H. Rickman (ed.), Reports on Astronomy, Vol. XXVA, 322–324.

WORKING GROUP ON OPTICAL/IR INTERFEROMETRY

(GROUPE DE TRAVAIL POUR INTERFEROMETRIE OPTIQUE/INFRAROUGE)

CHAIRPERSON: P.R. Lawson
MEMBERS: John Davis, Christopher Haniff, Christian A. Hummel, Pierre J. Lena, Christoph Leinert, Harold A. MacAlister, Denis Mourard, Andreas Quirrenbach & Charles H. Townes

The Working Group on Optical/IR Interferometry is a unit of Division IX. It originally was established within Division IX during the General Assembly in Manchester 2000 with a goal of encouraging international cooperation and collaboration in topics in stellar interferometry and to further progress in this field. The current Working Group carries on the efforts of the Working Group on "High Angular Resolution Stellar Interferometry" which was created at the General Assembly in Montreal in 1979. That Working Group operated within Commission 9 until Manchester 2000.

The purpose and activity of the original Working Group had been to organize a scientific program covering both technical and scientific matters at IAU General Assemblies since interferometry was not being included by any IAU Commission. These original meetings also performed the useful purpose of bringing together the relatively small number of people working in the field to exchange ideas, news and results.

The field of optical/infrared interferometry underwent rapid expansion during the decade of the 1990s. Many new arrays became operable. Optical aperture synthesis imaging was shown possible in 1995 by the Cambridge Optical Aperture Synthesis Telescope (COAST, United Kingdom). The Navy Prototype Optical Interferometer (NPOI, United States) also produced images in 1996. Techniques of narrow-angle astrometry were pioneered in 1999 by the Palomar Testbed Interferometer (United States). Since 1999, the CHARA Array, the Keck Interferometer, and the European Southern Observatory's Very Large Telescope Interferometer all have begun operations. The interferometers in use have evolved from being relatively small instruments, with 40-cm size apertures and baselines of tens of meters in length, to instruments with apertures of 8-10 meters and baselines up to 200-300 meters in extent.

Although still limited to stars brighter than about 8th magnitude, long-baseline optical/infrared interferometers have now measured the diameters of some 355 stars and the orbits of 26 binary stars. Although most measurements have been of late-type (G, K, and M) giant and supergiant stars, carbon stars and a small number of main-sequence stars also have been measured. The pulsations of Mira variables have been measured through complete cycles. Several Cepheid variable stars also have had their diameters measured, which ultimately will allow the direct calibration of the Cepheid period-luminosity relationship. Several instruments have observed more complicated objects with extended circumstellar material, for example, T Tauri and Herbig Ae/Be pre-main-sequence stars. This class of object soon should be resolved in greater detail by larger arrays. The use of adaptive optics on the largest interferometers should permit the observation of objects of about 14th magnitude within the next three years.

The first meeting of the current Working Group took place at the Observatoire de Haute Provence, France, 30-31 August 2001. Thirty-two participants attended, coming from Europe, the United States and Australia. A wide range of topics was explored with an emphasis on short presentations; long open discussions followed. The first part of the

meeting focused on understanding the perspectives from the U.S. National Science Foundation, the European Southern Observatory (Munich), and the French Jean-Marie Mariotti Center (Grenoble). There followed more focused discussions on individual topics, in particular including data formats, common software suites, calibrator standards, and progress with imaging algorithms.

A common data format for calibrated imaging data had the strong endorsement of a meeting in June 2000 hosted by J. Breckinridge of the U.S. National Science Foundation (see http://www.chara.gsu.edu/CHARA/ for details). That data format subsequently was developed through efforts of the Working Group, with the help of John Young (COAST, Cambridge University), Tom Pauls (NPOI, U.S. Naval Observatory) and Bill Cotton (National Radio Astronomy Observatory, USA). Although the format was in a preliminary form at the 2001 meeting at Observatoire de Haute Provence, it provoked considerable discussion and interaction among participants.

An attempt was made to explore the common development of software suites, such as ASPRO within GILDAS (Grenoble) or AIPS++, aimed specifically at the needs of the optical/IR interferometry community. It became clear that although separate progress would be made on different packages, there was no consensus for a common international effort.

Participants in the meeting were encouraged to think in terms of science observations spanning several complementary instruments and arrays to make the most use of existing interferometers. There was a strong recommendation by the Scientific Organizing Committee that the number one priority of the Working Group should be to help the current generation of interferometers reach their full potential, thereby proving a sound basis for yet more ambitious instruments and science in coming decades.

The second meeting of the Working Group on Optical/IR Interferometry took place on the Big Island of Hawaii, 29-30 August 2002, following the SPIE's conferences on Telescopes and Astronomical Instrumentation. The format of the meeting was similar to that in 2001. The initial sessions included presentations from the Eur-Interferometry Initiative and the Michelson Science Center at Caltech.

The Eur-Interferometry Initiative has the tasks of facilitating communications between European scientists and institutes involved in optical/IR long-baseline interferometry, to coordinate European workshops and symposia, and to develop long-terms strategic planning for optical/infrared interferometry facilities. The Initiative involves participants from fourteen European countries and includes both the European Southern Observatory and the European Space Agency. The Initiative was established on 30 January 2002 by the Jean-Marie Mariotti Center (Grenoble, France), the NOVA-ESO VLTI Expertise Center (Leiden, the Netherlands), and the Frontiers of Interferometry in Germany (Heidelberg, Germany). Plans are underway to submit a proposal for support within the European Union's Integrated Infrastructure Initiative.

The FITS format for calibrated imaging data was reported to be near completion. After a brief presentation, a call was issued for final comments on the draft. The format already has been included in software packages from various centers. Comments on the draft were presented by participants from the European Southern Observatory and by the Michelson Science Center at Caltech. The format is expected to be completed by November 2002.

Reports were given on calibrator selection and on ongoing programs of calibrator monitoring. The possibility of a common database of calibrator stars was discussed at length. The Michelson Science Center was invited to participate in European efforts in this activity.

Progress in imaging algorithms was reported, although insufficient progress had been made since the 2001 meeting to merit a formal comparison between techniques. It was reported that AIPS++ had been used to image data from the Navy Prototype Interferometer.

The Working Group next will meet at the IAU General Assembly in Sydney in July 2003. Information on the IAU Working Group on Optical/IR Interferometry is available through their website at http://olbin.jpl.nasa.gov/iau/.

P. R. Lawson
Chairperson of the Working Group

https://doi.org/10.1017/S0251107X00001656 Published online by Cambridge University Press