Altrincham and District Astronomy Society

Meeting number **614** held on 7th February 2025 at 8pm

Location: Timperley Village Club

Apologies: Peter Baugh (Chairman) and Bansa Singh Hayer

Members Present (in person): 20

PRESENTATION

The presentation for the evening was given by a former member, Dr Colin Steele from Manchester University and Sheffield Astronomical Society, who gave a talk entitled "Jupiter and the Trojan Wars".

Dr Colin Steele began by presenting various statistics on Jupiter and it's moons. He then went on to provide some background on the Trojan Wars; the key events and main characters involved on both sides (Greek & Trojan). This was followed with more detail, supported with diagrams, on Jupiter's position within the solar system and how it was the dominant object (apart from the sun).

With the scene set Dr Colin Steele moved onto how knowledge of the solar system and the various bodies within it grew, beginning with Bode's Law. He demonstrated how the law had worked for each of the planets' orbits and how a gap had been identified between the orbits of Mars & Jupiter. This had resulted in the setting up of a group of astronomers called the "Celestial Police" who looked for the "missing planet." This in turn ultimately led to the discovery of Ceres in 1801, although not by the group. Dr Colin Steele then showed photos of Ceres moving against the background stars. The following year a second object had been found, Pallas and the discoveries did not stop there, many others were found. Eventually all these objects were downgraded from being defined as planets to redefinition as minor planets. Further photos were shown of other minor planets moving against a background of stars and then a graph was presented plotting the minor planets' orbital periods in terms of Jupiter's orbital period. This demonstrated that some fractions worked well but others did not. The data also highlighted that there were two groups of bodies moving around the sun in the same orbit as Jupiter but 60° ahead or behind the planet.

This was the point where the "Trojan Wars" in the title of the presentation came in. These two groups of bodies were called Trojan asteroids and individual bodies had been named after characters from the Trojan war. The naming convention had started with the first-discovered Trojan asteroid, "588 Achilles," named after the famous Greek hero Achilles. Subsequent discoveries followed this trend, with asteroids in one group named after Greek heroes and those in the other named after Trojan heroes (apart from two interlopers who had already been named the opposite way around (spies in the respective camps)). Dr Colin Steele went on to say that the two groups of asteroids were explained by understanding how Newton's Law of Gravity, Kepler's Three Laws, and the restricted three-body problem interacted to provide five regions of gravitational equilibrium, called the Lagrange Points. Two of these points (L1 & L2) were unstable and objects orbiting at those points needed "nudges" to keep them in place, L3 was on the far side of the sun and also unstable but L4 & L5 were stable. This was where the Trojan asteroids around Jupiter were found. Jupiter was not the only body in the solar system to have Trojans, for example two of Saturn's moons were also Trojans. Dr Colin Steele ended this part of his presentation by describing the views of various solar system objects from the surface of a Trojan.

Finally, the presentation took a look at the future: space probe Lucy was already on its way to explore the Trojans and other minor planets. Dr Colin Steele went through the probe's timeline, set targets and experiments on board. He also talked through it's first encounter with Dinkinesh and it's satellite Selam, which showed the little satellite was in fact a composite of two small bodies gravitationally bound together. He finished his presentation by asking the question "who knows what Lucy might find when it gets to L3 & L4?"

ITEMS OF BUSINESS

1) **Member's Talks**
   It was highlighted that members were acting as speakers at other events; Colin Henshaw was giving a talk at the Sheffield Astronomical Society the following week, a month later the Secretary was also giving a talk at Sheffield and the Treasurer was due to give a talk at High Legh Community Observatory in the near future.
2) **Observing Highlights**
   a) The Secretary reported that there was a brief window when all the planets would be visible at the same time in the sky (around 22nd).
   b) There would be a total lunar eclipse on the 14th of March but timing was poor as the moon would only just be rising at 06:58.
   c) On March 29th, at around 10:40, there would be a 50% solar eclipse.
3) **Any Other Business**
   It was reported that an asteroid had been discovered for which it was currently calculated that there was a 1:40 chance of hitting the earth in 2032. The chances of it hitting the earth were initially likely to increase until a better fix could be obtained of it's trajectory. At the moment it's path would take it over the equator and major cities. The asteroid was known as 2024 Y4 and was estimated to be around 90m in size. It would make a close pass in 2029, when it would be visible from the UK at an estimated magnitude of +2

Next meeting

The next meeting was 7th March 2025