

The first meeting of 2023 was greeted by proper January weather in Norton sub Hamdon with some very icy pavements around the village hall. Everyone managed to make it inside carefully where it was (eventually!) warm and snug. Our first speaker of the year, Dr Claire Davies of Exeter university, was the first speaker we had to cancel back in March 2020 for the Covid lockdown. I think (and hope) that we can finally say goodbye to that rather sad episode in our history.

Dr Davies's talk was entitled "Flip it and reverse it: disruption in young planetary systems". She started with a look at our Solar System which is mainly co-planar and most bodies rotate in the same direction (anticlockwise as seen from above the North pole of the Sun). The nebular hypothesis of solar system formation, first proposed by Kant and Laplace, explains the formation of a disk around a star condensing from molecular clouds and hence the co-planarity of planets forming from that disk. We saw snapshots from simulations of condensation showing how planets form but also how moons form around planets, again co-planar and rotating in the same direction.

And... all was well with the universe until the discovery of many exoplanet systems where one or many planets in the system are non planar with the rotation axis of the central star. The Rossiter–McLaughlin effect (Google is your friend here – it was mine!) can be used to detect when the observed star rotates in a direction different to that implied by transiting planets. This non-planarity can be explained by a) changes to the rotation axis of the star, b) changes in planetary orbits after formation and c) changes in the disk of material **before** planetary formation. This last is the area of Dr Davies's research and the rest of the talk concentrated on theoretical models of how these mis-alignments can form and supporting observations.

She showed an interesting model of a tertiary system with a close coupled central binary that produced a complex but elegant system with an inner disk co-planar with the star while the outer disk was mis-aligned. She then followed this up with a model where mis-alignments can occur where the flow of material forming the disk is inconsistent in angular momentum.

Dr Davies is an observational astronomer looking for examples that either show (or disprove!) these models. She showed us examples of high resolution observations taken with the ALMA array and with other interferometric telescopes showing disk distortions. She also showed examples from rather nearer stars like Beta Pictoris where distortions of the disk are evident.

A very interesting talk on a subject that few of us were aware of. It's always enjoyable to see the work of a professional astronomer presented in such an entertaining manner. Many thanks to Claire for braving the elements for us.

The half-time refreshments (thanks, as ever, to Sue and Paul for the cakes and drinks and to the press-ganged washer-uppers!) were followed by a quick look at forthcoming events (posted separately in this blog) and some announcements by Bud. His article in Astronomy Now on the Ladder-scope has been published and is an entertaining read. He also noted that the formal AGM will take place at next month's meeting though we anticipate that this will be a fairly short session.

We also discussed the forthcoming "outreach" visits to Manor Court school in Chard (26th January) and Ash Primary near Martock (agreed to suggest 9th February to the school). Terry will release final details of the Manor Court visit this weekend and contact Ash Primary with the suggested date. If

anyone is interested in helping with either of these visits, then please contact Terry on the e-mail address on the website home page.

Just a few images from Terry this month as the weather has been unfavourable on both sides of the planet. He showed images (taken with a DSLR through a standard zoom lens) of Venus, Mars, Jupiter and Saturn in the evening sky in early January. Crops from these 18mm lens images showed both Uranus and Neptune (which was very faint) which does go to show what can be done even without a telescope.

Next month's meeting is on February 15th when Steve Tonkin will talk about "Ten Ways the Universe Tries to Kill You". We hope to see you at the meeting (assuming the Universe hasn't got to us first!).