



THE POINT SOURCE

A quarterly newsletter for employees of The National Radio Astronomy Observatory

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Spring 1995

Joint effort overcomes logistical problems in Chile by Dave Finley

On a treeless Chilean high plain rising above the world's driest desert, an adventurous NRAO team has installed high-tech equipment that will tell if this remote spot is, as some suspect, the ideal site for the Millimeter Array (MMA). The MMA, a planned instrument with 40 antennas, each 8 meters in diameter, will make the best millimeter-wave images ever of objects as close as the sun and planets and as far away as galaxies that were just forming when the universe was young.

The logistical problems in making the measurements needed to determine the appropriateness of the site were compounded by the fact that there was no electrical power or access to communications. To overcome these difficulties, communication was established via satellite telephone, and electricity provided by a system of solar panels, wind generators, and batteries. This system is capable of continuously providing 500 watts of power.

This has truly been a joint Observatory project. The power systems and the enclosure (a 20-foot shipping container) were assembled and tested at the VLA site, then shipped to Chile. This electrical system powers the test equipment designed and assembled by NRAO engineers, technicians, and scientists from the AOC, the VLA site, the VLBA station at Kitt Peak, the Central Development Lab in Charlottesville, and the machine shop in Green Bank.

Early in 1994, the site was first explored by Paul Vanden Bout and Bob Brown of Charlottesville. In November, Peter Napier and Frazer Owen from Socorro and Simon Radford from Tucson went

to the Chilean site and, with the help of Juan Uson of Socorro, made preliminary measurements of the atmospheric properties. Their results indicated that

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Employees honored for years of service

*The following employees are being honored this year at Service Awards
Ceremonies for either 10, 20, or 30 years of service to the Observatory and AUI:*

<i>Charlottesville</i>		<i>Socorro</i>	
Monroe Petty	30	Barry Clark	30
Morton Roberts	30	David VanHorn	30
Larry D'Addario	20	Philip Dooley	20
Raymond Escoffier	20	Patrick Lewis	20
Gareth Hunt	20	Kenneth Sowinski	20
Harvey Liszt	20	Larry Brothers	10
Frederic Schwab	20	Joseph Greenberg	10
Patrick Murphy	10	Stella Gutierrez	10
Sivasankaran Srikanth	10	Theresa McBride	10
		James Nieri	10
		Robert Peralta	10
Green Bank		Robert Smith	10
George Behrens	30	Louis Stephenson	10
Jacoba Mann	30	Juan Uson	10
William Shank	30		
David Williams	30		
Alice Riley	20	<i>Tucson</i>	
Martin Chestnut	10	Robert Freund	20
Edwin Childers	10	Dale Webb	20
Daryl Shinaberry	10	Philip Jewell	10
Robert Simmons	10	Jennifer Neighbours	10
Robert Simon	10	Antonio Perfetto	10
Zula Taylor	10		
Herbert Winchell	10		
<i>Pie Town</i>			
Kelly Gatlin	10		

Ask employees receiving a Service Award this year to see the new certificate designs. There are now five certificate designs—one for each of the four major sites and the VLBA.

Scientific news...

Jansky Lab Addition by Mike Holstine

The NRAO-GB Site is presently undergoing a major construction project which will add a 2-story addition adjacent to the Jansky Lab. The addition will be attached to the existing building via an arc which will serve as the new entrance foyer to both parts of the building. The entrance will be open and airy, with columns and a wall of glass along the rear of the foyer.

The addition will house offices on both floors, a new shipping/receiving area, control and equipment rooms for remote operation of telescopes, an anechoic chamber for receiver testing, as well as a state-of-the-art auditorium. The auditorium will include projection capability for both video and computer-generated A/V, and a complete sound system. The two balconies off the second floor control rooms will provide a beautiful view of the site, including the GBT.

The building will be constructed of steel member units, similar to the present Lab, with a white stucco-type insulated panel on the exterior of the building.

As part of the project, parking at the site will be greatly improved. New parking lots will more than double the amount of parking available. Landscaped islands will house halogen lights to softly illuminate the parking areas.

All new control and equipment rooms will be completely shielded with a copper paint and sealant system with a shielding effectiveness rating of 60 dB over the frequency range of 10 MHz to 1 GHz. This will ensure that the equipment in the new building, as well as the telescopes on site, will be as free as possible from RF interference.

Floor coverings were selected to allow easy movement of computer equipment, and electronics racks and components. The elevator will serve a dual purpose. It has been designed to look and function as a personnel elevator, but will also provide for the transportation of equipment.

All new rooms, as well as the elevator, canteen, auditorium, and restrooms have been designed to comply with the Americans with Disabilities Act. Unlike the existing lab, the new building will also allow occupants to control the temperature of each room separately.

The addition is being funded by the Navy and is expected to be complete in 1996.

New Employees

Green Bank

Mary Perkins, Administrative Services
Tonya Vandevander, Administrative Services

Socorro

Jon Thunborg, Engineering & Services

Returned from LOA

Ron Heald

Departures

Charlottesville

Bob Burns, retired

Sally Bussey

Green Bank

Brian Crouse

Mark Leach

Patricia Thompson

Owens Valley

Robert Morgan

Socorro

Douglas Wood

Tucson

Graeme Carrad

1995 Summer REU Students (Staff Advisors)

Charlottesville

Christopher Allen, Amherst College (A. Wootten)
David Copeland, Reed College (D. Nice)
Edward Gray, Boston University (D. Schiebel/P. Shannon)

Green Bank

Katrina Koski, Lake Forest College, (G. Langston)
Daniel McCoy, WV Institute of Tech (M. Stennes)
Daniel Pisano, Yale University (J. Lockman)
Douglas Williams, Stanford University (R. Lacasse)
Thomas Wilson, Univ of Nevada, Las Vegas (D. Balser)

Tucson

Larissa Bowles, Univ of Virginia (M. Kutner/K. Mead)
Francis Kolor, Stanford University (M. Waddell)
James Wren, NMIMT (P. Jewell/D. Emerson)

Socorro

John Barthelmes, State Univ of NY (R. Milner)
James Brauher, Univ of Michigan (H. vanLangerveld)
Chrisper Carpenter, Harvard University
(J. Navarro/D. Frail)
Amy Hronek, Occidental College (C. Walker)
Audress Johnson, Univ of Texas @ Austin (R. Perley)
Ngan Ying (Annie) Lui, Polytechnic University
(B. Brundage)
Allison Nugent, Southwest Missouri St Univ (M. Holdaway)

Scoping the sites...

Charlottesville

○ The Wellness Program in Charlottesville has offered employees two lunch talks this year. The first was on the prevention, treatment, and detection of high blood pressure. The second program covered colon cancer.

○ Non-scientific employees attended a talk given by Jim Condon entitled "Parallel Universes." Jim gave about 20 employees a tour of the sky at both optical and radio wavelengths. This talk was part of an ongoing series of talks given by scientific staff for non-scientific employees.

Green Bank

○ Green Bank and Charlottesville employees competed in a semi-annual golf tournament at Birdwood in Charlottesville. About 20 employees, retirees, and Bob Hughes of AUI participated in this year's event. On the first place foursome were Mike Holstine, Richard Fleming, Ted Riffe, and Mike Hedrick, while Russ Poling, Monroe Petty, Jim Gibb, and Ray Hanshew placed second. Other winners included Robert Senter and Richard Fleming for the longest drive; Bob Hughes, Jim Desmond, Richard Fleming, and Wendell Monk for closest to the pin; and Robert Senter in the putting contest. Tim Roberts, a Socorro employee who participated, received his orders to return to Socorro shortly after the match.



The winning team at the annual
Charlottesville - Green Bank
Golf Tournament .

○ Grote Reber arrived on May 24 to assist in the final stage of setting up a museum in the Reber Telescope building near the entrance of the Green Bank site. When finished, the museum will have an observation area surrounded by three laminated safety glass walls which will protect the items on display and allow visitors an unobstructed view. The museum is expected to open at the end of June, in time for the many visitors who come to Green Bank each year.

○ The 140 Foot Telescope will undergo a cosmetic upgrade this summer to prepare for its 30th anniversary celebration. The celebration is scheduled for September 29-30.

Socorro

○ Paul Harden was invited to share the results of amateur radio observations of the comets colliding with Jupiter (see Summer 1994 issue of the *Point Source*) with the International Astronomical Union Colloquium 156, held in Baltimore in May.

Paul used a radio telescope that he built in his backyard to monitor low frequency emissions before and during the collisions. Representing his observations and those of other amateurs, Paul presented a poster and participated in the JPL workshop on impact timing. The amateur data supports that the comet fragments were not as heavy or dense as they were first believed and they exploded in Jupiter's upper atmosphere. The quality of the amateur data was confirmed by similar observations from observatories in Australia, Ukraine, and China. Paul was the only amateur invited to present data.

From this meeting, it was learned the amateur's have the only known observations of the last two impacts, fragments "U" and "V." JPL may fine-tune the final impact times based on the amateur data and others have requested copies of the data.

It was also revealed the radio emissions from Jupiter have been altered since the impacts, and Paul was asked if the amateurs could continue to monitor Jupiter in an attempt to offer an explanation. This request demonstrates how amateurs and professionals may work together as a result of this meeting.

Since most of the attendees were optical astronomers, Paul was often found describing the NRAO or radio astronomy fundamentals to the participants.

Paul was ready to return to New Mexico, however. "All those people in Baltimore eat for breakfast, lunch and dinner is bagels," Paul reported. "I was about to kill for a good meal, like a green chili enchilada!"

Tucson

○ Tucson is taking advantage of the University of Arizona's Health Science Center Speaker's Bureau, and plans to have a speaker each quarter on an appropriate Wellness topic. A program on "Disease Prevention through Nutrition" was offered in April. Other activities planned include CPR and First Aid Certification.

○ Representatives from Fidelity and TIAA-CREF gave a presentation on retirement services to employees in April.

○ A symposium entitled *CO: Twenty-five Years of Millimeter-wave Spectroscopy* took place the week of May 29-June 2. This symposium was sponsored by the NRAO, The Submillimeter Telescope Observatory, and the International Astronomical Union. Information about the symposium will be included in the next issue.

Health in the good old summertime. . .

Protecting yourself from the Sun

by Nancy Clarke

It is getting to be that time - time to think about bathing suits, swimming pools, which SPF level to wear . . .

Of course, a good sunscreen is not the only thing you will need in order to prevent skin cancer. The American Cancer Society recommends that in addition to wearing a sunscreen with a SPF of 15 or greater, you should wear protective clothing (especially between the hours of 10:00 a.m. and 3:00 p.m.), generally limit your exposure to the sun, and perform monthly self-exams.

Cases of the most dangerous skin cancer—melanoma—continue to increase dramatically. Fortunately, skin cancers are easy to detect early. Also, if detected early, they are easy to treat. Perform monthly self-exams, paying particular attention to moles, freckles, and "beauty marks." These are where most melanomas originate. Use the following "*ABCD*" rule to help identify potential skin cancers:

Asymmetry - One half does not match the other half.

Border Irregularities - The edges are jagged, notched, or blurred.

Color - The pigmentation is not uniform. Shades of tan, brown, and black are present. Red, white, or blue may add to the mottled appearance.

Diameter Greater than 6 mm. - Any sudden or continuing increase in size should be of special concern.

Immediately report anything unusual to your physician.

Remember, with skin cancers, an ounce of prevention really IS worth a pound of cure!



Recognizing (and avoiding) Lyme disease

Lyme disease is an infection cause by a bacteria called *Borrelia burgdorferi*. This disease is spread from animal to animal (or human) by a tiny tick – in many areas, the deer tick. Other ticks also may be culprits. Cases have been reported in 43 states, though the disease most frequently occurs in the coastal areas of New York, New Jersey, and Connecticut, and the upper Midwest.

No one is immune. All it takes is a bite from an infected tick. Many mammals, including mice, raccoons, horses, dogs, cats, and people carry the tick around. Most commonly encountered in high, uncut, grassy areas, infected ticks can be brought in the home by pets or field mice.

Certain steps can reduce chances of infection.

1. Use repellants such as DEET.
2. Avoid uncut grasses and weeds.
3. Carefully inspect your skin after potential exposures, since it takes at least 12 hours for the tick to begin to feeding and transmitting the infection.
4. Wear long clothes, with shirts tucked in and pants tucked into socks when you know you will be in wooded or grassy areas.

Since the ticks are tiny and the bites are painless, you may not know you have been bitten. Identification of Lyme disease requires close attention to symptoms. Initial symptoms may be nonspecific and flu-like, including fever, malaise, headache, swollen glands, sore throat, muscle aches and pains. Some infected people report a red circular asymptomatic rash, called erythema chronicum migrans, but many people do not see a rash. Other symptoms may include muscle soreness, joint pain, joint swelling, and severe fatigue.

Lyme disease is treated with either oral or intravenous antibiotics. Improvement of symptoms may not occur for a few days or even a few weeks after treatment, but most patients can be cured.

GBT Elevation Shaft raised

The GBT elevation shaft was raised in two parts on May 2 and 3. The 150-foot shaft will support a 9.4 million pound load which constitutes the entire elevation rotating structure.

The shaft was shipped from Mexia, Texas to Green Bank in five sections which were then welded together on the ground. The shaft weighs approximately 400,000 pounds or 200 tons. Each half was raised into position using the 450-foot derrick crane and lowered into position at the top of the two alidade towers.

The two towers were built with a slight outward lean. Collars installed at the center of the shaft were used to pull the two halves together for final welding. It was predicted that each tower was expected to move inward by 1-3/8". When the two parts of the shaft were pulled together prior to welding, they moved 1-3/8" and 1-1/4", respectively. The tower with the elevator attached moved the lesser amount. When the full weight of the structure comes onto



The GBT with the Elevation Shaft in Place

the bearings, the tension which has been built in will be relieved.

Bob Hall, GBT Project Manager, said, "The beauty of it was that the towers performed as they should. The calculations were correct. It was like proving Einstein's theory."

The telescope, which is taller than the Statue of Liberty and only 23 meters shorter than the Washington Monument, will weigh as much as 41 of the largest diesel train locomotives. Its purpose is to receive radio signals emitted by astronomical objects and analyze these signals to better understand the universe.

Joint efforts (continued from page 1)

the site was well worth more extensive testing, so, between December 1994 and March 1995, the larger package of test equipment was designed, built, and tested at the VLA site and at the VLBA at Kitt Peak.

In April, Gerry Petencin from the AOC and Ramon Gutierrez from the VLA site set up the equipment on the mountain. Later, Simon Radford and Bill Shillue from Tucson went to Chile to help complete the installation and Mark Gordon of Tucson collected logistical information from the area.

The equipment is now operating, taking continuous measurements of how well the thin atmosphere above the mountain

allows millimeter-length radiation from cosmic sources to be received. The data from the test equipment are sent directly to an orbiting satellite telephone system and relayed to the AOC in Socorro and to Tucson. Summaries of the data are available via the Internet and a workshop to review the scientific requirements of the MMA will be held in October in Tucson.

This task could not have been completed without the collaboration of many employees (only a few of whom are named in this article). Overcoming the logistical problems of measuring the suitability of sites is just an example of one of the many Observatory-wide efforts of which we should all be proud.

Where are they now?

Thomas H. Brown (Tom), son of Howard and Leona Brown, was an AUI scholarship winner in 1967. In 1971 he received a B.A. degree from Hope College, where he was a charter member of the Phi Beta Kappa chapter and graduated 6th in a class of 376. He studied Classics for four years at the University of Colorado, and has a Master's degree in Latin. He has been a newspaper reporter, railroad laborer, teacher, and personnel manager. He currently lives in Winston-Salem, NC and works as an officer-level computer programmer/analyst for an employee-benefits consulting firm. He has two daughters. Howard was a Technical Specialist in the cryogenics area in Green Bank. He retired in 1981 and lives in Daniels, WV.

Susan Vance, daughter of Bob and Bunny Vance of Green Bank, was an AUI Scholarship winner in 1980. She graduated from West Virginia University in 1984 with a B.A. in Psychology and received a Master of Education in School Psychology from James Madison University in Harrisonburg, VA in 1985. Susan also received an Education Specialist degree from James Madison University in 1989. She is currently employed as a School Psychologist with the Mineral County schools in Keyser, WV, working with children from pre-school through age 21. Bob is Head of the Computing Division in Green Bank.

Readers:

Each year AUI awards three or more scholarships to the children of regular full-time and eligible part-time NRAO employees. If you know the whereabouts of an AUI Trustee Scholarship winner and would like to share their accomplishments with the readers of *The Point Source*, please contact me at wmahe@nrao.edu or (804) 296-0265.

Personnel news...

Is your son or daughter graduating from college?



The 1995 college graduation season is upon us and that means that your children may be becoming independent adults. Parents should bear in mind that children who are graduating from college (and who do not intend to attend graduate school) have only three months of coverage remaining under NRAO group medical and dental insurance programs.

Any eligible child can have their medical and/or dental coverage continued for up to 36 months by paying the necessary premiums. If your son or daughter requires insurance coverage after that three month period, please contact your local personnel representative to make arrangements for continuation (called COBRA). Consult your insurance handbook for further details.

Please remember that it is your responsibility to inform the Personnel Office that your graduating child is no longer eligible for coverage as a dependent. The following representatives may be contacted to assist you in this:

Charlottesville - Billie Jo Mattox
Green Bank - Shirley Curry
Tucson - Nancy Clarke
Socorro - Ina Cole

Verifying earnings with the Social Security Administration

If you are age 60 or older and are not receiving Social Security benefits, the Social Security Administration will send you a Personal Earnings and Benefits Statement (PEBES) sometime between February and September. This statement will show the earnings recorded under your Social Security number. Carefully check your earnings to be certain they match your statement. If your NRAO earnings are not correct, contact the Fiscal Office. If there is an error in earnings reported by a previous employer, follow the instructions included to report the error to the Social Security Administration.

Beginning October 1995, and each year thereafter, a PEBES will be sent to all eligible individuals who turn 60 in that year.

Notes from the Editor

Q&A

If you have a question you would like answered or a topic you would like addressed in this publication, please submit it in writing. All questions and topics will be referred to the appropriate person. Responses will be published in the next issue, as space is available.

Suggestion email Box

If you would like to make a suggestion to improve the operation of the NRAO or to improve worklife, submit the suggestion to me in the Personnel Office or send email to wmahle@nrao.edu.

Wendy Mahle, Editor

Q&A

The following question was submitted by an employee at the AOC: How do benefits differ for people who retire early (eligible at 55) vs. benefits for those who wait until a later age?

Retiring employees age 55 and over may continue their group medical insurance if their age and continuous years of service add up to 70. This means that an employee retiring at age 55 would need 15 years of service, an employee age 60 would need 10 years of service, etc. In any case, the employee must have at least 5 years of continuous service.

Until a retired employee and his/her spouse reach age 65, the benefit coverages are the same as those of an active employee. That means the same hospital coverage, the same surgical benefits and the same major medical benefits. Both the employee and spouse are required to satisfy a \$250 calendar year deductible before any major medical benefits are payable.

At the present time retired employees who were hired before 1/01/92 are not charged a premium for their retired medical insurance coverage. Employees hired on or after 1/01/92 will be required to pay a premium when they attain retirement age. In the future, if medical costs continue to rise and, in particular, if Medicare benefits continue to be reduced, it may be necessary to begin charging all retired employees for their coverage.

For other insurance benefits, there is no distinction made between retirement and termination.

Another consideration in determining your retirement age, is the amount of the retirement annuity payment. The longer an employee delays retirement, the greater the retirement annuity payments will be. This is true for several reasons. First, NRAO will continue to make contributions as long as an employee remains employed, so the principal balance will be higher. Second, the account will have the opportunity for further growth (this could be affected by market fluctuations). Third, the older the person is when he/she begins annuity payments, the higher the annuity payments from a given accumulation. This is because the number of years that the payments are spread over is assumed to be less.

If you have any questions about retirement or other benefits, contact the Personnel Office in Charlottesville or your local personnel representative.