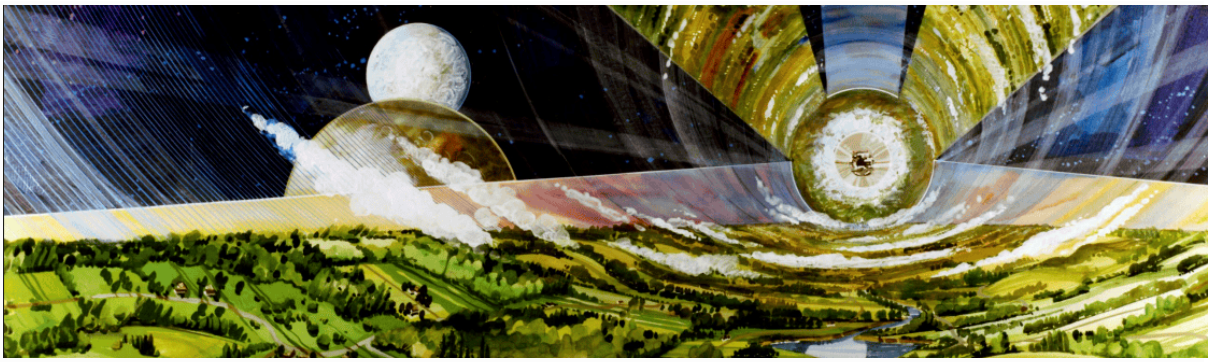

Alfvén Lecture 2025: How to Inhabit the Solar System

Welcome to this years Alfvén lecture! During the lecture Dr. Pekka Janhunen will speak about how to inhabit the solar system! Make sure to come a bit earlier to not miss coffee and "fika".

📢 Alfvén Lecture 2025
🎙️ Title: *How to inhabit the solar system*
👤 Speaker: Dr. Pekka Janhunen, Finnish Meteorological Institute, Helsinki

📍 Location: Lecture hall D2, Lindstedtsvägen 5, KTH Campus
🗓️ Date: 22 September 2025
⏰ Time: 15:30–16:30

☕ Coffee served: Outside D2 , from 15:00

Full info (pdf 783 kB)

Mars is often considered as a settlement target, but it has a problem of maybe too low gravity (38%) for children to grow to full-strength adults. Mars is also smaller than Earth so even in the best case it could expand our living area only modestly.

Gerard O'Neill (1974) proposed to solve the gravity problem by a kilometre-scale rotating cylindrical space habitat which mimics Earth's gravity by the centrifugal force.

A Ceres megasatellite scales up O'Neill's cylinder by attaching many cylinders to a growable frame. Different cylinders are connected by train-like vehicles. Each cylinder hosts a sunlit closed ecosystem with agriculture and e.g. 50000 people living in 100 square kilometre area. Ceres is proposed as the source body because it has nitrogen to make earthlike atmospheres, and ample resources in general.

Why consider such unplanetary living? In addition to paradise-like climate and continuous crops, absence of natural catastrophes like earthquakes is a permanent benefit. Asymptotically, a megasatellite is million times more mass-efficient than planetary living because instead of having 6000 km of rock below our feet we would have only 4 m thick radiation shielding and pressure containing walls around us.

Large-scale migration to such secondary home of mankind would need a lot of spacecraft and propellant. To this end we discuss how to sling raw material from the Moon scalably with the help of the lunar gravity anomalies.

Hosts

- Anita Kullen, Head of Division of Space and Plasma Physics, KTH
- Christer Fuglesang, Prof. in Space Travel, KTH Space Center
- Nickolay Ivchenko, Prof. in Experimental Space Physics, KTH
- Andris Vaivads, Prof. in Space Physics at KTH, Rector of Ventspils University of Applied Sciences, Latvia

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