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Patterns of the stars

Ken Tapping, 1st January, 2019

In our library at the observatory, there is a collection of little coloured balls and a bit of cotton wool hanging on strings from the ceiling. From most directions, it just looks like a random collection of objects. However, when looked at from the direction of the little blue ball, we see the constellation of Orion, “The Hunter”, now conspicuous in the southern sky. The most obvious feature of this constellation is an almost equally spaced row of three stars. These represent Orion’s belt. Starting from the belt, we can see extending downwards a collection of faint stars and a fuzzy blob, which we can easily imagine to represent his sword. That fuzzy blob is the “Orion Nebula”, a cloud of gas and dust where new stars and planets are being born. That is represented in our library model by the piece of cotton wool. Once we have found his belt, we can pick out the four stars representing his shoulders and legs, with one star on the right where his knee would be. His left shoulder is marked by the bright, red star, widely referred to as Betelgeuse, pronounced “Beetle Juice”. Astronomer and writer Patrick Moore, believing it cannot be right to call a red giant star “Beetle Juice”, consulted some Arab scholars and found that over time the Arabic name of this star had become highly corrupted and that “Betelgeux”, pronounced “Bayteljurze” is probably more appropriate. It certainly sounds better. Orion is a constellation that actually looks like what it represents. Leo, “The Lion” is another. This definitely does not apply to most constellations. Have a look at Aries, “The Ram”, Auriga, “The Charioteer”, for example. One has to wonder at the powers of imagination of those who named them.

Most star names and constellations were set out by our ancestors, over thousands of years. One can imagine them storytelling around a fire at night in the desert, fixing their favourite mythic or legendary heroes and beasts in the sky. Then, over the last few hundred years there has been some tidying up, with some minor, inconspicuous constellations being merged with more obvious neighbouring star groupings.

For most of our history, we have taken the constellations as being a permanent feature of the night sky. This is because the amount of time our species has been looking up is tiny from the cosmic point of view. All the stars we see in the sky are actually moving, so the constellations are slowly changing shape. In about 50,000 years, the Big Dipper won’t look like a dipper at all.

Then there is the possibility of more catastrophic change. Betelgeux is a red giant star approaching the end of its life. It is a high-mass star, which means its end will be in a spectacular collapse and explosion – a supernova. This might happen in five minutes time or 50,000 years from now, but it will happen. It will become bright enough to be seen in daylight. Then, over weeks, it will fade, finally becoming invisible to the naked eye, and Orion will never be the same again.

Moreover, as is clear from the model in our library, the stars making up Orion lie at different distances from us, and they only form that familiar shape in the sky when looked at from the position of the Earth. Cosmic distances are so large that the constellations will look much the same from anywhere in the Solar System, but once we venture beyond, their shapes will change hugely and many of them will become unrecognizable.

It will be interesting to see whether, when we find ourselves sitting around a campfire or some hitech alternative, on a planet orbiting another star, looking up at a new starry sky, we start telling stories and pasting them in the sky. We probably will, because that is what we’re like.

Mars, fading as it moves further away, lies in the south after dark. Venus and Jupiter shine low in the dawn glow. The Moon be New on the 5th.

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