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HARVESTING ICEBERGS AND SPACE ROCKS: SMALL SCALE RESOURCE EXTRACTION ENTREPRENEURSHIP IN AREAS BEYOND NATIONAL JURISDICTIONS

New opportunities for small-scale, but potentially highly profitable, extractive industries either arise or have the potential to grow, both in the Arctic and in outer space. In the Arctic, icebergs which have broken off from Greenland's glaciers and which have been transported south through the Davis Strait by the water currents are being harvested off the coast of Canada. The perceived purity of the water and the exotic origin make this risky endeavor commercially interesting. Iceberg harvesting has been undertaken for some time and is likely to become more important: along with increased melting of Greenland's ice sheet and calving into icebergs, also the Arctic sea ice is melting rapidly due to climate change. Icebergs are an attraction in cruise tourism, too, but also pose threats particularly in the uninhabited sea routes where rescue preparedness is low and distances to help are long. Also Arctic-related products and services are gaining the attention of consumers and investors from outside the region, in particular when high-priced luxury items and services are concerned. It therefore seems a fair assumption that iceberg harvesting off the coast of Canada is likely to remain relevant for the foreseeable future. Meanwhile, outer space is becoming the latest frontier for extractive industries, not only for the minerals and metals found on celestial bodies but also regarding water and materials which will be needed to give human activities there some degree of permanence. While the privatization of space operations is already well-advanced, be it with regard to off the shelf technologies, data services, launch services or space tourism. Recently, the U.S. National Aeronautics and Space Agency (NASA) announced plans to engage in contractual relationships with private entities for the purpose of extracting lunar regolith. The background for these planned contracts appears to be the potential of regolith to serve in the construction of a base on the Moon. Both iceberg harvesting and lunar regolith extraction require that economic (and in the case of iceberg harvesting very real personal) risks are taken before any income is generated. Issues of severed title constantly plague the extractives industry as ownership rights to the surface and sub-surface are different in every country. At the moment, however, the legal norms, in particular for space mining, are far from clear. The Moon Agreement (MA) calls for the creation of an international legal framework, but no such framework exists at the moment (which is hardly surprising, given the limited number of parties to the MA). The United Nations

Convention on the Law of the Sea (UNCLOS) contains only one norm on ice-covered areas (Art. 234 UNCLOS) but does not regulate the use of icebergs *expressis verbis*. It is the purpose of the ongoing research project to investigate different regulatory systems to identify regulatory gaps which can impede economic and technological progress, and, in a second step, infusing comparative law methods and approaches into public international law, to identify potential solutions by taking into account existing regulations elsewhere. Article 234 UNCLOS only refers to exclusive economic zones (EEZs), while icebergs which are located in the high seas are treated no differently than other high seas resources, regardless of the country of origin of the iceberg in question. Similarly, it can be argued that the Article 56 UNCLOS would even give Canada exclusive extraction rights regarding icebergs of Greenlandic origin, if and as long they are located in Canada's EEZ. In so far, the situation of floating icebergs can be compared to the legal regulation of straddling and highly migratory fish stocks prior to the entry into force of the Fish Stocks Agreement in 2001.

Who then owns the high seas or the Moon? From the perspective of international law, the clear answer is that no state may exercise sovereignty over these regions which are areas beyond national jurisdiction (ABNJs). While the United States of America, Luxemburg and the United Arab Emirates have enacted domestic legislation facilitating the extraction of resources from other celestial bodies, these measures have been criticised as running afoul of this prohibition, which is contained in Article 11 (2) MA and Article II of the Outer Space Treaty. Private law ownership over material taken from other celestial bodies has been respected so far, but until now this has only concerned scientific samples, not commercially extracted materials. A clear legal framework is essential for private actors to be willing to make the necessary investments and take substantial risks for the chance to profit eventually. Part XI of the UNCLOS provides a legal framework for a very similar situation, deep sea mining. The model created under Part XI UNCLOS could provide a template for the future commercial use of celestial bodies. Like in the case of Part XI UNCLOS, which was created when deep sea mining was seen as a technical possibility but not yet profitable, any such regulation of space mining has to happen before extractions actually begin on a commercial scale. Although the Artemis Accords try to pave the way towards space mining, their legal status as intergovernmental agreements but not international treaties and their limited regulatory content mean that they will likely fall short of the requirements of Article 11 (5) MA. Currently, public international law does not provide clear answers – but it has the potential to do so. International space law has long been inspired by the international law of the sea. While space law has become a legal discipline in its own right long ago, lessons learned in the context of deep sea mining might be useful for the development of a separate

legal regime for commercial extractive activities on celestial bodies other than Earth.

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