Wendelstein Observatory
Ludwig-Maximilians Universität München
From Observations to Science

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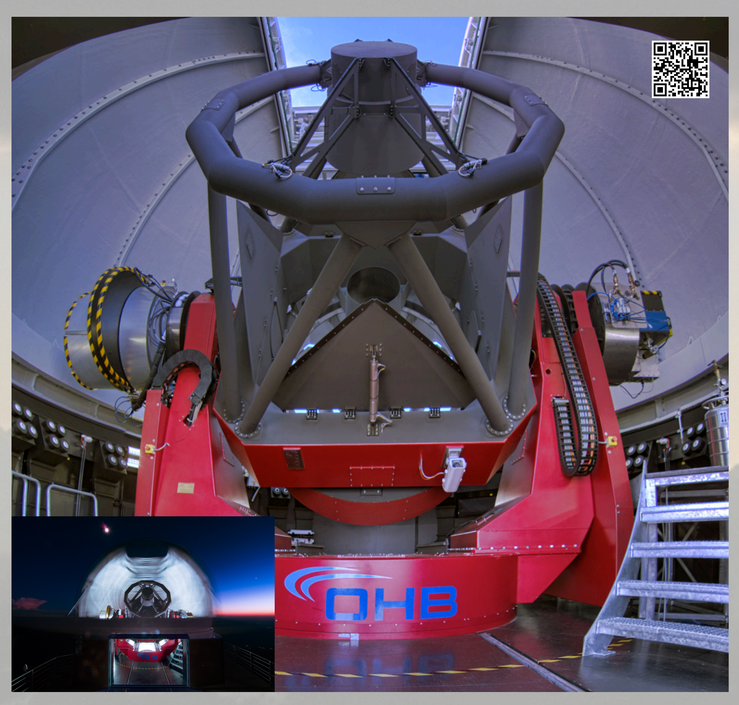
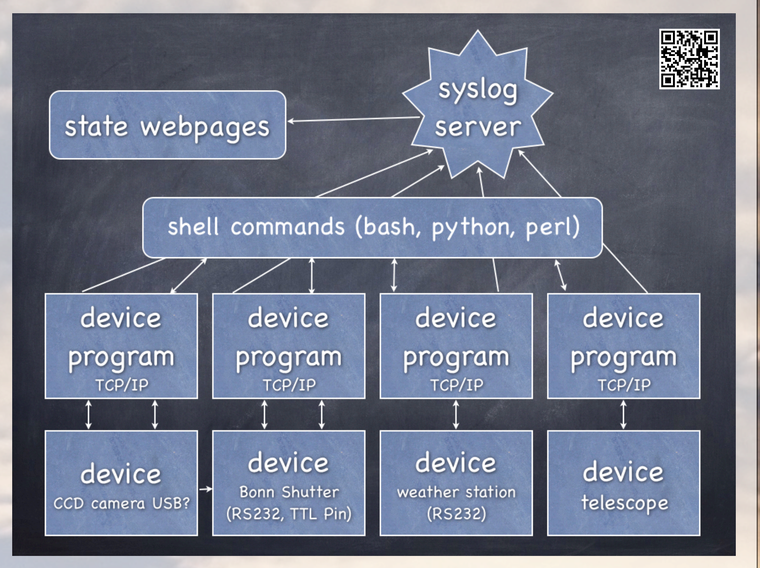
LMU München operates an astrophysical observatory on Mt. Wendelstein with two telescopes (2m and 40cm) and five instruments (three imagers and two spectrographs) for night time observations. The observatory offers service observations for the astronomy groups of the LMU physics department as well as for their collaborators.

Wendelstein Observatory, site:
Bavarian Alps, ~60km SSE of Munich, 1850m Alt., view to the north with Munich under clouds.



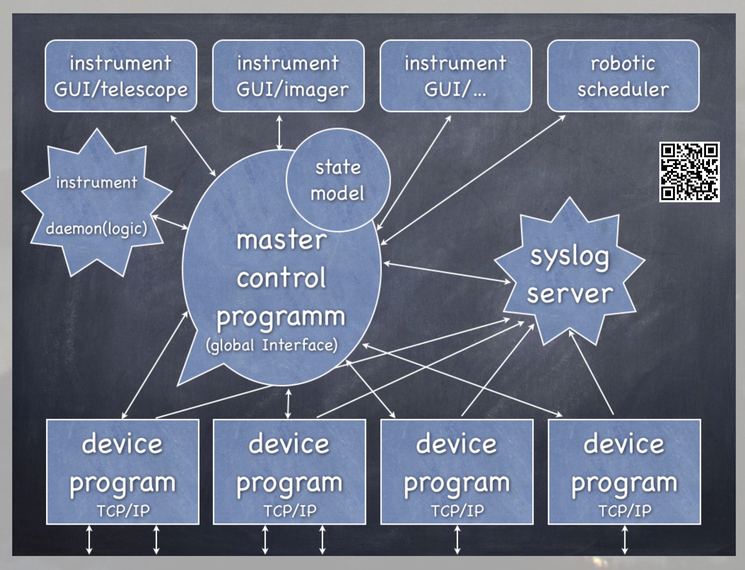
Wendelstein Observatory, instruments:

- 2m RC telescope, 40cm telescope
- $(0.5\ deg)^2$ FoV optical imager (left)
- $(8')^2$ FoV 3 channel optical NIR imager (right)
- low resolution IFU spectrograph (on loan at McDonald Observatory, TX)
- high resolution Echelle spectrograph (fibre coupled in the basement)
- simple imager & spectrograph for 40cm

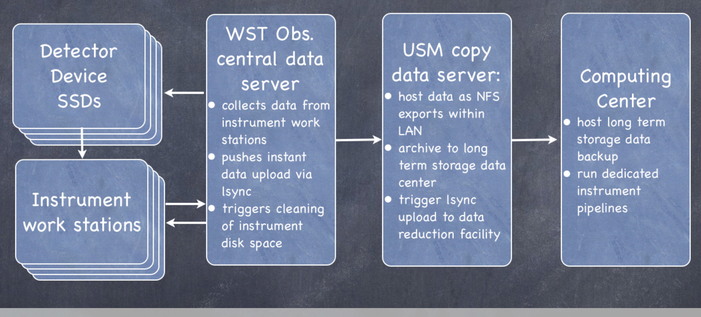


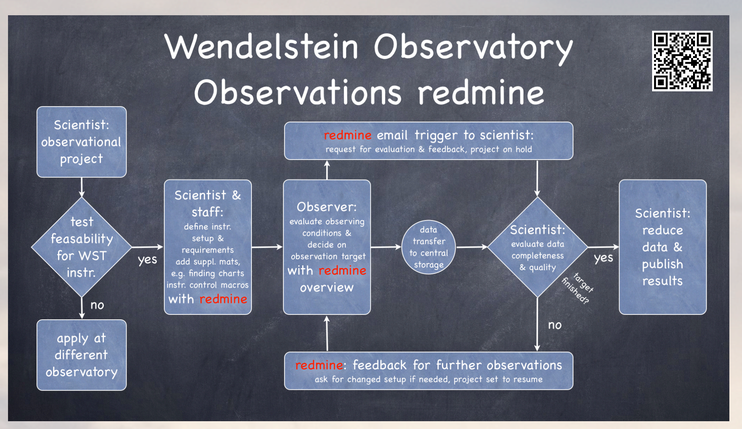
Observatory Control

Our software concept for hardware control can be broken down into several hierarchies. Three main layers define the logic what happens where: A device control layer, a centralised system state and control layer, and the user interface domain. The communication between those layers is handled by appropriate interfaces. A second hierarchy comes with the successive development of control software, but follows the first hierarchy: First hardware is controlled as supplied from the vendor. The second step takes control to simple command line and scripts by implementing the software for the device control layer. Intermediate device state overview per webpages is also provided here. The third step is to build a representation of a device within its instrument context in the centralised layer. The last step is to implement the web based graphical user interface as well as modules for complex observing scripts. While successively developing control software the data and meta data management has to be adjusted accordingly. Another hierarchy follows the internal layers of the software: Wherever possible we build libraries which handle common problems (DRY concept), e.g. interface objects for communication via IP sockets, USB or serial interfaces, parse objects for translating between the different layers etc.



Wendelstein Observatory Data Flow





Staff and student observers have to be able to adjust observation scheduling to a wide range of observing conditions (often changing several times during an individual night) meeting the demands of very different observation project constraints (background limited, seeing limited, time limited etc.). To meet these requirements we adapted a free bug tracking software (https://www.redmine.org) which was already in place for observatory operations and software development. The tool enables easy communication between, and progress documentation for observers and observing projects leads with only very little administration overhead.

More on science @ talks, Tuesday 14h45 - 15h30