

**Title:** The next Land of Freedom is in Free-Space

**Subtitle:** Why 1G simulated gravity is important and mandatory for Gerard K. O'Neill

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While planet Earth is becoming more and more narrow, and her Citizens are hit by a growing political madness, it becomes evident that a vast movement of migration will gain momentum, as soon as the first space destinations will become available.

Considering the possible choices — the Moon, Mars, and habitats in free-space — these last are preferable, as Gerard K. O'Neill has written in his book "The High Frontier - Human Colonies in Space". As a very key rationale, while the Moon and Mars have limited ground for human settlements, the enormous quantity of asteroid resources allow the building of virtually unlimited habitats, floating in free-space.

Physiological and social requirements were the main focus of Gerard K. O'Neill design of rotating space colonies. O'Neill required 1G simulated gravity because it simultaneously preserves *human biology, natural social behavior, intergenerational development, and economic practicality*. This made 1G not a preference but a mandatory condition for his vision of "*truly human life beyond Earth*."

Basic freedom requirements were considered equally important. If settlers will be used to less-than-1G gravity they couldn't exercise this fundamental human right, should they change their mind about space migration, and wanted to return living on Earth. That strikes at the *ethical and political foundations* of O'Neill's space colony vision. Freedom — both physical and personal — is deeply linked to the gravity environment the colonists would live under.

For O'Neill, maintaining 1 g simulated gravity was not just a matter of health or habitability — it was a principle of liberty and human rights. A colony whose inhabitants physically cannot return to Earth would violate one of his central ambitions: that humanity's expansion into space increase freedom, not diminish it.

O'Neill also discussed the Coriolis effect, and the optimal (minimum) diameter and (maximum) rotating speed of a rotating colony. O'Neill's 1 rpm / 1 km-radius rule is the cornerstone of all later rotating-habitat studies (e.g., Kalpana One, Stanford Torus, and present-day NASA artificial-gravity evaluations). His approach to the Coriolis effect was both quantitative **and** human-centered: large enough to feel like Earth, slow enough that you forget you're spinning.

Freedom of migration is not the only rationale for the 1G mandatory requirement. The O'Neill "Bible" (The High Frontier: Human Colonies in Space) also mention a key industrial sector that will expand proportionally to human settlement in the Solar System: tourism, two ways. Earthly citizen will want to visit the colonies, and the settlers will like to visit Earth. The tourism industry will be a key pillar of the solar society economy: we definitely don't want visitors coming to Earth from space communities to have an uncomfortable experience, due to the Earth's gravity!

Konstantin Tsiolkovsky, 50 years before, had formulated the same concept: "People will live for months, for years, in free space... They will construct enormous dwellings in the shape of spheres, cylinders, and other figures, which will rotate to give all objects inside a pressure similar to that of gravity on Earth."— K. E. Tsiolkovsky, *Beyond the Planet Earth (Вне Земли, 1920–21)*, published posthumously 1960; NASA TT F-1641 (1967), p. 36.

That line is the earliest known explicit proposal that **artificial gravity should equal normal Earth gravity** ("similar to that of gravity on Earth") inside a *rotating free-space* habitat.

**This quotation needs to be checked.**