

# Lunar Exploration Key for Advancing American Technology, International Status, Access to Resources

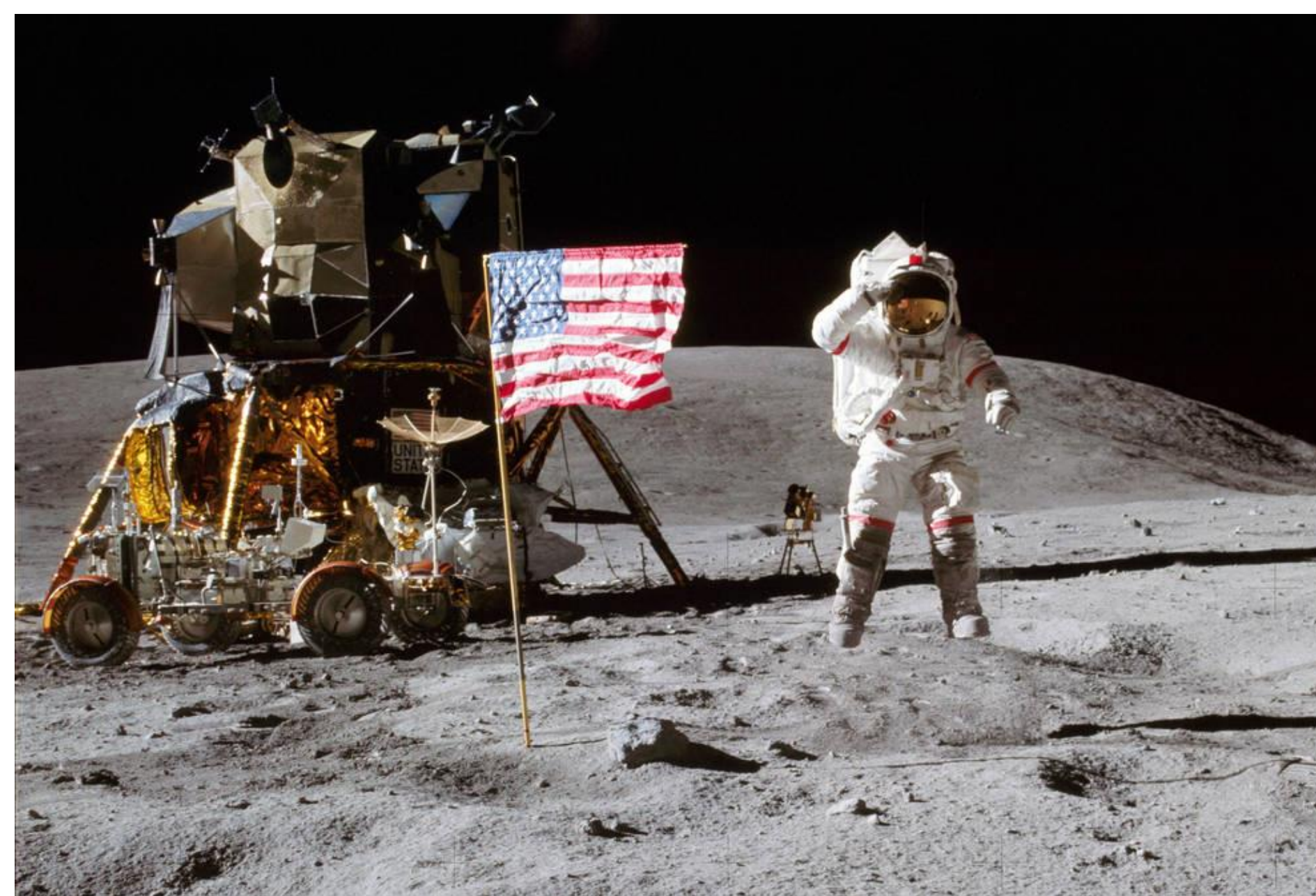
Cara Frischkorn, *Utah State University*

## Introduction

Lunar exploration and colonization has a wide range of benefits for the United States, particularly in international relations, technological advancement, and economic benefit.

NASA needs adequate funding to lead the way in Lunar exploration. As the increasing availability of Low Earth Orbit has shown, once NASA proves the feasibility and develops the technology to make space colonization and mining economically viable, commercial companies can take the opportunity to take advantage of these lucrative opportunities.

**Figure 1 – Apollo Landing, 1969**



*Photo from NASA.gov*

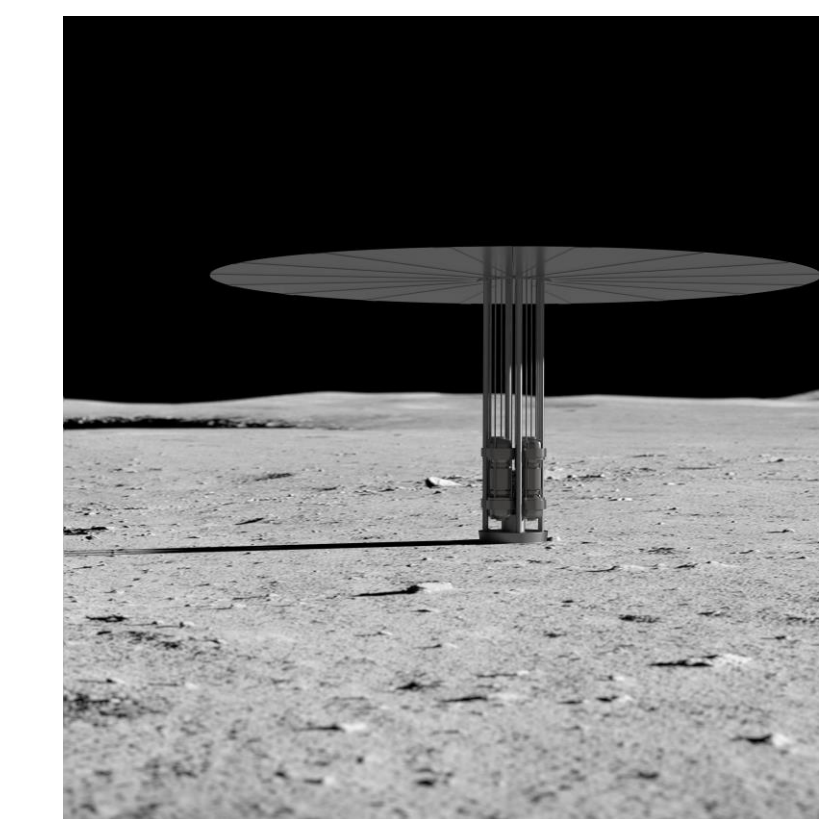
**Figure 2 – Benefits of the Space Program: Preserved Food, Fireproof materials, Rechargeable Hearing Aids, GPS, Power sources**



*Photo from NASA.gov*



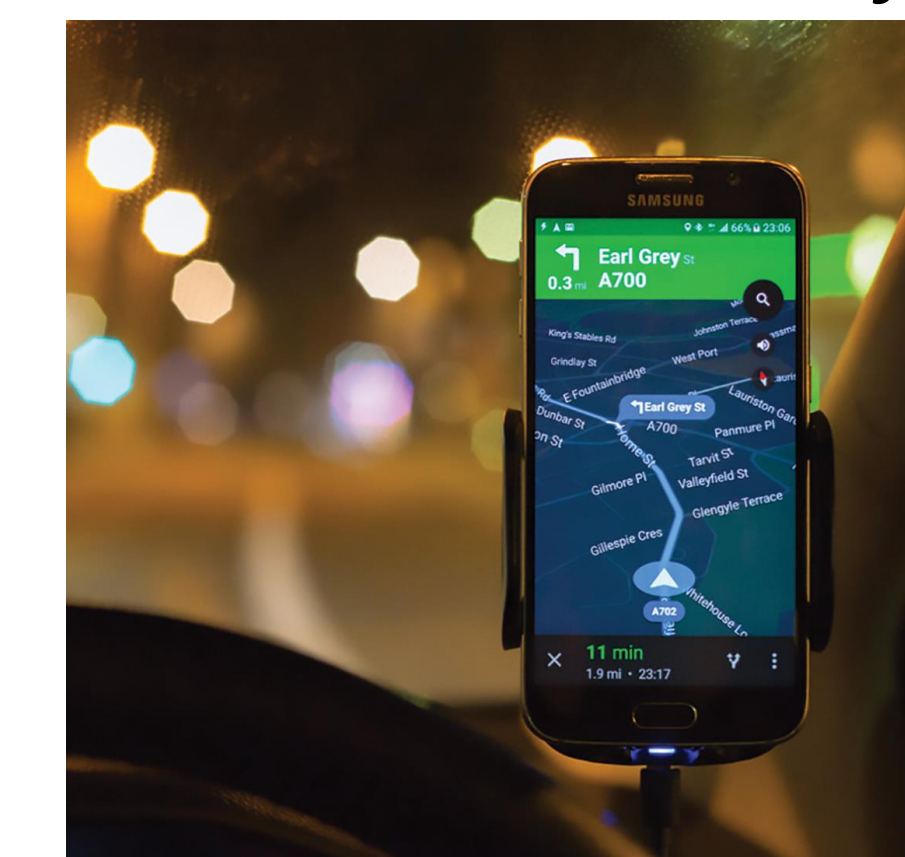
*Photo from Harvard.edu*



*Photo from NASA.gov*



*Photo from Wikipedia*



*Photo from NASA.gov*

## International Relations

Lunar exploration would improve the United State's international standing, both in cooperation and competition.

- China's technological capabilities have drastically increased, and their space program has made progress.
- China and Russia are already working on a joint Lunar base.
- A joint exploration expedition would be a great step to better relations with the countries willing to work with America, as shown by the International Space Station.

## Economics

The economic benefits of Lunar exploration could be significant, from mining resources to creating jobs.

- The Moon has a variety of useful minerals, including  $^3\text{He}$ , silicon, and rare earth metals. These could be mined without the environmental impacts of Earth mining.
- NASA creates rewarding skilled jobs across all 50 states and generates billions of dollars in economic output, as well as inspiring next-gen scientists and engineers.

## Technology

The Apollo program pioneered many technologies we now take for granted, and lunar exploration would continue that trend.

- NASA has recorded > 2000 spinoff technologies since 1976 that have benefitted many industries and changed American lives.
- The Artemis program has already made progress in radiation shielding, material processing, power sources, and high temperature materials.
- The technology developed would be crucial for further exploration: advances need to be made in radiation protection, food production, and propulsion before we can send humans to Mars.



Cara Frischkorn  
Utah State University  
College of Engineering  
Cara.Frischkorn@aggiemail.usu.edu

