Observing the mysteries of the universe

Telescopes have opened our eyes to the universe. They have revealed new planets and asteroids, helped us understand gravity and other fundamental laws of the physical world. Large science facilities underpin research and progress our knowledge and understanding of the world we live in. As part of our portfolio of funding, STFC provides access to several telescopes and other world-leading science facilities around the world. This includes the ING.

The telescopes at ING are the most frequently used facility by our researchers, according to their Researchfish submissions. Usage was also reported by a number of STFC-supported students, providing them with a unique opportunity to train in the exploitation of a major science facility.

The ING is made up of the William Herschel Telescope (WHT), the second largest telescope in Europe and the Isaac Newton Telescope (INT), operating on the island of La Palma in the Canary Islands, Spain. The ING is operated under a tripartite arrangement on behalf of the UK, the Netherlands and Spain.

The suite of telescopes contribute to a diverse range of astronomy. Recent highlights include:

- The WHT helped to identify a system of seven potentially habitable planets, six of which are comparable in size, mass and temperature to the Earth, raising the possibility that they host liquid water on their surfaces. Several UK authors were involved in the work identifying the planets.
- The ING supported the ground-breaking Rosetta mission, providing external observations of the comet as the Philae probe studied the internal composition.
- The telescopes observed a black hole present in our own Milky Way galaxy emitting red flashes 1,000 times brighter than our Sun, for a fraction of a second. This has allowed researchers to study the nature and environment of black holes. Lead author on this study was STFC fellow Dr Poshak Gandhi from the University of Southampton.
- The WHT recently investigated the first interstellar body to visit our solar system, the 400-metre-long ‘Oumuamua asteroid.

STFC and the other ING partners have supported the development and construction of the new WEAVE instrument, to be deployed on the WHT. The new instrument will allow astronomers to observe and analyse up to 1,000 stars and galaxies in a single exposure. This huge leap in observing efficiency (currently a maximum of 100 objects can be observed simultaneously), will allow astronomers to tackle several astrophysical problems that until now have remained out of reach. First light for the new instrument is planned for May 2019.

A new tripartite agreement was signed in 2017. Under this 10-year agreement, telescope time will be shared between the three partners. With the new agreement signed and upgrades taking place, the ING will be helping to push the boundaries of science for years to come.

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4. ING of Telescopes. Available at: www.stfc.ac.uk/research/astronomy-and-space-science/isaac-newton-group-of-telescopes/ Accessed: February 2018
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