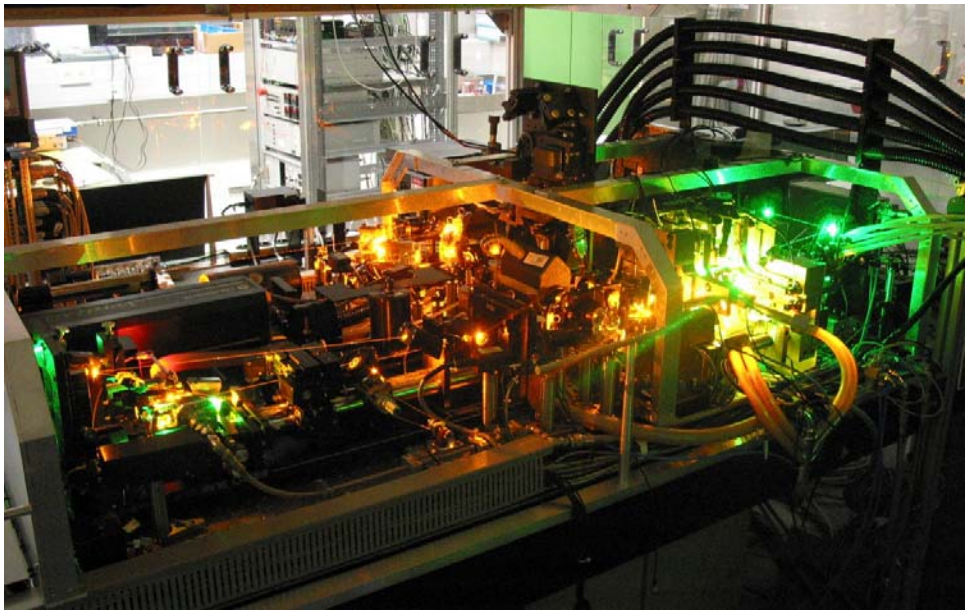
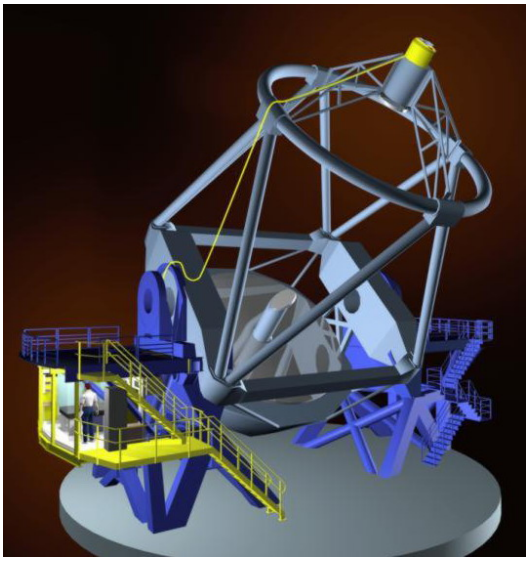
PARSEC – the laser for the VLT

PARSEC is a sodium line laser which produces a stable single high quality 10 W continuous wave output beam. In Spring 2004 it had its European Acceptance Test and is currently undergoing joint testing as part of the Laser Guide Star Facility. In 2005 the LGSF will be commissioned with the adaptive optics instruments NACO and SINFONI for which, with Strehl ratios expected to reach 40% in the K-band, it will greatly increase the useful sky coverage.

The PARSEC system is based on dye laser technology, with many innovations. Commercial 532nm lasers excite a dye solution which is pumped through sapphire nozzles at a pressure of nearly 30 bar. In the master laser, a low power single frequency and single mode beam is produced, and used to feed a power amplifier which is phase-locked to the seed beam and, in typical conditions, can boost the output power to 15 W. Steerable mirrors keep the beam aligned with an accuracy of a few microns, and considerable automation allows the laser to be started from a remote site.





Above: the PARSEC laser bench in the lab at MPE, without the cover. The master laser is front left; the amplifier on the far right. The highest output power achieved to date is 23.9 W.

Left: a drawing of the how the laser system will be installed on the VLT UT4. The laser itself will sit on the bench in the clean room under the Nasmyth platform. The output beam will be taken to the launch telescope above the secondary mirror by a single mode photonic crystal fibre.

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