

Astronomy Talk 12th March 2024

Inside Stars – Cooking Pots for the Elements

This hybrid Zoom talk was given in person by the ex-chairman, James Fradgley. 18 attended in the hall and 37 on Zoom, making 55 in total.

First, we looked at what sorts of stars there are, using the H-R Diagram and covering Pop II stars and Pop I stars. Then we looked at some of the nuclear processes, defining some of the nuclear components, as seen in a bit of the Periodic Table, and covering binding energy, beta decay and inverse beta decay.

We then moved on to stellar reactions, starting with the hydrogen burning PPI, PPII and PPIII reactions. Then on to the formation of carbon and oxygen through the triple-alpha reaction. We also looked at the hydrogen burning CNO bi- and tri- cycles, followed by medium weight element synthesis from carbon to calcium, and then the silicon burning network.

Heavy elements have more varied sources which include the s-process, the r-process and the p-process. Really heavy elements, e.g. gold, platinum and plutonium, are produced in supernovae and colliding neutron stars.

Lastly, we looked at how the synthesised elements are distributed in the interstellar medium.