

ORIGINAL ARTICLE

INTERNATIONAL LEGAL THEORY: SYMPOSIUM ON LAND-GRABBING

# Mining for humanity in the deep sea and outer space: The role of small states and international law in the extraterritorial expansion of extraction

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## Abstract

This article explores how Luxembourg and Nauru put their sovereignty to use in order to become global players in what can be considered extraterritorial landgrabs – the turning of the deep seabed and outer space into realms of commercial exploitation. It shows how the international legal framework puts states, however small, into a position to facilitate private enterprises' endeavours to obtain extraterritorial exploitation rights. The article further enquires into the public interest justifications put forward by governments to legitimate their support for the expansion of private resource extraction into the deep sea and outer space. It finds that these justifications are very tenuous; that governments refer to vague notions of economic growth and benefits that may accrue from extraction to an undefined humanity while it remains unclear whether their own populations will obtain any concrete gains. Both case studies illustrate how states, on the basis of international law, facilitate the expansion of private value extraction, thus perverting the redistributive ambitions that may once have motivated the negotiations of the United Nations Convention on the Law of the Sea and the Outer Space Treaty.

**Keywords:** asteroid mining; deep seabed mining; landgrab; outer space law

*There is a recreational side, too. Space travel companies promise an exhilarating ride to the edge of our atmosphere and are actively offering seats on their future spacecraft.<sup>1</sup>*

*I believe we are about to enter an era where much of what we thought we knew is going to be rewritten and I hope we enjoy the ride because to learn and grow from the experience will lead us to a sustainable future while not to learn will give us a very uncomfortable endgame indeed.<sup>2</sup>*

*Wie vermochten wir das Meer auszutrinken? Wer gab uns den Schwamm, um den ganzen Horizont wegzuwischen? Was thaten wir als wir diese Erde von ihrer Sonne losketteten? Wohin bewegt sie sich nun? Wohin bewegen wir uns? Fort von allen Sonnen? Stürzen wir nicht fortwährend? Und rückwärts, seitwärts, vorwärts, nach allen Seiten? Giebt es noch ein Oben und ein Unten? Irren wir nicht wie durch ein unendliches Nichts?<sup>3</sup>*

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<sup>1</sup>[www.spaceresources.lu](http://www.spaceresources.lu).

<sup>2</sup>T. Smits, 'The Role of Plants in Sustainable Space Travel', in M. Najjar (ed.), *Outer Space* (2014), 110 at 111.

<sup>3</sup>How could we drink up the sea? Who gave us the sponge to wipe away the entire horizon? What were we doing when we unchained this earth from its sun? Where is it moving now? Where are we moving to? Away from all suns? Are we not

## 1. Introduction

On 30 June 2017 the Luxembourg Asteroid Foundation celebrated Asteroid Day with a 24-hour livestream broadcast from Luxembourg and the United States. Astronauts and cosmonauts, scientists, astropreneurs and politicians conversed about the perils and promises of asteroids. Asteroids emerged from their discussions as a potentially great uniting force at a time when conflict on earth is palpable: on the one hand, asteroids were presented as a common enemy to humankind, threatening to extinguish humans as they once extinguished dinosaurs; on the other hand, asteroids were hailed as a source for humanity's regeneration, as a springboard for production and human settlements in outer space due to their mineral riches and water reserves.

Indeed, in recent years commercial enterprises have dedicated increasing resources not only to space transportation and satellite technology but also to space mining. Asteroids and other celestial bodies, in particular the moon, have been identified as sources of valuable minerals such as platinum, as well as water and helium-3. Future scenarios envision water from space, broken up into oxygen and hydrogen, to serve as cheap rocket fuel and minerals to provide raw materials for 3D printing in space, but also to meet raw material demands on earth. In these scenarios, asteroids hold particular promise as they are abundant, with many orbiting near Earth. The website [www.asterank.com](http://www.asterank.com) gives access to a database owned by the US space mining corporation Planetary Resources Inc. with information on orbits, mass, composition and estimated dollar value. In a recent research report entitled 'Space – The Next Investment Frontier', Goldman Sachs alerts investors to the potential of space mining, citing Planetary Resources Inc.'s assertion that a single asteroid the size of a football field could yield platinum worth US\$25 to 50 billion.<sup>4</sup>

'Tucked away in the fairyland duchy of Luxembourg',<sup>5</sup> Etienne Schneider, Minister of Economy and Deputy Prime Minister, has made it his mission to position his country as leader in the race for resource extraction in space. He is the architect of the SpaceResources.lu initiative. As part of this initiative, in 2017 Luxembourg passed legislation on the licensing of commercial space mining and is investing in private space mining companies. Luxembourg is not the only small state seeking to facilitate extraterritorial mining. The Pacific island republic of Nauru, one of the world's tiniest states, has also placed its bet on mining – in its case of the deep seabed, rather than outer space. In 2008, Nauru sponsored an application of a subsidiary of the Canadian corporation Nautilus Minerals Inc. to the International Seabed Authority (ISA) for the right to explore an area of 74,830 square kilometres in the Pacific Ocean for polymetallic nodules. Like Luxembourg, Nauru participates in building a legal infrastructure that enables private commercial enterprises to engage in extraterritorial mining. Nauru and Luxembourg, thus, are contributing to the establishment of new extraterritorial political economies of resource extraction. What allows them to do so, is primarily the international law of spaces beyond national jurisdiction combined with their sovereign statehood. Due to their sovereign statehood under international law, Nauru and Luxembourg can impact significantly the evolution of international law through interpretation and, more importantly, their state practice; they can fill gaps and build on the international legal order through national legislation; they can act as sponsoring state for companies wishing to mine the seabed and as licensing states for companies seeking to conduct activities in outer space.

The first part of this article explores how Luxembourg and Nauru, with the help of international law, put their sovereignty to use in order to become global players in what can be considered extraterritorial landgrabs – the turning of the deep seabed and outer space into realms of

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continually falling? And backwards, sideways, forwards, in all directions? Is there still an up and a down? Aren't we straying as through an infinite nothing?', F. Nietzsche, *The Gay Science: With a Prelude in German Rhymes and an Appendix* (2001), cited in A. Beitin, 'A Question of Perspective', in Najjar (ed.), *supra* note 2, 26, at 33.

<sup>4</sup>Goldman Sachs, *Space – The Next Investment Frontier*, 4 April 2017, 74.

<sup>5</sup>E. Stein, 'Lawyers, Judges, and the Making of a Transnational Constitution', (1981) 75 AJIL 1, at 1 (referring to a different legal transformation – European integration through the jurisprudence of the European Court of Justice located in Luxembourg).

commercial exploitation through the allocation of exploitation rights to private enterprises. The second part enquires into the public interest justifications put forward in support of these governmental contributions to the expansion of private resource extraction. Traditionally, states have supported mining for tangible economic benefits to government and the national constituencies – the creation of large-scale employment, supply of the domestic manufacturing industry with raw materials or the generation of public revenue. Yet, with respect to mining in the deep seabed and outer space these justifications become increasingly tenuous. They are being replaced with vague notions of economic growth and appeals to the benefits that are to accrue from extraction to an undefined ‘humanity’. While government officials may be in for an exhilarating ride, the newly emerging political economies appear to lack any moorings in a conception of how the interaction between state and economy in facilitating extraction might contribute to the well-being of concrete communities.

## 2. Rekindling mining pasts

If you google the combination ‘Luxembourg’ and ‘mining’, the first hits will refer you to sites on space mining. Yet, Luxembourg had already been a famous mining nation in the nineteenth and twentieth centuries. In 1913 Luxembourg was one of the ten largest producers of raw iron and iron ore in the world. From the mid-1960s the industry started to decline and in 1981 the last mines were closed.<sup>6</sup> Nauru, in turn, has a history of commercial phosphate mining which lasted from 1907, when the Pacific Phosphate Company started mining on Nauru, then a German protectorate, until the 1990s (with a not very successful revival in the early 2000s).<sup>7</sup> While in Luxembourg sentimentality seems to prevail with respect to the times when mining provided a large segment of the population with job security – despite serious health damage done to many miners – collective memory in Nauru is more ambivalent. During the colonial period, the Pacific Phosphate Company and later the British Phosphate Commissioners reaped enormous profits from mining in Nauru, with little thereof accruing to the local population, and blatantly disregarded the devastation of the island’s habitat.<sup>8</sup> For a brief period after Nauru had gained independence in 1968, phosphate mining turned Nauru into the richest state in the world, measured by per capita income. Financial wealth, however, did not last; in the 1990s the state, mainly due to bad investments, was highly indebted. Both, Luxembourg and Nauru reconnect to these histories in territorial mining. Luxembourg invokes past economic prosperity derived from iron ore extraction to make space mining appeal to its population. Nauru’s case, moreover, is presented in terms of learning from the past. In this vein, the UN Economic Commission for Africa states: ‘Having experienced at first hand the drastic negative impacts of mining, the small Pacific Island state of Nauru has a strong incentive to support better mining practices’.<sup>9</sup>

Despite their differing situatedness, at the centre and the periphery of the global political economy, Luxembourg and Nauru have an important asset in common that makes possible their renewed extractive engagements: sovereign jurisdiction. Within the current international legal framework this attribute allows them to significantly assist private mining operations in obtaining

<sup>6</sup>S. Casali, ‘L’industrie sidérurgique luxembourgeoise depuis les années 60’, *Institut National de la Statistique et des Études Économiques*, 12 March 2013, available at [www.statistiques.public.lu/fr/publications/series/luxembourg/2013/02-13/index.html](http://www.statistiques.public.lu/fr/publications/series/luxembourg/2013/02-13/index.html).

<sup>7</sup>L. Folliet, *Nauru, l’île dévastée. Comment la civilisation capitaliste a anéanti le pays le plus riche du monde* (2009).

<sup>8</sup>In 1989 Nauru instituted proceedings against Australia, which together with New Zealand and the United Kingdom, had administered Nauru under the UN Trusteeship System, claiming reparations for the violation of obligations with respect to certain phosphate lands; the ICJ determined that it had jurisdiction to hear the case (*Certain Phosphate Lands in Nauru (Nauru v Australia)*), Preliminary Objections, Judgment of 26 June 1992, [1992] ICJ Rep. 240), but did not decide on the merits as the dispute was settled out of court; on this case, see A. Anghie, ‘“The Heart of my Home”: Colonialism, Environmental Damage and the Nauru Case’, (1993) 34 *Harv. Int’l L. J.* 445.

<sup>9</sup>UN Economic Commission for Africa, *Africa’s Blue Economy: A Policy Handbook* (2016), 57.

exploitation rights even in areas beyond their national jurisdiction and in the acquisition of private property rights in the mined resources. While I focus here on the significance of this jurisdictional asset, I indicate further circumstances that support Nauru's and Luxembourg's attempts to position themselves at the forefront of the extraterritorial expansion of extraction. These include, in the case of Luxembourg, financial investments by the government in space mining enterprises and, in the case of Nauru, Nauru's status as a developing state and development assistance from the EU.

### 2.1 Nauru in deep seabed mining

Nauru's sponsorship of commercial deep seabed mining is best understood within the context of other initiatives to reap economic gain from sovereign jurisdiction. When its phosphate deposits had been exhausted, Nauru first established itself as an attractive jurisdiction for financial institutions that assist their clients in tax evasion; furthermore, Nauru sought to extract profits from its sovereignty by offering Nauruan citizenship and passports for sale and detains refugees in exchange for financial support from the Australian government.<sup>10</sup> A further innovative way to draw economic benefits from sovereign jurisdiction was recently revealed by another small Pacific island state. In January 2017, French Polynesia concluded a memorandum of understanding with the Seasteading Institute to allow the latter to create a floating city with its own governing framework – a 'special economic sea zone' – within the territorial waters of French Polynesia.<sup>11</sup>

Against this background, sponsorship of commercial deep seabed mining presents itself as one further way for the small Pacific island state of Nauru to put its sovereign jurisdiction to use for economic gain; more specifically, to share in the profits from private mineral extraction in the deep sea. As a sovereign state and party to the UN Convention on the Law of the Sea (UNCLOS), Nauru can act as a so-called sponsoring state to commercial mining enterprises. State sponsorship is a necessary condition for commercial enterprises to be accorded exploration and – once a mining code has been enacted – exploitation rights in the deep sea by the ISA. What makes Nauru a particularly attractive sponsoring state for deep seabed mining corporations is the fact that under its sponsorship mining companies can obtain access to areas reserved for exploration and exploitation by developing states. Moreover, as a developing state Nauru has been the recipient of assistance by the EU directed at supporting deep seabed mining.

#### 2.1.1 The international deep seabed mining regime: Exploitation under state sponsorship

The deep seabed is the part of the ocean floor that is not subject to the jurisdiction of individual states; its exact geographical delimitation is undetermined due to a number of unresolved claims by states with respect to the extension of their national jurisdiction over the so-called continental shelf.<sup>12</sup> Certain areas, however, doubtlessly form part of the deep seabed, among them the Clarion Clipperton Zone of the Pacific Ocean. Part XI of the UNCLOS denotes the seabed, ocean floor and subsoil thereof – called the Area – including its mineral resources as common heritage of mankind (Art. 136 UNCLOS). The qualification as common heritage is the outcome of a legal struggle concerning the exploitation of what since the 1960s have been perceived as vast mineral riches of the

<sup>10</sup> Folliet, *supra* note 7; C. Storr, Deep Water, *LRB Blog*, 19 September 2018; on sale of citizenship by the Comoro Islands: A. A. Abrahamian, *The Cosmopolities. The Coming of the Global Citizen* (2015); on 'offshore processing' of refugees at the behest of Australia: B. Doherty, 'A Short History of Nauru, Australia's Dumping Ground for Refugees', *The Guardian*, 9 August 2016.

<sup>11</sup> The Memorandum of Understanding is accessible via the Seasteading Institute's website, at [20xut21weba5oivlniw6geb-wpengine.netdna-ssl.com/wp-content/uploads/2017/01/Memorandum-of-Understanding-MOU-French-Polynesia-The-Seasteading-Institute-Jan-13-2017.pdf](https://20xut21weba5oivlniw6geb-wpengine.netdna-ssl.com/wp-content/uploads/2017/01/Memorandum-of-Understanding-MOU-French-Polynesia-The-Seasteading-Institute-Jan-13-2017.pdf).

<sup>12</sup> See S. Ranganathan, Ocean Floor Landgrab, (2019) 30 *Eur. J. Int'l L.* (forthcoming).

deep seabed.<sup>13</sup> While some states were eager to push for commercial exploitation, others – in particular newly independent states organized in the G77 – wanted to guard against a neo-colonial scramble for the deep seabed that would have favoured technologically advantaged states. Denoting the Area and its resources as common heritage was to ensure that exploitation would not proceed according to a first come, first exploit rule and that benefits from exploitation would be equitably shared among states.<sup>14</sup>

The administration of exploitation rights regarding the mineral resources that form part of the common heritage raised further contentious questions.<sup>15</sup> In particular, it was debated whether exploitation rights regarding the mineral riches of the deep sea should be centrally administered and whether they should be mined by an international mining enterprise or subject to exploitation by individual public and private mining enterprises. The compromise eventually reached in the UNCLOS entails the establishment of an international organization – the ISA – to administer exploitation rights (Art. 156 UNCLOS). The UNCLOS further envisages the establishment of an international mining operation – the Enterprise (Art. 158:2 UNCLOS) – while not prohibiting mining also by state and commercial enterprises. The interests of developing states were to be safeguarded through mining by the Enterprise as well as the so-called site banking or parallel system. Under this system, applications to the ISA for mining rights must designate areas divided into two parts of equal estimated commercial value. If the application is successful, one of the two parts will be reserved for (exploration and exploitation) activities by the Enterprise or by developing states (or enterprises sponsored by them) (UNCLOS Annex III, Arts. 8 and 9).<sup>16</sup> Moreover, the UNCLOS envisages the collection of royalties which are (at least in part) to be equitably shared (Art. 140:2 UNCLOS).<sup>17</sup>

For commercial mining enterprises to apply for exploration (and exploitation) licenses,<sup>18</sup> they must be nationals of a state party to the UNCLOS or be effectively controlled by it or its nationals and they must be sponsored by that state party (Art. 153:2 UNCLOS). The sponsoring state has the obligation to ensure that the mining enterprise complies with the obligations established by the law of the sea and the contract that the company concludes with the ISA upon approval of its application for mining rights (Art. 139:1 UNCLOS; Annex III, Art. 4:4).<sup>19</sup> Currently, only licenses for exploration are being issued, work on a mining code – to regulate the issuance also of exploitation licenses – is still ongoing. When, in the future, a corporation will mine seabed minerals under an exploitation license, it will acquire private property in the minerals with recovery (UNCLOS Annex III, Art. 1).

<sup>13</sup>On the promises and disappointments of mining manganese nodules: S. Ranganathan, 'Manganese Nodules', in J. Hohmann and D. Joyce, (eds.), *International Law's Objects: Emergence, Encounter and Erasure through Object and Image* (2018), 272.

<sup>14</sup>R. P. Anand, *Legal Regime of the Sea-Bed and the Developing Countries* (1976).

<sup>15</sup>For a concise summary of the contentious issues and the legal regime embodied in Part XI UNCLOS on the Area, see R. Churchill and V. Lowe, *The Law of the Sea* (1999), 223–53.

<sup>16</sup>Currently, the parallel system is only fully in place with respect to polymetallic nodules. The regulations on the exploration of cobalt-rich crusts and sulphides provide that instead of designating a reserved area, applicants may elect to offer the Enterprise a future equity interest: Regulation 16 of the Regulations on Prospecting and Exploration for Cobalt-rich Ferromanganese Crusts in the Area, ISBA/18/A/11 (2012), Annex; Regulation 16 of the Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area, ISBA/16/A/12/Rev. 1 (2010), Annex.

<sup>17</sup>On the fiscal regime: I. Feichtner, 'Sharing the Riches of the Sea', (2019) 30 *Eur. J. Int'l L.* (forthcoming).

<sup>18</sup>According to the terminology of UNCLOS, an enterprise applies for the approval of a plan of work for exploration; upon approval of a plan of work by the Council, the Secretary General issues the plan of work in form of a contract (Art. 153:3 UNCLOS).

<sup>19</sup>For further obligations and responsibilities of the sponsoring state: Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area*, Advisory Opinion of 1 February 2011, available at [www.itlos.org/fileadmin/itlos/documents/cases/case\\_no\\_17/adv\\_op\\_010211.pdf](http://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/adv_op_010211.pdf).

Despite the numerous compromises between the coalition of newly independent states that aimed at an equitable international distribution of the benefits from deep seabed mining and a number of industrial states that favoured less public control and greater freedom of commercial enterprise, the final outcome of negotiations adopted in 1982 by the UN Conference on the Law of the Sea was not acceptable to a number of industrialized states including, *inter alia*, the United States, Great Britain and Germany. These states also did not feel bound by a moratorium on deep seabed mining that newly independent states had sought to establish with General Assembly Resolution 2574 (1969)<sup>20</sup> until an international mining administration would enter into force. Instead, they proceeded to issue licenses on the basis of national legislation for deep seabed exploration. In order to co-ordinate their respective activities – and provide legal security to their licensees – they concluded international agreements, forming what has come to be known as the Reciprocating States Regime. They did, however, recognize the conceptualization of deep seabed resources as common heritage even if they did not agree with its institutional implementation by the UNCLOS 1982. To take account of the common heritage principle, in their national legislation they envisaged the collection of a portion of financial gain from deep seabed exploitation for future redistribution.<sup>21</sup>

Eventually, a further multilateral compromise was reached with the Implementation Agreement of 1994. This agreement significantly changes Part XI on the Area of the UNCLOS. It weakens norms on technical assistance, enhances the voice of industrialized states in the ISA's political organs and modifies provisions on royalty payments in order to make the deep seabed regime conform more to 'market-oriented approaches' (Implementation Agreement, Preamble and Annex, Section 8). Most important for understanding Nauru's role in deep seabed mining: it reduces the potential scope of Enterprise activities and thus facilitates access under developing state sponsorship to reserved areas.<sup>22</sup> On the basis of these changes, a number of previously opposing states (not including the US) were ready to become parties to the UNCLOS and consequently the convention entered into force in 1994.<sup>23</sup>

### 2.1.2 Nauru's sponsorship of Nauru Ocean Resources Inc.

On 10 April 2008 Nauru Ocean Resources Inc. (NORI), then a wholly-owned subsidiary of the Canadian corporation Nautilus Minerals Inc., under the sponsorship of Nauru submitted an application for the exploration of polymetallic nodules in the Clarion Clipperton Zone to the ISA.<sup>24</sup> The application concerned a reserved area of 74,830 square kilometres that had been designated in the joint application for an exploration license by the German Federal Institute for Geosciences and Natural Resources, Yuzhmorgeologiya and the Interoceanmetal Joint Organization.<sup>25</sup> While UNCLOS Annex III, Article 9:1 gives priority to the Enterprise to decide whether to conduct exploration and exploitation activities in reserved areas, this provision currently is not operational. Due to the changes introduced with the 1994 Implementation Agreement the Enterprise to date only exists on paper, its functions being exercised by the ISA Secretariat; for the Enterprise to function independently, a Council decision to this effect is required (Implementation

<sup>20</sup>UN General Assembly Resolution 2574, (1970) 9 ILM 419.

<sup>21</sup>On the Reciprocating States Regime: E.D. Brown, *Sea-bed Energy and Minerals: The International Legal Regime, Volume 2 Sea-bed Mining* (2001), 244–91; S. Ranganathan, *Strategically Created Treaty Conflicts and the Politics of International Law* (2015), 161 et seq.

<sup>22</sup>See Section 2.1.2. below.

<sup>23</sup>On negotiation and content of the Implementation Agreement: S. Nandan, M. Lodge and S. Rosenne, *The Development of the Regime for Deep Seabed Mining* (2002), 59–66.

<sup>24</sup>Nauru Ocean Resources Inc., Application for Approval of a Plan of Work for Exploration, ISBA/14/LTC/L. 2, 21 April 2008.

<sup>25</sup>Legal and Technical Commission, Report and Recommendations to the Council of the International Seabed Authority Relating to an Application for the Approval of a Plan of Work for Exploration by Nauru Ocean Resources Inc., ISBA/17/C/9, 11 July 2011.

Agreement, Annex, Section 2:1). As of today, no such decision has been adopted.<sup>26</sup> In this situation, sponsorship by Nauru as a developing state made NORI eligible for exploration rights in a reserved area. After extensive deliberation, the Legal and Technical Commission found that NORI met all further requirements established by the UNCLOS and the Regulations on Prospecting and Exploration for Polymetallic Nodules and recommended that the Council approve of NORI's application.<sup>27</sup> Following approval by the Council,<sup>28</sup> NORI and the ISA concluded an exploration contract, which took effect on 22 July 2011.

In April 2008, not only NORI, but also Tonga Offshore Mining Limited (TOML), another subsidiary of Nautilus Minerals Inc., submitted an application for exploration rights in the Clarion Clipperton Zone.<sup>29</sup> It was sponsored by the small Pacific island state of Tonga and its application also concerned an area reserved under the parallel system. TOML's application, too, was approved by the Council.<sup>30</sup> Since then, the Pacific states Kiribati and the Cook Islands have sponsored two further applications for exploration in reserved areas for polymetallic nodules, both of which were approved by the Council.<sup>31</sup> Together, the four contracts cover an area of 298,973 square kilometres (approximately the size of Italy) in the Clarion Clipperton Zone.

### 2.1.3 Development assistance to support Nauru's sponsorship of deep seabed mining

While Nauru's 'developing state' status facilitates NORI's access to exploration (and exploitation) rights, it does not affect Nauru's responsibilities as a sponsoring state. The Seabed Disputes Chamber of the International Tribunal for the Law of the Sea in an advisory opinion issued in 2011 clarifies that developing and developed states have the same obligations and responsibilities when they act as sponsoring states; these include the due diligence obligation 'to ensure compliance by sponsored contractors with the terms of the contract and the obligations set out in the Convention and related instruments'.<sup>32</sup> At the same time, the advisory opinion recognizes the difficulties developing states might incur in complying with their obligations and proposes as a remedy that they 'receive necessary assistance'.<sup>33</sup>

Assistance was offered to Nauru by the EU. In 2011 the EU had started collaborating with the members of the Pacific Community in the 'Deep Sea Minerals Project'. Its objective was formulated as

helping Pacific Island countries to improve the governance and management of their deep-sea minerals resources in accordance with international law, with particular attention to the protection of the marine environment and securing equitable financial arrangements for Pacific Island countries and their people.<sup>34</sup>

<sup>26</sup>After Nautilus Minerals Inc. had submitted the first proposal for a joint venture with the Enterprise, the Council in 2013 concluded that it was too early for the Enterprise to function independently: Statement of the President of the Council on the Work of the Council during the Nineteenth Session, ISBA/19/C/18 (2013), 4.

<sup>27</sup>Legal and Technical Commission, *supra* note 25.

<sup>28</sup>Council, Decision Relating to a Request for Approval of a Plan of Work for Exploration for Polymetallic Nodules Submitted by Nauru Ocean Resources Inc., ISBA/17/C/14, 19 July 2011.

<sup>29</sup>Tonga Offshore Mining Limited, Application for Approval of a Plan of Work for Exploration, ISBA/14/LTC/L.3, 21 April 2008.

<sup>30</sup>Council, Decision Relating to a Request for Approval of a Plan of Work for Exploration for Polymetallic Nodules Submitted by Tonga Offshore Mining Limited, ISBA/17/C/15, 19 July 2011.

<sup>31</sup>Council, Decision Relating to a Request for Approval of a Plan of Work for Exploration for Polymetallic Nodules Submitted by Marawa Research and Exploration Ltd., ISBA/18/C/25, 26 July 2012; Council, Decision Relating to a Request for Approval of a Plan of Work for Exploration for Polymetallic Nodules Submitted by the Cook Islands Investment Corporation, ISBA/20/C/29, 21 July 2014.

<sup>32</sup>Seabed Disputes Chamber, *supra* note 19, at 242.

<sup>33</sup>*Ibid.*, at 163.

<sup>34</sup>[dsm.gsd.spc.int/index.php/news/91-spc-welcomes-nauru-s-new-legislation-to-govern-seabed-mining-activities](http://dsm.gsd.spc.int/index.php/news/91-spc-welcomes-nauru-s-new-legislation-to-govern-seabed-mining-activities).

As concerns Nauru, the EU assisted in the drafting of Nauru's International Seabed Minerals Act, adopted in October 2015, which aims to 'establish a legal framework for the sponsorship, and for the effective control, by Nauru of contractors to undertake Seabed Mineral Activities'.<sup>35</sup> Thus, NORI, through the sponsorship of Nauru, not only gains access to areas reserved for exploration and exploitation by developing states; it also is the indirect beneficiary of development assistance by the EU aimed at enabling Nauru to meet its obligations as a sponsoring state.

## 2.2 Luxembourg's *SpaceResources.lu* initiative

Luxembourg, like Nauru, has a history not only in mining, but also in attracting globally operating private enterprises to its jurisdiction. Since iron ore mining ceased to generate profits, Luxembourg not only has established itself as a tax haven and home to a prospering satellite industry, but also operates a ship registry. The latter was established with the 1990 Maritime Act and landlocked Luxembourg has since become an attractive flag state especially for its comparatively low tax rates. The way the government advertises the ship registry is paradigmatic for Luxembourg's contemporary economic policy:

The Grand Duchy with its expertise in the financial sector, combined with an attractive tax environment as well as a favourable legal and regulatory framework, offers real opportunities for players in the maritime sector in pursuit of globalisation of their activities. Compared to the complexity of the maritime sector, Luxembourg offers simple but effective solutions.<sup>36</sup>

Through favourable legislation coupled with financial incentives, Luxembourg successfully attracts private companies to its jurisdiction. Its latest reinvention as pioneer in space mining builds on this model. While Luxembourg is home to the Société Européenne des Satellites, the world's largest geostationary telecommunication satellites operator by revenue, it has until a few years ago not been known as a major player in the so-called New Space Economy made up, *inter alia*, of commercial space transportation and space mining enterprises. In two ways in particular, the government of Luxembourg attempts to make incorporation in Luxembourg attractive for extra-terrestrial mining enterprises and thus to make headway in the current race to colonize space.<sup>37</sup> First, the government of Luxembourg through national legislation establishes a legal basis for the authorization of space mining operations and recognizes property rights in extracted resources. Second, Luxembourg provides financial incentives to private space enterprises.

### 2.2.1 *International space law as interpreted by Luxembourg: Freedom to mine outer space*

A legal infrastructure, and most importantly property rights, are posited as key to the commercial success of extra-terrestrial mining ventures.<sup>38</sup> Space mining ventures, and in particular the US company Planetary Resources Inc., have been lobbying for legislation that would protect their commercial interests through the granting and recognition of property rights in mined materials. They contend that only if law establishes and enforces exclusive claims to the exploits of mining, commercial viability will be ensured.

<sup>35</sup>International Seabed Minerals Act 2015, available at [ronlaw.gov.nr/nauru\\_lpms/index.php/act/view/1150](http://ronlaw.gov.nr/nauru_lpms/index.php/act/view/1150).

<sup>36</sup>[www.luxembourg.public.lu/en/investir/secteurs-cles/secteur-maritime/index.html](http://www.luxembourg.public.lu/en/investir/secteurs-cles/secteur-maritime/index.html).

<sup>37</sup>With respect to the oceans as well as outer space the term colonization is used today not pejoratively to refer to unjust appropriation and exploitation, but to underline the (economic) benefits from the extraterritorial expansion of commercial exploitation, see, e.g., use of the term by the Seasteading Institute at [www.seasteading.org/tag/ocean\\_colonization/](http://www.seasteading.org/tag/ocean_colonization/) and the Wikipedia entry 'space colonization' at [en.wikipedia.org/wiki/Space\\_colonization](http://en.wikipedia.org/wiki/Space_colonization).

<sup>38</sup>Industry furthermore demands clear liability rules as well as legal limitations on liability; see, e.g., Bundesverband der Deutschen Industrie, 'Weltraumbergbau. Potenziale und Handlungsempfehlungen', Position Paper, August 2018.



In 2015 the industry's lobbying efforts resulted in the enactment of the US Commercial Space Launch Competitiveness Act. The act denotes as its purpose '[t]o facilitate a pro-growth environment by encouraging the private sector investment and creating more stable and predictable regulatory conditions'.<sup>39</sup> Section 51303 of Title IV 'Space Resource Exploitation and Utilization' (Space Resource Exploitation and Utilization Act) posits that US citizens engaged in commercial space mining shall be entitled to the extracted resources 'including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States'.

Luxembourg soon followed the US in enacting legislation to provide future commercial space miners with the legal security they demand. In 2016 Etienne Schneider presented to the public a draft law on the exploration and use of space resources including an explanatory statement.<sup>40</sup> On 13 July 2017 Parliament adopted the (slightly modified) law with a large majority of 55 to two votes and it entered into force on 1 August 2017.<sup>41</sup> According to the explanatory statement the law's main objective is to provide 'legal certainty as to the ownership of minerals and other valuable space resources identified in particular on asteroids'.<sup>42</sup> Legal certainty is to be achieved, first, by clarifying that space resources are capable of being appropriated (Art. 1); second, the law not only requires that space mining be authorized by the state (Art. 2), but also – and in this respect the Luxembourg legislation significantly goes beyond the US Space Resource Exploitation and Utilization Act – provides for such authorization and the issuance of licenses by the ministers in charge of the economy and space (Art. 3).

With this law Luxembourg establishes itself as administrator of exploitation rights for space resources. Whether the law can be reconciled with international space law is a highly contentious question.<sup>43</sup> Yet, Luxembourg purports not to ignore, but to comply with and build on (its own particular interpretation of) international space law. The government's stance that it is acting within the confines of international space law was made explicit in Article 1 of the Draft Law which read: 'Space resources are capable of being appropriated in accordance with international law'.<sup>44</sup> This reference to international law (which is also found in the US Space Resource Exploitation and Utilization Act) was deleted,<sup>45</sup> following an opinion by the Conseil d'État which stressed the existing disagreement with respect to the permissibility of space mining under international space law.<sup>46</sup> In its current form, Article 1 of the Luxembourg law merely states that space resources are capable of being appropriated<sup>47</sup> without indicating the jurisdictional basis of property rights in extracted space resources. Yet, from statements by the government it becomes clear that the government maintains its view that space mining is legal under international space law and that the jurisdictional basis of property rights in extracted space resources is to be found in international law, not national law. While it recognizes that space law is open to interpretation in this respect, with its space mining law it implicitly puts forward one particular interpretation according to which private space mining is permissible and

<sup>39</sup>US Commercial Space Launch Competitiveness Act, Public Law 114–90.

<sup>40</sup>*Projet de loi sur l'exploration et l'utilisation des ressources de l'espace*; I am referring here to the English translation, Draft Law on the Exploration and Use of Space Resources (Draft Law), available at [www.abanlex.com/wp-content/uploads/2015/07/Draft-law-space\\_press.pdf](http://www.abanlex.com/wp-content/uploads/2015/07/Draft-law-space_press.pdf).

<sup>41</sup>*Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace*. Journal Officiel du Grand-Duché de Luxembourg, Mémorial A, No. 674, 28 July 2017.

<sup>42</sup>Draft Law, *supra* note 40, at 1.

<sup>43</sup>See only the debates in the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space: COPUOS-LSC, Report of the Legal Subcommittee on its Fifty-sixth Session, A/AC.105/1122, 18 April 2017, 221–50; COPUOS-LSC, Report of the Legal Subcommittee on its Fifty-seventh Session, A/AC.105/1177, 30 April 2018, 229–65.

<sup>44</sup>Draft Law, *supra* note 40.

<sup>45</sup>Instead Art. 2:3 of the enacted law requires that space resources exploration and utilization conforms with Luxembourg's international obligations.

<sup>46</sup>Conseil d'État, *Projet de loi sur l'exploration et l'utilisation des ressources de l'espace*, Avis v. 7.4.2017, N° CE 51.987.

<sup>47</sup>In the original French: 'Les ressources de l'espace sont susceptibles d'appropriation.'

(if lawfully conducted) results in private property rights in extracted resources.<sup>48</sup> Anchoring its national space mining legislation in international law, serves as an important legitimization for Luxembourg's space resources initiative – generally referred to by its web address: SpaceResources.lu.<sup>49</sup> At the same time, through interpreting international space law in this way and transposing its interpretation into national law, Luxembourg may impact the future development of international space law in its desired direction.<sup>50</sup> In the following, I focus on (without endorsing) Luxembourg's interpretation of international space law that underlies its space mining legislation. I seek to clarify how this interpretation enables the government of Luxembourg to harness international law in combination with its own sovereign jurisdiction not only to promote commercial space mining, but also to present itself to space mining entrepreneurs as an attractive jurisdiction for incorporation.

The starting point for reconstructing Luxembourg's interpretation of international space law is the observation that outer space is no space beyond law, no extra-legal space. Rather, with the creation of international space law beginning in the 1950s, first through the adoption of General Assembly resolutions and then the conclusion of international treaties, states have extended international law's jurisdiction beyond earth and into outer space.<sup>51</sup> International law has thus become the law of the universe; international law and lawyers claim authority as concerns questions of use and appropriation of (and in) outer space (while not, just as in the case of the law of the sea, conclusively delimiting this space). The most important instrument pertaining to the legality of space mining is the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty/OST) which was adopted in 1966, entered into force in 1967 and today has 107 state parties, including Luxembourg and the United States. When this treaty was being negotiated, mining celestial bodies for minerals was already on the radar, not least due to the science fiction of space.<sup>52</sup> Still, it appeared a distant option and thus was not addressed explicitly.<sup>53</sup> The Moon Agreement, by contrast, which the General Assembly adopted in 1979 and which entered into force in 1984, contains provisions regarding space resources. Yet, as it has only been ratified by 18 states (as of January 2018), neither including Luxembourg nor important spacefaring nations such as the US, current legal debates concentrate on the OST. To make the case that its law on space mining conforms with and builds on international space law, the government of Luxembourg argues that neither commercial space mining nor its authorization by a state is rendered illegal by the prohibition of sovereign appropriation (Art. II OST), that commercial space mining constitutes a 'use of outer space' covered by the freedom of use as established by Article I OST and that the Moon Agreement does not give rise to a moratorium on mining; it further holds that private mining as envisaged by its space mining legislation can be reconciled

<sup>48</sup>Interview with Etienne Schneider, 'Die Vision', (2017) 379 *Forum* 24, at 25. Cf. L. Gradoni, 'L'astéroïde est-il un poisson de haute mer?', (2017) 379 *Forum* 35; P. de Man, *Luxembourg Law on Space Resources Rests on Contentious Relationship With International Framework*, KU Leuven Working Paper No. 189, July 2017, available at [ghum.kuleuven.be/ggs/publications/working\\_papers/2017/189deman](http://ghum.kuleuven.be/ggs/publications/working_papers/2017/189deman).

<sup>49</sup>When presenting the Draft Law, Etienne Schneider made frequent references to an unpublished study as the basis for the draft, conducted under the direction of Mahulena Hofmann, professor at the University of Luxembourg and with the assistance of Frans von der Dunk and Fabio Tronchetti.

<sup>50</sup>Cf. COPUOS-LSC, Report of the Legal Subcommittee on its Fifty-seventh Session, A/AC.105/1177, 30 April 2018, 247 (noting the critical view voiced in the committee that by reducing key issues of legality and finality to questions of interpretation of specific norms of international space law their resolution could be determined by the subsequent practice of merely a handful of states).

<sup>51</sup>B. Beebe, 'Law's Empire and the Final Frontier: Legalizing the Future in the Early *Corpus Juris Spatialis*', (1999) 108 *The Yale Law Journal* 1737.

<sup>52</sup>See only R. Heinlein, *The Moon is a Harsh Mistress* (1966).

<sup>53</sup>W. Jenks, *Space Law* (1965) devotes a one-page chapter to the 'Exploitation of Space Resources' holding that the 'régime applicable to any exploitable resources of outer space and celestial bodies . . . remains to be determined' (at 275).

with the legal principle laid down in Article I OST that the use of outer space ‘shall be carried out for the benefit and in the interests of all countries’ and ‘shall be the province of all mankind’.

According to Article II OST ‘[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means’. In holding that this appropriation prohibition does not prevent private space miners from obtaining property rights in space resources, Luxembourg can enlist scholars who make an *a contrario* argument and point out that the wording of Article II OST only prohibits appropriation by states not private persons.<sup>54</sup> This interpretation finds some further support in a juxtaposition of the wording of Article II OST with the wording of Article 11:3 Moon Agreement which states: ‘[N]either the surface nor the subsurface of the moon [and other celestial bodies], nor any part thereof or natural resources in place, shall become property of any State . . . or of any natural person.’ With reference to this explicit prohibition of private appropriation in the Moon Agreement, Luxembourg may argue that Article II OST only addresses and prohibits appropriation by states. Moreover, Luxembourg may cite in support of its interpretation (and more plausibly so) those who hold that non-appropriation in Article II OST only pertains to outer space and celestial bodies as such and not to their resources.<sup>55</sup> In this respect, too, the Moon Agreement is more specific, extending the non-appropriation prohibition explicitly to resources. Yet, also this more explicit wording leaves a loophole to proponents of the legality of space mining, allowing them to point out that Article 11:3 Moon Agreement only prohibits appropriation of resources *in place* not, however, resources recovered from space.<sup>56</sup> With respect to asteroid mining, in particular, it is, moreover, being argued that at least some asteroids are not to be qualified as celestial bodies and thus are not covered by the appropriation prohibition of the OST.<sup>57</sup>

Once Luxembourg has established that private space mining is not covered by the prohibition of appropriation under international space law, it then needs to argue that freedom of use, as established by Article I OST, encompasses space mining. Here, an analogy to the law of the high seas becomes relevant. The government invokes French law of the 19<sup>th</sup> century recognizing – as does the international law of the high seas – the right to appropriate as *res communis* shellfish and fish on the high seas beyond national jurisdiction.<sup>58</sup> According to the explanatory statement: ‘Space resources are appropriable, in the same way as fish and shellfish are, but celestial bodies and asteroids are not, just like the high sea is not’.<sup>59</sup> More difficult becomes Luxembourg’s position if confronted with the Moon Agreement. The Moon Agreement designates not only the moon and other celestial bodies but also space resources as common heritage of mankind (Art. 11:1 Moon Agreement) (in contradistinction to free for use *res communis*) and provides for the establishment of an international regime for the management of space resources (Art. 11:5–7 Moon Agreement). Like the UNCLOS, it envisages the administration of resources and exploitation rights by an international institution as representative of humankind. Whilst the Moon Agreement is clear in stating that celestial resources constitute common heritage of mankind and should be administered by an international regime, it does not, however, explicitly establish a moratorium on space mining until such a regime comes into force. Again, we are reminded of the law of the sea and the dispute between newly independent states

<sup>54</sup>For this view see S. Gorove, ‘Interpreting Article II of the Outer Space Treaty’ (1969) 37 *Fordham L. Rev.* 349; for the opposing view that Art. II OST prohibits sovereign and private appropriation and with references to the history of this provision: T. Gangale, *The Development of Outer Space. Sovereignty and Property Rights in International Space Law* (2009), 33–9.

<sup>55</sup>See Jenks, *supra* note 53.

<sup>56</sup>V. Pop, *Who Owns the Moon? Extraterrestrial Aspects of Land and Mineral Resources Ownership* (2010), 146.

<sup>57</sup>*Ibid.*, 51–8 (on the different interpretations of the term ‘celestial body’).

<sup>58</sup>Draft Law, *supra* note 40, 3.

<sup>59</sup>*Ibid.*, 4.

and industrialized states whether or not conceptualization of mineral resources as common heritage prohibited mining unless administered by an international organization. In any case, the Moon Agreement, if at all, establishes a moratorium only for its parties.<sup>60</sup> Luxembourg, not being a party to the Moon Agreement, maintains that private space miners are free to mine outer space under Article I OST.

Once Luxembourg has put forward that it is not violating the appropriation prohibition, but that space mining is encompassed by the freedom of use, it remains for Luxembourg to argue that commercial space mining as envisaged by its legislation also meets the requirement that the use of outer space 'shall be carried out for the benefit and in the interests of all countries . . . and shall be the province of all mankind' (Art. I OST). The industrialized states that had insisted on freedom of use and established licensing regimes for deep seabed mining outside the UNCLOS 1982 had recognized an obligation – flowing from designation of the deep seabed as common heritage – to share benefits from exploitation. By contrast, the Luxembourg space mining legislation does not (and neither does the US Space Resource Exploitation and Utilization Act) provide for the setting aside of revenue for redistributive purposes. To the contrary, Luxembourg advertises its legal regime to commercial space enterprises as aiming at low cost with moderate fees and tax rates.<sup>61</sup> In order to defend the lack of any provision for redistribution of profits from space mining, it may point to the fact that only the Moon Agreement, and not the OST, designates space resources as common heritage. As concerns the requirement that the use of outer space be carried out for the benefit of all countries, proponents of commercial space mining invoke benefits to mankind as a whole from space mining in the form of technological progress and scientific advances.<sup>62</sup> The explanatory statement to the Draft Law adds

economic growth on Earth and, in the interest of all countries and their inhabitants, . . . new horizons in space exploration . . . opening, in the interest of all, access to a wealth of numerous previously unused mineral resources on rocks travelling through space, without for all that damaging natural habitats.<sup>63</sup>

Etienne Schneider in an interview alleges a further benefit, namely that space resources when transported to Earth will make smartphones affordable for billions of people.<sup>64</sup>

### 2.2.2 Authorization of space mining by Luxembourg

As Luxembourg holds the view that commercial mining is encompassed by the freedom of use, what is still required then for actual space mining operations to be legal under international space law, is authorization by a state. This is where the Luxembourg government enters the scene and where its space mining legislation – by providing for the authorization of space mining – adds an important building block in the construction of a legal framework to operationalize commercial space mining.

Despite the numerous divergences in legal opinion as concerns the legality of space mining, there is wide agreement that private activities in space that are permitted under the freedom of use, must be authorized and supervised by a state.<sup>65</sup> Space companies do not question this

<sup>60</sup>On the question whether the Art. 11 Moon Agreement establishes a moratorium: L. Viikari, *From Manganese Nodules to Lunar Regolith. A Comparative Study of the Utilization of Natural Resources in the Deep Seabed and Outer Space* (2002), 121–2.

<sup>61</sup>Presentation of the Draft Law by Etienne Schneider on 11 November 2016.

<sup>62</sup>COPUOS-LSC, Report of the Legal Subcommittee on its Fifty-sixth Session, A/AC.105/1122, 18 April 2017, 242.

<sup>63</sup>Draft Law, *supra* note 40, 2.

<sup>64</sup>Interview with Etienne Schneider, *supra* note 48, 26.

<sup>65</sup>J. F. Mayence, 'Granting Access to Outer Space: Rights and Responsibilities for States and Their Citizens', in F. von der Dunk (ed.), *National Space Legislation in Europe. Issues of Authorization of Private Space Activities in the Light of Developments in European Space Cooperation* (2011), 73, at 74.

authorization requirement per se. Rather, they welcome some governmental oversight as a way to level the playing field and ensure orderly competition while lobbying for low intensity regulation that does not enhance the costs of their ventures. Article VI OST lays down the authorization requirement. The authorizing state is to ensure that activities comply with international space law. In case of a violation of its obligations of supervision it incurs state responsibility.

The Luxembourg law provides for the issuance of space mining licenses to legal persons incorporated under Luxembourg law (Art. 4). To be eligible for a license, corporations must have their central administration and registered office in Luxembourg (Art. 7:2). Since the law entered into force, Planetary Resources Inc. has established a European headquarter in Luxembourg<sup>66</sup> and Deep Space Industries, another Silicon Valley space mining company, also has opened an office in Luxembourg. The conformity of Luxembourg's licensing provisions with international space law, too, is not beyond doubt. In particular, it may be asked whether the OST allows for licensing of space mining companies by the state where these companies only have their administrative centre while conducting significant operations elsewhere. Article VI cl. 1 and 2 OST require that 'national activities' be authorized by the 'appropriate state party'. Luxembourg seems to adopt the view that incorporation of a space mining company in Luxembourg makes space mining by such a company a national activity of Luxembourg in the sense of Article VI OST and hence Luxembourg the appropriate state party to authorize it. It thus departs from interpretations that equate the appropriate state with the launching state (which incurs liability for damage under Art. VII OST).<sup>67</sup>

To conclude this reconstruction of Luxembourg's space mining legislation, a final note on property rights is in order as the debate on commercial space mining turns on the question whether international law stands in the way of space miners obtaining property rights in extracted resources.<sup>68</sup> As mentioned above, the Luxembourg law merely states that space resources are capable of being appropriated. Opponents argue that because private property is derivative of sovereignty, a law like Luxembourg's, which recognizes private property rights, would amount to an assertion of sovereignty prohibited by the non-appropriation obligation. Proponents, in turn, sometimes answer with John Locke<sup>69</sup> that private property need not be derivative of sovereignty and that private property in extracted space resources may originate in human labour.<sup>70</sup> Yet, the latter argumentation is not necessary to make sense of the Luxembourg law. If one argues that international law allows for space mining under the freedom of use then one may further argue that it is international law's jurisdiction from which private property in extracted resources derives. Thus, the Luxembourg law can be reconciled with a Benthamite approach that holds that property rights are derivative of jurisdiction.<sup>71</sup> In

<sup>66</sup>[www.planetaryresources.com/company/facilities/facilities-luxembourg/](http://www.planetaryresources.com/company/facilities/facilities-luxembourg/).

<sup>67</sup>On different interpretations of the term 'national activities' in Art. VI OST: F. von der Dunk, 'International Space Law', in F. von der Dunk and F. Tronchetti (eds.), *Handbook of Space Law* (2015), 29 at 53–4; F. van der Dunk, *Private Enterprise and Public Interest in the European 'Spacelandscape'. Towards Harmonized National Space Legislation for Private Space Activities in Europe* (1998), 17 et seq. It should also be noted that an argument can be made that it is through the act of authorization (and potential government support in defending the exclusivity of mining rights in space) that Luxembourg may violate the appropriation prohibition, cf. F. Tronchetti, 'Legal Aspects of Space Resource Utilization', in F. von der Dunk and F. Tronchetti (eds.), *Handbook of Space Law* (2015), 769, at 791–2; L. Gradoni, 'What on Earth is Happening to Space Law?', *EJIL: Talk!*, 31 July 2018, available at [www.ejiltalk.org/what-on-earth-is-happening-to-space-law-a-new-space-law-for-a-new-space-race/](http://www.ejiltalk.org/what-on-earth-is-happening-to-space-law-a-new-space-law-for-a-new-space-race/)

<sup>68</sup>For accounts of this debate, see T. Gangale, *supra* note 54, at 30–60; V. Pop, *supra* note 56, at 135–51.

<sup>69</sup>J. Locke, *Second Treatise of Government* (1689).

<sup>70</sup>J. Su, 'Legality of Unilateral Exploitation of Space Resources Under International Law', (2017) 66 *International and Comparative Law Quarterly* 991, at 1001.

<sup>71</sup>J. Bentham, *Theory of Legislation* (1802) ('Property and law are born together, and die together. Before laws were made, there was no property; take away laws, and property ceases.')

this reading, the Luxembourg law does not establish property rights, but merely recognizes property rights arising under international law.<sup>72</sup>

Not only Luxembourg's interpretation of international space law is contested, but so is its space mining legislation's effectiveness in providing space mining corporations with legal security. Whilst Luxembourg will recognize a corporation's entitlement to resources mined in space under an authorization issued by Luxembourg (and possibly also under authorizations issued by other states), other jurisdictions might not do so.<sup>73</sup> Since space operations are not launched from the territory of Luxembourg, legal security for companies that want to bring space resources to Earth will depend on recognition of their property rights also by the launching state.<sup>74</sup> Thus, the need might arise for international agreements between states, comparable to those concluded under the Reciprocating States Regime.<sup>75</sup> Yet, despite contestation of the compatibility with international law and effectiveness of its space mining legislation, Luxembourg has not only been successful in garnering worldwide attention and attracting space companies to Luxembourg. With its legislation it has also created facts that will have normative implications for the further development of international space law. In the meantime, until space mining becomes a reality, Luxembourg is concluding co-operative agreements with like-minded states, so far among them the United Arab Emirates, Portugal and Japan.<sup>76</sup>

### 2.2.3 Financial incentives to private space miners

Luxembourg not only seeks to attract private space mining companies with a legal infrastructure for space mining, but also with financial incentives. While the law on the exploration and use of space resources envisages the collection of licensing fees, the government has signalled that it does not seek to impose any financial burdens that might disincentivize mining companies to incorporate in Luxembourg.<sup>77</sup>

Moreover, Luxembourg acts as a venture capitalist for the space mining industry in order to lure space mining companies to Luxembourg. While for a long time activities in space were conducted by public space agencies, in recent years space operations increasingly are being privatized and commercialized. Many private space enterprises today are owned or funded by so-called High Net Worth Individuals.<sup>78</sup> Google co-founder and billionaire Larry Page, for example, is one of the main investors in Planetary Resources Inc. These private enterprises now have their capital bolstered by venture capital from Luxembourg. Minister Schneider boasts in an interview that within five minutes he was allocated a €200 million budget by the Government Council for this purpose.<sup>79</sup>

<sup>72</sup>See also COPUOS-LSC, Report of the Legal Subcommittee on its Fifty-seventh session, A/AC.105/1177, 30 April 2018, 250. This view was more clearly expressed in Art. 1 as worded in the Draft Law.

<sup>73</sup>Moreover, licensing of space mining activities might not entail the granting of exclusive access rights to a particular plot on a celestial body as this could be interpreted as a violation of the non-appropriation principle in Art. II OST, see *supra* note 67.

<sup>74</sup>For this objection, see Conseil d'État, *supra* note 46.

<sup>75</sup>See *supra* note 21. See also The Hague International Space Resources Governance Working Group, Draft Building Blocks for the Development of an International Framework in Space Resource Activities, available at [www.universiteitleiden.nl/en/law/institute-of-public-law/institute-for-air-space-law/the-hague-space-resources-governance-working-group](http://www.universiteitleiden.nl/en/law/institute-of-public-law/institute-for-air-space-law/the-hague-space-resources-governance-working-group) (proposing an international legal framework to 'enable the attribution of property rights to an operator to search and/or recover space resources *in situ* for a maximum period of time and a maximum area upon registration in an international registry, and provide for the international recognition of such property rights' as well as mutual recognition of property rights in extracted space resources).

<sup>76</sup>[www.spaceresources.lu](http://www.spaceresources.lu).

<sup>77</sup>*Supra* note 61.

<sup>78</sup>B. Cahan, I. Marboe and H. Roedel, 'Outer Frontiers of Banking: Financing Space Explorers and Safeguarding Terrestrial Finance', (2016) 4 *New Space* 253.

<sup>79</sup>Interview with Etienne Schneider, *supra* note 48, at 28.

The government promises financial benefits to privately held space mining companies, among them the US corporations Planetary Resources Inc. and Deep Space Industries, in memoranda of understanding (MoU) in order to motivate them to relocate part of their business to Luxembourg. These MoU are inaccessible to the public.<sup>80</sup> In 2016 – following the conclusion of a MoU with Planetary Resources Inc. – the government of Luxembourg, the Luxembourg investment bank Société Nationale de Crédit et d'Investissement (SNI) and Planetary Resources Inc. signed an investment and co-operation agreement according to which Luxembourg provides direct capital and R&D grants in an amount of €25 million, SNI becoming a minority shareholder in Planetary Resources Inc.<sup>81</sup>

### 3. Justifications of expanding extraction: Growing, winning, benefiting humanity

The cases of Luxembourg as well as Nauru raise a puzzle concerning the justification of the governments' policies promoting the extraterritorial expansion of mineral extraction. While states and state actors may pursue a multitude of different (stated and unstated) objectives with their economic policies, it is surprising that governmental actors in the constellations under review here do not even attempt to render a coherent justification in terms of public benefits to accrue to their respective constituencies, i.e., the populations of Nauru and Luxembourg. While it is difficult to see how the promotion of extraterritorial resource extraction may enhance the prosperity of the inhabitants of Nauru and Luxembourg, justifications of the expansion of resource extraction frequently invoke the notion of benefits to humanity as a whole.

#### 3.1 Nauru: Blue Growth, public revenue and mining sustainability

Nauru's engagement in deep seabed mining can be made sense of in the context of various governmental strategies to promote economic growth. States, the EU and international organizations are turning to the oceans as a potential source of growth. The EU Commission is promoting economic exploitation of the oceans under its Blue Growth strategy seeing growth potential in five 'focus areas', one of them being seabed mineral resources.<sup>82</sup> Similarly, the African Union is pushing for a Blue Economy, calling it the 'New Frontier of African Renaissance'.<sup>83</sup> The policy handbook of the UN Economic Commission for Africa on Africa's Blue Economy states: 'If fully exploited and well managed, Africa's Blue Economy can constitute a major source of wealth and catapult the continent's fortunes'.<sup>84</sup> While Nauru is the subject of case study 8 in the handbook,<sup>85</sup> the study is quiet about the exact benefits to be derived by Nauru from entering the deep seabed mining economy.<sup>86</sup>

Traditionally, resource rich poor states have turned to resource extraction as a source of government revenue. As of now, however, the prospects of Nauru reaping significant fiscal benefits from deep seabed mining appear low. Nauru's International Seabed Minerals Act provides for a

<sup>80</sup>Upon a request for access to the MoU concluded with Planetary Resources Inc., I received the following answer: 'Unfortunately, the MoU with Planetary Resources is confidential and cannot be shared. All public information is included in the press release that was published.' Email from the Deputy Director of Space Affairs, 1 June 2017 (on file with the author).

<sup>81</sup>A press release with this information is available at [www.spaceresources.public.lu/content/dam/spaceresources/press-release/2016/2016\\_11\\_03PlanetaryResourcesAgreement.pdf](http://www.spaceresources.public.lu/content/dam/spaceresources/press-release/2016/2016_11_03PlanetaryResourcesAgreement.pdf).

<sup>82</sup>[ec.europa.eu/maritimeaffairs/policy/blue\\_growth\\_en](http://ec.europa.eu/maritimeaffairs/policy/blue_growth_en).

<sup>83</sup>N. Dlamini-Zuma, Chairperson of the African Union Commission, Key Note Address, Launch of the 2015-2025 Decade of African Seas and Oceans and the Celebration of the African Day of the Seas and Oceans, 25 July 2015.

<sup>84</sup>UN Economic Commission for Africa, *supra* note 9, x.

<sup>85</sup>*Ibid.*, 57.

<sup>86</sup>The World Bank cautions that while potential revenue may be sizable (referring to seabed mining within national jurisdiction) the costs and risks were still unclear and might be significant: World Bank, *Pacific Possible: Long-term Economic Opportunities and Challenges for Pacific Island Countries* (2017).

sponsorship application fee of US \$15,000, and an annual administration fee of US \$20,000,<sup>87</sup> which is minimal compared to the application fee of US \$500,000 collected by the ISA.<sup>88</sup> Moreover, the bill contains provisions on seabed mineral recovery payments to be based on a percentage of the latest market value of the metal content of the mined substances. It further establishes a Seabed Minerals Fund that is mandated to manage revenues for the benefit of current and future generations of Nauru.<sup>89</sup> The percentage of market value that is to accrue to Nauru once deep seabed mining will take off is yet to be determined. Given that the ISA under its mining code (still to be adopted) will also collect royalties as well as the jurisdictional competition among potential sponsoring states, it is safe to assume that Nauru cannot hope to collect significant revenue from commercial deep seabed mining.

This pessimistic outlook is bolstered by NORI's ownership structure. When NORI first had applied for an exploration contract with the ISA in 2008, it had been a wholly owned subsidiary of the Canadian corporation Nautilus Minerals Inc.<sup>90</sup> To dispel monopolization concerns in the Council of the ISA, as Nautilus Minerals Inc. also was behind TOML's application for exploration rights under the sponsorship of Tonga, NORI's ownership structure was transformed. According to a 2011 report by the Legal and Technical Commission to the Council, NORI was then owned by two public foundations. The report states that the two foundations

will distribute within the State the income NORI receives from mineral production in the Licence Area. The Nauru Education and Training Foundation will distribute its share of the income to promote education and capacity-building in Nauru, while the Nauru Health and Environment Foundation will utilize the income for health services and environmental rehabilitation in Nauru.<sup>91</sup>

This promise of immediate benefits for the population of Nauru from deep seabed mining was only of short duration. Today, NORI is again a wholly owned subsidiary of a Canadian corporation, this time Deep Green Resources Inc. As a consequence, Nauru can share in NORI's profits only by way of the mineral recovery payments provided for in its International Seabed Minerals Act or taxation.

As generation of substantial government revenue is unlikely and the benefits for the Nauruan population from blue growth remain unspecified, the policy handbook of the UN Economic Commission for Africa points to a further justification for Nauru's engagement in deep seabed mining. In stressing that Nauru will promote sustainability in mining it invokes benefits not for the particular community of Nauruans, but benefits for the whole of humanity.<sup>92</sup> The argumentative move from tangible benefits for concrete communities to benefits for humanity as a whole can also be observed in the current deliberations on a mining code for the deep seabed, which is to provide for an equitable sharing of benefits from deep seabed mining according to Article 140:2 UNCLOS.<sup>93</sup> To justify deep seabed mining with reference to benefits for humanity as a whole – including advances in technology for sustainable mining or the alleviation of global resource scarcity – conceals important questions of distribution. Related to the case of Nauru these include, in particular, the question as to the distribution of costs and benefits from deep seabed mining between NORI, the government of Nauru and the Nauruan population.

<sup>87</sup>International Seabed Minerals Act, *supra* note 35, Part 7 Fiscal Arrangements.

<sup>88</sup>For the application fee for a license for polymetallic nodules exploration, see ISA, Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (as amended), ISBA/19/C/17 (22 July 2013), Regulation 19, paragraph 1.

<sup>89</sup>International Seabed Minerals Act, *supra* note 35, Part 7 Fiscal Arrangements.

<sup>90</sup>Nauru Ocean Resources Inc., *supra* note 24.

<sup>91</sup>Legal and Technical Commission, *supra* note 25.

<sup>92</sup>UN Economic Commission for Africa, *supra* note 9, 57.

<sup>93</sup>Feichtner, *supra* note 17.



### 3.2 Luxembourg: Winning the space race and preparing humanity's resettlement to outer space

Perusing the vast media coverage of Luxembourg's Space Resources initiative, one may get the impression that Luxembourg's space policy is indeed about winning a race. On SpaceResources.lu the government proudly reposts news articles with titles like 'A Tiny Country is About to Win the Global Space Race'.<sup>94</sup> For Etienne Schneider the initiative appears to have paid off already. He is travelling the world, advertising Luxembourg to the space industry and is the subject of numerous journalistic features. Politico in 2017 included him in its selection of the 28 people 'who are shaping, shaking and stirring Europe'.<sup>95</sup> In interviews he frankly admits that he had had no particular interest in outer space until a visit in 2012 by Pete Worden, then Director of NASA's Ames Research Center, who enthusiastically talked to him about the opportunities of space mining. Schneider's joke about how he wondered what Worden, now a member of the Space Resources Advisory Board, had smoked, is becoming something of a founding myth of SpaceResources.lu. For the government, the Space Resources initiative asserts the value of sovereignty.<sup>96</sup> No matter how small a state, Luxembourg can put this sovereignty to use in authorizing non-governmental activities in outer space.

Yet, if politics is to be about more than boosting the ego of politicians or asserting the continued relevance of the state, one may want to probe more deeply for further justification. The government gives a number of reasons for its interest and involvement in space mining. Disentangling these justifications, one may distinguish three socioeconomic rationales for Luxembourg's space mining policy. First, the government points out how space mining will provide raw materials for production in space, thus, for example, reducing the cost of satellite operation, and – once technology is sufficiently advanced and the cost of space transportation reduced – on Earth. On Earth, space resources may lower the price of rare earths and weaken dependence on resource states, in particular China, which is currently the largest exporter of rare earths. In response to this rationale, it should be noted that the return of space resources to Earth is still a very distant option. If space mining is to take place, it will therefore primarily benefit activities in outer space. This in turn means that as the commercialization of space activities proceeds, the most immediate beneficiaries from space mining will be private space enterprises.

Second, Luxembourg's space mining policy may be justified with job creation and fiscal revenue. As concerns this rationale, it is surprising how little these concrete benefits for the local population figure in the government's communications. In a long interview with 'Happen', a publication of the government agency Luxinnovation, Schneider, named by the journal *Mister Space Business*, only very late into the interview states: 'the long-term [goal], of course, is to earn money, to assure that people will have good jobs, and to develop research activity'.<sup>97</sup> Yet, it is doubtful whether the Space Resources initiative will indeed result in the creation of significant employment in Luxembourg. To be eligible for a space mining license in Luxembourg, mining enterprises must incorporate in Luxembourg and move their administrative centre to Luxembourg. More job intensive activities may, however, be conducted elsewhere. As concerns fiscal revenue, since the Luxembourg government has repeatedly stressed that it intends to collect neither significant licensing fees nor taxes from space enterprises, earning money will depend on the government's capital investments in the private space mining enterprises paying off.

Third, as in the case of Nauru, we see appeals to humanity as a whole – possibly to make up for the uncertainty as to the gains for Luxembourg's population, but also to prove conformity with the demands of international space law. In addition to pointing to cheaper mobile phones and

<sup>94</sup>[www.spaceresources.public.lu/en/actualites/2017/tiny-country-win-race.html](http://www.spaceresources.public.lu/en/actualites/2017/tiny-country-win-race.html).

<sup>95</sup>[www.politico.eu/list/politico-28-2018-ranking/](http://www.politico.eu/list/politico-28-2018-ranking/).

<sup>96</sup>For a similar assessment, see A. A. Abrahamian, 'How a Tax Haven is Leading the Race to Privatise Space', *The Guardian*, 15 September 2017.

<sup>97</sup>Interview with Etienne Schneider, 'Mister Space Business', 2017 *Happen* 10, at 20.

exhilarating space rides for everyone at low cost, the government joins the multiplying voices locating humanity's future habitat in space.<sup>98</sup> According to the government: 'The possibilities are truly endless. Space mining could open up a wealth of new resources and opportunity to build economies beyond what we have on Earth today, and allow humans to become an interplanetary species.'<sup>99</sup>

It may be concluded that, to date, the government has failed to clearly outline how space mining is to translate into prosperity for the population of Luxembourg apart from an uncertain 'trickling down' from a profitable private space industry. In times of mounting societal challenges one might expect more from a government in terms of rationalizing its industrial policy. Given that the government with its legislation on space mining actively engages in market creation one may demand, with economist Mariana Mazzucato, that the government policy be informed by societal needs.<sup>100</sup> It may well be the case that a number of societal challenges could be addressed successfully by innovation in space technologies and facilitated by space mining – just think of the possibilities created by satellite technology to facilitate earth observation, communication and transactions.<sup>101</sup> In order for these possibilities to yield societal benefits, it would be necessary, however, that innovation is indeed driven by societal demands and that the fruits of innovation are put to use for public benefit. Precautions would need to be taken against the privatization of benefits and the socialization of costs from space mining.<sup>102</sup> Yet, no such program is offered by the government of Luxembourg for its Space Resources initiative. This is particularly curious given that the government of Luxembourg had initiated a collaboration with economist Jeremy Riffkin to devise a strategy for a third Industrial Revolution. Space resources do not appear once in the 475-page-long strategic study published in 2016 as a result of this co-operation.<sup>103</sup>

#### 4. The dystopia of the extraterritorial landgrab

What sounds like noble aims of international law – the designation of outer space as free for the peaceful use by all for the benefit of all countries and of the deep seabed as mankind's common heritage – turn out to provide the basis for extraterritorial landgrabs. In their jurisdictional competition with other states to attract business and in their battle for continued relevance as sovereign states, the tiny states of Luxembourg and Nauru become active promoters of these landgrabs within the framework of international law.

Whereas the arts are replete with utopian visions of ventures into the deep sea and outer space, the governmental activities described in this article provoke an increasing sense of bleakness. While the international law of deep seabed mining from its inception in the 1960s was a project of large-scale exploitation, at least it held the promise of turning the oceans into a source of revenue that could be used to remedy global inequality. Today, the redistributive ambitions have receded; economic growth remains the sole guiding star for governmental economic policy. In both cases, of Nauru and Luxembourg, governmental actors provide justifications in

<sup>98</sup>See only Stephen Hawking in BBC, *The Search for a New Earth*, 11 September 2017.

<sup>99</sup>[www.spaceresources.public.lu/en/faq.html](http://www.spaceresources.public.lu/en/faq.html).

<sup>100</sup>M. Mazzucato, 'From Market Fixing to Market-creating: A New Framework for Innovation Policy', 23 *Industry and Innovation* 140; see also M. Mazzucato and D.K.R. Robinson, *Market Creation and the European Space Agency. Towards a Competitive, Sustainable and Mission-oriented Space Eco-system* (2016), available at [marianamazzucato.com/wp-content/uploads/2016/11/Mazzucato\\_Robinson\\_Market\\_creation\\_and\\_ESA.pdf](http://marianamazzucato.com/wp-content/uploads/2016/11/Mazzucato_Robinson_Market_creation_and_ESA.pdf).

<sup>101</sup>Cahan et al., *supra* note 78.

<sup>102</sup>Currently, international space law with Art. VII OST places liability for damages caused by (private) space activities on the launching state.

<sup>103</sup>The TIR Consulting Group LLC, *The 3<sup>rd</sup> Industrial Revolution Strategy Study for the Grand Duchy of Luxembourg* (2016), available at [www.troisiemerevolutionindustrielle.lu/wp-content/uploads/2016/11/TIR-CG\\_Luxembourg-Final-Report\\_Long-Version.pdf](http://www.troisiemerevolutionindustrielle.lu/wp-content/uploads/2016/11/TIR-CG_Luxembourg-Final-Report_Long-Version.pdf).

terms of necessity – mining as a way to keep the motor of economic growth running, to overcome resource scarcity – as well as rather vague allusions to benefits for humanity. No formulation of a mission, a vision or even a plausible narrative is offered why and how government-enabled extraction by private mining enterprises may not only avert disaster – stagnating growth, exhaustion of resources, overpopulation – but improve the lives of the inhabitants of Nauru and Luxembourg.

More generally, these case studies underline three features of the global political economy: first, international law's implication in the expansion of political economies of resource extraction; second, the perversion of redistributive intentions; and third, the crucial role of states in enabling private value extraction.<sup>104</sup> More clearly than constellations of territorial mining, the cases presented here reveal how international law is foundational in establishing the legal framework for the expansion of resource extraction. Whilst lawyers, politicians and activists often look to international law for fixes to the harmful effects of extractive industries, the cases I presented clarify how international law – by providing the jurisdictional basis for exploitation and property rights – partakes in the very structures that result in the situations of over-exploitation and unequal distribution that it is then called upon to fix.<sup>105</sup> The stories of Luxembourg and Nauru further show how the good intentions, and in particular the redistributive ambitions that motivated parts of international space law and the 1982 UNCLOS are being perverted. Where the drafters of the international deep seabed mining regime and the Outer Space Treaty aimed at the socialization of benefits from the exploitation of the common heritage and the province of mankind, the reference point of humanity time and again is being invoked to justify commercial exploitation for private gain. Appeals to benefits for humanity as such (or rather for the world's consumers) serve to detract attention from the difficult questions how costs and benefits are (and should be) distributed within and among concrete communities. States within the framework of international law become facilitators of private value extraction.<sup>106</sup> The UNCLOS and the OST accord to states primarily the role to ensure that private actors comply with their legal obligations and minimize harm resulting from extraction. Yet, as can be seen in the cases of Nauru and Luxembourg, sponsorship of mining enterprises under the UNCLOS and authorization of space activities under the OST become opportunities for states to attract mining companies to their jurisdictions. In today's governmental quest for economic growth, governments make use of such opportunities even though as sponsoring and authorizing states they incur potentially far reaching liability risks while the benefits from the commercial activities to their populations remain vague and uncertain.

The bleakness of the extraterritorial landgrab is well captured in a promotional video posted prominently on SpaceResources.lu. The opening scene zooms in on a grey suburban residence which apparently has seen better and happier days; the camera's gaze enters a girl's bedroom. Etienne Schneider – surreally speaking from an iPad lying on the girl's bed – announces 'an initiative to position Luxembourg as the European hub in the exploration and use of space resources'; the lonesome girl gazes into the stars. The video then shows us how a dynamic school teacher alerts the girl and her peers to the fascination and value of asteroids proposing that 'maybe one of these days some of you will develop the technology to extract and use these resources and this will enable us to explore other planets'. And indeed, the girl becomes a space scientist. While she is working away in the laboratory a little robot that is keeping her company prophesizes that with the help of her pioneering work 'your species will soon be able to inhabit other planets'

<sup>104</sup>On value extraction as opposed to value creation: M. Mazzucato, *The Value of Everything. Making and Taking in the Global Economy* (2018).

<sup>105</sup>Cf. S. Marks, 'Human Rights and Root Causes', (2011) 74 *The Modern Law Review* 57.

<sup>106</sup>On the crucial role of states in capitalism, see G. Arrighi, *The Long Twentieth Century. Money, Power and the Origins of our Times* (1994).

and with a sense of irony adds 'but instead of celebrating you are talking to a robot. You work too much'. The director, a young film maker, prior to making the promotional video had directed the thriller '51 Degrees North'. In this movie a saturated millennial social media star eventually finds purpose in life in documenting the Earth's destruction by asteroids.<sup>107</sup> The apocalypse pictured does not sit well with the exhilarating rides to the edge of our atmosphere promised by SpaceResources.lu. Yet, as an astute observer of Silicon Valley billionaires' preparations for the apocalypse reminds us, 'the dystopia of your darkest insomniac imaginings is almost always someone else's dream of a new utopian dawn'.<sup>108</sup>

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<sup>107</sup>[www.vimeo.com/170546202](http://www.vimeo.com/170546202).

<sup>108</sup>M. O'Connell, 'Why Silicon Valley Billionaires are Prepping for the Apocalypse in New Zealand', *The Guardian*, 15 February 2018, available at [www.theguardian.com/news/2018/feb/15/why-silicon-valley-billionaires-are-prepping-for-the-apocalypse-in-new-zealand](http://www.theguardian.com/news/2018/feb/15/why-silicon-valley-billionaires-are-prepping-for-the-apocalypse-in-new-zealand).

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