Philosophical Aspects of Interstellar Exploration

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June 20, 2019

Socioeconomical Grounding Motivational Aspects Obligations Basic Considerations Mission Types Ethical considerations



Figure: The New Frontier

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Interstellar Missions

- Nearest Exoplanet roughly 4 ly away.
- Accelerating to significant fraction of LS takes enormous power and time.
- A starship needs to decelerate at the end of the trip.
- Estimated Cost between 0.1 and 1 GNP US depending on mission type and fuel. (Freeman Dyson 1968, similarly Robert Zubrin 2000)
- Travel time between 10 to 1000s of Generations.
- Communicating from other stars takes a lot of power.

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Interstellar Missions

Pick	one!			
٥	Speed			
0	Size			

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Interstellar Missions

Pick one!

- Speed
- Size
- Sense of Purpose

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Interstellar Missions

Pick two!

- Speed
- Size
- Sense of Purpose

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Sleeper Ships



Basic Considerations Mission Types Ethical considerations

Generation Ships / World Ships / Space Arks



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Seed Ships



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Interstellar Mission-Types

Mission Type	Max Speed	Payload	Purpose	Perception
Seed Ship	High	Small	Survival	Message
Sleeper Ship	High	Medium	Discovery	Pioneers
Generation Ship	Low	X-Large	Emigration	Migrants

Table: Mission-Type Comparison

Basic Considerations Mission Types Ethical considerations

Generation Ships / World Ships / Space Arks



Basic Considerations Mission Types Ethical considerations

- Cathedrals are an excellent example for religiously motivated multi-generational endeavours:
 - Cologne Cathedral 1248 1880 (with interruptions)
 - Canterbury Cathedral 602 19th century in different architectural styles
 - Basílica i Temple Expiatori de la Sagrada Família 1882 today
- Rendering an interstellar voyage as a voyage of faith, a pilgrimage or any other form of religious endeavour might be a good idea

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Seed Ships



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Seed Ships



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Ethical Problems:

Sending unborn life

Is "survival of humanity" a good enough argument to send unborn life into the unknown?

- Survival of humanity.
- Predetermining (individual) human life.
- Philosophical evaluation of human life.

It's complicated

What really makes a human being?

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What really makes a human being?

Earth first! Yes We Can

Should we not ...?





Fewer People Than Ever Live in Poverty — But the W... news.vice.com



Capitalism and Poverty Jacobinmag.com



Globally, youth are the largest poverty-stricken group, says $\mathsf{n} \dots$ news.un.org

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Earth first! Yes We Can

Sure, but why not do both?



Compelling reasons Cultural precedents

We really should!



Compelling reasons Cultural precedents



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Planetary protection rules

A binding legal set of rules that is enforced for solar system missions

- Rules for contamination of other Moons and Planets (forward contamination)
- Rules for contamination of Earth (backward contamination)
- 'all of the planets, all of the time'

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Rule for forward contamination

Limit to 10^-4 the probability that a single viable Earth cell is introduced into a potential habitat, defined as liquid water or warm ice.

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Comparison of probabilities

1 in 15	Admission to Yale, 2016
1 in 20	Lifetime death from injury
1 in 133	Admission to RuPaul's Drag Race, 2017
1 in 606	Lifetime death from vehicular injury
1 in 1525	Admission to the NASA astronaut class
1 in 1615	Yearly death from an injury
1 in 9737	Lifetime death from aircraft accident
1 in 10,000	One Earth organism into a potential habitat
1 in 11,207	Yearly death from assault with a gun
1 in 141,571	Yearly death from falling down stairs
1 in 13,744,732	Yearly death from lightning
1 in 13,983,816	Winning 6-number lottery from pool of 49 numbers

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Extraterrestrial brothers and sisters?!

- Gabriel Funes: "... just as there is a multiplicity of creatures on earth, there can be other beings, even intelligent, created by God."
- No limits to God's creative freedom
- Humanity may be the 'lost sheep' of the universe.
- There may be other beings 'who remained in full friendship with their creator'.

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Problem: Human nature



Figure: Can we fly into outer space and risk taking original sin with us?

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Problem: Redemption



Figure: Can Christianity deal with a race of possible redeemers?

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