as well as representatives from the Pantex, Y-12, Kansas City and Savannah River plants.

My written testimony is linked from the Director's Web page (*http://www.lanl.gov/worldview/news/director/*). I thought I'd describe here some of the points I emphasized in my oral testimony.

• I told the subcommittee Los Alamos employees have rebounded from our security incidents and the Cerro Grande Fire with professionalism and with increased strength. This echoed comments Gen. John Gordon, head of the National Nuclear Security Administration, made in his testimony about how impressed he is with the employees of the NNSA, particularly their dedication and the energy they bring to their jobs.

• I also emphasized that stockpile stewardship has been successful to date, but our ability to sustain the

continued on Page 6

Lab's online periodic table …

continued from Page 1

"Nobody quite remembers how exactly it got started," said Attrep. "It was developed more than five years ago by a grad student and was originally designed to be a resource internal to the Lab, but has evolved into a reference source externally, focused on chemistry students in the mid- and high-school-age group.

There are many periodic table sites on the World Wide Web, originating from around the globe, many geared to the college or professional level. The Lab's site is set apart from most of the others because of its easy-to-use format and its feedback channel for questions and comments.

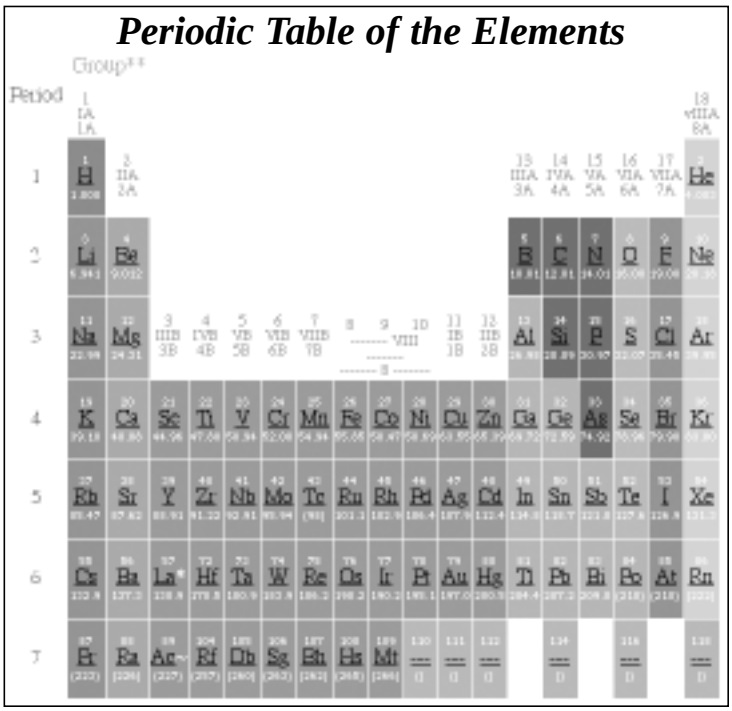
To go directly to the periodic table click at *http://pearl1.lanl.gov/periodic/* and you'll see the full-color periodic table with links to every element, answers to frequently asked questions and a place for asking questions.

In just a few clicks you can find out that the periodic table was originally developed in 1872 by Russian scientist Dmitri Mendeleev, and that the table is arranged by atomic number, which generally follows atomic weight. There are detailed pages that address what a periodic table is, how it is used, what chemistry is, in a nutshell, and how new elements are named.

A quick click on the element carbon and you'll find that its atomic number is six, its symbol is "C" and its weight is 12.011. You'll also find descriptions of carbon's uses, history, forms, compounds and isotopes. The information is detailed enough for the high school chemistry student and is up to date. Under carbon you'll find that while three forms of carbon exist naturally, amorphous, graphite and diamond, there is new research that indicates a man-made form of carbon, so-called "white" carbon is also thought to exist.

But the really fun thing about the site for Attrep and Degidio are the questions that pour in from kids taking their first steps toward a better understanding of chemistry.

"It's fun, I really enjoy answering the questions," said Attrep. "I can tell if the kids are really curious about chemistry or if they are just trying to get me to answer a question for their teacher. Sometimes the grammar is a bit suspect, but we try our best to supply a good answer."



LANL

LANL, the Laboratory bi-weekly publication for employees and retirees, is published by the Public Affairs Office in the Communications and External Relations (CER) Division. The staff is located at TA-3, Building 100, and can be reached by e-mail at *newsbulletin@lanl.gov,* by fax at 5-5552, by regular Lab mail at Mail Stop C177, or by calling the individual telephone numbers listed below.

Editor:
Kathy DeLucas, 7-1455

Assistant editor:
Judy Goldie, 5-0297

Managing editor:
Denise Bjarke, 7-3565

Graphic designer:
Edwin Vigil, 5-9205

Contributing photographers:
Michael Carlson, 5-4610
LeRoy N. Sanchez, 5-5009

Contributing writers:
Michael Carlson, 5-4610
Todd Hanson, 5-2085
Chris Pearcy, 5-3892
James E. Rickman, 5-9203
Kevin Roark, 5-9202
Steve Sandoval, 5-9206

Los Alamos National Laboratory is an Affirmative Action/Equal Opportunity employer. It is operated by the University of California for the U.S. Department of Energy's National Nuclear Security Administration

Please recycle

Los Alamos NATIONAL LABORATORY

NNSA

Lab awards nuclear facilities subcontract agreements

by James E. Rickman

Laboratory officials recently announced the award of two agreements for advisory and support services related to the operation of the Lab's major nuclear facilities.

The Lab awarded agreements to BWX Technologies and Westinghouse Government Services Co. Both companies have experience operating nuclear facilities for the Department of Energy.

The companies will help the Laboratory improve its operation of nuclear facilities, including the Plutonium Facility, Chemistry and Metallurgy Research facility, and critical experiment facilities. By awarding the agreements, the Laboratory has met one of the first specific requirements of Appendix O, part of the recently modified University of California management contract. Appendix O specifies performance milestones that Los Alamos and Lawrence Livermore national laboratories must attain before DOE will consider awarding certain performance fees to UC.

"We are very pleased to be able to have the experience base of BWXT and Westinghouse supporting us as we strive to improve the efficiency and operational excellence of our nuclear facilities," said Tony Stanford, Facility and Waste Operations (FWO) Division director. "Both companies have a wealth of experience with nuclear facilities of the same complexity as the ones at Los Alamos. BWXT and Westinghouse will give us a fresh look at our nuclear facilities operations, and valuable insight into the best practices that industry leaders are implementing."

Under the agreements, the companies will focus on six areas: management processes, business management practices, facilities operations, facilities maintenance, and system design and engineering. The agreements could continue for up to five years and potentially could be worth up to $20 million.

The first milestone in the agreements will be reached within 120 days: BWXT will work with Lab personnel to produce an assessment of the Laboratory's major nuclear facilities. Based on the assessment, personnel from Los Alamos and the two advisory/support companies will make recommendations about how the Laboratory can modify, strengthen or improve nuclear facilities operations.

Finally, DOE, the Laboratory, BWXT and Westinghouse will work together to implement recommendations — which ultimately will assist in making Los Alamos' nuclear facilities operations among best in class.

New program promotes development of young scientists and engineers

New to the Laboratory this fiscal year, the UC/LANL Educational Internship Program is a unique internship program for undergraduate and graduate students. EdIP is managed by selected individual University of California campuses in collaboration with the Laboratory's Education Program Office (EPO). The goal of the program is to combine on-campus academic programs with off-campus work experiences at the Laboratory. The program will lead to the awarding of a bachelor's/ master's degree to those participants who meet the minimum BS/MS requirements of the participating campus departments.

The philosophy of EdIP is to promote the development of young scientists and engineers. These students could then become the next generation of scientists, mathematicians and engineers in areas that focus on the Laboratory's mission. The structure of the program reflects the belief that work experience is an important part of a sound education. Exposure to such work adds relevance to a student's education and ultimately produces stronger students and more effective scientists, mathematicians and engineers.

The participating University of California campuses and departments for summer 2001 are

• Univerity of California, Santa Barbara, materials, mechanical engineering and chemical engineering departments

• University of California, Riverside, department of physics

It is hoped the program will expand to include additional UC campuses in the near future. Sandra Landry, EPO coordinator for the program, can be reached at 5-6346 or at *landry@lanl.gov* by e-mail.

Science is truly becoming a family affair

by Michael Carlson

As a graduate student in marine biology at New Mexico State University, Annie Lindgren recently visited the Laboratory in hopes of educating a new generation of teenage girls on what she has learned as a woman in science.

Lindgren was a co-presenter with her mother Jill Ryan at this year's Expanding Your Horizons conference held at the Laboratory. Lindgren participated in EYH as an eighth-grader in the early '90s in an effort to find the type of science that suited her interests. A 1997 Los Alamos High School graduate, Lindgren also is a former Lab UGS student.

"EYH influenced me to work at the Lab by encouraging me to go into the sciences," said the 21-year-old Lindgren. "It was several years after EYH that I ended up working for the Lab, but it may not have happened at all had I not seen what an amazing network of women are employed here."

She worked in the Health Research Laboratory under the direction of Scott White during the summers of 1999 and 2000, using genetic techniques to find similarities between different organisms. Without the assistance of White, she would not be working in her current lab at NMSU, she said.

"It was great to see the turnout of both scientists and young women," said Lindgren. One young lady asked me if science was hard. I told her it was no more difficult than any other field. Mostly the girls were interested and attentive. I feel that we got through to at least a couple of girls. I also felt that if at least one of the students went away with an interest in science, we had been successful."

An estimated 138 teenage girls participated in all-day workshops and enjoyed a free concert by the Physics Chanteuse Lynda Williams.

Held annually across the nation at varying dates throughout the year, the program is intended for teenage girls who already show an interest in math and science as well as those who are uncertain about their career paths.

The forum is an opportunity to meet and form personal contacts with women working in traditional male occupations, according to Logistical Assistance Coordinator Diane Lamkin.

Marielle Remillard, 13, of Los Alamos Middle School assembles a motor-control circuit during the recent Expanding Your Horizons conference in the Laboratory's Moon Room at Technical Area 3. The all-day event featured various workshops that emphasized science and mathematics.
Photo by Michael Carlson

The Los Alamos Chapter of the EYH is sponsored by the New Mexico Network for Women in Science and Engineering and Los Alamos Women in Science. The NMNWSE is a non-profit organization with a membership of more than 100 female scientists and engineers who volunteer their time and energy to ensure young people, especially young women, have access to information on exciting and meaningful careers in the sciences and engineering, said information provided by the EYH committee.

For more information about the program, contact Dana Roberson at 7-3935.

Scholarship fund set up in honor of slain Los Alamos students

Johnson Controls Northern New Mexico, in partnership with the not-for-profit Laboratory Foundation and Northern New Mexico Community College, have established two $10,000 scholarships in the names of Ricky Martinez and Karen Castañon who died last year.

The two Los Alamos High School students were slain April 21, 2000, while on a pilgrimage to Chimayo.

Michael Shepherd of Johnson Controls Northern New Mexico said the scholarships will be funded by donations from the general public and corporate sponsorships. Once $10,000 is raised, $500 scholarships will be awarded annually in October/November to local worthy students at a banquet, Shepherd explained.

Johnson Controls Northern New Mexico's corporate office will match JCNNM employee donations to the scholarships fund, and the Laboratory Foundation has pledged $1,000 to the scholarship fund.

Shepherd said donations to the scholarship fund can be addressed to the Northern New Mexico Community College Foundation and sent to Shepherd at Mail Stop A199/MGPM, or to Felicia Casados at the college, 1027 Railroad Ave., in Española. A note should accompany personal checks stating it is for the scholarship fund.

A mid-school first

Nearly 250 students competed in the 11th annual New Mexico High School Supercomputing Challenge and about 120 students were at the Lab last month to take part in the awards ceremony. The Judges Special Recognition Award was presented to Jordan Aday, left, Hector Cardona, center, and Eddie Banda of Picacho Middle School in Las Cruces for their project, "Gas Diffusion." This is the first time any middle school has won an award at the challenge. Thirty teams, including a dozen finalist teams, heard talks from researchers at Los Alamos and toured the supercomputers they used during the challenge. Students from 30 schools spent the last year researching scientific problems and writing programs to solve them on supercomputers at Los Alamos and Sandia national laboratories. For more information, see the April 26 Daily Newsbulletin at http://www.lanl.gov/newsbulletin. *Photo by LeRoy N. Sanchez*

Committee strives for A+ in student experiences

by Chris Pearcy

The Laboratory's Student Programs Advisory Committee is working on ways to improve student employment at the Lab, says Robert Gurule, SPAC co-chairman. "Our goal is to give every student at the Laboratory a positive and educational experience."

To ensure that student expectations are met, the committee of 20 members is working on improving student work plans and exit surveys, creating stronger student-mentor relationships and ensuring student safety. "Our role is advisory in nature," explained Michael Murillo, co-chairman of the committee. "We identify areas for improvement between the Lab and its student employees and work with the Human Resources (HR) Division, Science and Technology Base (STB) Programs, Environmental Safety and Health (ESH) Division and other Lab organizations to implement positive changes."

The SPAC created the Laboratory Student Association, an all-student organization focused on issues such as easing students' transition to Laboratory work and finding housing in Los Alamos. The Student Association chairperson also serves as a member of SPAC.

Started in 1997 and sponsored by STB, SPAC brings together students, Laboratory professionals involved in student issues and the Laboratory staff who provide jobs for students. Although SPAC is not involved with postdoctoral programs, it works with the approximately 1,200 students employed by the Lab every year that range from high school cooperative students to college graduate research assistants.

Lab student employment programs hire high school, undergraduate and post-baccalaureate students to work throughout the Laboratory in both technical and administrative areas. All students have a mentor and are encouraged to participate in Laboratory activities.

The GRA program is a year-round educational program that provides students with relevant research experience while they pursue graduate degrees. In some cases, students can arrange to conduct master's or doctoral thesis research at the Laboratory. Most GRA appointments are in the technical and scientific disciplines.

The committee will be recruiting new members soon. For more information about the SPAC, contact Co-Chairman Michael Murillo at 7-6767 *murillo@lanl.gov* by e-mail. Although not fully completed, a SPAC Web site is now online at *http://int.lanl.gov/orgs/cic/cic1/testsite/spac_web/index.html*.

Newsmakers

Carol Smith

Carol Smith of Materials Management (BUS-4) has been chosen to receive a New Mexico Distinguished Public Service award for 2001. Smith was chosen to receive the award in the federal agencies and national laboratories category. Smith has been instrumental in the success of the Lab's Bridge to Employment program, which provides on-the-job training and experience for people who have been receiving public assistance. The program has been so successful at Los Alamos that several other Lab organizations now are participating in the Bridge to Employment program. Smith is BUS-4 group leader, managing a 120-employee warehouse, a gas plant, the Lab's mail services team, the compliance operations of the packaging and transportation of hazardous and radioactive waste and the movement of special nuclear materials at the Laboratory.

Charryl Berger

Charryl Berger is the new Laboratory senior manager on the Quality New Mexico Board. QNM is a nonprofit organization that seeks to educate New Mexicans about quality; encourages and rewards quality in business, education, government and health care; and promotes an economic climate to foster and enhance the prosperity of New Mexico citizens. Berger is the director of the Energy and Sustainable Systems (ESS) Program Office. ESS develops and executes programs using the Lab's science and technology base to meet current and future needs in applied energy areas such as fossil and nuclear energy, energy efficiency and renewable energy. ESS partners with major industry sectors. Before being director of ESS, Berger was acting director of the Lab's former Industrial Partnership Office (IPO).

News from UC

It happens every spring

University of California, Davis, graduate students LeRoy Alaways and Sean Mish, with engineering professor Mont Hubbard, built computer simulations of the forces on a flying ball.

Alaways, Mish and Hubbard used two sets of data--one from two high-speed video cameras that filmed pitches at the Atlanta Olympic Games in 1996 and another from balls thrown by a pitching machine and filmed with seven cameras simultaneously.

Data from the cameras were digitized, combined and used to build a computer model of baseballs in flight. The studies could aid in design of pitching machines and help pitchers hone their curves, fastballs and sliders, said Alaways, who currently teaches at the California Maritime Academy in Vallejo.

Baseball aerodynamics were first studied experimentally in the 1950s by helicopter pioneer Igor Sikorsky, but the results were lost for over 40 years before Alaways found them in a Cape Cod attic. Working with one of the original scientists involved in the study, Alaways plans to publish Sikorsky's results this year.

For more information, go to *http://www.news.ucdavis.edu/newsreleases/04.01/news_baseball_flight.html* online.

Director's news …

continued from Page 2

program is impacted by 1) aging effects in weapons, 2) the need to revitalize the infrastructure at the labs and plants and 3) our ability to recruit so we replenish the skills in our work force.

I noted that pit manufacturing and certification are the highest priority at Los Alamos. In previous years, we could certify a pit through a test at Nevada. Now we have to certify in other ways, and this, I believe, is the most difficult challenge for stockpile stewardship.

Gen. Gordon explained to the subcommittee that while we had not identified any showstoppers to certification, there is still a lot of work ahead. He clearly stated that the proposed FY02 budget will not support our efforts to demonstrate certification by the time the first W88 replacement pit is manufactured in 2003. That pit will be "certifiable," meaning it's ready for certification, but we will not be able to complete the necessary steps for certification under the proposed budget.

I and the other lab directors were able to address the importance of Laboratory-Directed Research and Development funding and explain the value of its continued and perhaps increased support. I noted that all three of us were recruited into the laboratory system through LDRD.

The subcommittee, led by Sen. Wayne Allard, made very positive comments about the importance of stockpile stewardship and clearly recognized the needs we have in the areas of infrastructure revitalization and recruitment. The hearing was an opportunity to provide some initial comments on the impact of the proposed FY02 budget. I'll be watching with interest as the process to develop that budget continues in Congress.

This month in history

May

1940 — Igor Sikorsky makes his first public flight in a helicopter

1943 — First chain reaction at the Water Boiler, a reactor built to provide neutrons for experimental purposes and to help study the designing and building of reactors

1945 — The new post office opens in Los Alamos between Fire Station No. 1 and the Gamma Building

1951 — Jay Forrester patents computer core memory

1991 — First woman inducted into the National Inventors Hall of Fame: Gertrude Belle Elion, co-recipient of the Noble Prize in Medicine. Her research led to the development of leukemia-fighting drugs and immunosuppressant Imran, which is used in kidney transplants

1991 — Lab-designed minisatellites are released from the Space Shuttle Discovery as part of a defense experiment

1996 — ALEXIS, a Lab-built satellite designed to operate for one year and once feared lost after launch, celebrates its third birthday

2000 — A prescribed burn is started May 4 on the slopes of the Cerro Grande

Volunteer opportunities

Available on the Community Relations Office (CRO) Web site

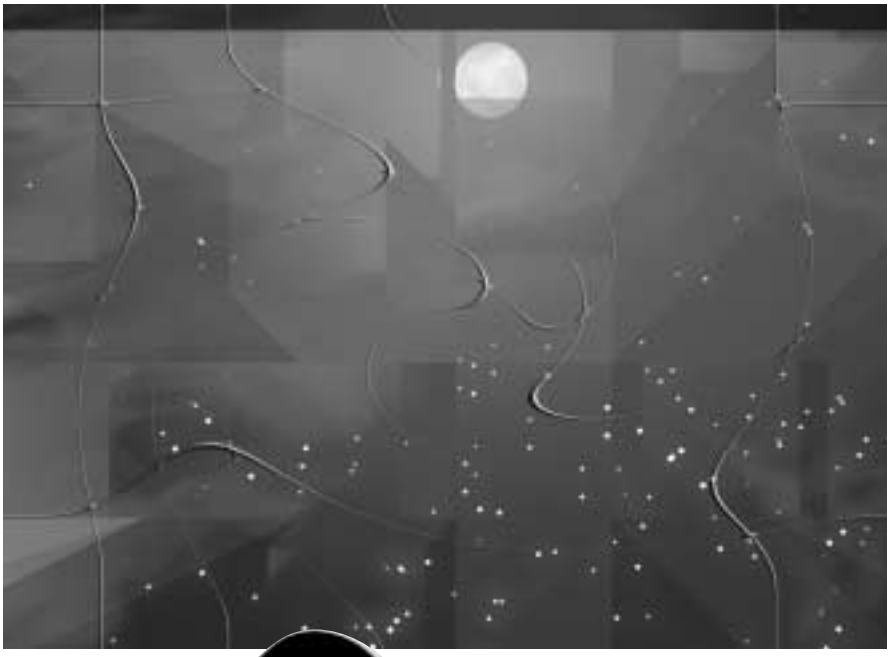
http://www.lanl.gov/orgs/cr/cr_volunteerop.html

Syndicated materials

Removed at the request of the syndicate

Local astronomers have their eyes on the stars

by Michael Carlson



Once a month, from spring to autumn, the Pajarito Astronomers gather at Overlook Park in White Rock to observe the activities of the night sky. Peering through various sizes and shapes of telescopes, these individuals are an audience to a show of constellations, planets and an occasional celestial phenomenon.

Some are professional astronomers including club president Stephen Becker, whose doctoral degree focuses on stellar evolution — the birth and death of stars. A Laboratory employee in Thermonuclear Applications (X-2), he has been a regular at the monthly dark-night viewing sessions for the past 10 years.

"It's always neat to see things that require a telescope," said Becker. "People are always amazed when they look through a telescope for the first time."

As a participant in the dark-night viewing sessions, Becker's group of about 60 members has had the opportunity to view the collision of two galaxies that occurred an estimated 500 million years ago and a comet that crashed into the surface of Jupiter.

According to University of New Mexico, Los Alamos, astronomy instructor Thomas Beach, those colliding galaxies still are visible in the night sky by use of a telescope.

The group even had what was thought to be a close encounter with an extraterrestrial spacecraft, but later learned that it was just a high-altitude research balloon.

Vice president David Hollowell, also an employee of X-2, became interested in astronomy at the age of 10. His neighbor had a telescope, but couldn't use it in his own yard because of too much lighting, so he used Hollowell's dimly lit yard as a place to study the stars. Combined with glimpses through his neighbor's telescope and watching the Apollo moon missions on television during the '60s, Hollowell felt inspired to pursue astronomy as a career.

Hollowell says he enjoys attending the viewing sessions, often staying until 1 a.m., answering questions from nonastronomers who have an interest in the subject.

You don't have to have a telescope or a background in astronomy to participate," said Hollowell. The public is welcome to come and see the celestial sights. Many people, walking through the park just stop by. Others are taking an astronomy class and come to take notes.

The club also hosts speakers four to six times a year at the Mesa Public Library.

The next dark-night is scheduled for Saturday at Overlook Park.

For more information about the Pajarito Astronomers, contact Stephen Becker at 7-8964 or visit the group's Web site at *http://www.la.unm.edu/~beach/pajarito.html*.

Los Alamos News Letter
Mail Stop C177
Los Alamos, NM 87545

Nonprofit Organization
U.S. Postage Paid
Albuquerque, NM
Permit No. 532

LALP-01-4