The Economic Times, Pune, February 14 2015, Pp.10

Moolah By Moonlight

The Outer Space Treaty is often hailed as "the Magna Carta of international space law" but it has ambiguities that actually allow unhindered exploitation of celestial bodies, writes **Prakash Chandra**

The answer to the world's energy problems lies 384,000 km out in space—on the moon. At least that's what many space scientists believe, as they cheerlead the idea of tapping the moon's significant raw materials that could potentially help establish a resource mining industry there. This possibility has been debated for years as unmanned lunar probes hunted for minerals and rare-earth elements (REEs—chemical elements found in Earth's crust with unique magnetic and electrochemical properties vital to many modern technologies) lay hidden below the moon's surface.

Remote sensing of the moon by orbiting space probes (like India's Chandrayaan 1) has confirmed the presence of nearly two billion tonnes of water ice (from ancient comet collisions) at the lunar north and south poles. Imagine mining and processing all that water into oxygen and rocket fuel! Future colonists could even 'squeeze' breathable air out of lunar rocks! Then there's all that sunlight the moon soaks in—some 15,000 terrawatts—which could be trapped and beamed Earthwards through microwave 'bridges'. Just 1% cent of this solar energy would suffice to replace all the fossil fuel power plants on Earth with clean, low-cost electricity.

Such possibilities have now prompted the US Federal Aviation Administration (FAA) to issue licences to wannabe moon settlers who could help themselves to their own pieces of

lunar real estate. An FAA announcement last week spoke of modifying licensing laws to "encourage private sector investments in space systems by ensuring that commercial activities can be conducted on a non-interference basis," (read: dig up as much lunar land as you like). But the prospects of private entities building expandable lunar habitats and carrying out mining activities on the "magnificent desolation"— as Buzz Aldrin famously described the lunar surface—are fraught with legal pitfalls. Which is why a cautious Obama administration has distanced itself from the FAA initiative, quoting Washington's signature on the 1967 UN Outer Space Treaty which supposedly controls lunar exploration.

Much before Earth's first artificial satellite Sputnik 1 went into orbit in 1957, countries were deliberating the legal problems thrown up by rapid advances in space science and technology. Although World War II briefly interrupted this interest, the war engendered rocket technology that could not only deliver explosives in enemy territory, but also reach outer space. So after the war, this new technology and emerging space activities prompted the UN to establish the Committee on the Peaceful Uses of Outer Space (COPUOS) to work out the definition of outer space and its legal status. Of the several agreements drafted by COPOUS over the years, the 1967 Outer Space Treaty (which mandates countries to supervise private entities operating in space) found favour with most countries while the 1979 Moon Agreement (which turns jurisdiction of all celestial bodies over to the international community) has had the least adherence.

In fact, the Outer Space Treaty is often hailed as "the Magna Carta of international space law", supposedly based on the cardinal principles of freedom of exploration of outer space, including the freedom of scientific investigation and free access to all celestial bodies. Although this broad freedom is limited by several provisions, there are still ambiguities in the treaty that actually allow unhindered exploitation of celestial bodies. There is nothing to prevent a country from taking advantage of these loopholes and, say, proclaim mining rights on the moon. China did just that recently when it announced plans to set up a permanent moon base and start mining REEs and helium 3, a light non-radioactive isotope of helium. (Unlike Earth which is protected by a magnetic field, solar winds dump helium 3 on the moon and it could be extracted by heating lunar dust to around 600°C.) Just 45 tonnes of helium 3 could power a country the size of India for a whole year.

Today, as space agencies routinely plan manned missions to the moon, Mars and beyond, the unique fraternity of yesterday's space pioneers who thought of space flight purely in terms of 'space exploration' has been replaced by a new breed of space enthusiasts chanting 'commercialise space, militarise it' mantras.

In the absence of robust space laws, this could lead to a chaotic free-for-all scramble to establish national industrial bases off terra firma. It is, therefore, imperative for space-faring countries to get together and revamp the existing space pacts. Such a collaborative effort is probably the best bet to ensure the new lunar initiatives underway don't end up strip-mining Earth's lone natural satellite and turning it into an orbiting quarry.