The VLT Unit Telescopes are four 8.2m telescopes, which can host up to three different scientific instruments each. The TIO has the full responsibility of operating the telescopes and instruments from sunset to sunrise.

During Service Mode observing, all instruments are available for performing science observations. As a result, the TIO assigned to the UT has to be fully certified for operating all instruments and related sub-systems.

According to the Science Operations Plan each TIO is assigned to drive one single telescope each night. The TIO operates the telescope and its instruments while maximizing operational efficiency and maintaining the safety of the people and the equipment. In normal Service or Visitor Mode operations, the TIO is at the front-line in case of instrument problems prior to the start of the observing period.

On Paranal ESO operates the Very Large Telescope (VLT) with four 8.2m telescopes (the Unit Telescopes or short UTs). Each UT provides one Cassegrain and two Nasmyth focus stations for facility instruments. In addition each UT is equipped with a Coude focus station from which the light can be coherently combined (interferometric observations). ESO also operates four 1.8m Auxiliary Telescopes (ATs) for the interferometric array (VLTI), and two survey telescopes: the 4m infrared VISTA, and the 2.6m visible VST. Currently there are sixteen scientific instruments operated at Paranal. Eleven of them are located at the UTs, one at each Survey Telescope, and three at the VLTI complex. Furthermore, several other subsystems are required to be in support of the scientific operations (complementary Adaptive Optics systems, Laser Guide Star, Delay Lines, etc.).

The know-how of the TIO is essential to fulfill the particularly complex of the VLTI operations, the Night-time Astronomer works together with the TIO for the full night, sharing duties. In addition to the instrument, the TIO operates the full array of telescopes and related systems and subsystems. Due to the complexity of the VLTI operations, the Time-Of-Flight Astronomer (TIO) during nighttime and daytime has been evolving over the years, along with the department science operations model.

The TIOs contribute to all SCIOPS Operations Groups (General Operations, VLTI, Training and documentation, UT Teams, etc), as well as being active participants of department projects. They also help in the definition of new operational standards. The professional background and the operations expertise acquired by the TIOs allow them to be at the front line for problem detection and resolution (via a strong interface with Engineering).

In order to fulfill the requirements of the recently revised Operations Plan, the Science Operations Department (SCIOPS) implemented a standard training system in which all TIOs are the autonomous operation of the Telescopes and Instruments installed at the Unit Telescopes (UTs), the Survey Telescopes (VISTA and VST), the VLTI Complex (VLTI Interferometer), and their auxiliary subsystems (Laser Guide Star, domes, cooling, but also DIMM, ASM, etc.). Experienced TIOs have the additional functions of Weather Officer or Safety Coordinator, depending on scheduling requirements.

The staff is standardized for all units, and is performed with direct coaching of the Astronomers and the most senior TIOs. A standard certification process was conceived for every instrument, and was prepared in collaboration with the Instrument Scientist. The TIOs are themselves in charge of producing documents about instrument operations, from the operator’s point of view (e.g. “Survival Guides”), which clearly define the process of data quality control. Such documents are used to perform the training of the newcomers. In addition to the core operations training, the TIO members receive a training on Optics and Adaptive Optics.

The VLT

**Operations of the VLT by Paranal Telescope Instrument Operators**

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