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Riccardo Giacconi to Become President of AUI by Martha Haynes

Map Project Draws to an End

by John Webber



Riccardo Giacconi, currently the Director General of the European Southern Observatory (ESO), in Garching, Germany, will become the new President of Associated Universities, Inc. on 1 July 1999. An internationally recognized and honored astronomer, Dr. Giacconi is no stranger to science management in the United States. His early career was spent at

American Science and Engineering, Inc. in Cambridge, Mass. where he was Executive Vice President and Senior Scientist. He then became head of the High Energy Astrophysics Division and Associate Director of the Harvard/Smithsonian Center for Astrophysics where he held a concurrent position as Professor of Astronomy at Harvard. From 1981 until 1993, he was Director of the Space Telescope Science Institute in Baltimore. Among other honors, he has been elected to the National Academy of Sciences and is the recipient of the Wolf Prize in physics.

Dr. Giacconi has extensive experience in science management, project management and international scientific relations. At ESO, he has been responsible for seeing the first light of the Very Large Telescope at its newly developed site on Cerro Paranal in Chile. At STScI, Giacconi oversaw the first years of operations of the Hubble Space Telescope including the formulation and initial execution of the repair mission. At both institutions, he stewarded both technical development and operations and the support of facility users.

A renowned scientist, Giacconi has received, among other awards, both the Warner Award and

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On October 23, there was a celebration at the Central Development Laboratory (CDL) as the last of the MAP (Microwave Anisotropy Probe) flight amplifiers was shipped. A few more spares and extras remained to be finished, but Princeton University had everything they needed to build the flight hardware. Congratulations are due to the MAP team and everyone else who did some work on the project. The primary team consisted of Marian Pospieszalski, Ed Wollack, Nancyjane Bailey, Skip Thacker, Bill Lakatos, Ron Harris, Bill Wireman, Tod Boyd, and Matt Dillon. There was some work done by Dan Boyd, Kirk Crady, Neil Horner, Françoise Johnson, Mark Wharam, Vince Summers, and Pat Madigan. Finally, support from Cathy Burgess and Karen Whitcomb was much appreciated.

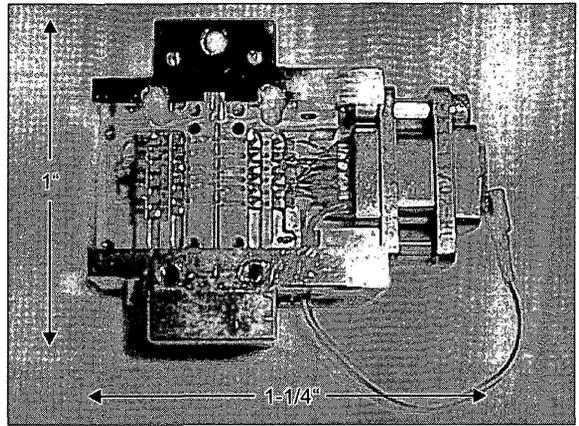
The MAP amplifiers represent another significant step in the evolution of the design of low-noise amplifiers from the CDL, and an additional step in refining and improving the assembly process. These factors have resulted in a level of consistency and repeatability of performance which is truly remarkable. They are also extremely rugged. Only a few days ago, a test bracket holding a flight radiometer disintegrated during a vibration test at Goddard Space Flight Center, allowing the amplifiers to be beaten severely before the apparatus shut down. The worst amplifier "looked like it had been beaten with a ball peen hammer," according to Dave Wilkinson at Princeton. Nevertheless, all four abused amplifiers still work perfectly! It seems likely that they will have no difficulty surviving the rigors of launch on a Delta rocket in September 2000.

With the end of the MAP project at the NRAO, the CDL will turn its attention to internal needs which have suffered during MAP construction. New production batches of amplifiers for 18-26, 26-40, and 40 - 50GHz are already under way. Over the next 2 years, the CDL anticipates building enough amplifiers to outfit all existing and new 22, 43, and 86 GHz receivers on the VLA and VLBA, and at least a 43 GHz receiver for the GBT, with

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Riccardo Giacconi to Become President of AUI (continued)

Heinemann Prize of the American Astronomical Society and the Gold Medal of the Royal Astronomical Society. Most of his career has been focused on the X-ray regime, beginning with his leadership of the team that discovered the first non-solar celestial X-ray source. He is the author of more than 200 scientific publications on explorations of X-ray universe from stellar black hole candidates to distant clusters of galaxies. He is the co-author of a 1997 paper on deep VLA-C observations of the so-called "Lockman Hole" (The "Lockman Hole" is the direction in which our view of other galaxies is least obscured by matter in the Milky Way. It lies in the Big Dipper and was found by Jay Lockman, Dan McCammon, and Keith Jahoda).



Six-stage MAP amplifier covering 84–104 GHz



The selection of Dr. Giacconi culminates an extensive search for a new President taking place over the last six months. The Search Committee was chaired by AUI Trustee Claude Canizares of MIT and included four other Trustees and two outside members. Ken Kellermann was the NRAO representative. The Search Committee solicited nominations and applications internationally and conducted numerous teleconferences and interviews in its deliberations. The Board of Trustees unanimously and enthusiastically endorsed the selection of Dr. Giacconi as the presidential candidate.

Dr. Giacconi will replace Martha Haynes, Professor of Astronomy at Cornell University and a member of the AUI Board, who has been serving as Interim President since April.

AUI and the NRAO are pleased to give Dr. Giacconi the chance to extend his involvement in science planning and management to the longer wavelengths exploited by the NRAO, and we welcome him to our organization.

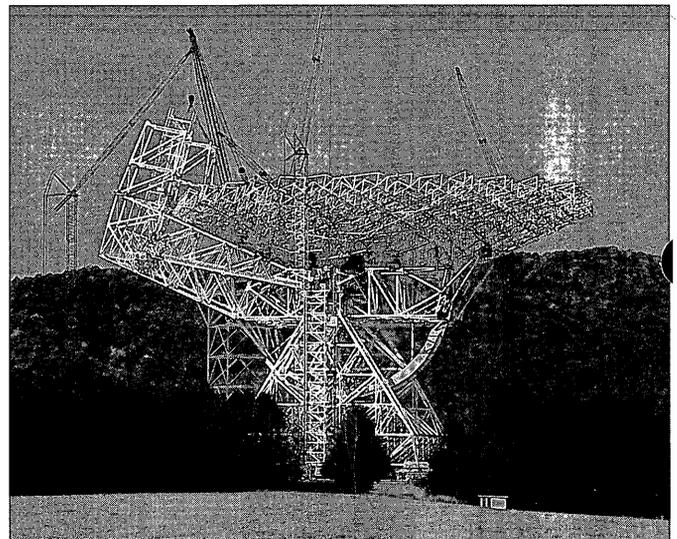


Map Project Draws to an End (continued)

modern indium phosphide amplifiers similar to the MAP units. Including spares, this is about 160 amplifiers—more than the MAP project!

Even during MAP, Richard Bradley, Françoise Johnson, and Ron Harris managed to complete the design and construction of a new series of low-frequency amplifiers for the GBT prime focus receivers. These cover 290–1230 MHz in several bands, with noise temperatures in the range 2–3K. At the high frequency end of this range, good gain and noise can be obtained in a single balanced amplifier covering the range 600–1200 MHz—a full octave.

Green Bank Telescope Update



The above photograph, taken October 1998 shows that the Green Bank Telescope (GBT) is beginning to resemble its concept drawings now that the reflector backup structure (BUS) has been fully installed and the vertical feed arm started.

All 2209 actuators which control the 2004 surface panels are in place. The workers are now welding the connections between the BUS and the box and wheel structures.

The vertical feed arm consists of 13 modules plus the feed/receiver room and upper feed arm. By the end of October 1998, the bottom two sections on each side of the 200-foot vertical feed arm were placed on the outboard end of the horizontal feed arm. Two additional sections, and the platform which supports the feed/receiver room, have been assembled and await erection along with the upper feed arm and feed/receiver

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No One Has Ever Fallen *by Jody Bolyard*

According to the American Society of Safety Engineers, one of the most common excuses against the development of a fall protection policy is “no one has ever fallen.” Other frequently heard comments include the following:

***If you want this done on time...
What do I tie off to?
We only have to hook up if we stop in one
place for a while.
We never had to do it before.
Safety just slows things down.***

To meet the need for a fall protection program to address the climbing at the Green Bank site, a series of training sessions has been instituted whereby two levels of fall protection are addressed. The initial level is designed for general audiences who are not expected to be exposed to the need for climbing. This session is designated as the Fall Awareness Training. Typically the course covers the basics of fall protection and reviews the site policy on climbing structures. Generally lasting an hour, it is intended to allow the attendees an opportunity to discuss the aspects of fall protection in a classroom setting.

The second tier of fall protection training is designed to provide the individuals expecting to climb the site structures with the information necessary to perform the climb safely. This session can last up to two hours and includes a hands-on fitting of a full body harness. The attendees are instructed in the inspection, care and use of fall protection equipment including lanyards, beam straps, and the harness itself. Occupational Safety and Health Administration (OSHA) regulations and site policy are reviewed. After the formal instruction, the attendees are provided an opportunity to view the fall protection systems in place on the Green Bank Telescope (GBT). This session is designated Safety Harness and Fall Protection Training.

Currently, over 60 percent of the staff at Green Bank has participated in these training sessions. We are in the process of a positive culture shift in the way employees view fall protection safety. The questions regarding fall protection heard at Green Bank are now more typically :

***What training do my visitors need before I
take them up on the GBT?
Wouldn't two lanyards be better than one?
When is the next training session?
Where can I order a safety harness?***

Providing the tools, the training, and the desire to be safe the workplace will allow us to continue to say, “no one has ever fallen,” not as an excuse but as an accomplishment.

Where Are They Now?

Venessa Myers, daughter of NRAO retiree Dave Myers, won an AUI Scholarship in 1976. She graduated from the University of Arizona with honors in 1980 with a B.A. in English Education. She was the recipient of the Senior Scholarship Award in 1979 and the Outstanding Student Award in 1980, and graduated summa cum laude. Vanessa feels that she would not have done as well in school had it not been for the AUI scholarship because she would have spent more time working and less time studying. Vanessa then continued on at the graduate level and received her M.A. in Education in 1986. She spent 15 years teaching English in local secondary schools. She spent time designing ways to coordinate various disciplines and created upper elective course work as well. Vanessa has “retired” from the education field now and enjoys being involved in her hobby of playing harp and writing harp music. Vanessa still resides in the Tucson area.

From the editor:

AUI awards three or more scholarships to the children of regular full-time and regular part-time eligible NRAO employees each year. If you are in contact with or know the whereabouts of a past scholarship winner and would like to help share their success stories with our readers, please contact me at (804) 296-0312 or tschlemm@nrao.edu.

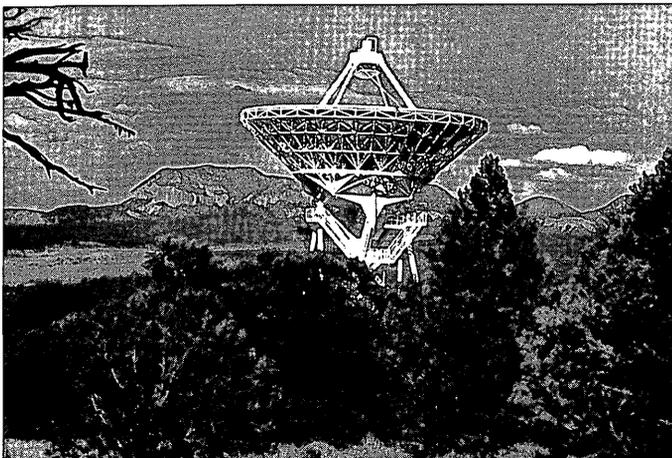
Green Bank Telescope Update (continued)

building. The upper 60-foot portion of the feed arm has been trial erected at the site including the deployable prime focus boom, the prime focus rotation mount, the subreflector, and the subreflector adjustment mechanism. The feed arm servo, which controls the above equipment had been installed and preliminary tests run. The feed/receiver room, which is located directly below the upper feed arm, has been located nearby with the secondary focus feed turret in its roof. The upper feed arm servo will be operated continuously for at least a month before the 60-foot section is to be erected on the structure. The vertex platform has been installed on the telescope, and the access walkways to the vertical feed arm have been installed.

Recently, the contractor sent 20 surface panels to the site to test shipping, handling, installation, and alignment procedures. The panels were unpainted so that they might be returned to the contractor's plan for remeasurement. This will provide an evaluation with respect to any deterioration of surface tolerances during shipment.



Reprint of Article from *Steppin' Out Magazine* by Gwen Roath



Pie Town, New Mexico – VLBA Station

Pie Town, Catron County – This is Agnes Morley (No Life for A Lady) country. And in some ways it's just as rugged and wild as it was when Mrs. Agnes Morley Cleaveland wrote her book.

But there's high tech now, too, in this land that straddles the Continental Divide. And both the wild beauty of the mountains and the high-tech beauty of the antennas of the National Radio Telescope network inspire photographer Kelly Gatlin.

Perhaps to some extent it's still true that to survive in these parts it takes guts and determination, combined with luck and the ability to ride life's sometimes twisting fortunes. That would seem to be the case for Kelly Gatlin, whose grandparents were neighbors to the Morleys. His grandfather worked for the Englishman Montigue Stephens and went bear hunting with Mrs. Morley.

Kelly spent some time in the region as a young man, graduating from Magdalena High School. But much of his life was lived elsewhere until fortunes combined to bring him back – to stay in the old Agnes Morley home near the Continental Divide.

Born in Cimarron, Kelly and his folks moved to Mexico City when he was a year old. They lived in various places in Southern California until they returned to Catron County in the 60s. After graduation, Kelly worked with his father on a ranch between Gallup and Grants before going to Eastern New Mexico University in Portales for a couple of years. He then transferred to the University of Albuquerque, becoming the university's first graduate from the criminology program.

Kelly never actually worked in law enforcement, but his experiences in the darkroom of the Albuquerque Police Department tweaked his interest in photography. "I decided I wanted to go into investigative work," Kelly relates. Unfortunately, his UNM graduation in 1971 coincided with the government freeze on hiring. When

his father got a job at the Rio Grande Gorge with the Bureau of Land Management (BLM), Kelly moved to Taos and got a job at the Moly mine at Questa. In his only law-enforcement-related job, Kelly worked as captain of the guard unit for a time and then at the assay office. But lack of seniority meant he was bumped when the mine laid-off workers.

Jobs were hard to come by in the state but finally, Kelly was hired as an adult leader of the newly formed Youth Conservation Corps group at the Rio Grande Gorge. He set to work enthusiastically, setting up camp with his young employees. "As often happens, things changed abruptly," Kelly says, "and it turned out better for me". I'd only been there two or three weeks at the most, when the camp director came and told me he had bad news: Since Dad worked with the BLM, I couldn't."

So Kelly found himself without a job again. But he ended up in Santa Fe as coordinator for the YCC and Young Adult Corps, an exempt position which didn't come under the national organization's nepotism rules. Meanwhile, his folks had moved back to Morley land, and helped take care of the ranch which Norman Cleaveland had inherited. When Kelly Gatlin's dad died in 1983, he moved back to be near his mother.

Once again, fortune played into Kelly's hand when he landed a temporary job at the Very Large Array radio telescope site on the San Augustin Plains. Later, he was hired for a position in the front-end lab at the site. The job gave him once again an opportunity to work in a dark room; and he also took over care of the visitor's center and its slide projectors.

The spectacular views at the VLA makes the area a popular site for advertising crews from Japan to Europe to America. When photographers came to take pictures of the VLA, Kelly worked as the liaison with the groups and the VLA. He noticed that while there were lots of pictures being taken of the VLA, there was little documentation of the variety of photographers. "I started taking pictures of them doing their work."

When the Very Long Baseline Array (VLBA) began operation, employees were moved from the VLA site into the new headquarters on the New Mexico Tech campus. Fortunately, Kelly was offered a position at the Pie Town antenna, a short commute from his home.

Five years ago, Gatlin combined with Datil writer Anne Sullivan to do a piece on the New Mexico Volunteers for the Outdoors at the VLA, which they sold to *New Mexico Magazine*. Since then, he has had several photographs published by the magazine, including several in the '98 *Vacation Guide* as well as the *New Mexico Wildlife Magazine*, the *Santa Fean*.

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Reprint of Article from Steppin' Out Magazine (continued)

"The VLA is really a photographic piece of work," Kelly says. "It's a leading-edge of technology spread out along the San Augustin plains mixed in with cattle and antelope."



The VLA continues to be a favorite topic of Gatlin's. Landscapes are the other predominant focus. Gatlin's work shows not just an eye for beauty but also an eye for composition and detail. Not to mention an affection for spending lots of time stomping around the area.

Kelly Gatlin will be at the Magdalena Fall Festival Nov. 21-22. His work also is in Sundance Gallery in Socorro and the Red Hen Cafe in Alma, New Mexico.

Hurricane Georges Hits St. Croix

by Herb Winchell

Hurricane Georges hit St. Croix, U.S. Virgin Islands, and the VLBA site during daytime hours on Monday, September 21, 1998. The morning of the hurricane the winds and rain were too severe to be outdoors. The electricity was turned off on the island, and long distance phone service and cable TV service were lost, though local telephone service for most of the island was never lost.

The eye of the storm was over the island for about an hour around noon. During the storm I attempted to open my front door. The door opens outward so I tied a rope to the doorknob to prevent the wind from removing it. I only opened the door a few inches but the force of the wind was too strong to hold it with the rope. The rain came in like a vertical waterfall. I won't do that again!

The wind blowing through the utility wires caused them to make a very loud whistling noise, so when they finally blew down, it was actually a relief. As the eye of the hurricane passed over us, the wind stopped but light rain continued. When the wind returned, it came from the opposite direction and seemed more severe. I went to bed early and with the aid of earplugs and a little rum, I slept until morning.

The next morning the winds had decreased but it was still raining. Many trees were blown down, the leaves were stripped from many bushes, and utility wires and some poles were down. All of the houses I could see were intact. I went to the marina to check on my boat; the road was passable but just barely! The boat survived without a scratch as did most of the boats in the marina. What a relief! The next concern was the VLBA site.

John Williams and I arrived at the site at about the same time. We found things in pretty good shape so we started the standby generator and tested the coffeepot. Since we couldn't reach the outside world we gave ourselves the rest of the day off and went home.

Telephones are working again and electricity was gradually restored within two weeks after the storm. The site was operational using generator power and our diesel fuel tank was full. There were no lives lost on St. Croix. Some homes and boats were damaged but John's and mine came through fine.

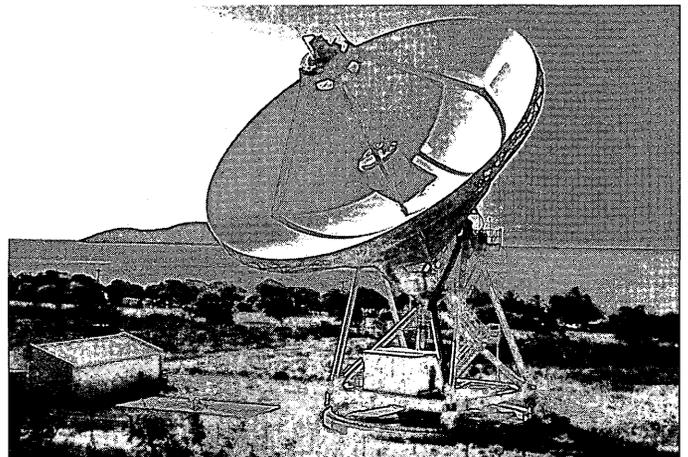
One of the not so great days in the U.S. Virgin Islands, "America's Paradise."

Site preparation:

Site hurricane preparation starts at the beginning of the official hurricane season which lasts from April 1 through October 31. We check the forecasts daily using the National Oceanic and Atmospheric Administration (NOAA) and other weather web pages on the Internet, TV, radio and local marine VHF. When a tropical storm becomes a named hurricane (winds reach speeds over 74 mph), we implement a procedure that has been written for the site. The procedure defines what we do at decreasing radial distances of the storm to the site starting at 1000 nautical miles. A storm moving at a rate of 10 to 15 knots gives us 4 to 5 days to prepare.

We start with the fuel storage tanks for the emergency generators, making them as full as possible so that the site will have power until island electricity is restored. It is

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St Croix, Virgin Islands - VLBA Station

Jansky Symposium 1998: Expanding the Local Frontiers

**by Jack Gallimore, John Hibbard and
Michele Thornley**

The Third Annual Charlottesville NRAO-UVa Jansky Symposium was held in the Edgemont Road auditorium on October 20, 1998. The symposium comprised a daylong series of short talks by local astronomers on their field of expertise, leading up to the Jansky Lecture, presented by recipient of the 1998 Karl G. Jansky Lectureship award, Professor Bernard Burke of M.I.T.

NRAO Director Paul Vanden Bout kicked things off with a brief introduction, followed by 21 lively and well-attended presentations. NRAO and UVa faculty and students presented their research, covering virtually every aspect of contemporary astronomical research. Topics described by this year's speakers included the properties of Solar System objects, the physics of star formation, the nature of black holes, the dynamics of merging and starbursting galaxies, and the possibility of detecting the most distant, earliest galaxies. In addition, participants got a glimpse of the status of upcoming NRAO projects, including management and science goals for the Millimeter Array and the current construction progress of the Green Bank Telescope.

An interesting addition this year was a pizza lunch which was held in the Edgemont Road conference room. This allowed the Symposium participants the time and venue to discuss that morning's talks and otherwise socialize with each other. A further opportunity to hobnob was provided during the break between the Symposium and the Jansky Lecture, which was filled with a traditional repast of barbecue and associated vittles on the Edgemont Road lawn. Rumors of a slightly crazed raccoon kept things hopping, but fortunately no one was hurt.

Later that evening, both astronomers and members of the University of Virginia community at large flocked to Gilmer Hall on the campus of "The University" to attend the public lecture by Professor Burke.

The Jansky Lectureship has been presented by the AUI Board of Trustees since 1966 to recognize individuals who have made outstanding contributions to astronomy. This year's honoree, Professor Burke, was selected for his wide-ranging work in radio astronomy, from the discovery of radio emission from Jupiter to work on the first ever "Einstein Ring." His lecture, "Radio Telescopes. Reaching for the Astronomical Frontiers," was both entertaining and thorough, covering the history of radio astronomy and radio astronomy techniques. He concluded with a glimpse of future efforts, including the NRAO-sponsored Millimeter Array, and the Square Kilometer Array, currently being planned as an international effort. The Jansky Lecture was followed by a lavish and friendly reception held in the NRAO auditorium that went on until late into the evening.

We would like to express our thanks to all who contributed, especially to all of the scientists who took time out to present a talk or attend the lectures. The meeting organizers would like to give special thanks to Billie Rodriguez and Sheila Marks, who were

indispensable in many ways. This year's symposium was a great success, and we look forward to the next.

1998 New Mexico Symposium by Craig Walker

On Wednesday, November 4, NRAO held the fourteenth annual New Mexico Symposium in Socorro at the NRAO Array Operations Center. The symposium is always held in conjunction with the NRAO Jansky Lecture in Socorro. More than 80 people attended the symposium. Attendees came from the University of New Mexico, New Mexico State University, New Mexico Institute of Mining and Technology, the National Solar Observatory, Los Alamos National Laboratory, the Air Force Research Laboratory, Ft. Lewis College, New Mexico Highlands University, Eastern New Mexico University, and of course, NRAO. Twenty-three oral presentations and eighteen poster presentations were given. Topics ranged from reports on new gamma ray observatories to new VLA and VLBA results to a theoretical attempt to explain the magnetic fields of the universe. As always, the breadth of astronomical research occurring in this relatively low population state is impressive.

That evening, the annual Jansky Lecture was held at Macey Center Auditorium, on the campus of New Mexico Tech. The speaker was Professor Bernard Burke. His public lecture was very informative and drew many favorable comments from the 250 attendees.



Hurricane Georges Hits St. Croix (continued)

sometimes difficult to do this because the supplier is generally very busy prior to a storm. We have about a 10-day supply of fuel when everything is full. As the hurricane approaches, we begin securing the equipment at the site. The weather station tower is lowered and the instruments are removed. Cryogenic compressors are tied down and the subreflector is restrained using a network of webbing, ropes and pulleys that prevent it from blowing away. To prevent the antenna from moving in the elevation axis, a stow pin is inserted, which is a locking device for the elevation gear. The dichronic panel is removed. Our site water is supplied by a cistern so we disconnect and seal it to prevent contamination.

When it becomes apparent that the effects of the hurricane will be felt on the island/site, we complete our preparations. In the control building, our major concern is the hydrogen maser, which supplies very stable master timing for the station, which is critical to site operation. Because of its nature, it cannot be turned completely off without requiring a lengthy period of time to regain stability. Batteries are removed from the uninterruptable power system (UPS) and connected to the maser to provide several days of additional power in the interim. We turn off the generator so that they will not start when island power is lost, and then notify the AOC that we are leaving. We then disconnect the station from island power, and leave, hopefully to return to find the site intact.

The VLA Upgrade by Rick Perley

Twenty years ago, construction of the Very Large Array was approximately halfway completed. When officially dedicated in 1980, the VLA immediately became the most heavily used radio telescope on earth. In fact, well before the official dedication, the VLA had surpassed every other radio telescope in terms of resolution, sensitivity, spectral capability, and flexibility. It was, and remains, the most powerful radio telescope on earth.

The VLA is a smashing success by any standard. Nearly 2000 astronomers have used it to study the radio emission from components of our universe – on scales ranging from the sun and planets, through our galaxy, to other galaxies and quasars, and beyond to the limits of the known universe. Without hyperbole, we can say that if an astronomical object emits radio waves, the VLA can usefully observe it, and help us to understand the physical processes behind that emission. The VLA has been, and continues to be, the preeminent radio telescope on earth.

The VLA's amazing versatility is the key to its longevity. This versatility is due to a number of factors – the 27 antennas give sensitivity and imaging performance unmatched by any other instrument. The multiple frequency bands permit changing frequency in less than a minute. The reconfigurable configurations allow resolutions to change by more than a factor of 50. The electronics design is superbly stable and accurate, and permits addition of new bands without major changes. The correlator provides up to 512 'frequency slices' to permit accurate measurement of the emission of atoms and molecules. All of these characteristics, and more, were designed into the VLA from the beginning.

The VLA was designed in the 1970s with the best technology available at the time. When commissioned, the array was an excellent demonstration of the benefits that come from the combination of sound, intelligent design and modern technology. But technology has advanced enormously since 1980, and we must consider the benefits of incorporating such technologies into the VLA.

Since 1980, many important improvements to the VLA have been made – improved receivers at the 21-cm band have greatly increased our sensitivity to hydrogen, the most abundant element in the universe. New receivers, sensitive to wavelengths near 400 cm, 90 cm, 3.6 cm, and 0.7 cm have vastly increased the spectral reach of the instrument, and enabled observations of phenomena undetectable by the original four receiver bands (21, 6, 2 and 1.3 cm). Over the next couple of years, new receivers at the 1.3 cm band will vastly increase the array's ability to detect water, ammonia, and other molecules which radiate near that wavelength.

But most of the original design characteristics of the array remain. Evidence of the remarkable advance of

technology is found in noting that the VLA's total instantaneous bandwidth of 200 MHz, or its spectral capability of up to 512 channels, or its maximum baseline of 35 Km, which were once considered outstanding examples of front-line technology, are now considered serious limitations on the array's scientific capability!

The reason for this perception is easy to find – modern technology can provide an instantaneous bandwidth of 16 GHz –80 times the VLA's maximum. Modern correlator design can provide 32768 spectral channels – 64 times the current maximum. Modern feed and receiver designs can give us complete frequency coverage over the entire range provided by the parabolic antennas – 50 MHz to 50 GHz. (Currently, only a small fraction of that vast frequency range can be accessed by the VLA.) Modern signal transmission technologies will permit real-time operation of antennas in an expanded array whose size could be ten times that of the current VLA.

In short, incorporation of modern technologies can transform the VLA into an instrument with ten times or more the capabilities of the existing array. The VLA Upgrade is a plan to do just that – expand the power of the world's most powerful radio telescope by a factor of at least ten in all of the key instrumental characteristics: sensitivity, resolution, frequency capability, spectral capability. Attaining such improved capability would enormously enhance the scientific viability of the array, and ensure its relevance as a front-line scientific instrument for another twenty years.

How would the VLA change, if the upgrade becomes a reality? The best way to answer this starts with describing what would *not* change: the antennas themselves, the array layout, the support infrastructure, and the staff. Nearly everything else would. If we are successful in securing funding, we would do the following:

- 1) Install new frequency bands centered on 2.7 and 33 GHz.
- 2) Replace the receivers and/or feeds at all existing bands.
- 3) Install a fiber-optics transmission system to all antennas.
- 4) Redesign the quadrupod legs and focus-rotation system to enable access to the prime focus.
- 5) Install receiver systems to cover the frequency bands below 1 GHz from the prime focus.
- 6) Build new antenna stations to permit a super-compact configuration.
- 7) Build a new correlator to handle 40 antennas with up to 16 GHz bandwidth and 32,768 spectral channels.

The VLA Upgrade (continued)

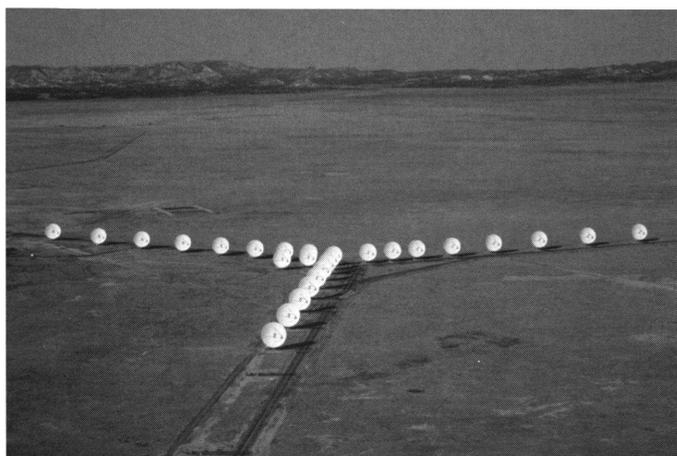
- 8) Build new antennas, situated up to 400 Km from the VLA, which will be connected to the new correlator by fiber optic lines for real-time operation.
- 9) Connect the nearby VLBA stations to the correlator with fiber optic lines.

How much would all this cost, and how long would it take to do it? Our plans show the construction phase lasting nearly ten years, starting immediately. In fact, we have already started, with completion of the 0.7 cm installation, and replacement of the 1.3 cm receivers with a design which is the prototype for all future high-frequency systems. The upgrade consists of two phases:

- a) The Ultra-Sensitive Array. This would incorporate all modifications at the VLA site: new bands, new receivers, antenna modification, fiber-optics, a super-compact configuration, and the new correlator. The plan would have this phase continue until the middle of the next decade.
- b) The 'A+' Configuration. This would expand the resolution of the array by about a factor of ten by incorporating both new antennas and existing VLBA antennas. This phase could be delayed until completion of the Ultra-Sensitive Array.

The cost of each phase, if fully implemented, would be about \$70M – a hefty price tag! However, it is not large in comparison to the investment cost of the VLA and VLBA. Considering these, adding in the cost of improvements made so far, and converting to current dollars shows that the full upgrade's cost is less than half, and probably less than a third of the investment already in place. Seen from this point of view, this incremental cost is a small price for more than a factor of ten times' improvement in capability.

Obtaining such funding is a long process – as the proponents of the MMA well know! The astronomy community is now gearing up for the 'decade review' – a



process by which the merits of many projects will be debated. We are preparing our case for this process. Sometime next year, we will be presenting our plans to a special panel of experts in radio astronomy for their consideration. Their judgement, and the final judgement of a panel drawn from across all of astronomy, will be instrumental in determining the course of our upgrade plans.

What are our chances? We're optimistic that we'll get a strong recommendation from the panel. We're confident that much of what we plan will be accomplished – our scientific and technical case is strong. Can we do all of it? It's hard to see how we'll get everything we'd like – but of course that doesn't mean we shouldn't try. Stay tuned!

Social Security: Your Personal Earnings and Benefit Statement *by Roy Norville*

Have you updated your personal financial plan lately? An important component of that plan is your social security benefit at retirement. You, NRAO and past employers have made contributions to the Social Security Administration (SSA) on your behalf. Although you should not depend solely on your social security benefit to meet all your retirement needs, the social security payment you receive after retirement may become the foundation of your total retirement income.

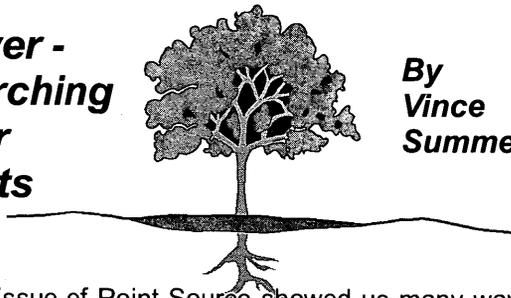
To help you know how to plan for this future benefit, the SSA has created an individual earnings statement called the Personal Earnings and Benefit Statement or "PEBES." **It is recommended that you request this statement every three years to be sure your benefit information is accurate.** Many things may cause your earnings statement to be inaccurate including name change, change of social security number, change of employer, or confusion with another person with the same name.

There are two convenient ways for you to request an earnings statement. The most convenient method, for the Web surfing crowd with computer access, is the SSA Home page at <http://www.ssa.gov>. A click of the mouse will move you through two screens where you are able to fill out an online request for your personal earnings and benefit statement. To receive **earnings information** you will need to have available your social security number, birth date, place of birth and mother's maiden name. For optional **estimated benefits**, you will need to provide your last year's earnings, estimated future earnings and the date you plan to stop work. It takes the SSA about four weeks upon receipt to process these requests.

For those who like the old fashioned mail method, a convenient form and mailer are available from the Personnel Office. This form requires the same data as the online version but takes up to six weeks for the SSA to process upon receipt.

No matter your preference, be a smart retirement planner, request your "PEBES" today.

Power - Searching Your Roots



By
Vince
Summers

The last issue of Point Source showed us many ways to search for our hidden roots, our family members deceased and buried. Now consider various angles of a power-search for obtaining thousands of family members.

The first and foremost way to start your genealogy search has already been brought up – contact all living family members, obtain photographs, stories, obituaries and other articles; anything and everything you can. This method is the best, but it did not work for me. Another method is to obtain a family tree program. I use the common one, Family Tree Maker. Data CD's come with this package, and you may find individuals of your family in the Social Security Death Index. Also, you may be as lucky as I was - I found an entire branch of my mother's tree there, and later more. Next is the LDS (Latter Day Saints) method. This can be very fruitful, but it's not the quickest way, and it's not the best source if one wants total accuracy. In fact, I have only obtained two names from LDS, and one proved inaccurate. The odds are usually better than this, but beware – it is not flawless.

The internet method is quickest, if you have access to it. It's only a phone call away, but you have to have a degree of insight as to how it ticks. Many find this difficult. Despite that, I've found it to be a very useful tool.

Now, consider this scenario...

You are in your fifties or sixties... a typical age for a large percentage of those seeking their roots. You feel you have limited time to find your family tree. You have a bit of data from family members, but not too much to go on. What to do?

You power-search first, corroborate second. I've been searching for about 5 months but have found thousands of family members. I have found perhaps a dozen living, relatives, who had become lost to me. I may have a date or a name or two wrong. But so what. Now I have time to correct that. Most of my tree and my wife's tree have been assembled.

Here are some helpful hints:

- Go to your family tree program if you have one. Search each and every name and social security number you know. Gather your list. You can send away to the Social Security Information Officer for much info from these.
- Do you know where a relative lived and died? Join a mailing list at Rootsweb. For example, I went to <http://www.rootsweb.com/> and under State, Mailing List, Virginia Resources, I found the way to

subscribe to the Rockbridge County list. You post the surnames (last names) of your family members you suspect others on that site might recognize. Subscribers then send email which is forwarded on to you so you can read it and answer it. You read their letters, and help whenever you can. Others see your willingness to help and often will help you without you personally knowing them. Some have photographed gravestones for me, free of charge, in another state, because I have helped somebody else. Some do census lookups, some know where helpful maps are, and still others are relatives with sometimes massive chains of information. This is a great networking tool!

- There are surname search engines with places to post queries. Try <http://www.genforum.com/>, for instance. You can even have your own surname put up there if it is not already there. Check back from time to time and you will get results. I have several times. One relative obtained that way went back to Bavaria!
- Take daytrips to a gravesite where a relative is interred. Examine the surrounding stones to see if relatives of that person are also there. Look for surnames in the group that represent daughters and their husbands of a different surname.
- If a relative lived in a county for a while, but you can't find where they were born or where they are buried because they moved, try joining a mailing list temporarily, of adjacent counties. Most moves were harder to make, the farther you go back, and often one county away would be the most any would tend to travel.
- Consider slightly different spellings. One example that was brought to my attention was the surname Gillespie. Education was different in the past, so then were spellings – even among census takers. Galesby was found to be among the family members under a search for Gillespie.
- Use Telephone Directory Searches such as <http://www.switchboard.com/>. These will help you find living relatives.
- Did someone move out from an address with which you were familiar? Write the Borough or the Post Office for a change-of-address. It worked for me. Not only did I find a dozen living relatives, but all the information each one of them can provide about the family history, along with photographs!
- What was the religious affiliation of a relative? It is likely their parents and their parents' parents were of the same affiliation. Look in cemeteries of that church affiliation if you do not know where in the county they were buried. My Sommers family members (Dad changed his name to Summers) were found all together in a Catholic cemetery.

(continued page 10)

Power Searching Your Roots (continued)

Do not be afraid to politely ask for favors. You will be surprised how many people out there sympathize with your efforts and want to help. Don't be shy. It is a waste of time in your genealogical searches. Just be polite!

A few final possibilities to consider are to visit courthouses, check immigration lists, visit your local university library and search the state and county sections related to genealogy. Ask them about interlibrary loan services that don't cost you anything. Try to save your money for document purchases and family genealogy searches that are most pivotal to your cause. The costs will add up, including postage, books, documents, web time, gasoline and car usage, and of course, your patience. For a couple of months I could find no Ayres of my tree, the major one on my mother's side. Then, in less than 24 hours, I found just about the whole tree back all the way to Ireland. In fact, I may be called to stay at the ancestral Ayres home in the Harrisburg, Pennsylvania area as a guest. The home goes back to the 1700's and is called the John Ayres house.

If you seek to find your roots, don't expect it to be accomplished in a week. But be prepared to learn a lot of fascinating history, customs, and surprising facts about the people you call your relatives, and to understand better why you are you!



Who's Who Winner



Thanks to all who participated in the last Who's Who contest. Chuck Beverage of Green Bank's Administrative Services Department was declared the winner and claimed an NRAO golf shirt as his prize.

Summer 1998 answers (as pictured):

Omar Boyer - GB Ginny Goret - SO Tami Hale - SO
Billie Jo Mattox - CV Tessa Schlemmer - CV Amy Shepherd - CV

Look for more Who's Who in the next issue.

Fiscal Notes . . .

The flood of recent bank mergers may have affected your account or routing number for direct deposit. If this is the case, please be sure your bank account numbers and/or routing numbers have not changed. If they have, please submit a new direct deposit authorization form that gives the correct information.

Personnel Notes . . .

Flexible Spending Accounts

The address for filing reimbursement account claims has changed. Effective 11/1/98, the new address is:

CIGNA HEALTHCARE
REIMBURSEMENT ACCOUNTS
P.O. Box 0976
Bristol, CT 06010

A supply of the new CIGNA reimbursement claim forms has been sent to each site's Personnel Office.

NRAO is now offering a **commuter benefit** under the Reimbursement Account Program. The commuter benefit allows employees who commute to work via van pool or public transportation to set aside up to \$65 per month in pre-tax salary to pay for their commuting costs, and/or up to \$175 per month to cover their expenses for parking. The commuter benefit reimbursement account is similar to the medical and dependent care reimbursement programs. Participating employees realize a savings in income tax, FICA, and Medicare contributions on amounts set aside for such purposes. For more information, please contact Billie Jo Mattox in the Charlottesville Personnel Office.

Dental and Flexible Spending Enrollments Scheduled

As you may be aware, 1998 presents employees with open enrollment for the dental insurance. Any employee who wishes to add, drop, or make any changes to their dental coverage should do so during the enrollment period. Dental open enrollments will begin December 1, 1998 and end December 31, 1998, with the change becoming effective January 1, 1999.

Open enrollment is also taking place for the Flexible Spending Account plan. Every employee who wishes to participate in the plan must fill out the necessary forms regardless of whether or not they are enrolled for the 1998 plan year. The enrollment period is December 1 through December 23, 1998.

Look for more information on site bulletin boards and electronic mail.

YEAR 2000 UPDATE

by Alan Bridle

This is an update about "Y2K", the "Millennium Bug" in computers, programs and computer chips that track only the last two digits of the year. Because some will misbehave when those digits reach 00, the Millennium Bug can interfere with many aspects of daily life that depend on computers if it is not eradicated by the end of 1999.

There is both good news and bad news about Y2K since I wrote about it here a year ago. The good news is that many organizations are much more aware of the dangers and are working hard to ensure that essential operations and services will not be compromised by it.

At the NRAO, we inventoried all of our date-aware systems in 1997. Any hardware, and most software, considered essential to observatory operations but which was not already Y2K ready will have been replaced or modified by the end of 1998. The remaining essential items will be replaced early in 1999. The systems replaced include some older computers, and telephone systems. Purchasing and payroll processing software, which we get from outside contractors, will be Y2K ready by the end of 1998. The VLA and the 12 meter telescope have been tested successfully in simulated post 2000 conditions after fixing minor Y2K bugs. The VLBA was ready by design, but its test must wait for the sky itself to be more Y2K ready. (The motion of the Earth's axis in space makes the VLBA harder to test than the other telescopes until 1999.) The Green Bank interferometer is Y2K ready. The 140 foot telescope is not expected to be in use after 31 December 1999 but we know what needs to be updated in its computers if this changes. Items less essential to NRAO operations may not be updated to full Y2K compliance when their expected misbehavior is only cosmetic, or easily worked around. They will instead be upgraded as part of their normal replacement cycle. More tests will be done in 1999, with the goal that remaining Y2K problems in NRAO systems will be no more than an occasional nuisance.

Outside the NRAO, most businesses, utilities and government agencies are taking a similar approach; focusing effort on their most essential systems first. Some Y2K problems that were obvious a year ago (e.g. nonacceptance of credit cards with '00' expiry years) have already been fixed. The bad news is that the bug is more pervasive than first thought, and some fixes are taking much longer than expected. It is still unclear how prepared some sectors of the world economy will be for the century rollover. Y2K tests have produced surprises: a Chrysler assembly plant locked everyone "in" when its security system failed a test, but a California prison found that its doors would default to "open". Over-hasty Y2K bug fixers have created new bugs: Y2K changes to automated traffic lights caused big tie-ups in Dublin, automated banking systems failed in New Hampshire, some Kansas consumers with electronic debit agreements for their bills got instant overdrafts (and bad credit ratings) because their payees' computers overestimated their debits. One error

went the other way, as a brokerage (briefly) credited over half a million clients with an "extra" \$19 million. (Attempting to prefix a 19 onto every YYYYMMDD date in its database, it instead added 19,000,000 to every balance.) With much still to be done, many services that rely on "just-in-time" inventory management, accurate data exchange, or prompt transportation of goods and materials may still be at some risk when the Year 2000 arrives.

The most troublesome areas are where fix-up work started late, but manual methods have disappeared and human staff were "downsized" as computers proliferated. Computer chips and micro-controllers embedded in other hardware are potentially a big problem because chips in supposedly "identical" systems aren't always identical, and individual testing is needed. Some embedded chips, which cannot be reprogrammed, stop working altogether if the year reaches 00. Some date-aware chips are used even where no dates were required, as custom chips are expensive to design. Here are some examples of where Y2K is a concern:

Will the power stay on? This is critical: without power nobody can fix anything else. Electric power is generated in the U.S. by over 7000 independent small and large companies feeding a complex transmission grid. Power must also be generated on demand; when you turn an appliance on or off, a generator somewhere must respond almost instantaneously. Most of the systems that generate power and match it to demand can be operated without computerized controls, although doing so can be tricky for plant operators. The good news is that electric utilities are practiced at dealing with spot outages and large-scale emergencies, and they are testing and replacing vulnerable systems. The bad news is that tests have found that some power plants can indeed be shut down by Y2K problems, and that date-aware chips are present in parts of the power distribution system. It is hard to estimate how close to normal the supply of electric power will be in January 2000 because no one agency has access to all the data needed to do this. Some experts expect that load sharing and power generation may be (temporarily) more regionalized, so we could depend more than usual on the status of power plants closest to where we live. The century rollover itself could be a white-knuckle event for utility operators, but there are longer-term issues as well. Most fossil fuel plants are refueled by rail, and many railroads removed their manual switches as they computerized their operations. Large-scale power blackouts are considered unlikely, but brownouts and "spikes" (both in voltage and in consumer prices where utilities were ill-prepared) could be more common for a while.

Will water be safe to drink? Y2K tests of some water (and sewage) treatment plants have revealed problems with date-aware micro-controllers that could affect water quality (or even release raw sewage) after 1 January 2000 if not upgraded. The good news is that tests are being done; the bad news is that they are needed.

Will oil and gas supplies be normal? Date-aware micro-controllers are used throughout oil production and distribution. For example, a typical offshore oil-drilling rig contains thousands of embedded chips, many below the

Year 2000 Update (continued)

sea floor. One oil distributor found that a chip controlling a type of flow valve had to be replaced everywhere, with serious consequences; replacement chips required new circuit boards that were too large to fit in the old valves, so whole valve assemblies had to be replaced just to replace the defective chip. Supertankers now operate with tiny crews because they are so computerized, but tests have found Y2K problems in shipboard radar systems and in ballast-and performance-monitoring systems. The risks are clear, but it is hard to assess how ready suppliers will be when 2000 comes.

Will banks be immune? Most large US banks have been preparing for Y2K for years. Banks are highly regulated, so more is known about their Y2K readiness than for other institutions. Large US banks are thought to be on track for Y2K, but still have work to do. A few small banks have been warned by the FDIC about their lack of readiness. The Federal Reserve has contingency plans for handling transactions at banks that remain ill-prepared. It seems clear that a "Y2K bank run" by consumers wanting to hoard cash (which is always in short supply relative to bank deposits) could be much more dangerous to the banking system than Y2K itself. Financial advisers say that now is a good time to ask your own bank, mortgage company, or loan institution about its Y2K preparations. If you do not like what you hear, there is time to make other arrangements. There may also be a time ahead when paper transactions are more reliable than computerized ones. It will be prudent to make sure that your own paper records of financial accounts, deposits, mortgages and loans are in good order, and to get printouts of your credit report and Social Security account status before the century rollover. You may also want to consider whether all of your automatic payment arrangements are strictly necessary, in case computer problems at your payees cause incorrect debits from your accounts.

Will hospitals be safe? Most medical equipment will keep working, but the safe use of some devices involves date-aware logging. Y2K problems have been reported in the logging systems of some pacemakers, defibrillators, IV systems and anesthesia machines. Diagnosis and treatment can also be affected if medical records are corrupted or inaccessible, or if computerized pharmacies get confused about expiry dates of drugs. The risks are obvious, so most hospitals have had Y2K teams in place for some time. Again, "local mileage may vary."

Will air travel be safe? There is no reason to believe that Y2K will make planes fall out of the sky. There are Y2K issues that could affect whether they get off the ground. There have been conflicting signals from the FAA (optimistic) and from other agencies (not) about the Y2K readiness of air traffic control systems. Uncertainties remain about flight scheduling and booking systems, and about date-aware airport functions such as fuel metering, baggage handling, fire alarms, environmental controls and even the cooling systems of airport radars. Several airlines have stated that they may not fly to all their usual world destinations in early 2000 if they anticipate Y2K problems on the ground.

What's happening in other countries? The USA has the world's most highly computerized economy. It may also be where manual methods and work-arounds have been left furthest behind. Countries with more regulated approaches to electric power distribution, transportation and communications are finding it easier to assess their Y2K readiness, but the USA appears to be making one of the biggest efforts to fix Y2K problems. In countries that are now distracted by economic crises or natural disasters, little Y2K work is being done. Y2K readiness is likely to vary enormously from country to country. The implications are, once again, hard to assess because the problem is potentially so widespread and could show up everywhere at once.

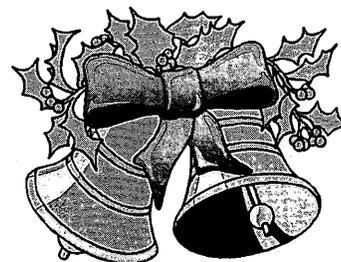
The bottom line is that it is still very unclear whether Y2K will be merely a nuisance, or something that will severely disrupt daily life. You can expect to hear much more about the impact of the Millennium Bug on daily life in 1999, as preparations around the world become more intense. If you want to find out more about these issues now, the NRAO Y2K Web Page at <http://www.cv.nrao.edu/y2k/> has links to information on the Internet about Y2K outside the NRAO, as well as to our internal Y2K documents.



Top 10 StressBusters for the Holidays

1. Avoid excess food, alcohol and caffeine.
2. Take time to nurture yourself with a brisk walk outdoors, your favorite music, a warm bath and a good book.
3. Surprise an old friend with a phone call instead of a card.
4. Appreciate the simple pleasures of the season: snowflakes falling, a child's expression of wonder, candlelight, a hot cup of cocoa.
5. Forget the "shoulds" and make commitments to do only those things you and your family really want to do.
6. Practice seeing the humor in all your holiday challenges.
7. Plan a special event for you and your family in the New Year to beat the post-holiday blues.
8. Spend within your budget, and avoid January's financial hangover.
9. Remember that each year presents opportunities for remaking old and adding new traditions to your family's celebrations.
10. Embrace a positive attitude of gratitude for all your blessings.

**Happy
Holidays!**



Scoping the Sites . . .

AOC

The Fifth Annual Enchanted Skies Star Party was held October 8 - 11 in Socorro, and hosted participants from across the U.S. and from Canada and Mexico. The event featured a tour of the VLA, lectures at Macey Center, and observing for amateur astronomers at the Etsorn Campus Observatory on the New Mexico Tech campus. The highlight of the star party is the "dark-dark-sky night" at the Pound Ranch southwest of Socorro, where participants enjoyed a chuckwagon ranch dinner, Indian dancers from the Alamo Navajo reservation, a campfire lecture on ancient astronomy, then excellent observing with instruments ranging from an 1875 Alvin Clark refractor to a home-built 41-inch portable reflector. Jon Spargo, Dave Finley, Paul Harden and Jason Wurnig are the principal organizers of this event. This year, AOC graduate students Alison Peck, Cornelia Lang, Michael Faison and Walter Brisken presented a series of talks on "Getting Started in Astronomy" that drew high praise from participants. *by Dave Finley*

On November 7, amateur radio operators from New Mexico, Arizona, Texas and Colorado converged on Socorro for the annual Socorro Hamfest. NRAO-NM hams Chuck Broadwell, Bill Brundage, Dave Finley, Paul Harden, Jim Oty, Paul Rhodes and Jon Spargo helped organize the hamfest. Visitors could buy equipment from commercial vendors, haggle over prices at a swap-meet, or hear lectures that included a talk by Paul Harden on the sun's effect on radio communications and one by Dave Finley on Morse Code. *by Dave Finley*

Charlottesville

Six volunteers from NRAO participated in the 6-mile American Heart Walk on October 4. The American Heart Walk is the American Heart Association's premier national walking event. NRAO walkers raised over \$450 from sponsors to support the AHA's research and education programs to help fight against heart disease and stroke. *by Billie Jo Mattox*



American Heart Walk

Top left to right Joe McMullen, Jack Gallimore, Tessy Schlemmer Bottom left to right Michele Thornley, Joe's wife Mary Gallagher, Billie Jo Mattox

NRAO-CV held a Chili Chow-Down on October 14. Employees were invited to enter their own special chili into a contest which was judged by individual ballot with the cooks remaining anonymous. Employees and spouses enjoyed a beautiful, fall afternoon as they savored the different chili variations and conversation with fellow co-workers. Employees were asked to vote in three categories, and the winners were: Best Overall - Tessy Schlemmer, Personnel; Runner-Up - Billie Jo Mattox, Personnel; and Most Original - Franz Bauer, Student Support. This is destined to become an annual event. *by Billie Jo Mattox*



Charlottesville employees (starting left - Sri Srikanth, Barry Turner, Ellen Bouton, Carolyn White, Juan Uson, Mort Roberts - peaking from behind the bush - and Ernie Allen) enjoy the tasty Chili and beautiful weather at the CV 1998 Chili-Chow-Down

Green Bank

The annual NRAO-GB Recreation Association Halloween parties were held on (what else?) Halloween. In the afternoon we had a children's party, complete with games and refreshments. The older kids went on a scavenger hunt for bones to build a skeleton, while the younger kids tossed beanbags, burst balloons, carried eyeballs, and generally ran amok. Luckily, the weather outside was warm and sunny, so we all went outside to bob for apples. Then we had a supper of hot dogs, chips, cookies, and cider, along with a fresh bowl of Monster Hand punch. All agreed that Monster Hand is the best flavor punch ever served at the party.



(continued page 14)

Scoping the Sites . . . (continued)

The last activity on the agenda was perhaps the most fun for all: A Monster construction project. We collected all manner of trash, boxes, packing materials, and so forth, and gave it to groups of kids, along with tape, and let them put together a monster from their pile of monster parts. Many wonderful creatures came alive as a result!



The kids were sent on their way to terrorize the neighborhoods with their trick-or-treating, and preparations were made for the adults' party. All the sharp things and breakables were put away, and the tour center turned into a ghostly den with live music. It was a fun evening, with costumes running from The Old West, to A Galaxy Far, Far, Away! The MIB made an appearance, which *spooked* the guests... Come and join us for next year's party! *by John Ford*



Tucson

NRAO operations in Arizona have been expanding rapidly recently due to the increased involvement in MMA activities. In order to accommodate the new personnel we needed to make offices out of our existing lab space. Conditions have been very crowded for the last few years.

Within the next two months or so, we'll be adding approximately 11 additional people to the project. There isn't any more space, and as a result, we made arrangements to rent offices from the University of Arizona. The University had converted a defunct sorority house into a very nice office space that will meet our needs well temporarily. We have rented 15 offices on the second floor of this building, and we now call it the MMA Office Building. It houses all of the scientific staff and MMA staff who are not involved in building hardware. This includes the Antenna Design group, but does not include the group working on cryogenics or receivers. By the end of November, everyone who is moving will be firmly established in the new office area.

A long term solution to the space problem is to have an addition built onto our original space. The University Regents recently approved that addition to our building and it will provide enough space for our operations for some time.

Employees should continue to use the 949 N. Chelton address for all correspondence, and continue to use current telephone extensions. *by Dale Webb*

VLA

The "End of the Summer" party was held on October 23, which was the last day for most of the VLA summer temporary workers. The temps have successfully completed many projects this summer including replacement of nearly 5000 track ties, replacement of the roof on the SLOB, repair of the stucco on two buildings, painting of all the VLA quad legs, and construction of a break room for the VLA operators. Pit barbecue and all the trimmings were served by the supervisors, and awards were presented to each shop and to the departing temps in appreciation of their efforts. Four of the temporary workers were hired full time; Johnny Gonzales, Chad Jones, Gilbert Montano and Ellison Thompson. *by Patty Lindsey*



Personnel News . . .

(8/1/98 - 10/31/98)

PROMOTIONS

Terry Cotter to Electronics Engineer I, SO
Victor Gasho to Mechanical Engineer III, TU
Kenneth Hartley to Scientific Associate III, SO
Mike Holstine to Business Manager, GB
Renee Saxton to Array Operator II, SO
Marlin Smith to Technical Specialist III, SO

NEW EMPLOYEES:

CHARLOTTESVILLE

Evelyn Braintwain, Scientific Services
Jack Gallimore, Basic Research
Lynn Matthews, Basic Research
Roy Norville, Personnel
Ronak Shah, Student Support
Michele Thornley, Basic Research

GREEN BANK

Byron Bertrand, Telescope Services
Gregory Black, Basic Research
Jody Bolyard, Scientific Services
Dennis Egan, GBT Project
Kevin Gum, NASA OVLBI Earth Station
Charles Knapp, Telescope Services
Jason Ray, Student Support
Michael Sumner, Non-NSF (Geo-SAR)

MAUNA KEA

Janis Hamersma, Electronics

SOCORRO

Joshua Bloom, Student Support
Gregorio Chavez, Electronics
Allen Lewis, Administrative Services
Andreea Petric, Student Support
Douglas Scott, Non-NSF (LO/IF Group)
Donald Welty, Fiscal

TUCSON

Christopher Heckler, Oper & Maintenance
Kevin Long, Oper & Maintenance
Andrea Vaccari, Basic Research

DEPARTURES

Marc Apgar
Nancyjane Bailey
Thomas Bania
Naomi Bates
Ronald Bates
Beth Biller
Joshua Bloom
Kjersten Bunker
Travis Burner

DEPARTURES (continued)

Joy Carpenter
Thomas Davin, Jr., retired 12 years, AUI
Frank Dobson
Keri Eberhardt
Joshua Eisner
Richard Fleming, retired 28 years
Christopher Garcia
Jessica Golub
Paul Greve
Martha Haynes, AUI
Steven Hicks
Alexis Johnson
Stephane Jouteux
William Ketzeback II
Jennifer Lockman
Alex Markowitz
Patrick Matheny
Lawrence Minitrez
Maury Modine
Ernesto Navarrette
Brian Olney
Andreea Petric
Maya Proulx
Timothy Rexrode
Joe Rodriguez
Alan Roy
Mary Ellen Sanchez
Jose Sanchez
Eddie Savedra
Seth Shinaberry
Charles Silver
Nathaniel Sizemore
Hanna Smith
Gregory Stinson
Richard Thompson
James Trujillo
Sarah Weadon
John Weiss
Andrew West
Nicole Wiersgalla
William Willems
Jennifer Wiseman
Laura Woodney
Lisa Wray
William Zamora
Pete Zamora, retired 8 years

TRANSFERS

Joseph McMullin from GB to CV
Gerald Petencin from SO to CV



A Note from the Editor:

Articles or ideas for the Point Source newsletter are welcomed. If you would like to submit an article, please contact the editor at phone (804) 296-0312 or by email to: tschlemm@nrao.edu.

Deadline for article submission for the upcoming Winter issue is January 22, 1999.

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