

Announcement of the ESO Workshop

## MAD and Beyond: Science with Multi-Conjugate Adaptive Optics Instruments

8–10 June 2009, ESO Headquarters, Garching, Germany

ESO has pioneered the use of adaptive optics assisted instruments for research in astronomy. Come-On+ and its heir, Adonis, were the first common-user adaptive optics instruments. Nowadays adaptive optics (AO) instruments are standard at all major observatories. AO adapters are routinely used to feed spectrographs that require very small entrance windows to achieve very high spectral resolution, such as CRIFES, or to increase the spatial resolution of spectro-imagers, such as SINFONI on the Very Large Telescope (VLT). In addition AO adapters are indispensable for the Very Large Telescope Interferometer (VLTI). The biggest shortcoming of AO instruments is their small corrected field of view, which is limited by the size of the isoplanatic patch that even in the infrared and at the best sites rarely exceeds 15 arcseconds. The ESO Workshop on AO in Venice in 2001 paved the way, on the basis of theory and simulations by researchers in Europe and the USA, to overcoming the isoplanatic barrier and thus atmospheric tomography was born.

The study phase for the European Extremely Large Telescope (E-ELT) provided the opportunity to actually demonstrate that atmospheric tomography, as implemented in its best known version of Multi-Conjugate Adaptive Optics (MCAO), can provide AO performance over fields of view significantly larger than the isoplanatic patch. This led to the construction of the Multi-conjugate Adaptive-optics Demonstrator, MAD, for the VLT. Thus, about 20 years after the deployment of the AO demonstrator Come-On at the 3.6-metre telescope at La Silla, ESO is again pioneering the field by commissioning MAD on Unit Telescope 3 at the VLT. The commissioning was so successful, that strong demand from the community led MAD to be offered for scientific observations, initially for 14 nights in the Chilean summer of 2007/2008 and then, again at the request of the community, for an additional nine nights in August 2008 to cover the winter period. One year after the first science demonstration run, close to ten papers based on MAD data

have been published and many others are in preparation, showing that the community is keen to apply MCAO techniques to ambitious astronomical problems.

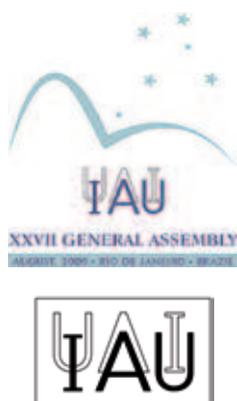
The success of MAD also demonstrated that the technology is mature, and the community prepared for the next generation of MCAO instruments. The aims of the workshop, therefore, will be twofold: to celebrate the achievements of MAD through a dedicated discussion of its design constraints and scientific achievements, and, with the strong foundation provided by the scientific results, to outline the high level requirements for the next generation of MCAO instruments. Thus, the spirit of the conference will be both festive, because we are celebrating MAD, and visionary, because we are dreaming about the future.

Further details can be found at [www.eso.org/sci/meetings/mad2009/index.html](http://www.eso.org/sci/meetings/mad2009/index.html). The deadline for registration is 10 May 2009.

Announcement of the IAU Special Session 1

## IR and Sub-mm Spectroscopy: A New Tool for Studying Stellar Evolution

3–6 August 2009, IAU General Assembly, Rio de Janeiro, Brazil



This IAU Special Session aims at fostering collaboration between various fields and will bring together experts from theoretical

and observational astrophysics, instrumentation and laboratory spectroscopy. In combination, these fields hold the key for the scientific success of current and planned facilities. New observations will foster new approaches to old problems and will no doubt lead to transformational thinking on stellar evolution.

The conference occurs at a particularly advantageous time for the transfer of knowledge in IR and sub-millimetre spectroscopy from mission to mission. Certain space missions have produced a wealth of data — Spitzer will have completed its cryogenic mission and entered the “warm” phase, while AKARI has ended operations after completing an all-sky survey. Others will either be presenting

early results (Herschel) or making advanced preparations for launch (SOFIA, JWST). New ground-based facilities (VLT, Gemini, Keck) have matured to the point of presenting results of unprecedented quality. In the near future ALMA will open up the study of sub-millimetre sources to unprecedented sensitivity. The next generation of extremely large telescopes (ELTs) will allow the study of individual stars in other galaxies. In this field, IR spectroscopy will be particularly important, as only the combination of ELTs with active optics will allow individual stars to be singled out in crowded regions.

For details please visit the website at: [www.eso.org/sci/meetings/iau2009-sps1/index.html](http://www.eso.org/sci/meetings/iau2009-sps1/index.html)