

Executive summary

**following the round-table discussion on the “Future of Interferometry”
between members of the EII¹, FIE², ASHRA³, FRINGE⁴ and IF⁵ working groups
organized on 25th September 2013 at 21h30 during the OHP Colloquium
“Improving the performances of current optical interferometers & future designs”**

Round Table participants: J.-P. Berger, G. van Belle, L. Labadie, H. Le Coroller, J. Monnier, J.-U. Pott, M. Tallon, J. Surdej (chair)

Additional participants: P. Kern, D. Defrère, G. Duvert, F. Malbet, A. Chelli, F. Martinache, J. Kluska, S. Minardi, D. Buscher, V. Garcia, T. Ten Brummelaar, M. Creech-Eakmann, C. Haniff, M. Ireland, D. Rouan, others

A general discussion on the Future of Optical/IR Interferometry has taken place during the OHP Colloquium “Improving the performances of current optical interferometers & future designs” organized on 23-27 September 2013 (Saint-Michel l’Observatoire, France) as a continuation of the currently on going community discussions within EII, ASHRA, FRINGE and IF.

It was first reminded that some nine and eight years ago, two European conferences had been organized on the “Science cases for next generation optical/infrared interferometric facilities (the post VLTI era)”⁶ and on a “Technology roadmap for future interferometric facilities”⁷. It is amazing how the conclusions of those two conferences established almost 10 years ago are still valid to day. They just need some minor polishing. The urgency of setting up a technology roadmap was already claimed very loudly in 2004. A natural conclusion is of course that it would be totally counter-productive to again carry out a similarly long exercise. Another good reason as to why we should move on is that the optical/IR community has been very active during the past 8 years, establishing several interferometry facility and pathfinder projects. However, most of these pathfinders come to an end, and ELTs are around the corner, probably meaning that if the interferometry community cannot propose now a strong science case for the future, the people and groups which are capable of advancing the field will quickly disperse.

As a result, the following recommendations were made:

- 1) First of all, in order to establish a credible roadmap for optical/IR interferometry, it was agreed that a very good, unique and common science driver ought to be identified. A very general consensus emerged that the “Planet Formation with a focus on direct observations at AU scale” should be proposed as the main science case. This does not

¹ European interferometry initiative

² Future of Interferometry in Europe

³ Action Spécifique Haute Résolution Angulaire, France

⁴ Frontiers of Interferometry center in Germany

⁵ Interferometry Forum

⁶ Proceedings of the 37th Liège International Astrophysical Colloquium (23-25 August 2004), Liège University, J. Surdej, D. Caro, A. Detal

⁷ Proceedings of the European Interferometry Initiative workshop organized in the context of the 2005 Joint European and National Astronomy meeting “Distant Worlds” (6-8 July 2005), Liège University, J. Surdej, D. Caro, A. Detal

mean that we exclude other important science cases (cf. stellar physics, AGN, ...) but most of us are convinced that a strong science case will help shaping a good and realistic technology roadmap.

- 2) It was also suggested that an international committee, as IAU Commission 54, should propose a mechanism and help coordinating a general discussion in order to define the main science goals in the field of Planet Formation. IAU Commission 54 could also help setting up an ad-hoc international science working group in order to define the short term and long term science goals addressing as many aspects of Planet Formation as possible and their corresponding top-level requirements (array architecture, size of unit telescopes, operating wavelengths, ...). A technology working group should similarly be created (somewhat later) to establish a technology roadmap for interferometry (including the upgrade of existing facilities), identifying all key technologies which will need further studies as well as to possibly define a next generation interferometric facility at the international level. Both the science and technology working groups should coordinate together the preparation of funding proposals.
- 3) A white book on the "Future of interferometry" ought to be ready by 2015, just before the review of the ASTRONET science vision document for the next decades. The perfect complementarity of optical/IR interferometry with respect to other existing major facilities (ALMA, JWST, ELTs, SKA, ...) should be clearly established in that white book. Some other major issues should be very carefully addressed: i) to identify the main questions in Planet Formation that can only be tackled by optical/IR interferometry observations, ii) to make sure that the breadth of the science goals matches the significant community funding effort required for any major upgrade / new facility. E.g. the capability to conduct statistically relevant (i.e. sufficiently large) surveys of planet formation at AU scale could play a big role⁸.
- 4) Hopefully, IAU Commission 54 could help organizing a forum meeting on the topics of the Planet Formation interferometer during the next General Assembly. It was suggested that members of the FIE working group would regularly meet during the VLT Community Day meetings (next one being planned in January 2014, Grenoble, France) and that members of the FI working group could also regularly meet during the week of the forthcoming SPIE meetings (next one being planned in June 2014, Montreal, Canada). Cross invitations should be organized. Such meetings will also serve the cause of the short term science goals and to coordinate the activities all over the world related to Planet Formation and optical/IR Interferometry.

A short list of Action Items (AI) follows:

- (i) Gerard van Belle needs to clarify IAU related work / lobbying, etc. and plan a meeting during the next IAU General Assembly
- (ii) Theo ten Brummelaar and Michael Ireland: to clarify US and Australian counterparts of

⁸ A major consensus at this meeting was that the community effort (including the white book) of the next two years should lead to well established, technically reachable scientific recommendations which should facilitate individual groups to work towards it by acquiring the respective funding. Current interferometric instrumentation research struggles because such a clear goal is missing. We need to leave the 'nice to have' niche, but establish a 'only optical / IR interferometry can do this' attitude

the EII (European) / ASHRA (France) / FRINGE (German) community networking efforts

(iii) Fabien Malbet and Michelle Creech-Eakmann to organize a joint Eii/IF/ASHRA/FRINGE... meeting adjacent to the upcoming SPIE in Toronto

(iv) J-Uwe Pott, Jean Surdej, and the EII-Future of Interferometry working group to get started the recruitment of a representative scientific advisory board for the 'Planet Formation interferometer' science case. Of course EVERYONE is very welcome to float names and motivate adequate people to apply⁹.

26 November 2013

The minutes were prepared by Jean Surdej and Jörg-Uwe Pott, chairing the EII-FIE

⁹ Be aware of the upcoming OLBIN (<https://listes.ujf-grenoble.fr/sympa/info/olbin>) news on the Planet Formation Imager (PFI) project!