

Development Zone: Lalande Thorium (LT)

Name: Lalande Crater

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This research is designed to highlight prospective locations of space resources, that can be registered by select clients via our Lunar Resources Registrations as a Service Platform, and included in our Public Registry.

Resources Profile

On the Moon, Thorium is most abundant in the regions of Ocean Procellarum and Mare Imbrium, which are situated in one of the major lunar geologic provinces – Procellarum KREEP Terrane. This region covers around 16% of the Moon's surface and is a location of over 60% of the lunar mare basalts. PKT contains around 40% of the total Thorium concentration. It is measured that Thorium abundance in the Procellarum KREEP Terrain varies between 3 and 12 ppm (parts per million). The KREEP (Potassium, Rare Earth Elements, Phosphorus) geochemical component is so enriched in incompatible (and radioactive) elements due to volcanic origin of the region.

Lalande Thorium Development Zone is established in the territory of lunar highland crater Lalande, which is located on the near side of the Moon, southeast of Mare Insularum with a diameter of 24 km. The crater is inferred as Copernican-aged, which runs from approximately 1.1 billion years. Lalande has almost the highest concentration of Thorium on the lunar surface, with an average value of ~ 12,6 ppm. This was measured by a gamma ray spectrometer of the Lunar Prospector spacecraft, which was operated in years 1998 – 1999 by NASA.

As mentioned above, Lalande is a lunar highland crater. The highland rocks are anorthositic in composition, meaning that 90 – 100% of their components are plagioclase feldspar. The iron content of highland rock material is very low, usually no more than 5 wt% FeO .

Further reading:

- 1) "Geological mapping of lunar highland crater Lalande: Topographic configuration, morphology and cratering process", Li, Bo; Ling, Zongcheng; Zhang, Jiang; Chen, Jian; Liu, ChangQing; Bi, Xiangyu, Planetary and Space Science, Volume 151, p. 85-96, February 2018
- 2) "Origin and Evolution of the Moon's Procellarum KREEP Terrane", Bradley Jolliff, Mark Robinson, and Srinidhi Ravi, Whitepaper #294 submitted to the Planetary Science and Astrobiology Decadal Survey 2023-2032
- 3) "Major lunar crustal terranes: Surface expressions and crust-mantle origins", Jolliff, Bradley L.; Gillis, Jeffrey J.; Haskin, Larry A.; Korotev, Randy L.; Wieczorek, Mark A., *Journal of Geophysical Research: Planets*. 105 (E2): 4197–4216.
- 4) "The Constitution and Structure on the Lunar Interior", Mark A. Wieczorek et al., Mineralogical Society of America geochemical society, Reviews in Mineralogy & Geochemistry Volume 60, 2006

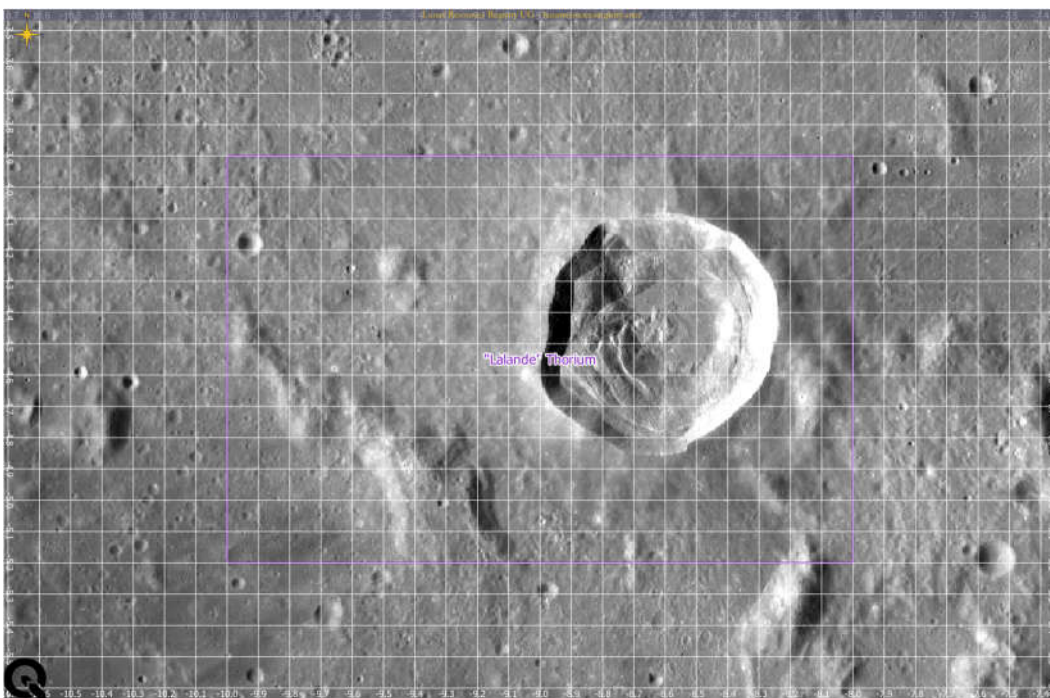
- 5) "Thermal and Magmatic Evolution of the Moon", Charles K. Shearer et al., Mineralogical Society of America geochemical society, Reviews in Mineralogy & Geochemistry Volume 60, 2006

Registration Development Status

Lunar Resources Registry and Lunar Station Corp have signed a Partnership Agreement to provide Registrations to selected clients in relation to this Development Zone.

Maps

Base Map. Source: LRR



Registrations Available

Registrations plots, 1km²

Qty 304

Source: Lunar Station - <https://lunarstation.space/>

