TIMES OF MALTA

Protect the night sky

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The night sky should be recognised as a cultural, scientific and natural heritage which should be protected and conserved for current and future generations, says Antoine Grima

The many opportunities the Maltese night sky offers in terms of learning and research is underestimated and undervalued. Photo: Shutterstock.com

For a long time, the stars served humanity well: a calendar and the first GPS to navigate the ocean. They also inspired storytelling of gods and heroes. Jupiter and Mars for example, gods for the Roman state until they were replaced by Christianity and Perseus and Orion, heroes in Greek mythology.

The stars inspired astronomers like Copernicus and Galileo who revolutionised our thinking by displacing earth as being at the centre of the universe and Giordano who extended our understanding of the universe by proposing that the stars were distant suns.

In Malta, celestial objects are referred to in some proverbs, words of wisdom based on experience passed on to us by our forefathers, such as: for weather purposes, “il-kwiekeb tegħmeż għandna r-riħ”, when the stars flicker expect the weather to become windy or stormy; in agriculture, “iż-żrigħ u t-tilqim fil-qamar qadim”, farmers should sow seeds and graft trees when there is a waning moon.

Some marvels of the night sky made their way into the Maltese vocabulary such as “Triq ta’ Sant’Anna” which refers to the milky way, “it-trajja” for the Pleiades star cluster, “kewkba ta’ filgħodu” for the morning star, Venus, “kewkba feġġeja” for shooting star and “dmugħ ta’ San Lawrenz” referring to the Perseid meteor shower. Also, some years back

several archaeoastronomers debated the orientation of our temples and whether they were directed towards particular celestial events.

Clearly, the night sky is part of Malta's history and cultural heritage.

Over the last years space has become accessible to private enterprise. As the space economy evolves new industries appear on the horizon like space tourism and asteroid mining. These will add to existing activities in the communications and remote sensing sectors. Malta will soon adopt its own Space Act to attract operators in the industry.

In terms of space exploration, we remain awed by ongoing discoveries made by satellites zooming within our solar system, by vehicles after landing on other celestial bodies and by the James Webb Space Telescope. These have increased our knowledge of the cosmos as we strive to find a meaning to our existence.

And yet paradoxically, we are gradually becoming visually disconnected from the night sky as it is constantly being eroded by light pollution. Indeed, as we get to know more, we get to see less.

The variety of opportunities that the Maltese night sky offers in terms of learning and research through ground-based amateur astronomy is perhaps underestimated and undervalued. Perhaps it is not understood well. The contribution to science by Maltese amateur astronomers is not only immeasurable but a crucial addition to that made by professional astronomers.

Some key areas where research is carried out concern long-term monitoring of selected stars like variable stars or supernovae, the tracking of asteroids and high-resolution imaging to search for new comets and deep-sky objects.

Amateur astronomers invest heavily in terms of personal time for research and endless hours of observing. Several also choose to invest financially by purchasing specialised equipment especially if they conduct astrophotography.

> *The night sky is constantly being eroded by light pollution*
>
> - Antoine Grima

Activities vary; monitoring the irregular brightness of many stars is one. The data collected helps to acquire a better understanding of stellar evolution.

For example, currently all sorts of instruments are targeting Betelgeuse, a supergiant star around 700 light years away, which is in its final stages of its life. Its recent erratic behaviour may be indicative that its end is near and if so, it will be spectacular. Other observations concern exoplanets by observing the brightness of their host star.

Amateur astronomy may be rewarding. Several discovered supernovae or novae whereas others had the privilege to have a comet named after them after they would have discovered it.

These are areas where the contribution of the amateur astronomer remains important despite the range of automated tracking and surveying systems designed to detect new comets and near-earth objects (NEOs).

In the case of the latter, each discovery is added to a database of over 41,000 known NEOs where their orbits are calculated to evaluate the potential hazard they pose to us. This is done after amateur astronomers would have followed up a discovery by carrying out thousands of observations and relayed that information to designated centres which would in turn refine the calculated orbits.

Meteor watching can be done in small groups and is an unparallelled experience which brings shared wonder and excitement. Valuable data can be collected without the use of any equipment.

An observer is simply required to sit comfortably and determine if a shooting star appears to originate from a particular spot in the night sky, the radiant, its brightness and record the

time of the event.

Such observations often take place during specific times of the year to coincide with the increased activity of annual meteor showers such as the Quadrantids (January), the Perseids (August), the Leonids (November) and the Geminids (December). Some may decide to conduct their observations differently and use cameras to record meteor tracks.

The information gathered, especially in case of a sudden outburst, may serve to alert of the increased risk this may pose to satellites and astronauts in space although admittedly major accidents to date have been rare.

The scientific value of the night sky is clear. The reason for its conservation is as clear.

Way forward – recognise the night sky as a cultural, scientific and natural heritage which should be protected and conserved for current and future generations. Promote public awareness of this. Implement measures to reduce light pollution while using resources more efficiently and responsibly.

This will not only enable the government to be taken seriously with its proposal to transform Fort Binġemma into a proper Space Park/Observatory but will enable Malta to meet several sustainability goals.

Finally, show commitment to defend the quality of the dark sky and rethink the proposed regulations on how artificial lighting will be used at Dwejra.