

Preface

The Workshop “Science with the VLT in the ELT Era” held in Garching from 8th to 12th October 2007 was organised by ESO, with support from its Scientific and Technical Committee, to provide a forum for the astronomical community to debate the long term future of ESO’s Very Large Telescope (VLT) and its interferometric mode (VLTI). In particular it was considered useful for future planning to evaluate how its science use may evolve over the next decade due to competition and/or synergy with new facilities such as ALMA, JWST and, hopefully, at least one next generation 30–40 m extremely large telescope whose acronym appears in the title to symbolise this wider context. These discussions were also held in the fresh light of the Science Vision recently developed within ASTRONET as the first step towards a 20 year plan for implementing astronomical facilities—the first such attempt within Europe. Specific ideas and proposals for new, second generation VLT/I instruments were also solicited following a tradition set by several earlier Workshops held since the start of the VLT development.

The programme consisted of invited talks and reviews and contributed talks and posters. Almost all those given are included here although, unfortunately not the several lively but constructive discussion sessions.

The scientific context was set by presentations of the highlights of nearly 10 years of VLT/I operations followed by projections into the future, including themes of the ASTRONET Science Vision to which the VLT will clearly contribute for the foreseeable future such as exoplanet searches and characterisation, tests of general relativity, galaxy evolution, etc. The scope was then widened with presentations of the European ELT programme, ALMA (ESO on behalf of Europe, North America and Japan (with Taiwan) and the James Web Space Telescope (JWST) and discussions of the synergies and complementarities to be expected.

Entering more then into the detailed plans for instrumentation at the VLT/I, the already approved second generation instruments under development were presented (X-Shooter, KMOS, SPHERE and MUSE) plus the proposed VLTI instruments GRAVITY, MATISSE and VSI and an overview given of the expected resources available for additional instruments within ESO’s medium and long range plans.

Finally, the longest session was devoted to new instrumentation proposals and related technology which confirmed that there should be no problem in making good use of the available resources. There was also a clear consensus that the priority was for maintaining or providing new instruments which fully exploit VLT/I’s unique capability to combine four 8.2 m telescopes at both its coherent and incoherent foci. In fact the Workshop contributed directly to subsequent recommendations made by our STC committee and endorsed by Council to proceed with development of all three of the VLTI second generation instruments proposed; to issue a formal call for proposals for an ultra-stable spectrograph (ESPRESSO) at the incoherent combined focus and to upgrade operating first generation instruments including the wide

field, multi-object spectrograph VIMOS. ESO has also been encouraged to issue calls for additional instruments including a new multi-object spectrograph covering the widest possible field for studies related to the nature and origin of dark energy. However, because of the technical challenges and likely cost involved the need for a wider study of the options for this within Europe has been recommended by ASTRONET in its infrastructure road-map.

I couldn't have organised such a large and successful Workshop without the help and support of many people and wish particularly here to thank the members of the Scientific Organising Committee—Willy Benz, Mark Casali, Tom Herbst (co-chair), Bruno Leibundgut, Yannick Mellier and Jorge Melnick and of the Local Organising Committee—Markus Kissler-Patig, Christina Stoffer, Iris Bronnert and Pam Bristow. I am also grateful to all the authors who have contributed to this written record for posterity. Also, special thanks to the Max Planck Institut für Extraterrestrische Physik and to Linda Tacconi in particular for making available to us their large seminar room once it was clear that the interest in this Workshop had exceed the capacity of our Auditorium.

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