

Important Letter to the Editor

On the Use of Astronomy: Predicting the Doom of Humankind

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ABSTRACT

We have obtained, after 200 hours of exposure, a decent spectrum of the recently discovered candidate brown dwarf located only 3 pc away from the Earth-Sun system. This allows us to derive the radial velocity of the object and determine its motion in the Galaxy. Based on this, we estimate that the object came close to the Sun 22,345 years ago and created havoc in the Oort cloud. This most likely implies that humankind will be erased from Earth's surface in 12,194,755 years, give or take 30 years. This assumes of course that Humans will still be around at that time.

Key words. Stars: cool – Stars: killers – Doomsday – April: fool – Brown dwarfs – Comets

1. Introduction

Despite continuous and dramatic cuts in funding, it is often said that astronomy is currently in its golden age. And it is true that there are claims for discovery of galaxies at the edge of the Cosmos (at least the one Humans know about) and we recently even had announcements made about the very early youth of our Universe. But these grandiloquent claims, for hopefully true they are, are only a mere diversion to make us forget that we are still very ignorant about our very close neighbourhood. Trujillo & Sheppard (2014), for example, just uncovered a dwarf planet, beyond the “known edge of the solar system”. This is according to them one of thousands of distant objects that are thought to form the so-called inner Oort cloud. Based on this, these authors also infer the potential presence of a planet, possibly up to 10 times the size of Earth, not yet seen! And in our stellar neighbourhood, Luhman (2013) reported the discovery of a couple of brown dwarfs located only two parsecs (pc) away, and therefore the third closest system to the Sun. As Luhman put it, “the distance to this brown dwarf pair is 6.5 light years – so close that Earth's television transmissions from 2006 are now arriving there”, and we may therefore be worried that the extraterrestrials who saw these images are now torn between being just flabbergasted or ready to commit suicide. We note in this respect that Boffin et al. (2014) found a hint of a possible signature of a planetary mass companion around one of the two brown dwarfs, so this is maybe not just a semantical question. Here, we study another example of a recently discovered close-by object to add to the point – and increase our number of publications, thereby ensuring continuous funding.

2. Observations and Analysis

Using the UNnecessary WIde SurVEy nano-satellite, an astronomer whose name shall not be spoken¹, discovered the object UNWISE J072004.20-084650.2. To avoid having to use an unfortunate acronym coupled to an unpronounceable phone number name, in the following and for reasons that will become clear later on, we will call this object the Death Star. This object is most likely a very cool object, at the boundary between stars and brown dwarfs, and was found to be located 3 pc away. This is thus another of our newly discovered neighbours.

After a long and painstaking process, typical in research but often kept secret, we obtained a spectrum of the Death Star with the FARCE instrument (Joke & Bug 2000) attached to the 5-cm Extremely LIttle Telescope (ELITE) donated by the son of one of us after he got fed up with observing the sky, just 2 days after he received it as a birthday present. As the object has a magnitude $V=18$, it was necessary to add spectra obtained with the 300V grism for a total duration of 200 hours, i.e. 25 nights spread between October 2013 and March 2014, when the conditions were good enough and the support observer did not fall asleep. The resulting spectrum has a signal-to-noise ratio of 20 and is not shown here as it has no interesting features (except for those that you expect for a cool red dwarf who is living with Snow White), and you don't really want to waste paper for it as you most likely won't even look at it. Those who absolutely want to see the spectrum can always send the first author a pre-paid envelope and he will happily send them by return mail a signed photograph of it.

The spectrum, however, confirms the very cool nature of the object and we were able to measure its relative radial veloc-

¹ Given the discovery made in this paper, this is mostly a safety measure to avoid angry people to try to make an attempt on this astronomer's life and not another case of not citing competing groups.

ity with respect to the Sun: 120 ± 5 km/s. This then allows us to determine the galactic velocity components: $U = -85.55$ km/s, $V = -84.09$ km/s, and $W = 3.66$ km/s. Per se, this is no big deal, and you could wonder why you are even reading this paper, apart from its appealing style, which makes a change from the usual boring astronomical articles you have to read. The fact is that if you now look back in time and compute the path of this object in the past, you will discover with horror that this object was closest to the Sun 22,345 years ago, when it was only 0.8205 light-years away from the Sun!

Yes, you read correctly: this object passed only 0.8205 light-years away from the Sun! Would this have had any important consequences? We here note that 20 000 BC corresponds to both the end of the last ice age and the beginning of arithmetic.

Based on the current absolute magnitude of the object, and making the reasonable assumption that the luminosity of a low mass star or a brown dwarf does not vary much of such timescale, we estimate that the brightness of the object at closest approach was $V = 12.5$ and $I = 8.3$. The object was certainly not very bright and even accounting for the fact that the skies in these nights were much darker than now, it must still have escaped detection by Humans – it was indeed still 400 times fainter than what the unaided eye can see! It is therefore unlikely to have had anything to do with the end of the last ice age, as its energy output must not have contributed much to the global one. On the other hand, given what we will show in the following, we hereby assert that this close-by passage must be the reason why humanity invented arithmetic as it was necessary to count the number of days till it would face its doom.

3. A global catastrophe

The distance of closest passage to the Sun is about 52,000 AU only. This means that the object was making a direct flyby of the Öpik-Oort cloud, the spherical cloud of icy planetesimals (which we will, for simplicity and to save space, call comets in the following) that lies roughly 50,000 AU away (Öpik 1932, Oort 1950, Whipple 1987)! It is therefore unescapable to assume that this will have produced strong perturbations of the orbits of these comets.

Based on the long experience in many-body problems we have had in our life, we performed N -body simulations to determine the fate of comets located in the Öpik-Oort cloud when perturbed by a star. The numerical simulations were made with GOUDA, the Gpu Optimised Underperforming Device Architecture, and its associated Dutch-Fortran precompiler. Alas, we should have never done these simulations as the outcome is unavoidable and well established: because of the gravitational force of the Sun, the comets inevitably fall towards the centre of the Solar System and a significant (for us) proportion of them collide with Earth. Based on a series of 100 000 runs, we estimate that the time between the disturbing event and the fatal collisions on Earth will be $12,217,100 \pm 30$ years! The continuous bombardment of comets at that time will most likely lead to a similar (or even larger) catastrophe as the Cretaceous-Paleogene (K-Pg) extinction event that caused the disappearance of some three-quarters of plant and animal species on Earth – including, as all children know, all non-avian dinosaurs – that occurred over a geologically short period of time 66 million years ago (Wikipedia, 2014). Our results thus show that it is quite likely that all non-avian mammals will disappear in 12,194,755 years, except for rats that will most likely take over the planet, although there are claims in the literature that this is already the case (or that at least it will happen very soon; see, e.g., Zalasiewicz 2014).

4. Conclusions

Using an incredible amount of effort that will never be paid enough, we have measured the velocity of the Death Star, located 3 pc away from us. This allowed us to derive the orbit in the Galaxy of this very annoying object that leads us to conclude that it came very close to the Öpik-Oort cloud in 20,000 BC. This most likely led to huge disturbances in the cloud and the beginning of the journey towards the inner Solar System for many comets. There is no doubt that a fraction of these will bombard Earth and lead to the disparition of humanity. This clearly also illustrates that not only was the 2008 American epic fantasy adventure film, *10,000 BC*, very bad, but its epoch was completely wrongly chosen, as 20 000 BC would have made for a much more interesting story. We are of course willing to assist any producers that would be interested in making a movie on this most important event.

Acknowledgements. It is a pleasure to thank our mutual friend, Charles Dickens, for donating a pile of scrap whose resale was used to hire a lawyer for a year to help us fill in the ERC proposal that allowed us to buy the microcomputer used to run the GOUDA simulations. H.M.J.B would also thank his wife for the daily cooking of great standard that allows him to continuously perform very well at work. H.M.J.B would also like to stress that he does not want to collaborate anymore with co-authors A.W., W.H.Y.C and I.S. as this is too much a tiring experience. He is happy to continue collaborate with J.B.W. even though this lead to some terrible headaches sometimes.

References

- Boffin, H. M. J., Pourbaix, D., Mužić, K., et al. 2014, *A&A*, 561, L4
 Joke, A., Bug, T.H.E., 2000, *A&B* 1, 1
 Luhman, K. L. 2013, *ApJL*, 767, L1
 Oort, J. H. 1950, *Bull. Astron. Institutes of the Netherlands* 11, 91
 Öpik, E. 1932, *Proceedings of the Am. Acad. of Arts and Sciences* 67, 169
 Trujillo C.A. & Sheppard S.S. 2014, *Nature* 507, 471
 Wikipedia, T.F.E. 2014, http://en.wikipedia.org/wiki/Cretaceous-Paleogene_extinction_event
 Whipple, F. L. 1987, *Royal Soc. of London Phil. Transactions Ser. A*, 323, 339
 Zalasiewicz, J. 2014, https://www.youtube.com/watch?feature=player_embedded&v=6-39edpXh9U