MUSE Busy Week

19-23 February 2007

From 19-23 February 2007 the MUSE instrument team gathered in the Lorentz Center to discuss the progress and critical items of the MUSE instrument. MUSE—the Multi Unit Spectroscopic Explorer—is a 2nd generation instrument for the VLT which uses a combination of wide-field integral field spectroscopy and adaptive optics to allow for both large area blind surveys of the high-redshift universe as well as resolved spectroscopy of extended nearby objects, like galaxies or globular clusters, resolved stellar spectroscopy of galactic sources, and high-spatial resolution monitoring of solar-system bodies. The MUSE instrument is being designed and built by an international consortium of 6 international institutes in partnership with ESO.

MUSE is currently in its preliminary design phase, which involves close collaboration between the different partners to remove discrepancies between the elements designed at the various institutes. This MUSE Busy Week was planned to provide input for the MUSE Preliminary Design Review, to take place in July 2007. As the title of the meeting already suggests, the Busy Week meeting required intense exchanges of information, both across the whole consortium, and between small working groups. The team meeting took place in the form of a number of plenary sessions, but mostly in smaller groups to discuss certain aspects of the MUSE instrument, science and interfaces. The days were divided in roughly four sessions, each containing either a plenary or group session.

With the optical design of MUSE nearly frozen and an initial mechanical design of MUSE available, more detailed items of MUSE needed to be discussed. After the initial day, which was mainly dedicated to the (project) management of MUSE, the independent subsystems of MUSE were adressed.

- The MUSE instrument will have a metrology system which keeps the instrument and its AO system (GALACSI—developed by ESO) aligned. This system should work in the various modes of MUSE and finally a good compromise between complexity and accuracy was found.
- The different elements of MUSE will have to interface together and fit within the total allowable mass- and volume budget. During the busy week both meetings on the overall mechanics of MUSE as well as meetings on the various substructures were held, like the Calibration Unit, Integral Field Units and support structure.
- Since MUSE will be operating with more than 24 ccd-cameras, cooling, vacuum systems and electronics are important elements of MUSE, even in the overall mass budget. A relatively advanced design of the cryogenic- and vacuum system was presented, base on LN_2 cooling. Furthermore, a balanced division was made between the MUSE instrument and the MUSE AO system GALACSI on the use of the available resources, like power and cooling.
- To be able to maintain the performance of MUSE detailed error budgets have been made and a full simulation of MUSE is under way, to verify that the expected performance is achieved.
- MUSE is a relatively complex instrument without movable elements for alignment. This means that special care is needed for the assembly, integration and testing (AIT)

of the instrument. A significant effort was devoted to determining the optimal way to do the AIT of MUSE both in Europe as well as in Chile. With 24 spectrographs, full (re-)alignment would cost too much time and an intelligent alignment scheme and stable structure is required to be able to deliver the instrument on time.

The week concluded with the bi-monthly MUSE Progress Meeting, where the consortium provided the client (ESO) with a summary of progress since the previous meeting. This meeting was a significant mile-stone in the project's development and the overall conclusion was that MUSE is well under way and that a lot of progress was made. The consensus was that the MUSE Busy Week was very successful, both from the perspective of progress in the instrument as well as in interaction of the MUSE team members.

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