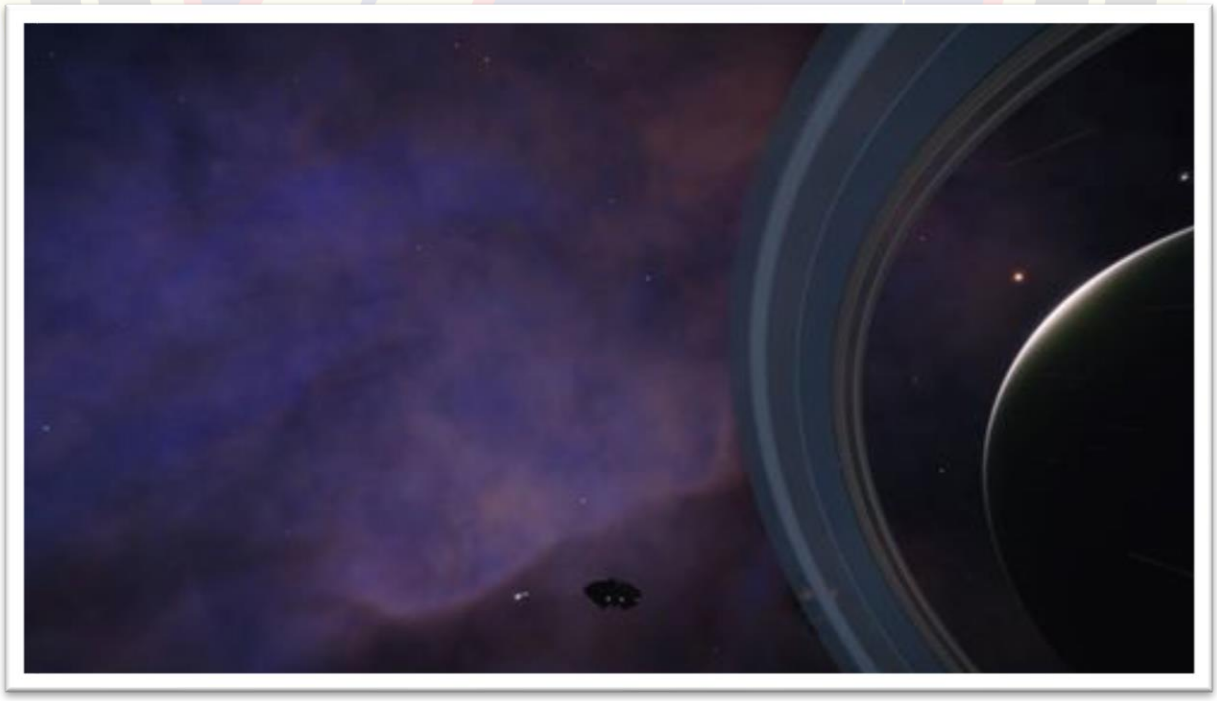
Dangerous Cosmology

Entry 01
by Dr Sarah Bosman (CMDR Shobah)

When I first started studying physics at University, I'd sometimes spend more time drawing cool spaceships and conceiving ill-fated warp-drive designs than jotting down lectures (something my marks reflected). As awesome as is it to look at beautiful pictures of SPACE!! and to learn about how distant planets curve space-time, there is no doubt for me that the final goal is to **get there**.

Clearly, none of these grand plans turned out in the end – otherwise I wouldn't exactly be hanging around anymore. But some of that enthusiasm was revived this Christmas when I received pretty much the best gift ever: Elite. You've got your warp drive now, so where would you like to go?

My first destination was the Witch's Head nebula, for no other reason than seeing it in the distance and deciding it looked cool – how else is exploration supposed to be conducted? It took less time to get there than it did to take screenshots galore. On the way there, my D-scanner revealed two more bodies than appeared in the system map (!!!) which lead to excited giggling, full scans and a very low-skilled planetary landing because these were "mine, now". They were the most anonymous ice bodies imaginable. Also, it turns out that in the past a System Scan wasn't enough to mark bodies as 'first discovered', so it's very likely that other commanders saw them before me and just didn't bother. I don't care. They bear my name now.

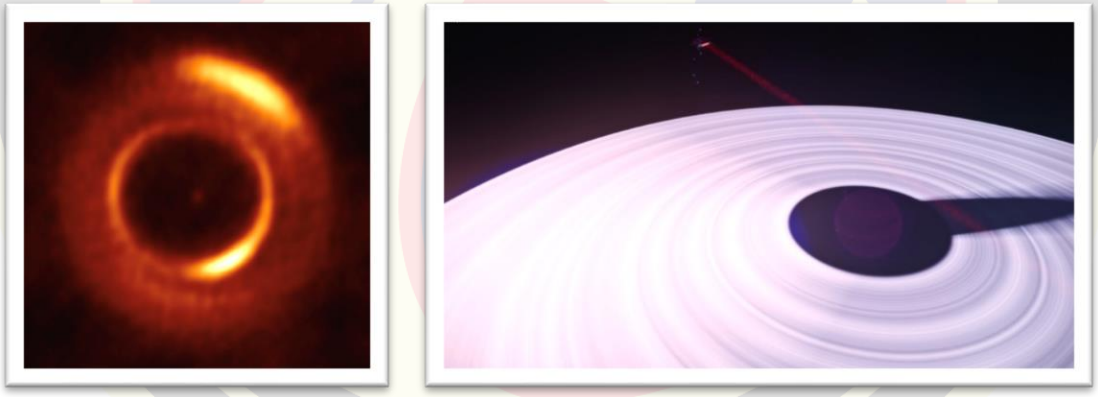


This is the life.

Once the initial shock of the immense variety of astronomical bodies in the game started to fade, my attention turned to their astronomical accuracy. Elite is incredibly immersive; jumping around the galaxy looking for cool objects is incredibly breath-taking, and the developers have clearly gone to great lengths to accurately portray star types, distances, and planet types. The kinds of planets found around various star types make sense, the varying spacing between stars across the galaxy makes sense, and the locations of many famous stars are correct. The variety of planet textures goes beyond what we currently know of planetology in real life. Yet is very realistic – a perfect example of "great sci-fi".

Yet looking at the in-game codex started to reveal interesting departures from realism. Some changes were simply made to add clarity compared to the real world: for example, the distinction between red and brown dwarf stars of the L/T/Y types is muddier than a simple difference in temperature and surface colour. They would certainly require proper scanning in order to be assigned to a category – with many likely fitting in-between or in neither type. We simply don't know much about this in real life.

Something I was particularly keen to look for in Elite were rare astrophysical events. Some events, such as supernovae, would be difficult to spot even if they *were* included due to being, well, just too rare. But other objects, such as X-ray binaries outbursts or proto-planetary disks, have been observed in real life and are sadly absent from Elite. In 2014 the ALMA interferometer started taking pictures of proto-planetary disks, with gaps in them carved by young planets. Not only are planets within rings not a bug; we actually know *where* in the Milky Way to go to see it happen, and it's only roughly 600 light-years from Sol.



Left: A huge proto-planetary disk around a star, which is starting to coagulate in strange ways as it's forming planets (MWC 758, credit: ALMA and Prof. Ruobing Dong)
Right: A huge ring around a brown dwarf in Elite: Dangerous (unknown system, credit: CMDR Nighfall Zero)

There are many other slight inaccuracies in Elite astronomy compared to real life, where for clarity, gameplay, or sheer coolness reasons. I plan to explore them as we all make our way to Beagle's Point over the next few months of Distant Worlds 2. I hope some of you will enjoy my nerd-rants – don't get me started on black holes.

Dr Sarah Bosman got her PhD in Cambridge for her work on distant quasars. She now works as a cosmologist at University College London in the 'First Light' group, studying distant galaxies as well.
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