

Title: Concentrated Lunar Resources: Imminent Implications for Governance and Justice

Abstract: Numerous missions planned for the next decade are likely to target a handful of small sites of interest on the Moon's surface, creating risks of crowding and interference at these locations. The Moon presents finite and scarce areas with rare topography or concentrations of resources of special value. Locations of interest to science, notably for astronomy, include the "Peaks of Eternal Light", the coldest of the cold traps and smooth areas on the far side. Regions richest in physical resources could also be uniquely suited to settlement and commerce. Such sites of interest are both few and small. Typically, there are about ten key sites of each type, each site being about 10 kilometers across. We survey the implications for different kinds of mission and find that the diverse actors pursuing incompatible ends at these sites could soon crowd and interfere with each other, leaving almost all actors worse off. Without proactive measures to prevent these outcomes, lunar actors are likely to experience significant losses of opportunity. We highlight the legal, policy and ethical ramifications. Insights from research on comparable sites on Earth present a path toward managing lunar crowding and interference grounded in ethical and practical near-term considerations.

Speaker: Dr. Martin Elvis is an astrophysicist at the Center for Astrophysics | Harvard and Smithsonian. He has published nearly 500 papers on supermassive black holes that have been cited over 38,000 times. He publishes widely on asteroid and lunar resources and the space economy. He is a fellow of the American Association for the Advancement of Science, a Member of the Aspen Center for Physics, and is past-Chair of the Hubble Space Telescope Users' Committee and of the High Energy Division of the American Astronomical Society. Asteroid 9283 Martinelvis is named after him. His book "Asteroids: How love, fear, and greed will determine our future in space" was published by Yale University Press in 2021.