Proposals for IRAM Telescopes

The deadline for submission of observing proposals on IRAM telescopes, both the interferometer and the 30m, is

18 September 2008, 17:00 MEST (UT + 2 hours)

The scheduling period extends from 1 Dec 2008 – 31 May 2009. Proposals should be submitted through our web–based submission facility. Instructions can be found on our web page at URL:

http://www.iram.fr/GENERAL/
submission/submission.html

Detailed information on time estimates, special observing modes, technical information and references for both the IRAM interferometer and the IRAM 30m telescope can be found on the above mentioned web page. The submission facility will be opened about three weeks before the proposal deadline. Proposal form pages and the 30m time estimator are available now.

Please avoid last minute submissions when the network could be congested. As an insurance against network congestion or failure, we still accept, in well justified cases, proposals submitted by:

– fax to number: (+33) 476 42 54 69 or by

– ordinary mail addressed to:
IRAM Scientific Secretariat,
300, rue de la piscine,
F-38406 St. Martin d'Hères, France

Proposals sent by e–mail are not accepted. Color plots will be printed/copied in grey scale. If color is considered essential for the understanding of a specific figure, a respective remark should be added in the figure caption. The color version may then be consulted in the electronic proposal by the referees.

Soon after the deadline the IRAM Scientific Secretariat sends an acknowledgement of receipt to the Principal Investigator of each proposal correctly received, together with the proposal registration number. Note that the web facility allows cancelation and modification of proposals before the deadline. The facility also allows to view the proposal in its final form as it appears after re–compilation at IRAM. We urge proposers to make use of this feature as we always receive a number of corrupted proposals (figures missing, blank pages, etc.).

Valid proposals contain the official cover page, up to two pages of text describing the scientific aims, and up to two more pages of figures, tables, and references. The normal proposals should *not exceed these 5 pages*. Except for the technical pages for the interferometer, longer proposals will be cut. The new **Large Observing Programmes** (see the announcement by P. Cox which appeared in the August 2008 Newsletter) have up to 4 pages for the scientific justification, plus cover page and 2 pages for supporting material.

The proposal template `proposal.tex` and the LaTeX style file `proposal.sty` may be obtained from the IRAM web pages[1] at URL `../GENERAL/-submission/proposal.html`. In case of problems, contact the secretary, Fabienne Schicke, (e–mail: `berjaud@iram.fr`). Please, make sure that your proposals use the current form pages.

In all cases, indicate on the proposal cover page whether your proposal is (or is not) a *resubmission* of a previously rejected proposal or a *continuation* of a previously accepted interferometer or 30m proposal. We request that the proposers describe very briefly in the introductory paragraph (automatically generated header "Proposal history: ") why the proposal is being resubmitted (e.g. improved scientific justification) or is proposed to be continued (e.g. last observations suffered from bad weather).

Do not use characters smaller than 11pt. This could render your proposal illegible when copied or faxed. If we notice any formal problems before the deadline, we will make an effort to contact the principal investigator and solve the problem together.

Applications for **short spacing observations** have been simplified. If the need for complementary 30m observations is evident already at the time when the PdB interferometer proposal is prepared, just note this need on the interferometer proposal. A separate proposal for the 30m telescope is not required. The blank form for interferometer proposals contains a bullet, labelled "short spacings" which should then be checked. The interferometer style file will prompt for an additional paragraph in which the scientific need for the short spacings should be described. It is essential to give here all observational details, including size of map, sampling density and rms noise, spectral resolution, receiver configuration and time requested.

A mailing list has been set up for astronomers interested in being notified about the availability of a new Call for Proposals. A link to this mailing list is on the IRAM web page. The list presently contains all users of IRAM telescopes during the last 2 years.

J.M. Winters & C. Thum

[1] from here on we give only relative URL addresses. In the absolute address the leading two dots (..) should be replaced by the address of one of our mirror sites: http://www.iram.fr or http://www.iram.es.

Travel funds for European astronomers

IRAM participates in the RadioNet project, an initiative funded by the European Commission within the FP6 Programme to improve and encourage communication among astronomers of the European Community and associated countries. Transnational access (TNA) is the largest RadioNet programme and provides funding for travel expenses incurred by eligible users for carrying out their observations or reducing their data. As a partner of RadioNet, IRAM has now some limited TNA funds to pay travel expenses for eligible users. Detailed information about user eligibility, TNA contacts, policies and travel claims for the IRAM 30m telescope and Plateau de Bure Interferometer can be found on the RadioNet home page at `http://www.radionet-eu.org`.

As the FP6 Programme comes to an end this year and the terms of its successor FP7 have not yet been finalized, the TNA support which IRAM can provide is uncertain after December 2008. This caveat therefore concerns the bulk of the coming winter semester. Eligible users will be contacted directly when the new terms are available.

Observers requesting TNA support will be asked to provide the necessary personal and professional information to IRAM. Funding through RadioNet should be acknowledged in publications resulting from TNA supported observations.

R. Neri & C. Thum

Call for Observing Proposals on the 30m Telescope

Summary

Proposals for three types of receivers will be considered for the coming winter semester:

1. the observatory's set of four dual polarization heterodyne receivers centered at wavelengths of 3, 2, 1.3, and 1.1 mm.
2. the 9 pixel dual-polarization heterodyne receiver array, HERA, operating at 1.3 mm wavelength
3. The MAMBO–2 bolometer array with 117 pixels operating at 1.2 mm; the smaller MAMBO–1 array with 37 pixels is kept as a backup.

Emphasis will be put on observations at the shorter wavelengths, but 3mm proposals are also encouraged inasmuch as they are suited for medium or low quality weather backup onservations. About 2000 hours of observing time are expected to be available.

The main news relevant for the coming winter semester are described here. Details of proposal formalities, instrumentation, observing modes, and estimation of observing time are described on the IRAM web site.

What is new?

In addition to the normal observing proposals, IRAM invites applications for special **Large Observing Programmes** (see the announcement by P. Cox which appeared in the Augist 2008 Newsletter). On the 30m telescope, these Large Observing Proposals are restricted for the coming winter semester to the bolometer and HERA instruments. The proposal cover page provides a checkbox for identifying a Large Programme.

The next generation single pixel heterodyne receiver for Pico Veleta, **EMIR** (Eight MIxer Receiver), consisting of dual-polarization 4 GHz bandwidth mixers operating at 3, 2, 1.3, and 0.9mm, will provide a boost in sensitivity and observing capabilities, fully justifying its installation as soon as possible during the coming winter semester. Installation and commissioning will take about 4 weeks. During installation, observation with HERA or MAMBO can still precede during night time, since the Nasmyth cabin optics are not affected at this stage. In view of the uncertain time scale and our lack of experience with EMIR, we request 30m proposer to use the performance of the *current receivers* for their estimate of observing time. Proposals scheduled after the installation of EMIR may see their time allocation adjusted accordingly.

An effort was made with EMIR to keep as much as possible of the frequency range below 83 GHz. As the final outcome will not be known before the proposal deadline, we recommend to interested astronomers to consider applying for these low frequencies now.

Remote observing is available from the IRAM offices in Granada and Grenoble, and from the remote stations in Madrid and Bonn. A remote station in Paris may also become available soon.

Applications

The official proposal cover page should be filled in with great care. All information on this page gets directly transferred into the IRAM proposal database. Attention should be given to *Other requirements* where the proposer can enter dates where he/she is not available for observing.

In order to avoid useless duplication of observations and to protect already accepted proposals, we keep a computerized list of targets. We ask you to fill in carefully the source list in equatorial J2000 coordinates. This list *must contain all the sources* (and only those sources) for which you request observing time. Your list must adhere to the format indicated on the proposal form. If your source list is longer than 15 sources that fit onto the cover page, please use the LaTeXmacro `\extendedsourcelist`.

A scientific project should not be artificially cut into several small projects, but should rather be submitted as one bigger project, even if this means 100–150 hours of observing time. Note that large programs of particular scientific importance can be submitted in the "Large Programs" category.

If time has already been given to a project but turned out to be insufficient, explain the reasons, e.g. indicate the amount of time lost due to bad weather or equipment failure; if the fraction of time lost is close to 100%, don't rewrite the proposal, except for an introductory paragraph. For continuation of proposals having led to publications, please give references to the latter.

Reminders

For any questions regarding the telescope and the control programs, we recommend to consult the NCS web pages (../IRAMES/ncs30m) and our page with the summary of telescope parameters.

The report entitled "Calibration of spectral line data at the IRAM 30m telescope" explains in detail the applied calibration procedure. Both documents can be retrieved from the URL ../IRAMES/otherDocuments/manuals/index.html. A catalog of well calibrated spectra for a range of sources and transitions (Mauersberger et al. [9]) is very useful for monitoring spectral line calibration. A copy of the 30m file with the calibrated spectra can be downloaded from the Spanish web site.

The astronomer on duty (whose schedule can be found at URL /IRAMES/mainWiki/-AstronomerOnDutySchedule) should be contacted well in advance for any special questions concerning the preparation of an observing run.

Frequency switching is available for both HERA and the single pixel SIS receivers. This observing mode is interesting for observations of narrow lines where flat baselines are not essential, although the spectral baselines with HERA are among the best known in frequency switching. Certain limitations exist with respect to maximum frequency throw ($\leq$ 45 km/s), backends, phase times etc.; for a detailed report see [4]. This report also explains how to identify mesospheric lines which may easily be confused in some cases with genuine astronomical lines from cold clouds.

If your observations with the 30-m telescope results in a publication, please acknowledge this in a footnote "Based on observations with the IRAM 30-m telescope. IRAM is supported by CNRS/INSU (France), the MPG (Germany) and the IGN (Spain). Please email a copy of the publication to Dennis Downes (downes@iram.fr).

Observing time estimates

This matter needs special attention as a serious time underestimate may be considered as a sure sign of sloppy proposal preparation. We strongly recommend to use the web–based Time Estimator at URL ../IRAMES/obstime/time_estimator.html , whenever applicable. Version 2.6 handles heterodyne (single pixel and HERA) as well as bolometer observations with updated instrumental parameters.

If very special observing modes are proposed which are not covered by the Time Estimator, proposers must give sufficient technical details so that their time estimate can be *reproduced*. In particular, the proposal must give values for $T_{\rm sys}$, the spectral resolution, the expected antenna temperature of the signal, the signal/noise ratio which is aimed for, all overheads and dead times, and the resulting observing time. The details of the procedures on which our time estimator is based are explained in a technical report published in the January 1995 issue[2] of the IRAM Newsletter [5].

Proposers should base their time request on normal winter conditions, corresponding to 4 mm of precipitable water vapor. Conditions during afternoons can be degraded due to anomalous refraction. The observing efficiency is then reduced and the flux/temperature calibration is more uncertain than the typical 10 percent (possibly slightly more for bolometer observations). If exceptionally good transmission or stability of the atmosphere is requested which may be reachable only in best winter

[2] electronically available at URL `../IRAMFR/ARN/-newsletter.html`

conditions, the proposers must clearly say so in their time estimate paragraph. Such proposals will however be particularly scrutinized.

Pooled observing

As in previous semesters, we plan to pool the bolometer with other suitable proposals into a bolometer pool. HERA projects will be pooled with other less demanding project into a HERA pool. Both pools will be organized in several sessions, occupying a significant fraction of the totally available observing time. The proposals participating in the pools will be observed by IRAM staff, the PIs and Co-PIs of participating projects and other cooperating external astronomers. The pool observations will be organized by the pool coordinators, Stéphane Léon (bolometers) and Helmut Wiesemeyer (HERA). The participating proposals are grouped according to their demand on weather quality, and they get observed following the priorities assigned by the program committee. The organization of the bolometer and the HERA observing pools are described at ../IRAMES/mainWiki/PoolObserving.

Bolometer and heterodyne proposals which are particularly weather tolerant qualify as backup for the pools. Participation in the pools is voluntary, and the respective box on the proposal form should be checked.

Questions concerning the pool organization can be directed to the scheduler (thum@iram.fr) or the Pool Coordinators, Stéphane Léon (leon@iram.es) and Helmut Wiesemeyer (wiesemeyer@iram.es).

Service observing

To facilitate the execution of short (≤8 h) programmes, we propose "service observing" for some easy to observe programmes *with only one set of tunings*. Observations are made by the local staff using precisely laid–out instructions by the principal investigator. For this type of observation, we request an acknowledgement of the IRAM staff member's help in the forthcoming publication. If you are interested in this mode of observing, specify it as a "special requirement" in the proposal form. IRAM will then decide which proposals can actually be accepted for this mode.

Remote observing

This observing mode where the remote observer actually controls the telescope very much like on Pico Veleta, will be available from the IRAM offices in Granada and Grenoble. It is also foreseen that the remote station at the MPIfR Bonn is available. The remote stations in Paris and Madrid will come on line later during the semester. If you are planning to use remote observing, please contact the Astronomer on Duty (for Granada), Pierre Hily–Blant (hilyblan@iram.fr) for Grenoble, or Dirk Muders, muders@mpifr-bonn.mpg.de for Bonn well in advance of your observing run. As a safeguard, please email observing instructions and macros to the AoD and/or operator. A dedicated phone line to the control desk for voice mail is available for remote observers: +34 958 482009.

Technical Information about the 30m Telescope

This section gives all the technical details of observations with the 30m telescope that the typical user will have to know. A concise summary of telescope characteristics is published on the IRAM web pages.

HERA

A full description of HERA **HE**terodyne **R**eceiver **A**rray and its observing modes is given in the HERA manual. Here we only give a short summary.

The 9 dual–polarization pixels are arranged in the form of a center–filled square and are separated by 24″. Each beam is split into two linear polarizations which couple to separate SIS mixers. The 18 mixers feed 18 independent IF chains. Each set of 9 mixers is pumped by a separate local oscillator system. The same positions can thus be observed simultaneously at any two frequencies inside the HERA tuning range (210-276 GHz for the first polarization, and 210-242 for the second polarization).

A derotator optical assembly can be set to keep the 9 pixel pattern stationary in the equatorial or horizontal coordinates. Receiver characteristics are listed in Tab. 1.

Recent observations have shown that the noise temperature of the pixels of the second polarization array may vary across the 1 GHz IF band. The highest noise occurs towards the band edges which are, unfortunately, picked up when HERA is connected with VESPA whose narrow observing band is located close to the lower edge of the 1 GHz band. Therefore, while not as important for wide band observations with centered IF band, the system noise in narrow mode is higher (factor 1.5 – 2) as compared to the first polarization array. We do not recommend to use the second polarization for frequencies > 241 GHz.

HERA can be connected to three sets of backends:

- ▷ VESPA with the following combinations of nominal resolution (KHz) and maximum bandwidth (MHz): 20/40, 40/80, 80/160, 320/320, 1250/640. The maximum bandwidth can actually be split into two individual bands for each of the 18 detectors at most resolutions. These individual bands can be shifted separately up to ±200 MHz offsets from the sky frequency (see also the sections on backends below).
- ▷ a low spectral resolution (4 MHz channel spacing) filter spectrometer covering the full IF bandwidth of 1 GHz. Nine units (one per HERA pixel) are available. Note that only one polarization of the full array is thus connectable to these filter banks.
- ▷ WILMA with a 1 GHz wide band for each of the 18 detectors. The bands have 512 spectral channels spaced out by 2 MHz.

HERA is operational in two basic spectroscopic observing modes: *(i)* raster maps[3] of areas typically not smaller than 1′, in position, wobbler, or frequency switching modes, and *(ii)* on–the–fly maps of moderate size (typically 2′ − 10′). Extragalactic proposals should take into account the current limitations of OTF line maps, as described in the HERA User Manual, due to baseline instabilities induced by residual calibration errors. HERA proposers should use the web–based Time Estimator. For details about observing with HERA, consult the User manual. The HERA project scientist, Karl Schuster (schuster@iram.fr), or Albrecht Sievers (sievers@iram.es), the astronomer in charge of HERA, may also be contacted.

Accepted HERA proposals will be pooled together in order to make more efficient use of stable 1.3mm observing conditions (see section . Questions concerning the HERA pool organization can be directed to the scheduler (thum@iram.fr) or the HERA Pool Coordinator, Helmut Wiesemeyer (wiesemeyer@iram.es).

The single pixel heterodyne receivers

Four dual polarization SIS receivers are available at the telescope for the upcoming observing season. They are designated according to the dewar in which they are housed (A, B, C, or D), followed by the center frequency (in GHz) of their tuning range. Their main characteristics are summarized in Tab. 1. All receivers are linearly polarized with the E–vectors, before rotation in the Martin–Puplett interferometers, either horizontal or vertical in the Nasmyth cabin. Up to four of these eight receivers can be combined for simultaneous observations in the four ways depicted in Tab. 1. Note that they cannot be combined with HERA nor with the bolometers. Also listed are typical system temperatures which apply to average summer/winter weather (7mm/4mm of water) at the center of the tuning range and at 45° elevation. All receivers are tuned by the operators from the control room. Experience shows that it normally takes not more than 15 min to tune four such receivers.

According to current planning IRAM will replace the present set single pixel heterodyne receivers by a new generation receiver designated EMIR (**E**ight **MI**xer **R**eceiver). EMIR is expected to be installed during the second half of the winter semester. Because this time scale is still somewhat uncertain and the EMIR characteristics are not yet precisely known, we request observers to still use the characteristics of the present receivers for their proposals. Observations scheduled after the installation of EMIR may get their time allocation adjusted accordingly.

Extended tuning range: 72 − 80 GHz. Several molecules of high astrophysical importance have transitions in the frequency band 66 − 80 GHz, i.e. between the atmospheric O_2 absorption band and the low frequency edge of the nominal 3mm tuning range (see Tab.1). Tests have shown that both 3mm receivers, A 100 and B 100 have good performance (good upper sideband rejection and system temperature) in the range 77 — 80 GHz. The receivers become increasingly double sideband below 77 GHz, until their behavior becomes erratic around 72 GHz. Due to the rapid variation of the image gain, special care must be exercised with calibration. A new image gain calibration tool is provided and described in the test report available on the IRAM web site (at ../IRAMFR/PV/veleta.htm). The report includes a set of reference spectra.

Observations in the 72 − 80 GHz range do not require any special arrangements. But note that the A 230 (B 230) receiver is not available when the A 100 (B 100) receiver is used below 80 GHz.

General point about receiver operations. Tuning of the single pixel/dual polarization receivers

[3] As long as the NCS raster command is not operational, the raster pattern has to be traced out with the help of a SIC loop.

Table 1: Heterodyne receivers available for the next winter observing season. Performance figures are based on recent measurements at the telescope. T^*_{sys} is the SSB system temperature in the T^*_A scale at the nominal center of the tuning range, assuming average winter conditions (4mm pwv) and 45° elevation. g_i is the rejection factor of the image side band. ν_{IF} and $\Delta\nu_{IF}$ are the IF center frequency and width. Note that the 8 standard receivers can be combined in 4 different ways.

receiver	polar–ization	combinations AB	CD	AD	BC	range GHz	T_{Rx}(SSB) K	g_i dB	ν_{IF} GHz	$\Delta\nu_{IF}$ GHz	T^*_{sys} K	remark
A 100	V	1		3		80 - 115.5	60 - 80	> 20	1.5	0.5	120	1
B 100	H	1			4	81 - 115.5	60 - 80	> 20	1.5	0.5	130	1
C 150	V		2		4	129 - 183	70 - 125	15 - 25	4.0	1.0	200	
D 150	H		2	3		129 - 183	80 - 125	8 - 17	4.0	1.0	200	
A 230	V	1		3		197 - 266	85 - 150	12 - 17	4.0	1.0	420	2
B 230	H	1			4	197 - 266	95 - 160	12 - 17	4.0	1.0	420	2
C 270	V		2		4	241 - 281	125 - 250	10 - 20	4.0	1.0	900	3
D 270	H		2	3		241 - 281	150 - 250	9 - 13	4.0	1.0	900	3
HERA	H/V					210 - 276	110 - 380	$\sim$ 10	4.0	1.0	400	2, 4

1: tuning range extended to $\geq$ 72 GHz under special conditions (see text)
2: noise increasing with frequency
3: performance at $\nu < 275$ GHz; noisier above 275 GHz.
4: the V–array of HERA has slighly higher noise which may vary across the IF band; it cannot be used for frequencies higher than 241 GHz.

is now considerably faster and more reproducible than before. Particular frequencies, like those in the range 72 – 80 GHz or those near a limit of the tuning range, may still be problematic. In these cases, we request to check with a Granada receiver engineers at least two weeks before the observations. HERA observers, however, are requested to send their frequencies as soon as their project gets scheduled.

Polarimeter XPOL. An upgrade of the IF polarimeter [16] is now available, where the cross correlation between the IF signals from a pair of orthogonally polarized receivers is made digitally in VESPA. The new observing procedure, designated XPOL, generates simultaneous spectra of all 4 Stokes parameters. The following combinations of spectral resolution (kHz) and bandwidth (MHz) are available: 40/120, 80/240, and 320/480.

Although successful XPOL observations were made at many frequencies, experience is still limited, particularly at 1.3mm wavelength and with respect to observations of extended sources. Considerable progress was made in reducing polarization sidelobes, notably for Stokes V. Interested users should contact C. Thum for details. Data reduction software using CLASS enhanced with a graphical user interface is available (H. Wiesemeyer). The technical aspects of XPOL and its observing capabilities and limitations are described in ref. **??**. Polarimetry proposals for observation of extended sources should demonstrate that their observations are feasible in the presence of the known sidelobes.

MPIfR Bolometer arrays

The bolometer arrays, MAMBO–1 (37 pixels) and MAMBO–2 (117 pixels), are provided by the Max–Planck–Institut für Radioastronomie. They consist of concentric hexagonal rings of horns centered on the central horn. Spacing between horns is $\simeq 20''$. Each pixel has a HPBW of $11''$. We expect that MAMBO–2 will be normally used, but MAMBO–1 is kept as a backup.

The effective sensitivity of both bolometers for onoff observations is ~ 40 mJy s$^{\frac{1}{2}}$ and ~ 45 mJy s$^{\frac{1}{2}}$ for mapping. The *rms*, in mJy, of a MAMBO–2 map is typically

$$rms = 0.4 f \sqrt{v_{scan} \Delta s}$$

where v_{scan}, in arc sec/sec, is the velocity in the scanning direction and Δs, in arc sec, is the step size in the orthogonal direction. The factor f is 1 (2) for sources of size $< 30''$ ($> 60''$). It is assumed that the map is made large enough that all beams cover the source. The sensitivities apply to bolometric conditions (stable atmosphere), (τ(250GHz) $\sim$

0.3, elevation 45 deg, and application of skynoise filtering algorithms). In cases where skynoise filtering algorithms are not or not fully effective (e.g. extended source structure, atmosphere not sufficiently stable), the effective sensitivity is typically about a factor of 2 worse. The principal investigators of accepted proposals will be requested to specify in the pool database which minimum atmospheric conditions their observations need.

The bolometer arrays are mostly used in two basic observing modes, ON/OFF and mapping. Previous experience with MAMBO–2 shows that the ON/OFF reaches typically an rms noise of ~ 2.3 mJy in 10 min of total observing time (about 200 sec of ON source, or about 400 sec on sky integration time) under stable conditions. Up to 30 percent lower noise may be obtained in perfect weather. In this observing mode, the noise integrates down with time t as $\sqrt{t}$ to rms noise levels below 0.4 mJy.

In the mapping mode, the telescope is scanning in the direction of the wobbler throw (default: azimuth) in such a way that all pixels see the source once. A typical single map[4] with MAMBO–2 covering a fully and homogeneously sampled area of $150'' \times 150''$ (scanning speed: $5''$per sec, raster step: $8''$) reaches an rms of 2.8 mJy/beam in 1.9 hours if skynoise filtering is effective. Much more time is needed (see Time Estimator) if sky noise filtering cannot be used. The area actually scanned ($8.0' \times 6.5'$) must be larger than the map size (add the wobbler throw and the array size ($4'$), the source extent, and some allowance for baseline determination) if the EHK–algorithm is used to restore properly extended emission. Shorter scans may lead to problems in restoring extended structure. Mosaicing is also possible to map larger areas. Under many circumstances, maps may be co–added to reach lower noise levels. If maps with an rms $\lesssim 1$ mJy are proposed, the proposers should contact R. Zylka (zylka@iram.fr).

The bolometers are used with the wobbling secondary mirror (wobbling at a rate of 2 Hz). The orientation of the beams on the sky changes with hour angle due to parallactic and Nasmyth rotations, as the array is fixed in Nasmyth coordinates and the wobbler direction is fixed with respect to azimuth during a scan. Bolometer proposals participating in the pool have their observations (maps and ONOFFs) pre-reduced by a data quality monitor which runs scripts in MOPSIC. This package, complete with all necessary scripts, is also installed for off-line data analysis in Granada and Grenoble. It is also available for distribution from the IRAM Data Base for Pooled Observations or directly from R. Zylka (zylka@iram.fr). The older software packages (NIC [7] and MOPSI [8]) are still available, but cannot process data obtained with the NCS.

Bolometer proposals will be pooled together like in previous semesters along with suitable heterodyne proposals as long as the respective PIs agree. The web–based time estimator handles well the usual bolometer observing modes, and its use is again strongly recommended. The time estimator uses rather precise estimates of the various overheads which will be applied to all bolometer proposals. If exceptionally low noise levels are requested which may be reachable only in a perfectly stable (quasi winter) atmosphere, the proposers must clearly say so in their time estimate paragraph. Such proposals will however be particularly scrutinized. On the other extreme, if only strong sources are observed and moderate weather conditions are sufficient, the proposal may be used as a backup in the observing pool. The proposal should point out this circumstance, as it affects positively the chance that the proposal is accepted and observed.

[4] see also the Technical report by D. Teyssier and A. Sievers on a special fast mapping mode (IRAM Newsletter No. 41, p. 12, Aug. 1999).

The Telescope

Beam and Efficiencies

Table 2 lists the size of the telescope beam for the range of frequencies of interest. Forward and main beam efficiencies are also shown (see also the note by U. Lisenfeld and A. Sievers, IRAM Newsletter No. 47, Feb. 2001). The variation of the coupling efficiency to sources of different sizes can be estimated from plots in Greve et al. [12].

At 1.3 mm (and a fortiori at shorter wavelengths) a large fraction of the power pattern is distributed in an error beam which can be approximated by two Gaussians of FWHP $\simeq 170''$ and $800''$ (see [12] for details). Astronomers should take into account this error beam when converting antenna temperatures into brightness temperatures. A variable and sometimes large contribution to the error beam was known to come from telescope astigmatism [3]. Extensive work during the last years had shown that the astigmatism resulted from temperature differences between the telescope backup structure and the yoke. The recent installation of heaters in the yoke by J. Peñalver has nearly completely removed the astigmatism [15].

Table 2: Main observational parameters of 30m telescope.

frequency [GHz]	θ_b ["] (1)	η_F (2)	η_{mb} (3)	S_ν/T_A^* [Jy/K]
86	29	0.95	0.78	6.0
110	22	0.95	0.75	6.3
145	17	0.93	0.69	6.7
170	14.5	0.93	0.65	7.1
210	12	0.91	0.57	7.9
235	10.5	0.91	0.51	8.7
260	9.5	0.88	0.46	9.5
279	9	0.88	0.42	10.4

(1) beam width (FWHP). A fit to all data gives: θ_b ["] = 2460 / frequency [GHz]
(2) forward efficiency (coupling efficiency to sky)
(3) main beam efficiency. Based on a fit of measured data to the Ruze formula: $\eta_{\rm mb} = 1.2\epsilon \exp(-(4\pi R\sigma/\lambda)^2)$ with $\epsilon = 0.69$ and $R\sigma = 0.07$

Pointing and Focusing

With the systematic use of inclinometers the telescope pointing became much more stable. Pointing sessions are now scheduled at larger intervals. The fitted pointing parameters typically yield an absolute rms pointing accuracy of better than $3''$ [10]. However, larger deviations can occur around sunset or sunrise, in which case we recommend more frequent pointings (every 1 or 2 hours, depending on the beam size). An effort is made that receivers are closely (usually $\lesssim 2''$) aligned. Checking the pointing, focus, and receiver alignment is the responsibility of the observers (use a planet for alignment checks). Systematic (up to 0.4 mm) differences between the foci of various receivers can occasionally occur. In such a case the foci should be carefully monitored and a compromise value be chosen. Not doing so may result in broadened and distorted beams ([1]).

Wobbling Secondary

- Beam–throw is $\leq 240''$ depending on wobbling frequency. At 2 Hz, the maximum throw is $90''$
- Standard phase duration: 2 sec for spectral line observations, 0.25 sec for continuum observations.

Unnecessarily large wobbler throws should be avoided, since they introduce a loss of gain, particularly at the higher frequencies, and imply a loss of observing efficiency (more dead time).

Backends

The following five spectral line backends are available which can be individually connected to any single pixel receiver and, if indicated, also to HERA.

The 1 MHz filterbank consists of 4 units. Each unit has 256 channels with 1 MHz spacing and can be connected to different or the same receivers giving bandwidths between 256 MHz and 1024 MHz. The maximum bandwidth is available for only one receiver, naturally one having a 1 GHz wide IF bandwidth. Connection of the filterbank in the 1 GHz mode presently excludes the use of any other backend with the same receiver.

Other configurations of the 1 MHz filterbank include a setup in 2 units of 512 MHz connected to two different receivers, or 4 units of 256 MHz width connected to up to four (not necessarily) different receivers. Each unit can be shifted in steps of 32 MHz relative to the center frequency of the connected receiver.

The 100 kHz filterbank consists of 256 channels of 100 kHz spacing. It can be split into two halves, each movable inside the 500 MHz IF bandwidth, and connectable to two different single pixel receivers (must be set up in narrow band mode).

VESPA, the versatile spectrometric and polarimetric array, can be connected either to HERA or to a subset of 4 single pixel receivers, or to a pair of single pixel receivers for polarimetry. The many VESPA configurations and user modes are summarized in a Newsletter contribution [14] and in a user guide, but are best visualised on a demonstration program which can be downloaded from our web page at URL /IRAMFR/PV/veleta.htm. Connected to a set of 4 single pixel receivers, VESPA typically provides up to 12 000 spectral channels (on average 3 000 per receiver). Up to 18 000 channels are possible in special configurations. Nominal spectral resolutions range from 3.3 kHz to 1.25 MHz. Nominal bandwidths are in the range 10 — 512 MHz. When VESPA is connected to HERA, up to 18 000 spectral channels can be used with the following typical combinations of nominal resolution (kHz) and maximum bandwidth (MHz): 20/40, 40/80, 80/160, 320/320, 1250/640.

The 4 MHz filterbank consists of nine units. Each unit has 256 channels (spacing of 4 MHz, spectral resolution at 3 dB is 6.2 MHz) and thus covers a total bandwidth of 1 GHz. The 9 units are designed for connection to HERA, but a subset of 4 units can also be connected to the backend distribution box which feeds the single pixel spectral line receivers. All these receivers have a 1 GHz RF bandwidth except for A100 and B100 (500 MHz only).

The **wideband autocorrelator WILMA** consists of 18 units. They can be connected to the 18 detectors of HERA. Each unit provides 512 spectral channels, spaced out by 2 MHz and thus covering a total bandwidth of 1 GHz. Each band is sliced into two 500 MHz subbands which are digitized with 2 bit/1 GHz samplers. An informative technical overview of the architecture is available at URL ../IRAMFR/TA/backend/veleta/wilma/index.htm. Note that WILMA cannot presently be connected to any of the single pixel receivers.

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These reports are available upon request (see also previous Newsletters). Please write to Mrs. C. Berjaud, IRAM Grenoble (e–mail: `berjaud@iram.fr`).

Clemens Thum & Carsten Kramer

News from the Plateau de Bure Interferometer

Weather conditions and observing

The end of the winter semester as well as the first two months of the current summer semester have been suffering from quite mediocre weather conditions on Plateau de Bure. We moved the array into its B configuration on March 10 after a two-weeks period in a configuration intermediate between A and B that still offered the longest baselines of the A configuration (up to 760m). Two projects requesting the A-configuration and three projects requesting the B configuration could not be finished and will be deferred to the upcoming winter semester. The C configuration was scheduled after March 29 and the interferometer was switched back to the most compact configuration D on May 1st. The spring VLBI session took place from May 8 to 13 with the interferometer working without technical problems and in good weather conditions. Since May 14th the array is observing with 5 antennas in D configuration. The current antenna maintenance period is foreseen to end in October. At the end of this period it is foreseen to equip the reflector of antenna 4 with new aluminum panels replacing the current mix of painted carbon fiber and Media Lario panels.

As far as A-rated projects are concerned, we still hope to bring many of these to completion before the end of the summer semester. B-rated projects are likely to be observed only if they fall in a favorable LST range. We remind users of the Plateau de Bure interferometer that B-rated proposals and A-rated time fillers which are not started before the end of the summer period have to be resubmitted.

Global VLBI observations, which include the array in the 3 mm phased-array mode, are planned from October 9 to 15.

Investigators who wish to check the status of their project may consult the interferometer schedule on the Web at ../PDBI/ongoing.html. This page is updated daily.

Jan Martin WINTERS

Call for Observing Proposals on the Plateau de Bure Interferometer

Important information

Please note that the proposal.sty file and the proposal.tex template have been changed considerably. We urge proposers to download the most recent version from our web page ../GENERAL/proposal/ . Proposals using older versions of the style/template files will not be accepted.

Conditions for the next winter session

Based on our experience in carrying out configuration changes in winter conditions with limited access to the observatory, we plan to schedule four configuration changes next winter. We therefore ask investigators to submit proposals for any of the 4 primary configurations of the six antenna array.

A preliminary configuration schedule for the winter period is outlined below. Adjustments to the provisional configuration planning will be made according to proposal pressure, weather conditions, and other contingencies. The configuration schedule given below should be taken as a guideline, in particular when the requested astronomical targets cannot be observed during the entire winter period (sun avoidance circle of radius 45°).

Conf	Scheduling Priority Winter 08/09
C	December
A	December – January
B	February – March
C	March – April
D	April – May

We strongly encourage observers to submit proposals for the set of AB configurations that include 730 and 760 meter baselines. For these proposals we ask to focus on bright compact sources, possibly at high declination.

We invite proposers to submit proposals also for observations at 3 mm. When the atmospheric conditions are not good enough at 1.3 mm or at 2 mm, 3 mm projects will be observed: in a typical winter, 20-30% of the time used for observations is found to be poor at 1.3 mm, but still excellent at 3 mm.

Proposal category

Proposals should be submitted for one of the six categories:

1.3MM: Proposals that ask for 1.3 mm data. 3 mm receivers can be used for pointing and calibration purposes, but cannot provide any imaging.

2MM: Proposals that ask for 2 mm data. 3 mm receivers can be used for pointing and calibration purposes, but cannot provide any imaging.

3MM: Proposals that ask for 3 mm data.

TIME FILLER: Proposals that have to be considered as background projects to fill in periods where the atmospheric conditions do not allow mapping, to fill in gaps in the scheduling, or even to fill in periods when only a subset of the standard 6-antenna configurations will be available. These proposals will be carried out on a "best effort" basis only.

SPECIAL: Exploratory proposals: proposals whose scientific interest justifies the attempt to use the PdB array beyond its guaranteed capabilities. This category includes for example non-standard frequencies for which the tuning cannot be guaranteed, non-standard configurations and more generally all non-standard observations. These proposals will be carried out on a "best effort" basis only.

LARGE PROGRAM: This category is offered for the first time on both IRAM instruments. See Sect. *Large Observing Programs* for a detailed explanation.

The proposal category will have to be specified on the proposal cover sheet and should be carefully considered by proposers.

Configurations of the six-antenna array

The six-element array can be arranged in the following configurations:

Conf	Stations					
A	W27	E68	N46	E04	E24	N29
B	W27	E23	N46	W12	E12	N20
C	W12	E10	N17	W09	E04	N11
D	W08	E03	N11	W05	N02	N07

The general properties of these configurations are:

- `A` alone is well suited for mapping or size measurements of very compact, strong sources. It provides a resolution of 0.8″ at 100 GHz, ∼0.35″ at 230 GHz.
- `B` alone yields ∼1.2″ at 100 GHz and, in combination with A provides an angular resolution of ∼1.0″ at 100 GHz. It is mainly used for relatively strong sources.
- `C` provides a fairly complete coverage of the uv-plane (low sidelobe level) and is well adapted to combine with D for low angular resolution studies (∼3.5″ at 100 GHz, ∼1.5″ at 230 GHz) and with B for higher resolution (∼1.7″ at 100 GHz, ∼0.7″ at 230 GHz). C alone is also well suited for snapshot and size measurement experiments.
- `D` alone is best suited for deep integration and coarse mapping experiments (resolution ∼ 5″ at 100 GHz). This configuration provides both the highest sensitivity and the lowest atmospheric phase noise.

The four configurations can be used in different combinations to achieve complementary sampling of the uv-plane, and to improve on angular resolution and sensitivity. Mosaicing is usually done with D or CD, but the combination BCD can also be requested for high resolution mosaics. Check the ANY bullet in the proposal form if the scientific goals can be reached with any of the four configurations or their subsets.

Please consult the documentation *An Introduction to the IRAM interferometer* (../IRAMFR/PDB/docu.html) and the IRAM Newsletter No. 63 (August 4th., 2005, accessible on the web at `../IRAMFR/ARN/aug05/aug05.html`) for further details.

Receivers

All antennas are equipped with dual polarization receivers for the 3 mm, 2 mm, and 1.3 mm atmospheric windows. The frequency range is 80 GHz to 116 GHz for the 3 mm band, 129 GHz to 174 GHz for the 2 mm band, and 201 to 267 GHz for the 1.3 mm band.

	Band 1	Band 2	Band 3
RF range*	80–116	129–174	201–267
T_{rec} LSB	40–55	30–50	40–60
T_{rec} USB	40–55	40–80	50–70
G_{im}/[dB]	-10	-12 ... -10	-12 ... -8
RF LSB	80–104	129–168	201–267
RF USB	104–116	147–174	

* center of the 4-8 GHz IF band

Each band of the receivers is dual-polarization with the two RF channels of one band observing at the same frequency. The different bands are not co-aligned in the focal plane (and therefore on the sky). Due to the pointing offsets between the different frequency bands, only one band can be observed at any time. One of the two other bands is in stand-by mode (power on and local oscillator phase-locked) and is available, e.g., for pointing. Time-shared observations between different RF bands are presently being tested. Please contact the Interferometer Science Operations Group (sog@iram.fr) to discuss the feasibility in case you are interested to use this mode.

The mixers are single-sideband, backshort-tuned; they will usually be tuned LSB, except for the upper part of the frequency range at 3 mm and 2 mm where the mixers will be tuned USB.

The typical image rejection is 10 dB. Each IF channel is 4 GHz wide (4-8 GHz). The two 4 GHz wide IF-channels (one per polarization) can be processed only partially by the existing correlator. A dedicated IF processor converts selected 1 GHz wide slices of the 4-8 GHz first IFs down to 0.1-1.1 GHz, the input range of the existing correlator. Further details are given in the section describing the correlator setup and the IF processor.

Signal to Noise

The rms noise can be computed from

$$\sigma = \frac{J_{\rm pK} T_{\rm sys}}{\eta \sqrt{N_{\rm a}(N_{\rm a}-1) N_{\rm c} T_{\rm ON} B}} \frac{1}{\sqrt{N_{\rm pol}}} \qquad (1)$$

where

- $J_{\rm pK}$ is the conversion factor from Kelvin to Jansky (22 Jy/K at 3 mm, 29 Jy/K at 2 mm, and 35 Jy/K at 1.3 mm)
- $T_{\rm sys}$ is the system temperature ($T_{\rm sys}$ = 100 K below 110 GHz, 170 K at 115 GHz, 150 K at 150 GHz, and 200 K at 230 GHz for sources at $\delta \geq 20°$ and for typical winter conditions).
- η is an efficiency factor due to atmospheric phase noise and instrumental phase jitter (0.9 at 3 mm, 0.85 at 2 mm, and 0.8 at 1.3 mm) in typical winter conditions.
- $N_{\rm a}$ is the number of antennas (6), and $N_{\rm c}$ is the number of configurations: 1 for D, 2 for CD, and so on.
- $T_{\rm ON}$ is the on-source integration time per configuration in seconds (2 to 8 hours, depending on source declination). Because of various calibration observations the total observing time is typically 1.6 $T_{\rm ON}$.
- B is the spectral bandwidth in Hz (up to 2 GHz for continuum, 40 kHz to 2.5 MHz for spectral line, according to the spectral correlator setup)
- $N_{\rm pol}$ is the number of polarizations: 1 for single polarization and 2 for dual polarization (see section *Correlator* for details).

Investigators have to specify the one sigma noise level which is necessary to achieve each individual goal of a proposal, and particularly for projects aiming at deep integrations.

Coordinates and Velocities

For best position accuracy, source coordinates must be in the J2000.0 system.

Please do not forget to specify LSR velocities for the sources. For pure continuum projects, the "special" velocity `NULL` (no Doppler tracking) can be used.

Correlator

IF processor

At any given time, only one frequency band can be observed, but with the two polarizations available. Each polarization delivers a 4 GHz bandwidth (from IF=4 to 8 GHz). The two 4-GHz bandwidths coincide in the sky frequency scale. The current correlator accepts as input two signals of 1 GHz bandwidth, that must be selected within the 4 GHz delivered by the receiver. In practice, the new IF processor splits the two input 4–8 GHz bands in four 1 GHz "quarters", labeled *Q1...Q4*. Two of these quarters must be selected as correlator inputs. The system allows the following choices:

- first correlator entry can only be Q1 HOR, or Q2 HOR, or Q3 VER, or Q4 VER
- second correlator entry can only be Q1 VER, or Q2 VER, or Q3 HOR, or Q4 HOR

where HOR and VER refer to the two polarizations:

Quarter IF1 [GHz]	Q1 4.2-5.2	Q2 5-6	Q3 6-7	Q4 6.8-7.8
input 1	HOR	HOR	VER	VER
input 2	VER	VER	HOR	HOR

How to observe two polarizations? To observe simultaneously two polarizations at the same sky frequency, one must select the same quarter (Q1 or Q2 or Q3 or Q4) for the two correlator entries. This will necessarily result in each entry seeing a different polarization. The system thus give access to 1 GHz × 2 polarizations.

How to use the full 2 GHz bandwidth? If two different quarters are selected (any combination is possible), a bandwidth of 2 GHz can be analyzed by the correlator. But only one polarization per quarter is available in that case; this may or may not be the same polarization for the two chunks of 1 GHz.

Is there any overlap between the four quarters? In fact, the four available quarters are 1 GHz wide each, but with a small overlap between some of them: Q1 is 4.2 to 5.2 GHz, Q2 is 5 to 6 GHz, Q3 is 6 to 7 GHz, and Q4 is 6.8 to 7.8 GHz. This results from the combination of filters and LOs used in the IF processor.

Is the 2 GHz bandwidth necessarily continuous? No: any combination of two quarters can be selected. Adjacent quarters will result in a continuous 2 GHz band. Non-adjacent quarters will result in two independent 1 GHz bands.

Where is the selected sky frequency in the IF band? It would be natural to tune the receivers such that the selected sky frequency corresponds to the middle of the IF bandwidth, i.e. 6.0 GHz. However, this corresponds to the limit between Q2 and Q3. It is therefore highly recommended to center a line at the center of a quarter (see Section "ASTRO" below). In all three bands, 3 mm, 2 mm, and 1.3 mm the receivers offer best performance in terms of receiver noise and sideband rejection in Q3 (i.e. the line should be centered at an IF1 frequency of 6500 MHz).

Spectral units of the correlator

The correlator has 8 independent units, which can be placed anywhere in the 100–1100 MHz band (1 GHz bandwidth). 7 different modes of configuration are available, characterized in the following by couples of total bandwidth/number of channels. In the 3 DSB modes (320MHz/128, 160MHz/256, 80MHz/512 – see Table) the two central channels may be perturbed by the Gibbs phenomenon if the observed source has a strong continuum. When using these modes, it is recommended to avoid centering the most important part of the lines in the middle of the band of the correlator unit. In the remaining SSB modes (160MHz/128, 80MHz/256, 40MHz/512, 20MHz/512) the two central channels are not affected by the Gibbs phenomenon and, therefore, these modes may be preferable for some spectroscopic studies.

Spacing (MHz)	Channels	Bandwidth (MHz)	Mode
0.039	1×512	20	SSB
0.078	1×512	40	SSB
0.156	2×256	80	DSB
0.312	1×256	80	SSB
0.625	2×128	160	DSB
1.250	1×128	160	SSB
2.500	2×64	320	DSB

Note that 5% of the passband is lost at the end of each subband. The 8 units can be independently connected to the first or the second correlator entry, as selected by the IF processor (see above). Please note that the center frequency is expressed in the frequency range seen by the correlator, i.e. 100 to 1100 MHz. The correspondence to the sky frequency depends on the parts of the 4 GHz bandwidth which have been selected as correlator inputs.

ASTRO

The software ASTRO can be used to simulate the receiver/correlator configuration. Astronomers are urged to download the most recent version of GILDAS at `../IRAMFR/GILDAS/` to prepare their proposals.

The previous `LINE` command has been replaced by several new commands (see internal help; the following description applies to the current receiver system). The behavior of the `LINE` command can be changed by the `SET PDBI 1995|2000|2006` command, that selects the PdBI frontend/backend status corresponding to years 1995 (old receivers, 500 MHz bandwidth), 2000 (580 MHz bandwidth), 2006 (new receivers and new IF processor, 1 GHz bandwidth). Default is 2006:

- `LINE`: receiver tuning
- `NARROW`: selection of the narrow-band correlator inputs
- `SPECTRAL`: spectral correlator unit tuning
- `PLOT`: control of the plot parameters.

A typical session would be:

```
! choice of receiver tuning
line xyz 230 lsb low 6500

! choice of the correlator windows
narrow Q3 Q3

! correlator unit #1, on entry 1
```

```
spectral 1  20 520 /narrow 1

! correlator unit #2, on entry 1
spectral 2 320 260 /narrow 1

! correlator unit #3, on entry 2
spectral 3  40 666 /narrow 2
...
```

Sun Avoidance

For safety reasons, a sun avoidance limit is enforced at 45 degrees from the sun. Please take this into account for your target sources.

Mosaics

The PdBI has mosaicing capabilities, but the pointing accuracy may be a limiting factor at the highest frequencies. Please contact the Science Operations Group (sog@iram.fr) in case of doubts.

Data reduction

Proposers should be aware of constraints for data reduction:

- In view of the new receiver system, we recommend that you reduce your data in Grenoble. Proposers will not come for the observations, but will have to come for the data reduction. For the time being, remote data reduction will only be offered in exceptional cases. Please contact your local contact if you're interested in this possibility.
- We keep the data reduction schedule very flexible, but wish to avoid the presence of more than 2 groups at the same time in Grenoble. Data reduction will be carried out on dedicated computers at IRAM. Please contact us in advance.
- In certain cases, proposers may have a look at the uv-tables as the observations progress. If necessary, and upon request, more information can be provided. Please contact your local contact or PdBI's Science Operations Group (sog@iram.fr) if you are interested in this.
- CLIC evolves to cope with upgrades of the PdBI array. The newer versions are downward compatible with the previous releases. Observers who wish to finish data reduction at their home institute should obtain the most recent version of CLIC. Because differences between CLIC versions may potentially result in imaging errors if new data are reduced with an old package, we advise observers having a copy of CLIC to take special care in maintaining it up-to-date. The recent upgrades of CLIC implied many modifications for which backward compatibility with old PdBI receiver data has not yet been fully checked. To calibrate data obtained with the "old" receiver system (up to September 2006), one has to use the January 2007 version of CLIC.

Local Contact

A local contact will be assigned to every A or B rated proposal which does not involve an in-house collaborator. He/she will assist you in the preparation of the observing procedures and provide help to reduce the data. Assistance is also provided before a deadline to help newcomers in the preparation of a proposal. Depending upon the program complexity, IRAM may require an in-house collaborator instead of the normal local contact.

Technical pre-screening

All proposals will be reviewed for technical feasibility in parallel to being sent to the members of the program committee. Please help in this task by submitting technically precise proposals. Note that your proposal must be complete and exact: the source position and velocity, as well as the requested frequency setup must be correctly given.

Non-standard observations

If you plan to execute a non-standard program, please contact the Interferometer Science Operations Group (sog@iram.fr) to discuss the feasibility.

Documentation

The documentation for the IRAM Plateau de Bure Interferometer includes documents of general interest to potential users, and more specialized documents intended for observers on the site (IRAM on-duty astronomers, operators, or observers with non-standard programs). All documents can be retrieved on the Internet at `../IRAMFR/PDB/docu.html`. Note however, that not all the documentation on the web has already been updated with respect to the current receivers. All information presently available on the current receiver system is given in the *Introduction to the IRAM Plateau de Bure Interferometer* at

`../IRAMFR/GILDAS/doc/html/pdbi-intro-html`
and in this call for proposals.

> Finally, we would like to stress again the importance of the quality of the observing proposal. The IRAM interferometer is a powerful, but complex instrument, and proposal preparation requires special care. Information is available in this call and at `../IRAMFR/PDB/docu.html`. The IRAM staff can help in case of doubts if contacted well before the deadline. Note that the proposal should not only justify the scientific interest, but also the need for the Plateau de Bure Interferometer.

Jan Martin WINTERS

Large observing programs

Starting with the upcoming winter observing period, IRAM offers the possibility to apply for observing time in the framework of a *Large Program* for the 30-meter telescope and the Plateau de Bure interferometer.

A Large Program should require a minimum of 100 hours of observing time, spread over a maximum of two years, i.e. 4 contiguous semesters. In the next two years, IRAM will accept a limited number of Large Programs to be carried out per semester and instrument (30-meter and Plateau de Bure interferometer), allocating a maximum of 30% of observing time to such projects.

The Large Program should address strategic scientific issues leading to a breakthrough in the field. Large Programs should be coherent science projects, not reproducible by a combination of smaller normal proposals.

The Large Program proposals should contain a solid management plan ensuring an efficient turnover, including data reduction, analysis, and organization of the efforts.

Because of the large investment in observing time, but also of the inherent support from IRAM, it is advised that Large Programs involve one or more IRAM internal collaborators.

During the execution period of the Large Programs (ideally before mid-term), the team leading the Large Program should report to IRAM about the preliminary results and possible technical difficulties, so that IRAM could assess the progress made, assist with any problems encountered in the course of the observations, and, if needed, adjust the program scheduling.

The proprietary period ends 18 months after the end of the last scheduling semester in which the Large Program was observed. The raw data and processed data then enter the public domain. An extension of this proprietary period may be granted in exceptional cases only. A corresponding request will have to be submitted to the IRAM director.

Because of the scope of the Large Programs and the need to explain the organization of the project, Large Program proposals will have a maximum length of 4 pages (not including figures, tables, or references), instead of the 2 pages for normal proposals. Large observing program proposals should be submitted using the standard proposal templates; just check the “Large Program” bullet on the cover page. The following sections should be included: i) Scientific Rationale, ii) Immediate Objective, iii) Feasibility and Technical Justification, and iv) Organizational Issues. For the Plateau de Bure interferometer, the latter section must include a consideration of sun avoidance constraints and configuration scheduling.

The scientific evaluation of the Large Program proposals will be done by the Program Committee at large (all 12 members, except if there is a direct implication of one the members in the proposal). External reviewers will be asked to evaluate Large Programs, if needed. In addition to the scientific evaluation, there will be an assessment of the technical feasibility by IRAM staff.

For the upcoming winter semester 2008/2009 (September 2008 deadline), the call for Large Programs will be open for the Plateau de Bure interferometer, and only for HERA and MAMBO at the 30-meter telescope. This is because the implementation of the new single pixel receivers at the 30-meter (EMIR) will not take place before the beginning of the winter semester. A call for Large Programs using EMIR at the 30-meter telescope will be issued for the summer semester 2009.

Pierre Cox