

Hi, this is Steve Nerlich from Cheap Astronomy [www.cheapastro.com](http://www.cheapastro.com) and this is *How to colonize the galaxy*.

Long, long ago, in a galaxy far, far away there were two civilisations - separated from each other by one hundred light years. Both had developed advanced technological capability and one day they each detected each other - even though that mutual detection involved picking up primitive radio transmissions that each had produced one hundred years earlier in their respective histories.

Unfortunately, neither civilisation could stand the thought of sharing their galaxy with another civilization. They were each livid and enraged and deeply frustrated by the fact that they had no hope of expressing their outrage in proper conversation, given the one hundred light year distance that lay between them.

And so both civilisations simultaneously began building battle fleets to wipe the other out and subsequently each civilisation launched its battle fleet on a long one hundred light year journey, unaware that the other civilisation was doing exactly the same thing.

One civilisation, whose biology was a *little* bit like Earth's, had generational crews aboard their battle fleet - meaning there was a short-lived crew that had children who then had children and so on.

The other civilisation was composed of virtually immortal individuals who were budded off from a central organic mass every now and again. These virtually immortal individuals had an inexorable need to sustain and nurture the central organic mass that had produced them - a kind of a reverse parent-hood. Being the source of all progeny, the central organic mass was the focus of the genetic investment of those progeny. Thus all the members of this civilisation viewed any newer progeny as just new work colleagues - who shared in their unconditional adoration for the central organic mass.

Anyway, the two battle fleets - one produced by the progeny-focused civilisation and the other produced by the progenitor-focused civilisation both met half-way on their respective voyages to wipe each other out. Of course a huge battle ensued. And who won? The answer is all about parenthood.

The left-behind population of the progeny-focused civilisation had been obsessed with keeping in touch with their steadily receding children and then their children's children and so on.

The left-behind population of the home world of the progenitor-focused civilisation had just wished their colleagues well, but thereafter remain obsessed with the vital job of sustaining their central organic mass. They were occasionally distracted by distant messages from the receding battle fleet expressing hope for central mass's well-being but did not bother to reply.

So when the two battle fleets met, the progeny-obsessed civilisation's fleet arrive armed with a technology which had been steadily upgraded in the course of all the ongoing communication with its homeworld. The fleet associated with the civilisation obsessed with

the welfare of its progenitor arrived armed with the same technology that it had left home with.

Of course, it was no contest and the fleet of the civilisation obsessed with the welfare of its progeny, won hands-down.

So... the moral of the story? Well, leaving the whole warfare and conquest angle to one side - consider that if Earth-like worlds are out there at hundreds or thousands of light year distances, the best we can ever hope to do is to populate the galaxy very, very slowly and without any expectation that our colonists will ever come back home again. But although those distant colonists are unlikely to ever return, they can still be kept in touch.

A planet with a population of billions of people will always be a better driver of learning, innovation and research than a tiny isolated colony of people who have been set adrift in the cosmos. In other words, just like it takes a village to raise a child - it takes a planet to raise a space colony.

So, after we have set our colonists adrift, Earth will retain the vital responsibility of keeping its disseminated colonies informed about developments back home. Whether or not we on Earth acknowledge it as a formal responsibility of ours, we will probably just find it's something that we instinctively want to do anyway.

So, we will need a permanent galactic broadcasting system. This will ensure that from the day that a colony crew leaves Earth and begins its journey to a destination 10,000 light years away, Earth will begin a broadcast that goes something like - the day after you left, we learnt how to prevent testicular cancer in athletes, which largely involves stopping them from injecting testosterone. And maybe 100 years after the colonists leave, it will be saying - hey guess what? We finally invented flying cars - the digital blueprints are attached. And 500 years after they left, we'll be telling a distant generation of humans who have never even seen Earth how they can tweak their propulsion system to achieve close-to-light-speed velocities.

Close-to-light-speed travel is an important part of this story and we shouldn't wait until we invent it before we leave Earth. As soon as we are able to send colonists in safety and relative comfort on a long voyage - we should do that. Once they are on their way, Earth can keep on updating their technology as they go.

Of course, once they start flying to their destination at almost the speed of light, they will experience a relative time dilation so they might cross 10,000 light years within a personal travel time of maybe just a day. But even then they will still want to tune into Earth's galactic broadcast. Although the broadcast will only allow them to find out what been learnt on Earth in the 24 hours since they accelerated to almost light-speed, it is still new information to them - even though they will know that the broadcast they receive is 10,000 years old, from good old Earth's frame of reference.

Maintaining the galactic broadcast over such time periods will require a substantial leap-of-faith by the people who remain on Earth. Once the colonists do start achieving almost-light-speed-velocities, they will move well out of range of practical two-way communication and

Earth will have to get used to the idea of sending information out without any expectation of getting a response - at least not for a very long time. We will just have to believe that those distant colonists are continuing the human legacy that their ancestors first left home with.

Hopefully, by this stage, we will have finally accepted that there is no such thing as space – there is only space-time. All the old fairy tales about faster-than-light travel will be forgotten as we finally accept that you just can't cross space without also crossing time.

If we are going to send our children across 10,000 light year distances, we need to accept that we are also sending them across at least 10,000 years of time. It is most unlikely that we will ever meet them again or even speak with them again – but we really can still keep them in touch. It seems almost inevitable that this is how we will colonize the galaxy – and hopefully without feeling compelled to wipe out any other civilisations along the way.

Thanks for listening. This is Steve Nerlich from Cheap Astronomy [www.cheapastro.com](http://www.cheapastro.com). Cheap Astronomy offers an educational website where every orbit around the Sun takes us a bit over 900 million kilometers into the future - although since our orbital velocity is only 30 kilometers a second, we move into that future fairly slowly. No ads, no profit, just good science. Bye.