

## Does Santa exist and why does Rudolph has a red nose? A scientific explanations!

Hello to all non-believers and believers. For those of you who do not believe in Santa and are looking for ways to prove that he does not exist, this post will show you some scientific reasons why he can exist. And for those who do believe in Santa, see this as prove to your believes.

As for me, well I like to believe in the spirit of Christmas and like to spend my time with family and friends and of course am happy for every gift no matter from whom.

First let's set a few ground rules/thoughts for our arguments. We are living in a modern world where science changes our thinking and way of life from day to day. Just about 20 years ago the very first exoplanet was found and before that nobody knew what was out there and how many other worlds are there orbiting other stars. I can remember the day I saw it in my astronomy magazine as I was very much into space and the stars back then and had a nice 114mm Newton telescope. Today we know of 1855 planets with 473 multiple planetary systems and our strongest telescopes are exploring the skies and find hundreds of new planets every year (in February 2014 NASA announced the discovery of 715 new exoplanets).

So who's to say that Santa is coming from earth and with that limited to our current technology?

Yes, he might look like an old white bearded man as we are told by our parents and grandparents but how do they know. And you might also know of the Grinch, a green (possibly furry) creature that hates Christmas. Couldn't he be an alien?

And of course the typical human reaction is that an alien is evil so the natural reaction would be to make the Grinch evil. He might have been spotted by someone in front of the Christmas tree with a gift in his hand and the person thought "This evil alien wants to steal the wonderful gifts someone wanted to give to me." And this rumor spreads making him the evil one but instead he was the one that placed it there and for the unknown bringer of gifts of course a nice older man with a beautiful white beard as they are usually friendly like everyone's grandfather.

So with this foundation we have to think broad in the alien technology that might assist this "Santa" in bringing us our gifts and maybe also the fact of giving only to the good children who wouldn't blame someone who's green to be evil by nature 😊

But now let's have a look at some major points that are used to prove that Santa does not exist.

- **There is no known reindeer race on earth that can fly!**

Assuming "Santa" crash landed somewhere near the north pole with his space ship, far away from any civilization. So after the crash his ship was mostly wrecked and he could only salvage some parts of its propulsion system, alloys, navigation system etc. Too little to get back home and enough to get around on earth. We all know in Star Trek there are inertia dampers for any shocks and vibrations, something that counteracts the rapid acceleration of an object and makes it possible to

survive the acceleration to warp speed. This technology as well as the generation of the gravity on board of the space ship in some way are most likely based on a flexible gravity generator, reducing or increasing the gravity in the ship. Maybe “Santa” was able to somehow bring that onto some reindeers he found strolling near his crash site and make them fly this way, or it is just a gravity field he can create around his sled and the reindeers. Well we don’t know that how that works as we don’t understand the technology but we know that superconductors can **levitate over a magnetic field** which the earth basically has already. So who knows what we will be able to do in future if this is the state of the art today.

- **There are approximately 378 million children (for some religious reasons are Muslims, Jews, Hindus and Buddhists who are apparently not visited by Santa I heard, but I don’t think this is Santa’s view) to deliver gifts to within 31 hours (considering time zones), which is 822.6 visits per second considering an average of 3.5 children per household. This would result to fly with Mach 3,000 for an average house to house distance of 1.3km and an overall distance of 120.8 million km in the 31 hours he has on Christmas.**

Well considering the distance Santa travelled from his home planet to earth in a reasonable time, the distance on earth should be easy for him. But let’s have a closer look.

The closest star system with an unconfirmed exoplanet is Alpha Centauri Bb with 4.36 light years distance and the closest with a confirmed exoplanet is 15.29 light years with actually four exoplanets orbiting the star named Gliese 876. Yes, a strange name but for Santa it might be some name we cannot even pronounce 😊

Now according to Wikipedia, with Warp 9 he would be able to reach earth in less than a day from Alpha Centauri and about 3 days from Gliese 876, which is a reasonable travelling time and certainly much faster than 3,000 times the speed of sound. And who says he jumps actually through each chimney himself to deliver the presents. With technology such as in Star Trek he could easily beam the presents into a range of houses within the range of the transporter. This makes cleaning up the soot in the house from sliding through the chimney redundant.

But we also know that jumping into warp speed within an atmosphere is not wise, but even with full impulse speed it is still  $\frac{1}{4}$  of the light speed and therefore still much faster than required.

Also considering other technologies such as from Doctor Who he would be able to travel through time or at least freeze time for a short period at once. As we know the time-space continuum is fragile so freezing it for too long or going back in time preventing him from stranding on earth would possibly cause catastrophic effects on our universe. But we could safely consider that he flies from village to village or city to city with full impulse, freezes time to have enough time to beam several presents at once into the houses of the families and then head to the other village or city.

- **The weight of the presents for all the children would be 378,000 metric tons considering a 1kg present per child. An average reindeer can pull not more than 175kg which would require 216,000 reindeers etc.**

Well we talked about Star Trek already and we all know they have the technology of replicators where the device can replicate any usual object such as a toy with ease. And since a few years 3D printer have reached public availability already, so who knows what will happen in future. Yes, at the moment we can only print from a material source we need to provide the printer of the same

material already but in general all material consists of protons, neutrons and electrons and therefore it is generally possible to create a metal toy out of air with the right technology. So a huge storage in his sled is not necessary.

- **With the huge amount and weight of the presents at 3,000 times the speed of sound the drag force of the sled is enormous and will cause a massive heat just like the reentry into the atmosphere. The reindeer in the very front (Rudolph) will have to absorb something around 15 trillion joule of energy per second. The reindeer would immediately burst into flame and be incinerated within an instance and the following reindeers will suffer the same and it will create a massive sonic boom. The reindeers will be vaporized within a fraction of a second, Santa would be pinned to the back of his sled by the 17,500 g-forces acting on him and with an approximately 120kg weight he would be squished by his own body forces of 20.6 million Newton.**

Now considering we don't have that much weight to carry and we have inertia dampers installed in the sled, the g-forces are not an issue as we can see in Star Trek. And of course every alien space ship just like the Enterprise in Star Trek has a force field to withstand the reentry temperatures. But even if not, maybe Santa's technology is so far advanced that similar to the space shuttle he has some heat shield technology. That far advanced it might be something like a sun blocker spray or paint for his reindeers protecting them from the heat generated by the friction and the ionization effects appearing at such velocities. There certainly is some technology that will protect him and his reindeers from the heat.

So you might think "Oh what a weirdo of Trekkie is writing this post." Well yes, I grew up with Star Trek and all the other Sci-Fi movies and TV series but we also know that such visionary thinking made researcher look to apply technology like that in reality. Laser cannons are in development and tested by the military to destroy incoming drones, planes and rockets. Beaming is already done, ok with by beaming the information of an atom over 1 meter from one atom to the other but that's the first step into the future and Michio Kaku (one of the world's most famous scientists) says that such teleportation device similar to those in Star Trek would be invented within 100 years.

### **So can you tell with 100% certainty that Santa is NOT real????**

(And I'm not talking about magic or the force of god, but science we might have not yet reached to understand.)

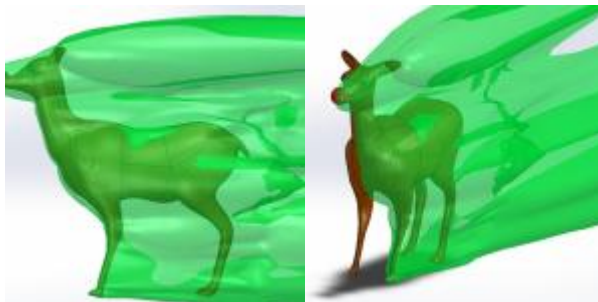
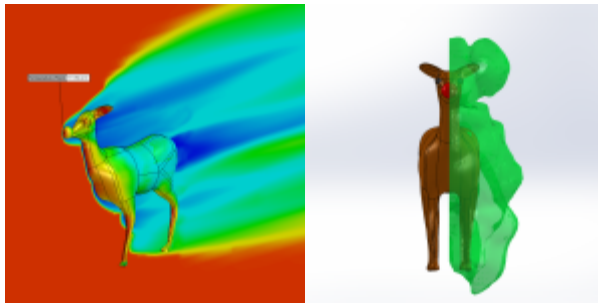
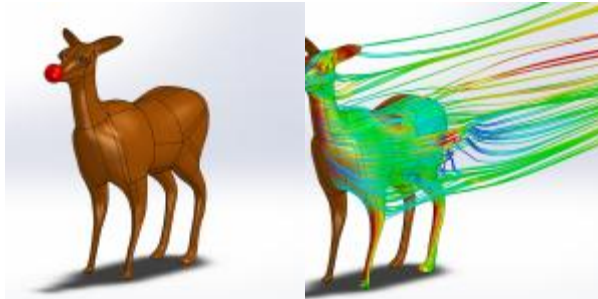
Here's a little simulation I did with a reindeer model in FloEFD where I added a red nose for Rudolph as he's the leading reindeer. This is with a velocity of Mach 25 and you can see the temperatures reached at his nose. The iso-surface shows the shock front of the velocity of Mach 9. FloEFD considers friction heating and velocities up to Mach 30 for re-entry vehicles such as space shuttles into the atmosphere and is used by customers of us exactly for such re-entry calculations.

See the surface temperature on Rudolph and tell me your nose would not get red under such conditions



Now the nose is either as usually the case sensitive and a little hot and stays that way, just like Obelix is always strong as he well into the magic potion pot when he was child, or it is another device that

creates a heat source a little bit in front of him which causes the air to ionize and reduce the drag for him 😊



So considering he has a type of sun blocker on his fur and nose, the nose we know is always the most sensitive and since he is leading the reindeers his nose (as the most upfront body part in the flow) is the part that creates the shock cone breaking the sound barrier and therefore might get a little red even with “sun blocker” or a force field.

So with this happy holidays to all of you and may Santa bring you a lot of gifts for those of you who believe in him and for those who don't... well don't bring you anything as you don't seem to need or want it 😊