Paper ID: 10235
oral

22nd SYMPOSIUM ON SPACE ACTIVITY AND SOCIETY (E5)
Habitation Throughout the Solar System (1)

Author: Dr. Dana G. Andrews
Andrews Space, United States

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 be moving 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. The precursor to this paper, presented last year, examined bringing critical metals back to earth from the moon as the economic driver for developing low cost access to space. The economic scenarios evaluated include commercial development of lunar resources from lunar LOX, through platinum group metals, energy metals (uranium and thorium), and rare earth metals vital for future advanced technologies. This year's version will update last year's resource materials results, plus visit various tourism-based development scenarios; 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.