



# THE POINT SOURCE

A quarterly newsletter for employees of The National Radio Astronomy Observatory

Volume 3, No. 2

Spring 1996

## AUI President, Robert Hughes, to retire

Robert Hughes notified the AUI Board of Trustees that he is prepared to retire from the position of President of Associated Universities, Inc. (AUI) when a successor can be appointed. In October 1996, Hughes will have served as President for 16 years.

The AUI Board has established a search committee to undertake a formal, nationwide search for potential candidates for the presidency. The committee is chaired by AUI Trustee John Armstrong and includes the other Trustees; Robert Brown, Associate Director of the NRAO; Denis McWhan, Associate Director for Basic Energy Sciences at BNL; and two members from the scientific community at large. Correspondence to the committee can be addressed to: John Armstrong, c/o AUI, 1400 Sixteenth Street, N.W., Suite 730, Washington, DC 20036-2217.

The AUI President, who serves as a Trustee ex officio, is concerned not only with overseeing the management of NRAO, but also with overseeing the management of NRAO's "sister" organization, Brookhaven National Laboratory (BNL), for the Department of Energy. The AUI President also manages AUI corporate affairs at AUI headquarters in Washington, DC, and serves as a focal point for all activities of the Board of Trustees.

Said Earnest Henley, University of Washington, Chairman of AUI's Board of Trustees, "Bob Hughes has been a great AUI President, with hands-on interest in all of the affairs of the two laboratories. He has worked with DOE and NSF effectively and with great finesse."

Hughes returned the compliment: "The heart of AUI lies in the Board of Trustees," he observed. "For the past half-century, the Board has provided the spirit, the sense of purpose and the broad guidance that has infused and stimulated its daughter institutions.

"This remarkable Board has continually attracted and maintained the interest and commitment of truly eminent

scientists and science administrators who serve pro bono, often for many years." Hughes continued, "The exemplar I.I. Rabi, one of the AUI founders, devoted about 40 years of his life to AUI/BNL/NRAO. The uniqueness of this Board is nationally recognized. With the distinguished Visiting Committees it establishes, it provides powerful links to the world of science."

In retrospect," added Hughes, "I sometimes find it difficult to  
*(continued on page 5)*

### Employees Honored for Years of Service

The following employees have been honored this year at Service Awards Ceremonies for either 10, 20, or 30 years of service.

#### Charlottesville

Kenneth Kellermann	30 years
Ellen Bouton	20 years
David Brown	20 years
Karen Whitcomb	20 years
William Lakatosh	10 years
Shing-Kuo Pan	10 years
Billie Rodriguez	10 years
Amy Shepherd	10 years
Paul Vanden Bout	10 years

#### Socorro

David Archuleta	20 years
John (Skip) Lagoyda	20 years
Rudy Latasa	20 years
Ramon Molina	20 years
Nicholas Montoya	20 years
James Oty	20 years
Rey Serna	20 years
Everett Callan, Jr.	10 years
Raymond Ferraro	10 years
W. Miller Goss	10 years
Kenneth Hartley	10 years

#### Green Bank

Thomas Dunbrack	30 years
Wendell Monk	30 years
Russell Poling, Jr.	30 years
J. Bruce McKean	20 years
Rebecca Warner	20 years
Dwayne Barker	10 years
Mark Clark	10 years
Charles Hedrick	10 years
Kenneth Lehman	10 years
Ronald Maddalena	10 years
Robert Sumner	10 years

#### Tucson

Jackie Cochran	30 years
----------------	----------



# Scoping the sites. . .

---

## Charlottesville

---

◦ Charlottesville and Green Bank employees met for a golf tournament in April. The winning team was Robert Hughes (AUI President) and his son, Jeff, Harold Crist, and Mike Hedrick. John Ralston, Pat Matheny, and Wendell Monk were a close second. Joining the usual Charlottesville players were Billie Jo Mattox and Wendy Mahle (on the last place team).

---

## Green Bank

---

◦ On April 2, 1996 the Pocahontas County High School and the National Radio Astronomy Observatory in Green Bank officially became "Partners In Education." The State of West Virginia recognizes that education is a joint venture between schools and communities, schools are an integral part of every community, schools are a key element in economic growth, and everyone has a stake in quality education. Hence, the state encourages schools and businesses to interact through these partnerships.

NRAO's role is that of an advisor to the school. Employees will assist in training and act as consultants. High School students will work on Observatory projects which will benefit both the NRAO and the students.

---

## Socorro

---

◦ Two NRAO employees, Clint Janes and Larry May, and one former employee, Mike Best, are instructors for a relatively new Electronics Technology Certificate program at New Mexico Tech. This program is designed for a hands-on understanding and trouble-shooting of circuits, electronics components, and test equipment.

◦ "Evil Luggage," the legendary NRAO Socorro city-league volleyball team, recently won the 1996 coed B-division championship. The iron-fisted approach of coach Dave Adler worked successfully; the long practice hours in the gym and endless wind-sprints paid off handsomely (well, actually, they paid off in t-shirts). Team members

were Dave Adler, Terri Bottomly, Dale Frail, Diane Jaramillo, Marie Glendenning, Kevin Marvel, Julie Montoya, Tim Roberts, and Magdalene Romero, with Ed Fomalont occasionally making a special cameo appearance. Special thanks to Caroline Smith for organizing the team spirit squad, affectionately known as "Hell's Handbags."

---

## Tucson

---

◦ Visitors to the Kitt Peak VLBA have made some interesting comments during their tour of the site over the years. Visitors typically are awed by

their tour. Along with the usual "Wow!" comments that the Operators hear, below are a few of the more unusual comments that have been written in the Kitt Peak Visitor's Log:

Magnificent edifice!  
Complicated  
Most impressive  
We know we are not alone!  
Not all tax dollars are wasted  
This is an amazing place  
You all have a unique job  
Outstanding, but cold  
I like the secret passages  
Nice place to change tapes!

---

## Parallel Universes (continued from page 2)

formed. The main reason that mostradio sources are so extraordinarily distant is that galaxies were much more active then. The old black holes must still lurk in the nuclei of galaxies, but they are silent now, probably because they have used up the surrounding matter that once fueled their radio sources. The NVSS will detect most of the radio-loud black holes in the universe and determine the sky positions of the 500,000 sources stronger than 10 mJy with 1 arcsec accuracy, equivalent to locating an object on the surface of the Earth within 100 feet. Such precise radio positions can be used with optical photographs to identify which galaxies contain the black holes. Radio galaxies and quasars are frequently strong sources at other wavelengths, such as X-rays. The accurate NVSS positions are being used by X-ray astronomers to help identify their sources as well, since the X-ray positions are less precise.

A few percent of the NVSS sources are produced by normal and "starburst" galaxies. The radio emission from these relatively nearby galaxies (typical distance, 100 million light years) is powered by short-lived massive stars and their supernova remnants. Stars more than eight times as massive as the Sun consume their nuclear fuel in less than 30 million years, collapse catastrophically, and explode as supernovae. The explosion sends a shock wave into the gas surrounding the star and accelerates electrons to nearly the speed of light, at which point they

emit synchrotron radio radiation. These radio sources tell us about recent star formation in other galaxies, a process often hidden from optical astronomers because massive stars form in dusty molecular clouds that absorb visible light, but not radio waves, and convert it to infrared radiation. Of particular interest are starburst galaxies, in which new stars are being made at a rate so high that it cannot be sustained for the life of a galaxy. For the first time, the NVSS should detect radio emission from tens of thousands of normal and starburst galaxies, including most of the galaxies discovered by the infrared satellite *IRAS*.

When the VLA was built, everyone believed that an all-sky survey like the NVSS would be impractical, taking hundreds of years to complete. Only during the past few years have technological advances in computers and radio receivers made the NVSS possible. Unfortunately, the same technology has brought us the beeper phones, broadcast satellites, etc. that threaten to blanket the radio spectrum with interference. The sensitivity of the NVSS depends on observing with a 100 MHz bandwidth, which is far wider than the protected radio astronomy band. The NVSS observations are being completed as quickly as possible in the narrow time window that may soon close on this view of the universe as electromagnetic "pollution" inevitably increases.

# Safety Net

This section of the Point Source will cover a variety of safety topics. The article below is the first in a series covering the ergonomics of computer use. If you have topics you would like to see covered, contact the editor at [wmahle@nrao.edu](mailto:wmahle@nrao.edu) or call 804 296-0265, or contact Jon Spargo, NM Safety Officer, at [jspargo@nrao.edu](mailto:jspargo@nrao.edu) or call 505 835-7305.

## **The Trouble With Computers is. . . Part 1** *by Jon Spargo*

Most of us use computers and a growing number of us have decided that since we have so much fun using them at work, we should go straight home and pick up where we left off!

Have you ever asked yourself any of these questions? If computers are so wonderful why does my back ache every time I sit at my computer for more than 10 minutes? Why don't my bifocals work when I'm trying to read the screen? Why does my wrist hurt after I have been using my keyboard or mouse for a few minutes? These and many other similar questions are all too common. Humans seem to find it difficult to physically adapt to using computers. Indeed, an entire industry based on "Computer Ergonomics" has been spawned from this fact.

Nearly all of the problems we encounter can be divided into three general categories: Posture, Vision, and Cumulative Trauma Disorder (better known as Repetitive Motion Disorder or Carpal Tunnel Syndrome). In fact, there are quite a number of simple things we can do to adapt ourselves to using computers without spending a fortune on furniture or accessories.

The first topic in this series is Posture. But, before we get into details, I would like to point out that a number of the things you can do to cure posture-related problems will also help with vision and cumulative trauma disorders. At the conclusion of the third article there will be a review of all the suggested remedies to use as a handy checklist.

I would also like to point out that if you are having problems and do not want to wait for a future issue, please feel free to contact me. I will be more than happy to help. Also, if you really want to dig into the subject, I can point you to the appropriate literature.

### **POSTURE**

When it comes to posture, the three most often heard complaints stem from neck, shoulder, and upper back discomfort; lower back pain; and discomfort associated with lower legs, ankles and feet. How many times, when you were a kid, did your mother tell you, "SIT UP STRAIGHT!?" Little did you know that she could foretell the future and had anticipated the age of the desktop computer! Her advice was sound then and—worth repeating now, SIT UP STRAIGHT! Now that you have done that, we will begin at the top and work our way down.

The first problem is that you have this great weighty lump, your head, perched on top of a long, thin, flexible shaft, your spine, all of which must be held together yet remain movable. Numerous muscles in your upper back, neck and shoulders are provided to do this job. However, they need a little help from you or they will certainly let you know about it. As it turns out, the most relaxing position, when these muscles have to do the least amount of work, is when your head is tilted just slightly downward about 5 to 10 degrees.

Have I reminded you lately to SIT UP STRAIGHT? With your head tilted slightly downward and your eyes looking straight ahead, you should be looking at the top edge of your monitor screen. This brings us to the most common no-no for computer users. Be honest now, how many of you have your monitor stacked on top of your CPU? Does this make the bottom of the monitor about chin height? Try putting the monitor on the table top and SITTING UP STRAIGHT. You may discover that your head naturally assumes the correct position, minimizing the stress on your neck and shoulders.

If you have a smaller monitor (13 to 15

inch screen), you may find that you need to raise the monitor slightly so that you look at the upper part of the screen with your head properly positioned. The bottom line is to not be afraid to experiment a little with your setup. The whole idea is to be comfortable.

The next part concerns the lower back. Even when sitting properly, there is still considerable strain on the lower back. After all, everything above it, including the great weighty lump, has to rest on something. As a result, the muscles in your lower back do the work and they too will let you know about it! There are two good remedies for lower back discomfort. The first is called lumbar (lower back) support. Whether it is an adjustment on your chair or an add-on cushion, it is important to provide support for your lower back. It also really helps if you SIT UP STRAIGHT! The next best thing to do is to take frequent breaks, perhaps two or three per hour, each for 3 to 5 minutes.

By breaks, I mean get up from your chair, stretch, and walk around; or work at a different task for a few minutes. The new task should be something that will not require that you be seated! Breaks are VERY important and I will repeat this advice many times before we are through here.

Finally, we need to talk a little about your legs, ankles, and feet. These too can give you problems, particularly when you are seated for long periods of time. Most of us have a "favorite position" for our feet. Some that I have seen are quite creative and lead me to believe that folks are using computers to practice being contortionists! The position for legs and feet that results in the least amount of strain is when the upper leg (thigh) is parallel to the floor, the lower leg vertical, and the foot flat on the floor, perpendicular to the ankle.

*(continued on next page)*

I said that is the most relaxing. In fact it is the least used, mostly because we have optimized the height of our chairs for typing position and vision. Happily there is a way around this. If your lower leg cannot be vertical or your foot perpendicular to your ankle, you should invest in an adjustable foot rest. You should adjust it so that, with your foot flat on the surface of the rest, your foot remains perpendicular to your ankle and lower leg.

Now that we have reached bottom, so to speak, it is time to move up a short way and consider something that plays an important role in all that we have talked about so far. Your chair! Chairs come in an astonishing variety of shapes and sizes with an equally bewildering number of "features." Sad to say, however, we frequently do a lousy job of selecting chairs.

Believe it or not, you can buy a chair for under \$300 that has all of the necessary features, looks nice, and will last one heckuva lot longer than a \$100 chair. A good chair should have the following features. Of course, it should be fairly comfortable to sit on. In addition, it should be adjustable in height. Most important of all, it should have adjustable-height arm rests. The combination of these adjustments will enable virtually anyone to be comfortable at all but the most awkward of computer locations. Chairs that allow the seat to tilt or have adjustable lumbar support are also good, but not necessary.

Making the effort to learn to sit properly at your computer will help you, not only be more comfortable, but healthier. If your work station is not set up properly, make the changes suggested above. Then remember to SIT UP STRAIGHT, keep your feet flat on the floor, take frequent breaks of 3-5 minutes, and stay comfortable at your computer.

The next installment will cover problems associated with vision.

believe that, upon retirement, I will have been president of AUI for essentially one-third of the existence of BNL and 40 percent of the life of NRAO. What has made it so satisfying is that it has been a period of challenge, excitement, growth and achievement for both institutions."

During Hughes' tenure as AUI President, the NRAO completed the VLA and the VLBA, began the construction of the GBT, and initiated planning of the MMA. BNL has been honored with two of the four Nobel Prizes that scientists have won for work done at the Lab. This was also the period when BNL made the transition from the closure of the Colliding Beam Accelerator project to the current era of construction and planning for science at the Relativistic Heavy Ion Collider.

Hughes earned his B.S. in engineering from Lehigh University in 1949. He then earned his Ph.D. in Chemistry from Cornell University in 1952. Cornell is one of the nine universities that founded AUI in 1946. He remained at Cornell an additional year as a chemistry instructor. In 1953, Hughes joined the Chemistry Department at the University of Pennsylvania as an assistant Professor, becoming a full

professor before he returned to Cornell in 1964, as Professor of Chemistry. He served as Director of the Cornell Materials Science Center from 1968-74.

In 1974, then President Gerald Ford appointed Hughes as Assistant Director for National and International Programs of the NSF. With the NSF's reorganization in 1975, he became Assistant Director for Astronomical, Atmospheric, Earth and Ocean Sciences, until he returned to Cornell in January 1977. He took the full-time position of AUI President in 1980.

Looking back, Hughes reflected, "Apart from three years each in the Army and industry, and five years devoted to obtaining a B.S. and Ph.D., my entire career has been shaped in three outstanding organizations, with 10 years as a professor at the University of Pennsylvania, 18 more at Cornell University, and now 16 at AUI. I cannot imagine being associated with any finer institutions or livelier, more committed colleagues.

"Now," said Hughes, "I hope to remain in association with AUI for some time, as did my predecessor, Gerald Tape. I also intend to undertake a number of other professional projects that have been long deferred."

## **RAO Answers**

(See the questions on page 6)

1. RAO 1 was assigned to Richard Emberson who was hired as Acting Deputy Director.
2. Dewey Ross, RAO number 47, has the lowest RAO number of all current employees, followed by Sid Smith (49), Omar Boyer (66), and Phyllis Jackson (72).
3. Sid Smith will have worked for NRAO a total of 38 years on August 1, 1996.
4. RAO #1000 was assigned to Ronald Turner on September 1, 1970. RAO #2000 was assigned to Thomas Armstrong on July 13, 1983. (RAO #3000 was assigned to Sarah Weadon on June 3, 1996.)
5. The most common last name for NRAO employees is Taylor (29), followed by Williams (19), and Smith (17).
6. We don't know the answer to this one, but we suspect there are quite a few!

# Personnel news. . .

## Retirement Info Available

The Personnel Office has a number of resources available to employees for retirement planning:

*Tales of Planning and Growth* is a PC software package that helps employees calculate how much their budget will allow them to contribute to their Supplemental Retirement Account and what the value of their monthly contributions plus accumulated interest will be at retirement.

*Save, Your Future Depends on You* is a video of a teleconference offered by TIAA on saving for retirement. The video stresses the importance of saving for retirement and suggests ten ways to save for retirement.

*TIAA-CREF Retirement Illustration* software for PCs lets employees calculate the amount of income they can receive based on their retirement accumulation and the payment option they select.

The *TIAA-CREF Financial Wellness* tapes are videos of seminars offered to employees on a variety of financial topics, including saving for retirement, Social Security, and passing assets to the next generation. There are two tapes, one for those over age 45 and one for younger employees. We also have a video of a similar talk given by Frank Federman of AUI.

Check the book racks outside of the Personnel Office or near your local personnel representative and your site library for more information about retirement planning. Many of the companies that are available through our retirement plan send regular newsletters and other information.

The Personnel Manager is always available for individual retirement counseling.

If you wish to borrow any of the above items, contact the Personnel Office in Charlottesville or your local personnel representative.

## 3000 Employees in less than 40 Years

Just months shy of its 40th birthday, NRAO hired its 3000th employee. The National Science Foundation and Associated Universities, Inc. entered into a contract which resulted in the creation of NRAO on November 17, 1956. RAO number 3000 was assigned on June 3, 1996.

See if you can answer the following questions about RAO numbers and employees:

1. Who received RAO number 1? What date was it assigned?
2. Which active employee has the lowest RAO number?
3. What employee has worked for NRAO the longest (continuously)?
4. What year was RAO number 1000 assigned? RAO number 2000?
5. What has been the most common last name for NRAO employees?
6. How many employees know their own RAO number?

(For the answers, turn back to page 5.)

## Suggestion

Many students take 5 years to complete their undergraduate degree. This is true of most students in technical programs, as well as many in liberal arts programs. Why not offer AUI Scholarship winners the option of taking their scholarship over 4 years at \$2500 per year or over 5 years at \$2000 per year? Since the AUI Scholarship is taken into consideration when computing the availability of grants and loans, the annual amount of the scholarship affects eligibility for other types of assistance.

## Answer

Susanne Demchak, the Program Administrator for the AUI Scholarship, writes that there is no reason winners should not have this option available. She does recommend that the student and his or her parent make arrangements to meet with the financial aid administrator before the start of the first year to discuss scholarship payments. This way, the school and student can tailor the payment schedule to best meet the needs of the scholarship winner and payments will be made to the school over five years.

## 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](mailto:wmahle@nrao.edu).*

**Wendy Mahle, Editor**

Printed on  
Recycled Paper

