

HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM (A5)
Long Term Scenarios for Human Lunar Presence (2)

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SPACE COLONIZATION, A STUDY OF SUPPLY AND DEMAND

Abstract

The last fifty years has nurtured the dream of living and working in space. Unfortunately, that dream appears to move further and further into the future, as financial resources become increasingly scarce and space program budgets shrink. This paper steps back and looks at the fundamental economics of people working (and playing) in space, and shows scenarios where colonization could, and should, succeed. The key to success for any economic scenario (plan) is correctly predicting supply and demand versus various pricing points. We based our supply and demand analyses on dozens of previous publications and surveys as well as extensive personal experience. Economic scenarios include commercial development of lunar resources from lunar LOX, through platinum group metals, energy metals (uranium and thorium), and He-3. Various tourism-based scenarios are also included; from space hotels in LEO, through lunar tourism, and space settlements for telecommuters. Eventually, if one or more of these scenarios are successful, enough people will be living in space to justify pure colonization, where people migrate to space to provide goods and services to other people living in space. There are numerous near-term technologies that are important to driving down costs and improving the safety and reliability of transportation system elements as well as some surface elements. The cost and impact of these technologies are shown. Also the cost and impact of some more speculative technologies like space elevators are included.