

Altrincham and District Astronomy Society

Meeting number **613** held on 3rd January 2025 at 8pm

Location: Timperley Village Club

Apologies: None

Members Present (in person): 21

CHAIRMAN'S WELCOME

The Chairman opened the meeting by welcoming new faces, he then went on to introduce the Speaker for the evening George Abraham and his presentation "Modelling Massive Star Evolution",

PRESENTATION

George began by explaining that massive stars were defined as stars with a mass greater than eight times that of our sun. He provided a brief overview of a star's life cycle from their birth out of dust clouds through pre-main sequence, to their life as main sequence stars, illustrated with real life examples. An explanation was given of what Population I, II and III stars were and the various evolutionary phases a massive star would go through, along with the timelines. Detail was provided covering each phase demonstrating the basic processes going on inside a massive star during its evolution. This provided background information to then understand the modelling that George had undertaken.

More detail of this modelling, how results could be depicted using Kippenham Diagrams; the physics behind the process such (MLT) Mixing Length Theorem, (TDC) Time Dependant Convection and use of MESA (Modules for Experiments in Stellar Astrophysics). This was followed by sharing an example of the test script and parameter chosen used for the modelling that George had undertaken.

Finally the methods for analysing the results were discussed; transferring the data to Kippenham Diagrams and the use of abundance plots. This was illustrated using the results from the modelling of a twenty solar mass sun. Finally the limitations of the process were highlighted; the difficulty in determining whether something was a true finding or a computer artefact and the sheer length of time it took to run one simulation (up to six days).

The presentation was followed by questions and further discussion.

ITEMS OF BUSINESS

1) Future talks

- a) Colin Steele, an ex-member, would be giving the talk the following month.
- b) It was noted that it would be interesting to see if a speaker could be found to give a talk on the James Webb telescope and how it compared with Hubble.
- c) It was also highlighted that members were acting as speakers at other events; the previous evening the Treasurer had given talk at Wincham Pickmere & District Astronomy Group and the Secretary was due to give a talk in two weeks time to Warrington u3a.

2) Any Other Business

It was suggested that it might be nice to every now and then get together before a meeting to have a social drink and a chat to get to know each other better. It was felt that if this became a fixture it could possibly draw in new members. There was of course the ADAS WhatsApp, where people could chat and observing sessions were organised but it was agreed to make enquiries about possible places to meet to provide more face to face interaction.

Next meeting

The next meeting was 7th February 2025