

COMMISSION 54

OPTICAL & INFRARED INTERFEROMETRY (OPTICAL & INFRARED INTERFEROMETRY)

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PROCEEDINGS BUSINESS SESSION, 11 August 2009

1. Introduction

Commission 54 held its business meeting on 11 August 2009 at “Botequim” at Rua Visconde de Caravelas 184/186, Humaitá, Botafogo, Rio de Janeiro. Individual members in attendance reported on activities of relevance to C54.

In attendance was Gerard van Belle, European Southern Observatory & incoming C54 vice-president (meeting scribe); Dainis Dravins, Lund Observatory; Andreas Quirrenbach, Universität Heidelberg; Theo ten Brummelaar, CHARA Array, Georgia State University; Brian Mason, United States Naval Observatory & incoming C26 (‘Double & Multiple Stars’) vice-president; Wes Traub, Jet Propulsion Laboratory; Anahí Granada, Facultad de Ciencias Astronómicas y Geofísicas, UNLP, Argentina; and Pascal Ballester, European Southern Observatory.

2. Proposal for C54-C26 Sponsorship of an IAU Symposium

Brian, along with Gerard, presented a suggestion for jointly sponsored C54-C26 IAU Symposium, tentatively titled (and topiced) as “Interferometry of Binary Stars”. The main theme would be the precision astrophysics enabled by astronomical interferometry of binaries, including measurements of masses, radii, and temperatures.

A General Assembly was thought to be the most appropriate venue for such an IAU Symposium for two reasons: first, the desire to continue bringing news of interferometric results and scientific impact to the astronomy community at large; and second, the advantages presented in having the local logistics support provided by a GA. Given the recent (2006, Prague, IAUS240) symposium on binaries, the 2015 GA (Honolulu) was suggested as the ‘preferred’ venue, but 2012 GA (Beijing) was also noted for consideration.

Other interested bodies would be IAU C30 (“Radial velocity”), C8 (“Astrometry”), and the US Interferometry Commission. Discussion covered widely the particulars of content, challenges of non-GA hosting, and calendar possibilities.

3. CHARA Array

Theo presented some comments on current developments at the CHARA Array (ten Brummelaar *et al.* 2008):

- A proposal for an AO upgrade has been presented to the National Science Foundation’s “Academic Research Infrastructure - Recover and Reinvestment” program.

- Worldwide community access to CHARA was being proposed. (After the meeting, this proposal was cleared and details can be found online: <http://www.noao.edu/gateway/chara/>).
- Beam combiner operations & development continues, with Classic, MIRC, VEGA (Mourard *et al.* 2008), PAVO (Ireland *et al.* 2008), CLIMB, and CHAMP (Berger *et al.* 2008) combiners all working on the sky.

4. OIFITS Standard

Theo noted that one of the main success stories (thus far) has been the development and implementation of the OIFITS standard (Thureau *et al.* 2006, Young *et al.* 2008). A question was then raised: is the next step the development of a body of common software for use by the community in exploiting this standard? Certain steps forward in this regard have already been made - e.g. NExSci's software tools (<http://nexsci.caltech.edu/software/>) and the JMMC tools (<http://www.jmmc.fr/index.htm>) were mentioned as examples. Some questions that popped up:

- Is there a command line tool to throw at an OIFITS file to do a simple uniform disk fit?
- Is there a "C54 Toolbox" - tools for image reconstruction, tools for model fitting?
- How much model fitting is appropriate for C54 to facilitate, versus what is investigator-specific?

Pascal noted the ongoing work at the JMMC on updating calibrator resources, and that OIFITS is now a standard format for AMBER and MIDI pipeline products (Ballester *et al.* 2006); the possibility & challenges of extending the OIFITS standard to the expected data products of VLTI-PRIMA was also discussed. Theo also mentioned that the MIRC & PAVO CHARA Array instrument use OIFITS as their data export format.

5. Very Large Telescope Interferometer (VLTI)

Gerard noted that the Phase-Referenced Imaging and Microarcsecond Astrometry (PRIMA) instrument for the VLTI shipped to the summit and achieved first fringes in September of 2008, with tests at the sub-system level being conducted over the past year. Full system tests should commence by the end of the calendar year (van Belle *et al.* 2008).

Development on the second generation of VLTI instrumentation is beginning with kick-offs for MATISSE (Lopez *et al.* 2008) and GRAVITY (Eisenhauer *et al.* 2009).

6. Keck Interferometer (KI)

Wes noted that the NASA Key Project Science with KI Nulling had achieved nulls to 1% on 30 stars, at about the 100 zodi level. By comparison, Spitzer was sensitive to only the ~1,000 zodi level. These results are being written up by the PIs of the 3 teams conducting the Key Project Science (e.g., Stark *et al.* 2009). Primary limitations on this technique appeared to be differential K-band versus N-band performance as a result of varying amounts of H₂O vapor in the atmosphere above and inside the observatory (Colavita *et al.* 2009).

7. Space Interferometry Mission (SIM)

Wes noted that SIM (Unwin *et al.* 2008) continues to be considered for implementation, notably as part of the ongoing Decadal Survey activities taking place in the US.

8. Large Binocular Telescope (LBT)

Andreas noted that the LBT continues progress towards interferometer operations (Herbst *et al.* 2008). "Generation 1.5" aperture masking instrumentation was suggested as something for the community to consider.

9. Intensity Interferometry (I²)

Dainis is chairing the I² Task Group for the Cherenkov Telescope Array (CTA, <http://www.cta-observatory.org/>). Intensity interferometry is a possible modest upgrade to the CTA that would

make use of the CTA's non-usable 'bright time' when the full moon were in the sky (Dravins & LeBohec 2008). A lively discussion ensued on the more ephemeral details of intensity interferometry.

10. Other Bits and Pieces

We noted that IOTA's detector, having had a brief stint at PTI with IONIC, was now moving south to the VLTI to serve as the detector for the proposed PIONIER [sic] 4-way visitor instrument being developed by Laboratoire d'Astrophysique de Grenoble.

The 4×1.8m "outrigger" telescopes, originally intended to augment the Keck Interferometer, are now slated to join the Navy Prototype Optical Interferometer (NPOI) under an agreement between USNO and NASA.

Gerard van Belle
Vice President of the Commission

References

- Ballester, P., *et al.* 2006, *Proc. SPIE*, 6270
Berger, D. H., *et al.* 2008, *Proc. SPIE*, 7013
Colavita, M. M., *et al.* 2009, *PASP*, 121, 1120
Dravins, D. & LeBohec, S. 2008, *Proc. SPIE*, 6986
Eisenhauer, F., *et al.* 2009, Science with the VLT in the ELT Era, 361
Herbst, T. M., Ragazzoni, R., Eckart, A., & Weigelt, G. 2008, *Proc. SPIE*, 7014
Ireland, M. J., *et al.* 2008, *Proc. SPIE*, 7013
Lopez, B., *et al.* 2008, *Proc. SPIE*, 7013
Mourard, D., *et al.* 2008, *Proc. SPIE*, 7013
Stark, C. C., *et al.* 2009, *ApJ*, 703, 1188
ten Brummelaar, T. A., *et al.* 2008, *Proc. SPIE*, 7013
Thureau, N. D., Ireland, M., Monnier, J. D., & Pedretti, E. 2006, *Proc. SPIE*, 6268
Unwin, S. C., *et al.* 2008, *PASP*, 120, 38
van Belle, G. T., *et al.* 2008, *The Messenger*, 134, 6
Young, J. S., Cotton, W. D., Gässler, W., Millan-Gabet, R., Monnier, J. D., Pauls, T. A., & Percheron, I. 2008, *Proc. SPIE*, 7013