

Build a Galactic Civilization

by Sven Nilsen, 2023

In this paper I present an argument that building a galactic civilization, even just thinking clearly about it theoretically, is a major non-trivial challenge for even the best human minds, with the potential to include many possible sub-goals that humanity otherwise might want to achieve. Therefore I suggest that “build a galactic civilization” might be used as a slogan to describe an emergent overarching goal of extending human activity into the far future, which represents significant philosophical and cultural obstacles that requires sustained effort over long time.

When people today think about building a galactic civilization, among the first things that come to mind, is an almost all-powerful emperor ruling from the galactic core, controlling spaceships and trade. Surely entertaining, but not physically realistic. This fallacy is based on a fantasy about faster-than-light travel through space and compressing the vast delays of time in the galaxy to human scales of story telling narrative. Our thirst for power is based on genes evolved to serve a lifespan of approximately a century or less. In fact, there are very few people today who have put much thought into how a galactic civilization might look like and how such a civilization might sustain itself over possibly trillions of years.

On the other hand, if humanity had a clear picture of what a galactic civilization might do and how it shapes motivations for collaborated actions, then it is possible that many problems our intelligent species faces today could be solved to some extent. It is a failure of imagination, or intellectual discipline, since there are no physical laws that prevents us in principle: To start thinking about how to build a galactic civilization.

The common temptation when creating a story about galactic civilization, is to devise some science-fiction literary trick to overcome the problem of large time delays. Instead of trying to work around this limitation, large time delays should be put up as a central constraint for reasoning. Another problem is that the human species has not existed for a long time, compared to galactic time scales. This means that whatever theories that are suggested must be tested in simulations. Luckily, humanity gets better at building such simulations over time.

One basic problem is to design systems that predict consequences reliably into far future. For example, if somebody wants to build a house today, it will be difficult, but not impossible, to achieve it within a week. There is a time interval where it is easiest to build the house and this time interval has a lower bound, e.g. a week and an upper bound where it starts to become more difficult again. The difficulty of the upper bound is due to the way human civilization works today, where motivations for building the house might be overwritten over time. There are many processes in our civilization that seeks to maximize the amount of effort into replicating various ideas and products on behalf of the cost other systems. Building a house in 1000 years is difficult. This is the sort of problem that a galactic civilization needs to overcome. The technical difficulties of building a house is not in question here, but sustaining the motivation for such long periods.

Another basic problem is that humanity is undergoing rapid technological development, which makes it difficult to predict what capabilities are available in the future. When trying to collect data from human history, the capabilities do not extend far back in time. This means that our cultural perspective, which is viewing the world through the lens of technology, is shifting radically. Sustaining a cultural identity for long periods might be viewed as something that needs to be done not before technological development levels off. This perspective contributes to undermining the motivation for building a galactic civilization, at the risk of never getting started.

A third problem is the current narrative that humanity should expand into space rapidly, to avoid total extinction. This might sound well intended, but who knows whether the basic problem of large time delays can undermine later efforts to coordinate the future. Reducing the risk of wars occurring, between concurrent fractions expanding into space, might have a limited time window. These possible problems are hard to predict, not only due to computational intractable problems, but also because nobody has thought much about them in the first place. This problem is not about the temptation to use conflict as narrative in story telling, but about the general nature of large time delays that puts constraints on the time window for committed coordination.

In summary, there are 3 basic problems in the short term to medium term:

- Predict consequences far into the future
- Adopt to rapid technological advancements
- Avoid destructive competitiveness for resources in space

Despite these difficulties, humanity already has some knowledge of how to design systems that coordinate many people over relatively large time scales in history and over relatively huge areas of land and ocean. The abstract properties of such systems were described by the author in the paper “Symbols of Power”^[1].

A Symbol of Power (SoP) is a possible mechanism where consequences of actions over large time scales might be predicted reliably to some extent. One of the reasons it might work is simply that once a SoP is active, it is very hard to get rid of and thus the normal tendency to overwrite motivations over time might be prevented. This has both an upside and a downside. On the upside, it might be used to produce desirable outcomes far into the future. On the downside, if humanity is wrong, which is frequently the case, it can have long lasting consequences.

One interesting observation about SoPs, is that they can overlap and interact with each other. For example, a donation to a scientific program involves both “money” and “science” as SoPs.

As much humanity would like to progress in science, when it comes down to allocating resources, the bottleneck is not motivation for doing science but the economic costs and investments necessary. A general rule of thumb is that when two SoPs overlap, they produce a gradient of polarity such that considering two situations A and B that are otherwise equal, there is an order provided by the SoP, e.g. “ $A > B$ ”. So, the amount of money required to perform a scientific experiment should be as little as possible, considering all other properties being constant. A scientist would like more money in payment per hour, considering all other properties being constant. A successful SoP is often one that can provide a clear incentive when making such decisions.

Now, humanity faces many challenges, which requires developing complex systems and hiring people with high skills to deal with a wide range of situations. The overall problem of collaboration is to communicate the motivation for various developments. One example is “cure all diseases”. Will all people on Earth agree about a such goal? Certainly not. There are many perspectives that people have that complicates such decisions due to cultural backgrounds and beliefs. What is missing is one overarching goal, which can include other sub-goals that we might want to have, that can enable progression in such debates.

This is why “build a galactic civilization” can be useful as an overarching goal for humanity, despite the problems with it and its seemingly irrelevance in the short term future. The point is not to solve every problem with a such goal within expected economic and lifetime boundaries. Even though humanity might fail at a such goal, if it increases the chance of solving some sub-goals by helping the debate forward, then setting it as a goal might be worth the costs.

Everybody can understand “build a galactic civilization”, even though what it actually requires is a major challenge for the best minds. It also sets the bar high, inspiring people to use their potential. Perhaps it also might help to unite humanity to accept cultural differences and deal better with communication problems. The extreme time delays in a galaxy is a working metaphor for the basic obstacles an intelligent species have in producing collaborative efforts on common problems. Another important aspect is the potential artistic and spiritual thinking a such goal opens up, which frequently in current movies and books leaves a blank space for the audience to fill in. I believe it should be explicitly mentioned to ground the idea and enable using it as a reference in search.

In one sense, “build a galactic civilization” might sound like something mostly technological or political. This is on purpose, to ease people into the mindset. By overcoming a few initial obstacles of thinking about it, with some help and guidance, people might find a sense of mastery and this increases the motivation to continue making progression in thought.

Here is one thought experiment: Assume you are a galactic emperor for 10 years. After this time, the glory and fame has faded in your mind and it starts to get boring. You look at the calendar and out of boredom turn the pages one by one. Each page has a month. 12 turns and you see the dates 1 year into the future. You continue another 10 000 years, swifting through the months rapidly. It takes 12 000 turns, one second each will take over three and half hours. Try visualize this and imagine yourself being on the galactic throne. Assume that you stay in good health. However, what mental changes do you expect? Now, imagine 100 000 years. This is a tic on the galactic clock, the time for light to pass from one side of the galaxy to the opposite side. Tic toc. A trillion years. A thousand trillion years. A million trillion years and so on. When does your imagination break down?

This is why nobody actually wants to be a galactic emperor. It sounds nice as an advertisement and surely for many people today it would improve their quality of life. However, assuming you live in a galactic civilization, this job offer is not very tempting. You have all the benefits of galactic civilization without needing to perform as a galactic emperor. Why give up your freedom?

A galactic civilization might last a trillion trillion years and perhaps even more. Who knows? There are very few people who tried to study or calculate how this would be like. Most of what the ideas that people have, come from science-fiction movies and books. It is not certain that these mediums are good at communicating even the essential topics that an actual galactic civilization would find interesting. Spaceships? Money? Power? Nope. There are many reasons these topics would blend into the cultural background. How can one easier imagine what the ideas a galactic civilization would think about? It would probably take up a lot of memory to describe a such idea to humans, perhaps look like gibberish. This is a typical scenario when thinking about building a galactic civilization.

The author has not met any people who find it easy to reason about how to build a galactic civilization. To humans, this challenge might seem so far off into the future and require much more advanced technology than is available today. Yet, the knowledge about physical laws required might not be that different from what is known today. The problem of large time delays is also known. How much could humanity infer based on what is known today, given a continuous effort doing so?

Perhaps a good start is to encourage people thinking about it, discuss it and come up with ideas on their own. Avoid taking ownership of ideas and let people feel significant. When a galactic civilization originating from Earth looks back on its history, it will likely emphasize aspects that are important for its own perspective and also pass the history forward knowing that the future civilization also has needs for history, viewed through new perspectives. Diversity and robustness are two words that comes to mind. Maybe humanity could decide to establish a public domain for this topic to preserve its history from the beginning and pass it on as a gift to future generations.

References

- [1] “Symbols of Power”
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https://github.com/advancedresearch/path_semantics/blob/master/papers-wip2/symbols-of-power.pdf