



# NRAO NEWSLETTER

1986 January 1

No. 26

## VLA

### VLA CONFIGURATION SCHEDULE

#### I. 1986/87

<u>Quarter</u>	<u>Configuration</u>	<u>Proposal Deadline</u>
1986 Q1	D, D+A, A [11]	Sept. 15, 1985
1986 Q2	A, A/B [13]	Dec. 15, 1985
1986 Q3	A/B, B, B/C [14]	Mar. 15, 1986
1986 Q4	B/C, C [16]	June 15, 1986
1987 Q1	C, C/D [18]	Sept. 15, 1986

A/B, etc., are hybrid configurations with a long north arm. D+A is only suitable for point source observations. [ ] indicates the number of antennas available at 327 MHz.

#### II. Approximate Long-Term Schedule

	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>
1986	D	A	B	C
1987	C	D	A*	B
1988†	B	C	D	A
1989+	A	B	C	D

\* We may modify the schedule to avoid A array in summer.

† All antennas equipped for 327-MHz operation.

+ All antennas equipped for 8.4-GHz operation.

R. D. Ekers

### PIPELINE NEWS

The Pipeline is currently available for data processing. The PDP 11/44 display system has been replaced by a VAX 750. AIPS is now running on that system, and a preliminary version of the old DISPLAY system is also available. Alan Pedlar is coordinating data processing activity on the Pipeline. Users are encouraged to consult with Alan before using the Pipeline.

Many users are not allowing enough time for spectral-line data reduction. Inexperienced users should allow one and preferably two weeks for data reduction. Also, it is best to arrive at least two working days before observing in order to set up an optimum observing strategy.

R. Payne

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SUPERCOMPUTER ACCESS PROGRAM

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VLA image-processing software has now been developed to the point where it is practical to use the NSF access program for processing VLA data. In order to begin a regular use of supercomputers for processing VLA data, NRAO has applied to the National Science Foundation Office of Advanced Scientific Computing for a larger block of time under their supercomputer access program. Initially processing will be possible on the Digital Production's Cray X-MP where our current software has been developed. During 1986, access will be diversified to other supercomputing centers. We have a growing list of projects for which supercomputer processing is required, and any other users who have data which would benefit from the use of a supercomputer should contact Ed Fomalont or myself, giving details of the requirements. A description of the capabilities now available can be obtained from Ed Fomalont at NRAO, Charlottesville.

R. D. Ekers

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AIPS ON THE CRAY X-MP

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AIPS processing is continuing on the CRAY X-MP computer at Digital Productions in Los Angeles. During the period November 15 to December 10, intense use of the CRAY demonstrated that the AIPS system in that supercomputer is reliable, relatively complete and simple to use. Six projects, which were too large to be conveniently reduced on the NRAO VAX AIPS, were reduced during this period. The CRAY is about 15 times faster in cpu speed than the VAX plus AP, although the decrease in real time was less because of the heavy use of the CRAY by Digital Productions.

W. R. Burns

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VLA COMPUTER OPERATIONS

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Jon Spargo has taken over as the Computer Operations Supervisor for VLA computers. He replaces Ina Cole who moved to join Peggy Perley and Dave Wunker as a data analyst. Jon will be responsible for overall operations of the off-line computers and is the prime contact for things like backups, disk pack allocations, documentation, etc.

We have hired two new computer operators for the VLA; one replacing Rick Placker who resigned recently, and the other a new position. They will be joining us early in the new year and will be available evenings and weekends (daytime) to assist users with the DEC-10, the Pipeline, and the VAX's.

D. S. Retallack

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VLA DATA REDUCTION IN CHARLOTTESVILLE

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VLA users who want to complete their data reduction in Charlottesville should now contact Jim Condon at (804) 296-0322 (or -0211) at least two weeks in advance. Long blocks of night and weekend time can be reserved on the VAX. As soon as the new Convex computer is working, it will be scheduled for outside users as well.

J. J. Condon

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VLA OBSERVATIONAL STATUS REPORT

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There will be a new version available in January, 1986. Please contact Alison Patrick.

Alison Patrick

DISTRIBUTION OF VLA TIME ALLOCATED PER PROPOSAL

Figure 1 shows the distribution of time allocated per proposal at the VLA during the last quarter of 1985 (D and CD hybrid arrays). This histogram may provide a useful guideline for proposers who are unaware of the amounts of time being granted to VLA proposals.

Figure 2 shows the fraction of the requested time allocated, plotted against requested time. Two conclusions of interest to proposers can be drawn from this figure. (1) In the majority of cases we allocate the actual time requested. (2) There is no significant tendency to allocate a smaller fraction of the time for larger requests. Consequently, there is no advantage to the proposer in breaking his proposal into smaller pieces, a practice which is also strongly discouraged because it increases the burden on both the referees and the time allocation committee.

The total number of proposals reviewed for this particular quarter was 140. Eighty-three percent of these have some time allocated, and 55% of the total requested time was allocated.

R. D. Ekers

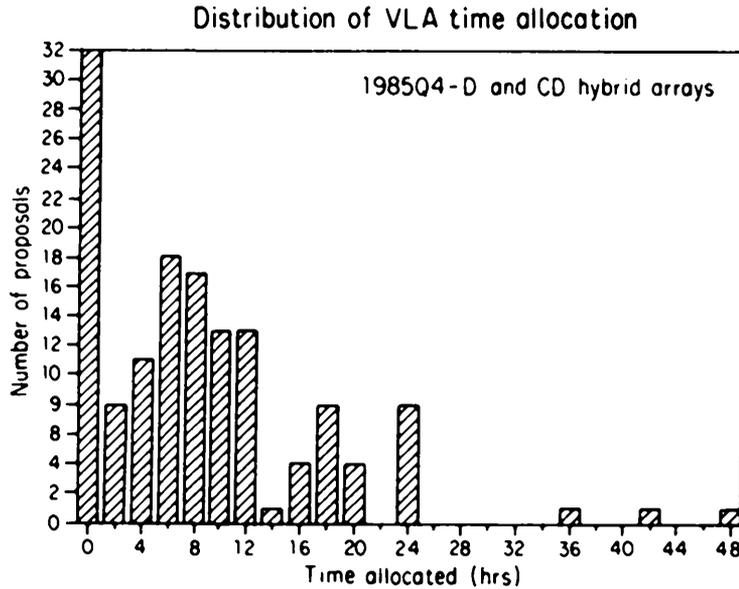


FIGURE 1

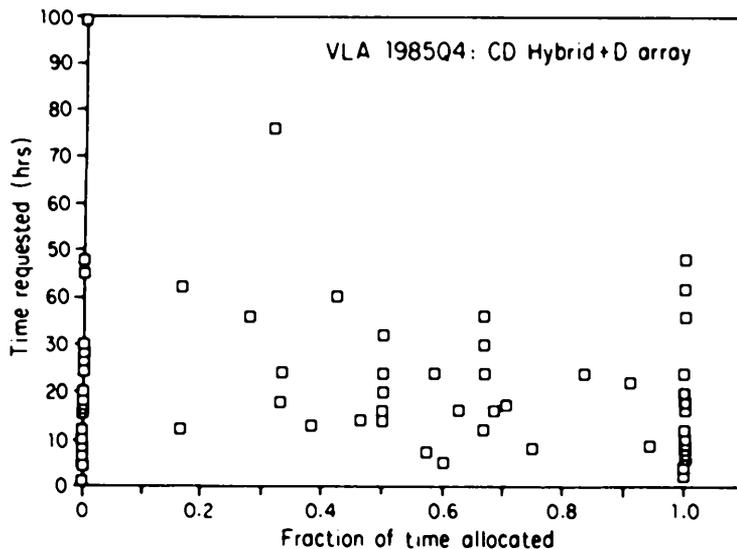


FIGURE 2

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AIPS WORKSHOP HELD IN CHARLOTTESVILLE

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An AIPS workshop was held in Charlottesville on Thursday, October 31 and Friday, November 1, in conjunction with the NRAO Users meeting. There were 35 participants, representing AIPS users from 15 sites in five countries. Topics discussed at the workshop included:

- (a) The use of AIPS in applications other than connected-element interferometry (single-dish mapping, reducing IRAS data, and VLBI).
- (b) Areas in which AIPS development is desirable (making it easier to program in AIPS, interactive image processing).
- (c) Experiences with AIPS at non-NRAO sites (CSIRO, Penn State, NRL, and Westerbork).
- (d) Transporting AIPS under UNIX and into new vector/parallel architectures.
- (e) Problem areas in AIPS and requirements for new tasks and system features.
- (f) Future evolution of AIPS.

It was clear that AIPS is now being used for a wide variety of astronomical applications, and also that many enhancements or modifications to the package would be of benefit to its broadening user community. A detailed account of the topics discussed at the workshop is now available as AIPS Memo No. 40. Anyone interested in obtaining a copy of this memo should contact Nancy Weiner in Charlottesville (ext. 328).

A. H. Bridle

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NEW AIPS COOKBOOK AVAILABLE

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A new edition of the AIPS Cookbook has been prepared by Alan Bridle and Eric Greisen. This document is the basic guide for users of AIPS, the NRAO Astronomical Image Processing System. It begins with detailed, step-by-step instructions for the beginning user, then treats a few more advanced topics. An index to all AIPS software, a glossary of astronomical image processing terms (prepared by Fred Schwab), and guides to using NRAO's AIPS hardware complete the book.

This third typeset edition has been corrected for all changes in the AIPS package through the 15 October 1985 software release. The chapters on image making and deconvolution have been rewritten to describe the program "MX" and to give additional guidance on running the self-calibration program "ASCAL." The chapter on spectral-line processing has been completely rewritten (by Jacqueline van Gorkom), and a new chapter on VLBI-specific processing has been added by John Benson. Samples of several display algorithms, and a number of new recipes, have also been added.

Copies of the new AIPS Cookbook may be obtained by requesting them from Nancy Weiner in Charlottesville (ext. 328). Alternatively, visitors to the VLA site can obtain them from Teresa McBride (Control Building, second floor).

A. H. Bridle

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VLA OBSERVING APPLICATION FORMS

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The most recent revision of the VLA observing application was made in April 1984 (dated on the reverse of the form, which is included herein). Although another revision is not foreseen in the near future, all versions will first appear in the NRAO Newsletter. Please make an effort to use the most current version.

R. J. Havlen



# VLA OBSERVING APPLICATION

A  
received:

SEND TO: Director NRAO Edgemont Rd. Charlottesville, Va. 22901

DEADLINES: 15th of Mar , June, Sept., Dec. for Q 3, 4, 1, 2 respectively

① Date:

② Title of Proposal:

③ Authors	Institution	Who will observe?	For Grad Students Only	
			Observations for PhD Thesis?	Anticipated PhD Year

④ Related previous VLA proposal number:

⑤ Contact author for scheduling:

Address:

⑥ Telephone:

TWX:

⑦ Scientific category: planetary, solar, stellar, galactic, extragalactic

⑧ Configuration(s) (A, B, C, D, A/B, B/C, C/D, Any)					
⑨ Wavelength (90 20 18 6 2 1.3 cm)					
⑩ Time requested (hours or days)					

⑪ Type of observation: mapping, point source, monitoring, continuum, lin poln, circ poln, spectral line, solar, VLBI, phased array, other \_\_\_\_\_

⑫ ABSTRACT (do not write outside this space):



## 12-Meter

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### OBSERVING RESTRICTIONS ON THE 12-M TELESCOPE

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We are continuing to experience excessive heating of the feed support legs, especially in the "north-south" direction. Therefore, effective immediately, we will no longer attempt to observe sources within one hour of right ascension or within 15 degrees of declination of the sun.

D. E. Hogg

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### 280-312 GHZ FREQUENCY COVERAGE

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It has been the intention to provide access to the band between 270 and 290 GHz by using mixers incorporated into the 1.3-mm receiver. However, there has been difficulty in producing a reliable LO source for this band. In addition, it is extremely desirable to have the capability to make observations in the band up to 310 GHz.

John Payne undertook a laboratory experiment in which he replaced the mixer in the 345-GHz receiver with one designed to perform in the range near 290 GHz. The LO system was the quasi-optical tripler designed by John Archer. The results were very encouraging, showing SSB receiver temperatures ranging between 1600 K at 285 GHz and 1000 K at 280 and 312 GHz.

The prototype tripler has now been redesigned, and a unit that will be more suitable for use on the telescope is being machined. It is now planned to have a period of observations at 345 GHz in early February, followed by a period for 300-GHz work in late February or early March.

D. E. Hogg

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### SIS 95-115 GHZ RECEIVER

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Problems with the cryogenic system have delayed the installation of the SIS receiver on the 12-m telescope. These problems have now been solved and the receiver should be ready for tests in early January. Various other minor problems have been sorted out in the meantime, and the phase-locked Gunn oscillator and digital data link are performing reliably.

Two SSB mixers (designed by S.-K. Pan and A. R. Kerr) will be installed, and these should give a factor of two improvement in sensitivity over the present Schottky receiver.

D. E. Hogg

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### HYBRID SPECTROMETER

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A spectrometer using a hybrid of analog-filter and digital-correlator techniques is being constructed for use at the 12-m Tucson telescope. The final system will comprise 8 segments, each analyzing bandwidths of 300 MHz to 37.5 MHz, with 192 channels. A prototype segment has been constructed and is under test along with further development of software. At present, the software is 90% complete and tests are in progress to measure the rms fluctuations as a function of integration time and to measure the shape of artificial spectral lines. The system is giving theoretical fluctuation for integration times up to a few hours, but has higher than theoretical fluctuation for integration times of the order of a day (twice theoretical at 100,000 seconds). Tests and further development will continue.

S. Weinreb

## Green Bank

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### DATA TAPE ARCHIVING AT NRAO-GREEN BANK

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Effective 1986 January 1, data tapes created at the Green Bank telescopes will be archived there as well, not--as in the past--in Charlottesville. Archived tapes will be stored for one year from the date on which they are created. If they are needed for a longer period of time, the burden is on the observer to insure their permanence. If no contact is made with the tape librarian before one year has expired, the tapes are automatically released, cleaned, and recycled. Please note this departure from past practice in Charlottesville.

Any copy of a tape needed by an observer can be obtained by contacting the librarian, Mrs. Berdeen O'Brian (304 456-2223), before the release date on the archived tape. The copy can either be exact or in ASCII format. If the observer wishes to retain copied data tapes or "keep" tapes, he will be billed for them.

B. Vance

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### ANALYSIS SOFTWARE ON LAB MASSCOMP

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Software for continuum and spectral-line analysis (CONDAR and POPS, respectively) of data obtained on either the 140-ft or 300-ft telescope has been installed on the Masscomp computer in the Jansky Laboratory. Now the observer can reduce his or her data on any of three Modcomps (one at each telescope and one in the Jansky Laboratory) or on the lab Masscomp. Any user familiar with the versions found on the Modcomps will have little trouble running the new versions.

The main advantage of the Masscomp versions are: (a) the possibility of increased storage space for user-defined procedures, and (b) complete independence from other POPS users. Since the Masscomp versions allow the user to write, edit, and manipulate files containing arbitrary data, it will be easy for a user familiar with UNIX, the operating system on the Masscomp, to perform preliminary data reduction with POPS and CONDAR, and subsequent and more sophisticated data reduction using code written by the user for his or her own needs.

Please contact Ron Maddalena at Green Bank if you have questions about POPS or if you plan to make extensive use of the new analysis systems while observing in Green Bank.

R. Maddalena

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### ANNOUNCEMENT OF A WORKSHOP

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We are currently planning a workshop on "Continuum Radio Processes in Clusters of Galaxies." Our tentative plans are to hold a 3-1/2 day meeting during the first week in August, 1986, either in Green Bank or Socorro. The emphasis of the workshop will be on what we can learn about clusters through the study of radio sources. The topics to be addressed include radio surveys of clusters, NATs, WATs, diffuse cluster halos, dominant cluster galaxies, accretion flows, cluster magnetic fields, and the interaction between radio galaxies and the ICM. Please write to Chris O'Dea in Charlottesville to indicate your interest in attending the meeting.

C. P. O'Dea and J. Uson

## In General

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### IBM REMOVAL/CONVEX INSTALLATION

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On December 20, the IBM 4341 system was removed. In its place, a Convex CI computer system was installed. The changeover was made because the older IBM system was no longer an attractive system for the NRAO's needs and because it was too expensive to operate. The new system is technically very attractive, and including capitalization is substantially less costly. A portion of the system will be made available to the University of Virginia under a suitable financial arrangement.

The Convex is a vector register machine analogous to the CRAY-1 or the CRAY X-MP. It has vector registers, constant stride loading, gather/scatter, and can do scalar operations while vector operations are in progress. The machine has a capacity of about four times a VAX 11/780 in scalar and about three times a VAX 11/780 plus array processor in vector work. AIPS has already been run on the Convex as a benchmark. The CI will be used both for AIPS processing and for general-purpose computing.

W. R. Burns

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### UNIQUE FOREIGN TELESCOPE TRAVEL SUPPORT

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A number of people have commented on the notable lack of travel support given to graduate students who accompany their research professors to obtain dissertation, observational material at foreign radio facilities. In view of the fact that deductible travel is normally reimbursable for two observers at all NRAO facilities and that the training of graduate students is of fundamental concern to the NSF, the NRAO policy for foreign telescope observing travel will be modified for thesis observations.

Faculty members and their PhD dissertation students who wish to take advantage of the available travel support should submit a statement that adequately justifies their case as part of the application process.

R. J. Havlen

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### NOBEYAMA USERS FROM U.S. INSTITUTIONS

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- Most of the U.S. observers who travel to Japan to use the Nobeyama 45-m telescope receive air fare support from the NRAO administered/NSF funded foreign telescope travel fund. The NRAO is therefore assembling a limited amount of useful information that has been gleaned from previous 45-m observers and that could presumably be valuable to future first-time visitors to Japan. If you wish to contribute additional perspectives to this document, or if you would like to receive a copy once it is completed, please let us know.
- If you have submitted a telescope proposal to the Nobeyama 45-m, and you are expecting support from the NRAO, would you please send the NRAO an advance copy of your proposal. If we have enough lead time, we can probably steer you to inexpensive air fares and/or fill you in on as much advance information concerning Nobeyama observing as we have available.

R. J. Havlen

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FALL USERS MEETING REPORT

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The following issues were highlighted during the most recent Users Committee meeting in Charlottesville on October 30 and 31, 1985.

12-meter

- The Users reiterated their concern over the assignment of routine test and troubleshooting time for NRAO staff at the 12-m telescope. Improved system performance and reliability would result if the entire telescope-electronics-computer system were occasionally reserved for NRAO scientist-engineer troubleshooting teams.
- The development of a 230-GHz multibeam system for the 12-m received the most enthusiastic User response. Early construction of an efficient mapping facility was viewed as the highest priority project discussed at the meeting.
- A satisfactory system continues to be needed for flexibly responding to high and low-frequency observers as dictated by the atmospheric conditions.

VLA

- The Users counseled the NRAO against scheduling numerous preliminary 327-MHz observations during the current period when not all antennas are outfitted and later reobservations will certainly be required.
- The Users were in favor of enforcing collaborative data-taking in obvious scientific areas where competition among numerous groups is high.
- On-line capability for calibration, editing, imaging, etc., received strong support.
- High-priority suggestions that were discussed included: upgrading the K-band receivers; providing supercomputer capability at the site; training a Pipeline operator; and providing support at the VLA for in absentia VLBI observing.

The Users also discussed the relative merits and judged priorities on the following four VLA instrumentation projects:

- - Implementation of a full VLA bandwidth link to the Pie Town VLBA antenna;
- - L-band system noise improvement;
- - Construction of the 75-MHz system at the VLA; and
- - H<sub>2</sub>O radiometer-based tests for improved phase calibration.

General

- The Users felt that, given the appropriate resources, the NRAO should begin to develop expertise in the area of sub-millimeter astronomy.

R. J. Havlen

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TELESCOPE PROPOSAL CLARIFICATIONS

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If you are submitting a proposal that is significantly related to another proposal, we would greatly appreciate it if you would attach a cover letter clarifying the connection. Typically, the NRAO receives proposals that completely replace or simply modify earlier proposals, and in the absence of an explanation the telescope time request becomes unnecessarily confusing to both the referees and the persons charged with telescope scheduling.

Please do not assume that we are clairvoyant. More than likely any confusion that arises over modified source lists, VLA configuration changes, or critical observing parameters will lead to delays in scheduling your proposal.

R. J. Havlen

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TRAVEL DEDUCTIBLE FOR VLA DATA REDUCTION

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For a number of years the NRAO has administered a progressive travel reimbursement scale where the minimum deductible was set at \$150 (applicable whenever the air fare was \$300 or less). Air fares exceeding \$300 were subject to a greater deductible (\$175 for a \$400 ticket; \$200 for a \$500 ticket, etc.). In addition, a further wrinkle was added for travel to use VLA data-reduction facilities: the \$150 minimum deductible was waived in cases where it had already been incurred in order to obtain the original observations.

In the future there will be no differentiation between observing travel and data-reduction travel with respect to reimbursement. The new reimbursement policy will be much easier to administer and removes the confusion that some users have experienced. The \$150 minimum deductible will apply equally to observing and data-reduction travel, while the actual deductible will scale upward with the air fare as described above. Because of the greater housing costs in Charlottesville, however, the \$20 per night housing allowance will still be maintained there.

R. J. Havlen

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PUBLIC INFORMATION AND NRAO OBSERVATIONAL DATA

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The NRAO encourages its users to keep us informed of new, interesting, and newsworthy observational conclusions that result from your NRAO data. Although the NRAO is not in the business of writing press releases, we do have limited resources and access to more extensive resources to assist you in communicating your findings to the public. In many instances we would be more than happy to issue a press release jointly with your home institution.

Reference to NRAO observational data in the popular press should clearly state that the facility (VLA, 140-ft, 300-ft, or 12-m) is part of the NRAO, operated by AUI, under contract with the NSF. Acknowledgement of the beneficial use of taxpayers money is a requirement that should not be overlooked, as we expect their increasing support in funding future astronomical research.

If you are considering the preparation of a news release based on NRAO data, please contact R. Havlen in Charlottesville [(804) 296-0223] to discuss guidelines for its preparation.

R. J. Havlen



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