Paper ID: 42559
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16th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FUTURE (D4)
Space Resources: Technologies, Systems, Missions and Policies (5)

Author: Mr. Toby Mould
CisLunar Industries, United Kingdom, toby.mould@cislunarindustries.com

Dr. Jan Walter Schroeder
CisLunar Industries, Germany, walter@cislunarindustries.com
Mr. Gary Calnan
CisLunar Industries, United States, gary.calnan@cislunarindustries.com
Mrs. Emeline De Antonio
Centre National d'Etudes Spatiales (CNES), France, deantonioemeline@gmail.com

SPACE FOUNDRY: RECYCLING SPACE DEBRIS INTO RAW MATERIALS FOR IN-SPACE USE

Abstract

The cislunar economy is beginning to take shape and a new frontier is opening through the pursuit of valuable space resources. The Space Resources Value Chain will be at the core of this new ecosystem, supplying the materials needed to develop a self-sustaining economy in Space. However, a critical link in this chain remains unoccupied. At present, no company is exclusively focused on the development of an industrial scale, in-Space processing and refining capability for structural materials. Without this capability, all Space mining efforts will fail to deliver materials in a format usable within other activities, such as construction and repair, and the cislunar economy will remain dependent upon components delivered from Earth. CisLunar Industries aims to fill this gap with the Space Foundry, the first in-Space facility able to refine any source of raw material into a usable form-factor for in-Space applications. The Space Foundry will become the first in-Space provider of refined material for the construction of large orbital stations, the retrofit and repair of satellites, and assembly of reusable spacecraft.

To fulfil our long-term vision, CisLunar Industries will initially tap into the most readily available source of material near Earth: space debris. At the Space Foundry, reusable space tugs will deliver large debris items, such as spent rocket bodies and defunct satellites, to be processed and refined to customer specifications. The tugs will then deliver these finished materials to said customer. By recycling space debris, CisLunar Industries will also be offering the first economically sustainable solution to address the growing space debris problem, not only generating an early revenue stream, but establishing a principle of long-term, sustainable use of the near-Earth orbital environment.