

Astronomers win satellite phone curb . . .

[MUNICH] Europe's radioastronomers have won significant concessions in their prolonged battle with the global mobile-telephone company Iridium over time-sharing in an astronomically important radio waveband.

Under an agreement signed last week, the company will provide 'quiet time' — defined by the International Telecommunications Union as pollution "below the level of detrimental interference" — for facilities in France, Germany, the Netherlands and Britain for seven hours every night and two weekend days per month. The same level of quiet time will be made available to Italy, Poland, Spain and Sweden on request. Interferometry facilities in Britain and the Netherlands will have quiet time every weekend because of their need for continuous 12-hour measurements to map celestial sources.

But the radioastronomers, who joined forces to negotiate through the Committee on Radio Astronomy Frequencies (CRAF), a body associated with the European Science Foundation, are far from satisfied with their victory. They complain that the agreement does not cover legitimate time-sharing, but time-sharing with unnecessary overspill — or 'polluting' — interference.

They argue that Iridium designed its satellite system without regard to its polluting effect, and they are now preparing to fight for a legal limit on overspill at the World Radio Conference later this year.

Iridium's armada of 66 satellites launched last year uses both 'uplinks' and 'downlinks' adjacent to the 1,612-megahertz band that is reserved by international law for radioastronomers. Overspill from the downlinks into this band drowns out weak deep-space signals.

European governments had withheld operating licences from Iridium until the company had reached an agreement with radioastronomers that allowed their research to continue at a "reasonable" level. Last August, an agreement was signed under which the company is to replace all its satellites with non-polluting ones by January 2006 (see *Nature* 394, 607; 1998).

"We are generally happy with our success," says Titus Spoelstra from the Westerbork Observatory in the Netherlands, who is CRAF's frequency manager. He says CRAF was helped enormously by the refusal of individual observatories — unlike those in the United States — to be drawn into isolated negotiations with Iridium, and by the support of European governments. But radioastronomers are not happy to share any time with 'radio waste', he adds.

Across the Atlantic, CRAF's achievements have been highly praised. Mark McKinnon, associate scientist at the National Radio



Time to observe: Italy's Noto radiotelescope is one of those that will benefit from 'quiet time'.

Astronomy Observatory in Greenbank, West Virginia, which has been allocated only four hours' quiet time a night, says this is the most generous agreement made with Iridium.

Mike Davis, spectrum allocation manager at the Arecibo Observatory in Puerto Rico, which negotiated eight hours' quiet time a night, describes the clauses obliging Iridium to stop polluting the 1,612-MHz band altogether after 2006, and concerning weekend observing time, as important victories. Arecibo fought hard for weekend days, but lost, "and this has a great impact on our scheduling [of observing time]."

The most astronomically interesting parts of the Galactic disk pass over Arecibo at fixed

times that vary according to season, and the 1,612-MHz observations are restricted to between May and August, when such regions transit over Arecibo during the night.

At present, neither observatory is having difficulty accommodating the observing proposals, and neither is therefore considering renegotiating its agreement in the light of the European agreement. "But if there is increased pressure of proposals we might think again," says Davis.

CRAF is now turning its attention to the "catalogue of problems that lie ahead", says its chairman, Jim Cohen, a radioastronomer at Britain's Jodrell Bank Observatory. These include threatened pollution in other important radio frequencies, particularly the 1,400–1,427-MHz band which corresponds to emission from atomic hydrogen.

CRAF will be fighting on different fronts for more security over its own radio frequencies at the World Radio Conference, a regular event run by the International Telecommunication Union, the United Nations body that carves up the radio spectrum.

The committee will press for a ban on uncontrolled overspill into wavebands that are allocated to another user. It will also press for clear rules on the allocation of the highest range of the radio spectrum — above 70 GHz — in which commercial companies had, until now, little interest because of the expense of the necessary technology (see *Nature* 390, 103–104; 1997). But commercial pressure is mounting — just as the interest of this millimetre-wavelength range is increasing for astronomers. **Alison Abbott**

. . . and plan for talks on sharing the spectrum

[MUNICH] Research ministers of member states of the Organization for Economic Cooperation and Development (OECD) are to be asked later this month to set up a task force to draw up stricter rules for sharing the radio spectrum between astronomers and telecommunications industries.

The international task force, whose members will include representatives of both sides, will also be asked to find ways of preserving 'radio-quiet zones' for the most sensitive radioastronomy research (see above).

A recently published OECD report points out that

interference in frequencies of importance to radioastronomers will become a much greater problem in the next decade. The report was prepared by a working group set up two years ago by the OECD's Megascience Forum (see *Nature* 390, 103–104; 1997).

Next-generation radiotelescopes are being designed to pick up very weak signals at sub-millimetre wavelengths to allow the study of events very early in the history of the Universe.

But the increased sensitivity of such telescopes makes them proportionately more sensitive to interference, says the report.

Also, commercial pressure from telecommunications industries on high-frequency sub-millimetre bands is set to mushroom.

Satellite records show that there are still a few radio-quiet zones on Earth, for example in western Australia and northern Chile. "We have to keep them quiet," says Harvey Butcher, chairman of the task force and general director of the Netherlands Foundation for Research in Astronomy.

On a task force to plan how to accommodate everyone's interests, Butcher says, "The problem is too big to solve in the long term without everyone getting together". **A.A.**