Altrincham and District Astronomy Society

Meeting number **606** held on 5th April at 8pm

At Timperley Village Club

Apologies: N/A

Members Present (in person): 17

Presentation:
The meeting's presentation was given by Professor René Breton and was entitled "Cosmic Fireworks". The presentation covered transient astronomical events beginning with one of the most famous historic transient events recorded, that of a "new star" seen by the Chinese in 1054AD, better known in modern times as the Crab Nebula. René explained that "the new star" had been a supernova, a massive star ending its life and that all that was left of the original star, the supernova remnant, was a pulsar. He then went on to describe what a pulsar was and how in the mid-1990s a systematic search for these supernova was enabled as digitisation and software to analyse data had greatly enhanced our ability to search for these transient phenomena. A couple of examples of two such projects was provided; the Supernova Legacy Survey (SNLS) and the Palomar Transient Factory (PTF).

It was explained that there were several different types of supernova and one type in particular had proved to be a useful tool for measuring cosmic distances and the expansion of the universe. Type IA supernova always produced explosions on the same luminosity scale thus enabling a correlation of brightness with distance and graphs were seen demonstrating this. Type IA supernova were so bright they could be seen in other galaxies and it was this information that enabled a calculation of the rate of expansion of the universe.

Other types of transient phenomena were described briefly before the presentation moved onto new transient phenomena and what key instrumentation was coming on line. First light of the Vera C. Rubin Observatory (formerly known as the Large Synoptic Survey Telescope or LSST) was expected late 2024. This had a very large field of view and could cover the entire sky every few days, collecting 30TB of data every night. It was explained that the raw data could not be stored so effective communications were required to pass on data on any possible transients found. Robots were needed to sift through the data to identify these possibles. The role of the Lovell Telescope in following up on pulsars and in catching Fast Radio Bursts (FRBs) was talked about and detail provided on the "Lorimer" burst found in 2006 and why it was thought to be of extra galactic origin. On a lighter note the story of the flashes seen soon after at Parkes was told – how the flashes seemed suspicious and were later traced to a microwave!

Finally the presentation moved onto the future of radio astronomy and in particular the Low Frequency Array (LOFAR); the Square Kilometre Array (SKA) and its precursor MeerKAT, providing an overview of what they were, where they were located and what would be needed to analyse all the data. The presentation finished with information on the detection of gravitational waves and the LIGO detector, providing detail on how it worked, what it detected and what problems it had to overcome. The presentation also covered what gravitation waves were, how they were formed and how there was an associated project the Gravitational-wave Optical Transient Observer (GOTO) looking for the optical counterparts to gravitational wave events e.g. it was now possible to look at the 2017 LIGO event across the whole electromagnetic spectrum.

The presentation was followed by a discussion on data analysis, the changing role of the amateur astronomer and how they might be able to contribute in the future.

Items of Business:

1. *Observers Group*

The Secretary reported that the weather app showed a favourable sky for Saturday night and asked if anyone was interested in setting up an observing session. This would be confirmed via the WhatsApp group.

Next meeting
May 3 2024 – Presentation/Guidance on Astrophotography