Interplanetary Ethics and Space Missions

Why ethics?

What is ethics about?

How to handle situations where your decisions affect others in a way that is important to them?

Ethical questions in connection with missions to habitable worlds:

Examples of ethical questions in connection with missions to habitable worlds:

- **Is it worth the cost?**

- **How do we distribute risks and benefits?**

- **What kind of life do we have to consider?**

- **What is safe enough?**

Is it worth the cost?

– The value of knowledge

– End value vs. Instrumental value

– How do we quantify non-economic value?

How do we distribute risks and benefits?

- – States / corporations / individuals / nature

- – Power and responsibility

- – Economic risks

- – Health risks (contamination, astronaut safety)

- – Political risks

- – Deontology – consequentialism

Theories of distribution

– Maximum ratio of good over bad

– Equal distribution

– Distribution according to merit

– Distribution according to need

– Different mixes of these (mini-max, etc.)

What kind of life do we have to consider?

– Does it matter how different they are from us?

– Does it matter how far away they are?

– Does it matter how intelligent they are?

– Does it matter that they are not related to us?

– Does it matter that we do not belong to the same society?

What kind of life do we have to consider?

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What kind of life do we have to consider?

– *Human beings* (Anthropocentrism)

– *Sentient beings* (Sentientism)

– *Living beings* (Biocentrism)

– *Species and ecosystems* (Ecocentrism)

What is safe enough?

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- When is it safe to send humans to a habitable planet?

- When is a spacecraft sterile enough to send to a habitable planet?

- When is it safe to bring samples home from a habitable planet?

- When is it safe to start geoengineering a habitable planet?

What is safe enough?

The asymmetry between proving an instance and proving a universal

What is safe enough?

The asymmetry between proving an instance and proving a universal

- **If disaster happens we will know.**

- **How many non-disasters does it take to know that something is safe?**

What is safe enough?

We cannot prove a universal …

What is safe enough?

The asymmetry:

We cannot prove a universal …

… in the same way as we can prove an instance.

What is safe enough?

We cannot prove a universal …

… in the same way as we can prove an instance.

$$\neq$$

We cannot say anything at all.
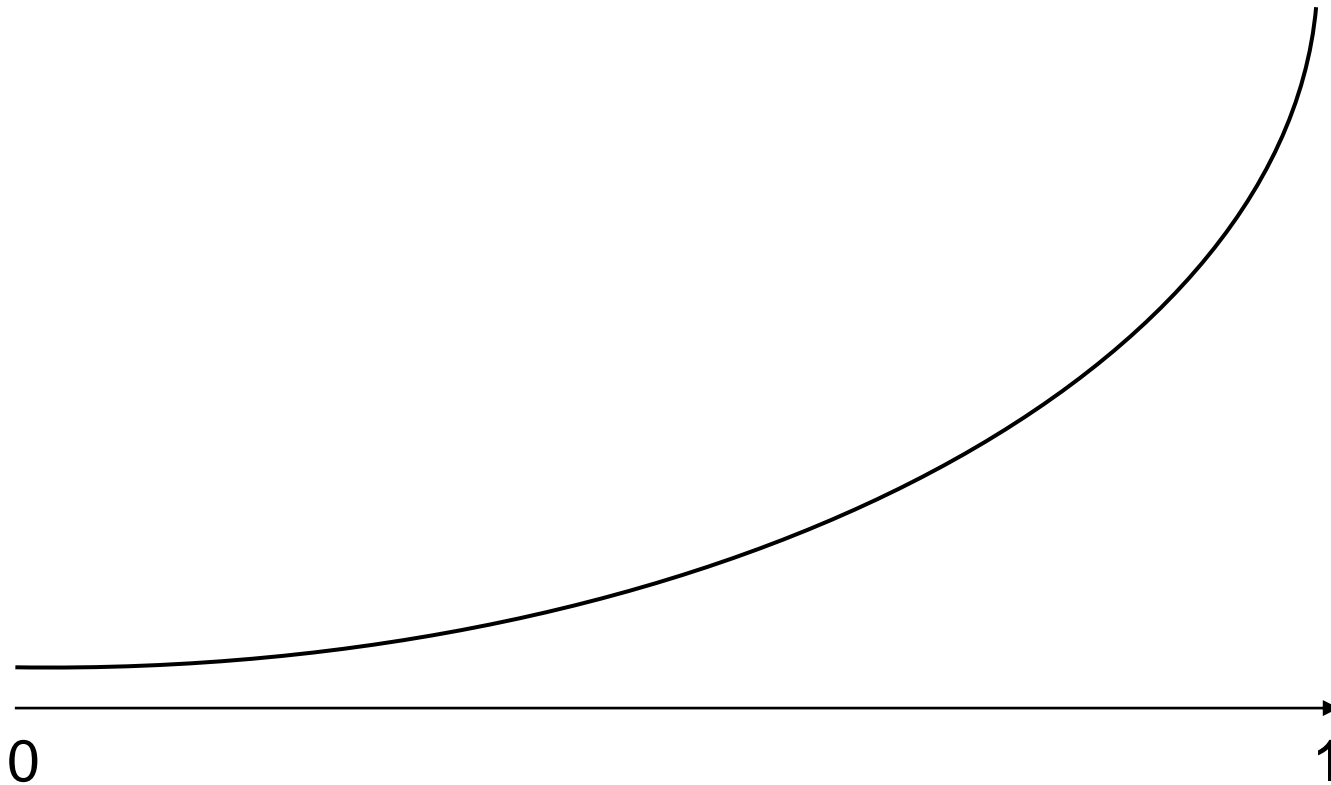
What is safe enough?

We cannot prove a universal …

… in the same way as we can prove an instance …

… but we can be more or less certain.

Establishing that a project is safe is not a matter of discovery. It is a gradual process asymptotically approaching certainty.

0   1

0 = Disaster has occured

1= Disaster will never occur.

Two challenges:

1. How do we improve safety?

2. What is safe enough?

What is safe enough?

This is not a scientific question.

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What is safe enough?

This is not a scientific question.

It is a value question!

Prediction:

People will disagree on how safe we need to be.

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People will disagree on how safe we need to be.

It is therefore also an ethical question.