DIRECTOR'S REPORT

The past two years have been a period of intense activity in all areas of the National Facility's operation. As always, the scientific outputs of MERLIN and the EVN have been impressive, with some fascinating results being produced. Some of these are discussed in more detail in the section on Astronomy, but some highlights to note are:

- the 6cm images of the Proplyds in Orion (a MERLIN Key Programme)
- recent results on starburst galaxies through observations with MERLIN and global VLBI
- the EVN detection and imaging of μJy sources in the Hubble Deep Field
- polarisation images of masers in the envelopes surrounding giant and supergiant stars
- combined-array observations of SS433.

The production of such high-quality scientific results requires a dedicated team of professionals to keep the telescopes, receivers, microwave links, correlator, VLBI backends and software running. It also requires a dedicated operational team who schedule the array, operate the telescopes and then provide the excellent support that our users have come to expect. I wish to publicly thank all staff of the National Facility for their efforts, which are often above and beyond the call of duty.

There has been significant engineering work over the period covered by this report, the major part of which has been the replacement of the drive systems for the three E-systems telescopes funded by part of a PPARC-funded restructuring programme. Other developments have resulted in the construction and installation of a cooled 6-7GHz receiver system for the 32m telescope at Cambridge, the construction of a dual-frequency prime-focus receiver box for Defford and the design and installation of a novel remote diagnostic system for outstation telescopes. The scope and progress of these and other projects are described in the section on Developments. Another major development at Jodrell Bank Observatory is the funding by the Joint Infrastructure Fund (JIF) of the upgrade of the Lovell Telescope (LT). The ~£2M grant is enabling the replacement of the surface of the LT (for current status see http://www.jb.man.ac.uk/tech/lovellupgrade), the refurbishment of the foundations and the installation of a new telescope drive system. When finished at the end of 2002, the LT will be a revitalised telescope capable of operating with almost full efficiency at ~8GHz. It will be an invaluable addition to MERLIN at 5GHz, increasing the sensitivity of the array by a factor of ~2.5.

In September 2000 an international panel of astronomers was asked to review the operation and future development of the National Facility. The panel consisted of Dr. Miller Goss (NRAO: chairman), Prof. Alain Baudry (Observatory de Bordeaux), Prof. Richard Hills (Cambridge University) and

Dr. Karl Menten (MPIfR). The panel spent three days at JBO receiving presentations on various aspects of the facility and conducting interviews with many NF staff and JBO academics. They produced a comprehensive report, which can be found in full on the internet at http://www.merlin.ac.uk/review-report. The panel's report was highly complimentary of the science performed and the operation and management of the facility. The panel strongly endorsed the *e*-MERLIN proposal.

Earlier in 2000, National Facility staff participated in a review of the EVN and its Joint Institute for VLBI in Europe (JIVE). This was conducted under the auspices of the European Science Foundation (ESF) and carried out by a panel consisting of Prof. Jens Fenstad (University of Oslo: chairman), Prof. Len Culhane (UCL), Prof. Calogero Natoli (INFN, Frascati) and Dr. Paul Vanden Bout (NRAO). The review was, like the review of MERLIN, very successful. The panel concluded that the science was 'rich in substance and impact', the user community was of 'sufficient critical mass' and that the EVN had 'professionalised a dedicated networking approach which capitalizes on the availability of the world's largest diameter telescopes'. A report of the review appeared in *Nature* (Volume 407, p. 437).

In 2000 a major effort was put into the preparation of the proposal for *e*-MERLIN, the optical fibre-based upgrade that is planned for MERLIN. Working groups at JBO were formed to translate a straw man specification into a full technical specification and associated costs. In addition, 54 astronomers from the UK and around the world participated in the generation of the science case for the upgrade. This huge effort culminated in the submission of a highly professional proposal to PPARC in November 2000. A copy of the proposal can be found on the internet at http://www.merlin.ac.uk/e-merlin. At the time of writing, funding for the £8.6M capital cost of *e*-MERLIN is being sought. We are hopeful of success sometime over the summer of 2001.

In late April 2000 we hosted a radio imaging school at JBO attended by ~50 'students'. Of these, about 2/3 were from one of fourteen institutes in the UK, the rest were from six countries across the EC and associated states, from Ireland to Poland. Astronomers from Russia and South Africa also attended. Lectures were presented by speakers from various UK and European institutes. The school provided a balanced mixture of basic radio astronomy practice and the more specialised techniques required to produce some of the spectacular results possible with today's instruments. Significant financial assistance was provided by the European VLBI Network through the EC grant 'Access to Large Scale Facilities'. The University of Manchester and PPARC also provided some financial help.

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