

# SPACE LAW

## In space, the other side should have the right to be heard

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### Introduction

Human settlements on Mars appear to be edging ever closer.<sup>1</sup> To get to destinations of such an order, extended periods of space travel will be required. Unlike the International Space Station, which operates in relatively close proximity to the Earth people involved in deep-space travel - or those stationed on Mars itself - will be far from their home-planet. With no immediate communication possible with Earth and a return journey being undesirable or impossible, how can questions of legal liability be resolved in a fair and practical way? Various solutions have been suggested, including that of complete immunity being granted,<sup>2</sup> through to absolute authority being vested in the commander of the mission. Whilst such solutions may appeal to a sense of convenience and tradition, it is submitted that another method of dispute resolution needs to be in place in anticipation of individual disputes that could arise – including those vis-à-vis Earth-based parties - with an inquisitorial investigatory style being adopted. Such a procedure must respect procedural fairness and situational expediency as far as possible whilst also maintaining the rule of law beyond the surly bonds of Earth. This article assesses the current legal framework and suggests improvements in respect of potential future problems.<sup>3</sup>

It has been noted that “Regulation of behaviour in a situation where a normal national, territorial law system is lacking, presents a challenge to jurists.”<sup>4</sup> That criminal and civil legal jurisdiction extends to human activity space is not, for the purpose of this article, disputed, and nor are questions of whether legal liability can arise within such an environment. Much has been written to suggest that legal jurisdiction follows astronauts and other crew members, and there are legal instruments which directly regulate life aboard spacecraft.<sup>5</sup> This article is concerned with the means by which individual disputes of a legal, quasi-legal or disciplinary nature should be resolved in deep-space travel, and the initial settlements on a foreign celestial body other than the Moon. Travelling to Mars would take a number of years and, during this time, it is probable, if not extremely likely, that some form of individual dispute will arise either between crew members or crew member(s) and those in overall charge of the mission on Earth or Earth Orbit. At the lower end of the spectrum, the dispute that arises may be a relatively minor disciplinary infraction, at the higher end, it may involve serious criminal or civil allegations.

In all cases, it may not always be appropriate for the Commander of the vessel to be charged with resolving or mediating such disputes. There are presently a number of legal models and frameworks that provide for dispute resolution in this regard but, to date, all such legal instrumentation has been crafted with operations in Earth orbit or the Moon in mind. In all such operations to date, astronauts and other personnel have been in relatively close proximity to the base of operations with a practically non-existent time delay on communications and regular staffing changes. Deep-space ventures – including missions to Mars – will not be of the same character. Whilst a serious dispute aboard the ISS could be ultimately resolved within a reasonable timeframe by NASA, ESA or other relevant investigating

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<sup>1</sup> N. Drake, *Elon Musk: A Million Humans Could Live on Mars by the 2060's* <https://www.nationalgeographic.com/science/article/elon-musk-spacex-exploring-mars-planets-space-science> (accessed 8 June, 2022).

<sup>2</sup> U.S. Congress, Office of Technology Assessment, *Space Stations and the Law: Selected Legal Issues-Background Paper*, OTA-BP-ISC-41 (Washington, DC: U.S. Government Printing Office, August 1986).

<sup>3</sup> This article was presented at the National Space Society's International Space Development Conference in Frisco, Texas on May 27th, 2023. Special thanks go to Dr Pascal Lee, Chairman of the Mars Institute and Principal Investigator at the Haughton- Mars Project at NASA Ames Research Centre.

<sup>4</sup> T.A. de Roos, *Disciplinary and Criminal Law in Space* in 'The International Space Station', 115, Brill (2006).

<sup>5</sup> H. P. Sinha, *Criminal Jurisdiction on the International Space Station* (2004) 30 J Space L 85.

authorities as in the case of Astronaut Anne McClain,<sup>6</sup> a dispute in deep space would not have this luxury owing to the ‘geographical dislocation’.

This is important for a number of reasons. First, circumstances may present themselves in respect of a dispute during which there is no possibility of a crew member availing themselves of the well-established right to be heard. Second - and relatedly- the well-established right to be heard by an unbiased decision-maker may not be possible where Command Authority is the established doctrine. A denial of procedural fairness in respect of either of these two matters could in the worst case, lead to crew disharmony which, in turn, could impact on morale and, consequently, sour relations and jeopardise mission objectives. Third, significant delays in investigation by appropriate authorities could lead to the value of evidence decreasing as the memories of witnesses wane with time. On one previous analysis, Astronauts have the legal rights to health, safety and to be compensated for damage along with the duty to submit to criminal jurisdiction, but, allegedly no right to a fair hearing<sup>7</sup>.

This article will assess the relevant applicable law and posed solutions – or, as appears to be the case, the paucity thereof – and then put forward a solution of its own. The core message is that whilst the present legal framework may work in respect of some types of dispute, there will be other occasions whereby resolution will be best conducted by means of remote procedures. Moreover, having regard to the nature of long-distance tele-communications, such procedures should be inquisitorial rather than adversarial in form. As has been stated “...that is for a great part what law is about: presenting tools of conflict resolution also when nobody can imagine that conflicts ever may arise!”<sup>8</sup>

## International space law

A number of international instruments and agreements extend to Outer Space. The UN General Assembly Resolution 1348 of 1958 on the ‘Question of the Peaceful Use of Outer space’ was the first ‘small step’ towards an international legal framework governing human activity in outer space.<sup>9</sup> Resolution 1472 - ‘International co-operation in the Peaceful uses of Outer Space’-<sup>10</sup> came in December 1959 from whence came the ‘Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space’,<sup>11</sup> and, ultimately, the 1967 Outer Space Treaty,<sup>12</sup> which stands as the most prominent legal instrument in the field to date.

This was followed by the ‘Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space’,<sup>13</sup> (known as the “Rescue Agreement) to guarantee some assistance to space-faring individuals (and their respective crafts, along with other ‘space objects’) in the event of peril. The 1972 Liability Convention’s prime focus was to ensure that “A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft in flight.”<sup>14</sup>

The 1975 Convention on Registration of Objects Launched into Outer Space<sup>15</sup> mandated the establishment of national registries for all objects launched or procured for launch by states party to the agreement and the final Treaty (so far) came in 1979 in the form of the Agreement Governing the

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<sup>6</sup> R. McKie, ‘Nasa astronaut ‘accessed ex-partners bank account from space station’ <https://www.theguardian.com/us-news/2019/aug/24/nasa-astronaut-allegedly-accessed-ex-partners-bank-account-while-living-on-iss> (accessed 8 June, 2022).

<sup>7</sup> Gabriella Catalano Sgrosso, ‘Legal Status, Rights and Obligations of the Crew in Space’ (1998) 26 J Space L 163, 182.

<sup>8</sup> N. 3 above at 116.

<sup>9</sup> UNGA Res 1348 (XIII) (13 December 1958).

<sup>10</sup> UNGA Res 1472 (XIV) (12 December 1959).

<sup>11</sup> UNGA Res 1962 (XVIII) (13 December 1963).

<sup>12</sup> Treaty on Principles Governing the Activities of States in Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (adopted 27 January 1967, entered into force 10 October 1967) 610 UNTS 205 (Outer Space Treaty).

<sup>13</sup> UNGA Res 2345 (XXII) (22 April 1968).

<sup>14</sup> Ibid article 2.

<sup>15</sup> UNGA Res 3235 (XXIX) (14 January 1975).

Activities of States on the Moon and Other Celestial Bodies.<sup>16</sup> There are also a plethora of other principles adopted by the UN General Assembly<sup>17</sup>.

Most recently, as political and commercial interest in exploration further afield has taken grip, the Artemis Accords<sup>18</sup> have joined these instruments with 20 signatories following France's recent ascension,<sup>19</sup> with others surely to follow. Other instruments specifically concerned with regulating Crew behaviour will be discussed later in this article.

## The problem

It has been noted that “wherever there is human activity, there is the potential for a crime to be committed, and space activities are no exception.”<sup>20</sup> Recently, NASA investigated allegations that Astronaut Anne McClain had accessed her ex-partner's bank account from the International Space Station in what was called the first criminal investigation in space.<sup>21</sup> Relatedly, an Earthbound test conducted by Russian authorities between 1998 and 1999, involving a replica of the Mir space station demonstrated the potential for criminal wrongdoing in such environments. A mixed-sex group of Russian and Japanese astronauts as well as a Canadian, Judith Lapierre, took part in the study to assess, among other things, adaptability to a ‘space like’ environment. It was reported that crimes occurred during this time: “Two Russian astronauts reportedly committed battery, assault and attempted murder, and one of them – the Russian commander – sexually assaulted and harassed Judith Lapierre.”<sup>22</sup>

It has also been speculated that behavioural and psychological problems leading to criminal and or civil transgressions could arise from allergic reactions arising from prolonged exposure to ‘synthetically-derived electro-magnetic energy fields.’<sup>23</sup>

The position has also been powerfully articulated as thus:

When great distances separate the spacecraft from its home port, it will not be as easy to offload the recalcitrant or disorderly crewman or specialist as it is for the aircraft to offload the offending air passenger by making an unscheduled landing. Spacecraft crews that live together over extended periods of time provide a greater potential for dissension and world disruption than do aircraft crews that have only transitory relations with their fellow crewmen on board. Just as a mariner finds limited diversion opportunities at sea to provide

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<sup>16</sup> Agreement governing the Activities of States on the Moon and Other Celestial Bodies, United Nations, <[https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg\\_no=XXIV-2&chapter=24&clang=\\_en](https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXIV-2&chapter=24&clang=_en)> (accessed 8 June, 2022).

<sup>17</sup> ‘The Principles Relevant to the Use of Nuclear Power Sources in Outer Space’, UNGA Res 47/68 (14 December 1992), ‘The Principles Relating to Remote Sensing of the Earth from Outer Space’, UNGA Res 41/65 (3 December 1986) and ‘The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting’, UNGA Res 37/92 (10 December 1982).

<sup>18</sup> The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes, <https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf> (accessed 8 June, 2022).

<sup>19</sup> Le Monde, ‘Moon Exploration: France Joins Nasa Program’ [https://www.lemonde.fr/en/international/article/2022/06/08/moon-exploration-france-joins-nasa-program\\_5986050\\_4.html](https://www.lemonde.fr/en/international/article/2022/06/08/moon-exploration-france-joins-nasa-program_5986050_4.html) (accessed 8 June, 2022).

<sup>20</sup> M. Chatzipanagiotis, ‘Criminal Issues in International Space Law’ (2016) 18 Eur JL Reform 105.

<sup>21</sup> See *supra* N. 5.

<sup>22</sup> N. 5, ‘CRIMES IN SPACE, A Legal and Criminological Approach to Criminal Acts in Outer Space’ Ann. Air & Sp. L., McGill University, Volume XXXI, 2006, 4.

<sup>23</sup> G. S. Robinson, J.J. Hughes, ‘Space Law: The Impact of Synthetic Environments, Malnutrition and Allergies On Civil and Criminal Behaviour of Astronauts’, *Jurimetrics Journal*, (1978) Vol. 19, No. 1, 59-69, 65. It was further suggested that an evaluation of such phenomenon is necessarily so that an appropriate regime of civil and criminal liability could accommodate such behavioural norms at p66 and, further, that such findings could question traditional reliance on the *M’Naughten* rules in cases of mental impairment. Discussion of this is beyond the scope of this article.

relief from the monotony of work, spacemen, without even limited opportunity for shore leave, may find time heavy on their hands.<sup>24</sup>

For the observer still unconvinced that criminal activity could arise amongst highly trained professionals, it should be much easier to envision situations arising involving negligence or other branches of the civil law. What if an astronaut negligently damages part of a spacecraft or raises a contractual dispute over matters of pay? Doctrinal matters of medical negligence could certainly be engaged should a crew member receive inadequate or otherwise faulty medical treatment from any such qualified individual.

Given the likely international nature of such a venture, the thorny question of what may happen in a complex choice of law scenarios such as the one outlined vividly by Helen Shin would be hideously complex to resolve on a long-haul flight:

An American biologist is conducting an experiment aboard an orbiting multinational space station built by the United States, Canada, Japan, and the European Space Agency. The biologist is passing through the Canadian module, where a French astrophysicist is repairing an instrument panel. The astrophysicist carelessly pushes aside a wrench, which floats away and injures the biologist. Which state's choice of law rules – and institutions – determine which state's substantive laws will apply to the issues of the astrophysicist's liability and the American's ability to recover damages?<sup>25</sup>

Matters *vis-à-vis* the crew aside, there would also be the potential for an astronaut in deep space to become the subject of a legal action on Earth. Whilst potential legal issues in respect of family matters have been the subject of academic speculation before in the context of settlements on Mars,<sup>26</sup> such matters could equally arise *en-route*. What if the Earth-based wife, husband or civil partner wishes to apply for the divorce of a crew-member during the mission, or what if a boundary dispute arises in respect of a crew-member's vacant property or, should an astronaut be renting out their home for the duration of the mission, perhaps a landlord and tenant dispute could arise? Furthermore, questions of product liability could arise regarding a range of matters, perhaps even in the case of a correctly administered course of medicine proving injurious owing to a perceived fault of a specified manufacturer. Moreover, various issues could arise in respect of a crew-member's Earth-based contractual arrangements, which would be expected to subsist throughout the duration of any given long-range mission – contracts of insurance, for instance, including home and life insurance. In respect of tort law, an action for defamation either against an astronaut or from an astronaut to a party based on Earth could arise. In all such instances, personal involvement in legal proceedings could arise.

It has been stated that “As space missions take transport spacecraft farther from Earth and require larger on board maintenance and operational crews, the precedent of maritime law will become increasingly important.”<sup>27</sup> It may well be that the common law maritime remedy of being able to sue the owner of the vessel if injury is caused through ‘unseaworthiness’ may need to be exercised.<sup>28</sup> Any such cause of action would potentially lie beyond the jurisdiction of the Commander, as would many of the other matters outlined.

Regardless of the form any dispute may take, it is clear from the above that it is likely, if not inevitable, that some form of legal dispute between either the crew themselves and the internal management

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<sup>24</sup> H. DeSaussure, ‘Astronauts and Seamen – A Legal Comparison’ (1982) 10 J Space L 165, 179.

<sup>25</sup> H. Shin, “Oh, I Have Slipped the Surly Bonds of Earth”: *Multinational Space Stations and Choice of Law*”, Helen Shin, (1990,) Vol. 78, No. 5 California Law Review, 1375, 1376.

<sup>26</sup> Ernst Fasan, ‘Human Settlements on Planets: New Stations or New Nations’ (1994) 22 J Space L 47 at 51.

<sup>27</sup> N. 24, 179.

<sup>28</sup> N. 24, 173.

structure, individual crew members or even an individual crew member and other individual(s) based on Earth. As will be discussed later, the present position vests the Commander with absolute authority. This was first put into law in the United States in 1980 arising from a NASA regulation concerning the Commander of the Space Shuttle <sup>29</sup> and presently finds itself in the United States Code of Federal Regulations:

This subpart establishes the authority of the NASA Commander of a NASA mission, excluding missions related to the ISS and activities licensed under Title 51 U.S.C. Chapter 509, to enforce order and discipline during a mission and to take whatever action in his/her judgment is reasonable and necessary for the protection, safety, and well-being of all personnel and on-board equipment, including the spacecraft and payloads. During the final launch countdown, following crew ingress, the NASA Commander has the authority to enforce order and discipline among all on-board personnel. During emergency situations prior to lift-off, the NASA Commander has the authority to take whatever action in his/her judgment is necessary for the protection or security, safety, and well-being of all personnel on board.<sup>30</sup>

In addition to the practical difficulties of such an approach as outlined, to grant the Commander a complete and unfettered discretion to make any decision in such matters would be unsatisfactory, especially where this will offend the rules of natural justice, in particular *Nemo iudex in causa sua* – that he or she should not be judge in their own cause. To have things otherwise could foster feelings of resentment amongst crew members which could, in turn, have a detrimental impact on the success of the mission.

As has already been powerfully articulated:

“Crew morale is an extremely important factor at sea and will be equally or more important in space. The need for the absolute, undivided disciplinary authority of the shipmaster, then, becomes a striking parallel to spell out in detail the full range of the disciplinary authority vested in the spacecraft commander by NASA regulation. There will have to be a statutory basis for command authority, authority which is not limited to NASA spacecraft commanders, but to all in charge of any object in space. The Tokyo Convention will have its application to spaceflight and so will the disciplinary laws and regulations pertaining to the Merchant Marine.”<sup>31</sup>

Whilst the disciplinary jurisdiction of the shipmaster certainly has its place, it does not provide adequate coverage for a range of scenarios including some of those discussed previously and some which will be outlined later in this article.

### **The right to be heard**

It has been noted that certain expressions within the space treaties, such as “in the interests of mankind”, “for the benefit of all peoples”, “envoys of mankind”, underline the universal scope of its norms.<sup>32</sup> Two most fundamental norms within the legal heritage of mankind are *audi alteram partem* and *nemo iudex in causa sua* – the right to be heard and the rule that nobody should be judge in their own cause.<sup>33</sup>

Lord Denning clarified these terms in the case of *R v Gaming Board for Great Britain ex parte Benaim*,<sup>34</sup> that:

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<sup>29</sup> N. 24,176-177.

<sup>30</sup> 14 C.F.R. § 1214.700 (1981).

<sup>31</sup> N. 24, 179.

<sup>32</sup> S. Williams, ‘*The Role of Equity in the Law of Outer Space*’ 5 Int’l Rel. (Eng.) 776 (1975).

<sup>33</sup> M. Freeman, ‘*Truth Commissions and Procedural Fairness*’, (2006), Cambridge University Press, at 119.

<sup>34</sup> [1970] 2 QB 417 at 430.

Those two rules are the essential characteristics of what is often called natural justice. They are the twin pillars supporting it. The Romans put them in the two maxims: *Nemo iudex in causa sua* and *audi alteram partem*. They have recently been put in the two words, Impartiality and Fairness. But they are separate concepts and are governed by separate considerations.

The importance of these rules has been proclaimed as biblical, Justice Fortescue once stating that: “God himself would not condemn Adam for his transgression until he had called him to know what he could say in his defence ... Such proceeding is agreeable to justice.”<sup>35</sup> The right to be heard is also referenced in ‘The Eumenides’, from 450 BCE whereby a goddess, charged with deciding guilt or innocence, stated that: ‘there are two sides to this dispute. I’ve heard only one half.’<sup>36</sup> It has even been written that such ideals regarding due process can be traced back to the Magna Carta,<sup>37</sup> in particular, Clause 39:

No freeman shall be taken and imprisoned or disseised of any tenement or of his liberties or free customs...except by the lawful judgment of his peers or by the law of the land.’ The important part is the exception, especially the words ‘by the law of the land’ (*legem terrae*).<sup>38</sup>

Such ideals were cited throughout the following centuries, with arguments advanced to the effect that the right exists independently of any statutory basis.<sup>39</sup> It was also famously stated in *Bagg’s case*<sup>40</sup> that: “The other side ought not to be deprived of the opportunity of confronting the witnesses, and examining them publicly, which has always been found the most effectual method for discovering the truth.”<sup>41</sup>

These rights are recognized in a variety of international statutes including Article 10 of The Universal Declaration of Human Rights:<sup>42</sup>

Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal, in the determination of his rights and obligations and of any criminal charge against him.

And Article 6(1) of the European Convention on Human Rights:<sup>43</sup>

...in the determination of his civil rights and obligations of any criminal charge against him, everyone is entitled to a fair and public hearing within a reasonable time by an independent and impartial tribunal established by law.

Furthermore, the African Charter on Human and People’s Rights<sup>44</sup> states that “every individual shall have the right to have his cause heard”. Other instruments where such matters can be found are the International Covenant on Civil and Political Rights<sup>45</sup> and the Convention on the Rights of the Child.<sup>46</sup> The international context aside, procedural fairness has been found to be endemic across a range of the world’s domestic legal systems.<sup>47</sup>

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<sup>35</sup> *The King v Chancellor of Cambridge* (1723) 1 Str 557, 2 Ld Raym 1334, 8 Mod 148, 164.

<sup>36</sup> The Chinese Journal of Comparative Law/2015 – Volume 3/Issue 1, 1 March/Articles ‘Western Culture and the Open Fair Hearing Concept in the Common Law: How Safe Is Natural Justice in Twenty-First Century Britain and Australia?’

<sup>37</sup> D. Galligan, ‘Due Process and Fair Procedures: A Study of Administrative Procedures’ 1997 OUP.

<sup>38</sup> N. 24, 171.

<sup>39</sup> N. 36, 31.

<sup>40</sup> KBD 1572.

<sup>41</sup> *Ibid*.

<sup>42</sup> The Universal Declaration of Human Rights, The United Nations, <https://www.un.org/sites/un2.un.org/files/udhr.pdf> (accessed 8 June, 2022).

<sup>43</sup> The European Convention on Human Rights 1953, The Council of Europe, [https://www.echr.coe.int/documents/convention\\_eng.pdf](https://www.echr.coe.int/documents/convention_eng.pdf) (accessed 8 June, 2022).

<sup>44</sup> The African Charter on Human and Peoples Rights, Article 7(1) [https://au.int/sites/default/files/treaties/36390-treaty-0011\\_0-african\\_charter\\_on\\_human\\_and\\_peoples\\_rights\\_e.pdf](https://au.int/sites/default/files/treaties/36390-treaty-0011_0-african_charter_on_human_and_peoples_rights_e.pdf) (accessed 8 June, 2022).

<sup>45</sup> N32 above at 94.

<sup>46</sup> *Ibid* at 94.

<sup>47</sup> *Ibid* at 118.

As has been noted, “Law must precede man into space.”<sup>48</sup> So must these most fundamental of considerations also precede man into *deep* space, for moral, ethical and practical reasons? Regarding a failure to follow procedural fairness, in the case of *John v Rees*,<sup>49</sup> Megarry LJ stated that:

...Nor are those with any knowledge of human nature who pause to think for a moment likely to underestimate the feelings of resentment of those who find that a decision against them has been made without their being afforded any opportunity to influence the course of events

Further, Gonzalez has written that:

Procedural fairness has long been recognized as a key determinant of people’s thoughts, feelings, and behaviours. In social spheres as diverse as the family, the work organization, and the legal arena, people react to how fairly they are treated.<sup>50</sup>

Feelings of resentment or unfairness on a mission of long duration far from the Earth would not be ideal, adding to the already stressful mission parameters and possibly heightening any real sense of alienation.

### **Existing legal frameworks pertaining to astronauts and other personnel**

Regarding astronauts in particular, it has been noted that legal responsibility for astronauts squarely belongs with their state of origin:

The general principle governing jurisdiction, including criminal jurisdiction, in outer space provides that the State of registry exercises jurisdiction over the space objects recorded in its national space registry and the persons on board these objects, regardless of their nationality.<sup>51</sup>

And, further that:

The Outer Space Treaty establishes that “a State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.”<sup>52</sup>

So far there have been no explicit legal rules promulgated on individual legal responsibilities or specific procedures for recourse for astronauts, save the MCOP Code of Conduct for the Crew of the International Space Station, which also has its own disciplinary procedure.<sup>53</sup>

According to part B of Title 14 of the United States Code of Federal Regulations on the ISS Code of Conduct,<sup>54</sup> the Code of Conduct was designed to:

*Inter alia*, establish a clear chain of command on-orbit; clear relationship between ground and on-orbit management; and management hierarchy; set forth standards for work and activities in space, and, as appropriate, on the ground; establish responsibilities with respect to elements and equipment; set forth disciplinary regulations; establish physical and

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<sup>48</sup> A.G. Haley, ‘*Space Age Presents Immediate Legal Problems*’, 1 PROC. COLLOQ. L. OUTER SPACE 5 (Andrew G. Haley & Welf Heinrich eds., Wein, Springer, Verlag 1959).

<sup>49</sup> [1970] Ch 345, at 402.

<sup>50</sup> C.M. Gonzalez, T.R. Tyler, ‘*Why Do People Care about Procedural Fairness? The Importance of Membership Monitoring*’ New York University, USA, (2006), 91.

<sup>51</sup> N. 22, 6.

<sup>52</sup> Ibid.

<sup>53</sup> 14 CFR§ 1214.403 IV, ‘Disciplinary Regulations’ See further A. Farand, *The Code of Conduct for International Space Station Crews*, European Space Agency, Bulletin 105, February 2001, online <[https://www.esa.int/esapub/bulletin/bullet105/bul105\\_6.pdf](https://www.esa.int/esapub/bulletin/bullet105/bul105_6.pdf)> (accessed 8 June, 2022).

<sup>54</sup> Ibid.

information security guidelines; and provide the Space Station Commander appropriate authority and responsibility, on behalf of all the partners, to enforce safety procedures and physical and information security procedures and crew rescue procedures for the Space Station.

There are also rules governing the conduct of both crew and tourists to the international space station.<sup>55</sup> In the immediate term, the Crew Code of Conduct gives some idea of how this may be handled – the ISS Commander is presently vested with a great deal of authority. In addition to being responsible for the outcome of the mission and for the protection of the ISS in general, the Commander also has responsibility for maintaining order and enforcing procedures<sup>56</sup> As the US Code of Federal Regulations states: “during all phases of on-orbit activity, the ISS Commander, consistent with the authority of the Flight Director, shall have the authority to use any reasonable and necessary means to fulfil his or her responsibilities,”<sup>57</sup> As de Roos states, “it has to be assumed, although it is not formulated in the Code, that the commander has the authority to use force or restraint as long as it is proportionate (reasonable and necessary) and justified by the need to ensure the immediate safety of the crew members and the ISS itself.”<sup>58</sup>

Command Authority has also been identified by Chatzipanagiotis as being a central pillar of governance on such endeavours,<sup>59</sup> as noted, regarding missions to the ISS. He further points out that this approach is mirrored by the Russian authorities in this area under Article 203(3) of the Russian Law on Space Activity.<sup>60</sup> The ultimate power of a ‘commander’ is nothing new. Chapter 3 of the 1963 Tokyo Convention on Offences and Certain Other Acts Committed on Board Aircraft, ratified by 186 states, confers broad ranging powers upon the Aircraft Commander. Article 6 (1) provides that:

The aircraft commander may, when he has reasonable grounds to believe that a person has committed, or is about to commit, on board the aircraft, an offence or act contemplated in Article 1, paragraph 1, impose upon such person reasonable measures including restraint which are necessary: (a) to protect the safety of the aircraft, or of persons or property therein; or (b) to maintain good order and discipline on board; or (c) to enable him to deliver such person to competent authorities or to disembark him in accordance with the provisions of this Chapter.

The next in the chain of command is the Flight Director - to whom the Commander is accountable,<sup>61</sup> and the Multilateral Crew Operations Panel is responsible for determining the order of succession. Although the rules as published are ultimately silent on the matter, it is to be assumed that any dispute involving the Commander directly would be addressed via the chain of command. For the sake of clarity this should be highlighted in respect of future deep-space ventures.

Such rules pertaining to the Commanders authority are nothing new in law. In the old era of sea-faring it was a well-established rule in the common law of England and Wales that the Captain of a ship had the right to discipline the crew and subject them to punishments.<sup>62</sup> This parallel has been noted elsewhere in the literature, most prominently by De Saussure:

In many respects, the astronauts of today are the modern equivalent of the ancient mariners. Like the mariners of old, they live in a cooped-up environment for significant periods of time, isolated from land-based communities, totally dependent upon the cooperation and

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<sup>55</sup> N.3, 117.

<sup>56</sup> N. 3 above, 119.

<sup>57</sup> N, 52 above.

<sup>58</sup> Ibid.

<sup>59</sup> N. 20, 105- 108.

<sup>60</sup> N, 20, 110.

<sup>61</sup> N. 20, 110.

<sup>62</sup> See, for example, *Lamb v Burnett* (1831) 148 ER.



assistance of fellow crewmen, and constantly under the shadow of tragedy from an essentially hostile environment.<sup>63</sup>

As satisfying an analogy as this one is, it does not completely fit the template of the modern day astronaut. With no radio communications or satellites to assist them, ancient mariners would have been well and truly cut off from the world for days, if not months at a time. Save for missions well beyond Mars, this is not likely to be the case for any space sojourn within the next 50 or so years as astronauts and crew members will surely be in remote contact with Earth for the duration of the voyage.

The disciplinary policy for the ISS attached to the Crew Code of Conduct contains three possible sanctions – Verbal Warning, Written Reprimand, and Removal from the Crew.<sup>64</sup> Both da Roos and Farand think that financial penalties should be added to this list.<sup>65</sup> The logic behind adding financial penalties to any regime of punishment seems to make sense, particularly as the option of depriving a Mars-bound astronaut or crew member of their liberty would be highly impractical. However, the greater the potential punishment, the more important becomes the requirement for independent appeals and the procedural mechanisms to facilitate them.

It is also worth noting that, in addition to such immediate responses to issues of misconduct, there is a significant deterrent in place by virtue of the nature of such missions by professional Astronauts. It has been strongly argued that:

Crewmembers and visitors on the International Space Station, as well as in any other space vehicle or platform in outer space, are continually monitored. Their actions are followed by NASA's headquarters in Houston, Texas. Non-American crewmembers are also continuously monitored by their own agencies. Astronauts' actions are covered by network and cable television and NASA TV provides live ISS mission coverage on a daily basis. So, the deterrent effect of all these actions is very high. In fact, it is higher than any criminal justice deterrent measure that has been implemented on Earth. Incarceration, which is one of the extreme measures of deterrence, does not generally imply a permanent monitoring of the inmates' actions. Other deterrence devices, such as the controversial closed circuit television cameras installed in public places only provide a limited control of the persons' actions, i.e., cameras are usually located only in strategic places and they do not generally monitor the totality of the space and all persons that enter this space on a permanent and continuing basis. Thus, at this time, deterrence in outer space is high and essentially permanent.<sup>66</sup>

Whilst this may be true for some types of conduct, it does not (as mentioned previously) cover civil disputes brought against crew members from Earth-based litigants and, as will be explored further, this type of monitoring will be subject to a lengthy delay as a spacecraft travels further away from Earth, so the 'deterrent' effect could lose some of its potency although the author is unaware of any psychological studies that may address this possibility. Furthermore, the presence of deterrent measures does not, in and of itself, lead to a complete absence of criminal activity as can be deduced from simple observances made on Earth.

### **The gulf between existing legal frameworks and the practical problems**

The present law appears to confer ultimate authority on the Commander in respect of every aspect of the mission and, indeed, every area of the law associated with the mission. In respect of how the law presently stands, The Commander, therefore, can rightly be regarded as being judge, jury and executioner – in some cases in their own cause. It is accepted that this position is entirely appropriate as regards the day-to-day mission parameters and to ensure operational efficiency, but on a long-duration flight to Mars or any other comparable destination, this may not be appropriate for each and

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<sup>63</sup> N. 2, 165.

<sup>64</sup> N.3 above, 120.

<sup>65</sup> N. 3 above, 120.

<sup>66</sup> N. 3 above, 11.

every potential circumstance. Chiefly there are two broad objections to the present regime subsisting in such circumstances.

First, it is not appropriate where a dispute involves the Commander or they are a party to a dispute. As well-qualified, highly-decorated, highly-trained and professional the Commander may be, to assume that they are beyond reproach and incapable of negligence or criminal or other nefarious activity, no matter how trivial, is, quite simply, a fantastical assertion. More so when one considers that, regardless of how extensively the effects of long-term space travel have been researched in Earth-based environments and settings or even aboard the International Space Station, there is no way of knowing how such an experience may impact an individual, particularly not during the first mission of its kind. As has been stated, the rules of natural justice are very clear in this respect, that one should not be judge in their own cause.

Second, legal disputes involving individual crew members could arise independently of the Commander. Examples are, as previously discussed, Earth-based disputes that may arise in the absence of the crew member. These could take the form of family matters – divorce or routine matters such as inheritance – to a range of other civil matters, as outlined previously. They could also potentially extend to matters of criminal investigation involving one of the crew. In all of these matters, the vesting of absolute authority in the Commander does not make any operational sense and, indeed, the Commander would surely be acting *ultra vires* in such matters.

We have had orbital space operations for over 50 years and, so far at least, the present legal regime appears to have worked effectively. So why is this a particular problem with long-distance space missions? The answer is that, whilst the substantive issues and potential problems remain largely the same, procedurally, careful thought is needed regarding the fair and just way of resolving such disputes. Taking an Earth-bound dispute involving an astronaut or other member of a space crew, for example. Due to the proximity of the Earth to the International Space Station, video and/or radio communications can, for all intents and purposes, be instantaneous. Owing to the laws of physics, the further away from Earth a space craft travels, the longer it will take for radio communications to reach parties on board and, in turn, those on Earth. From the orbit of Mars itself, it can take between 12 and 22.5 minutes for light- and hence radio waves – to reach Earth.<sup>67</sup> In respect of direct questioning from Earth-based authorities this may prove problematic as will be discussed later.

## The solution

In the course of deep space travel, individual legal problems may and probably will arise. The Commander will not always be the best person to deal with such problems, particularly if they involve legal disputes with Earth-bound individuals or entities. Such matters will well and truly be beyond the jurisdictional authority of the Commander. Moreover, if the Commander himself is so embroiled in such a dispute, the picture becomes more acute. To cater for such instances, legal apparatus must be created in order to facilitate the resolution of disputes via Earth-based authorities with judicial staff in the appropriate jurisdictions. It is with respect to these jurisdictions that attention should be given to the precise means by which any such disputes arising should be dealt with.

Broadly speaking there can be said to be two forms of legal trial procedure – adversarial and inquisitorial. Adversarial procedures tend to arise in Common Law Jurisdictions such as the United Kingdom, the United States of America, Canada, Australia and New Zealand. This mode of procedure requires that the parties lead the proceedings as opposed to the judge.<sup>68</sup> A particular cornerstone of adversarial proceedings is cross-examination, whereby evidence is sought from witnesses via a series of leading questions with little intervention from the judge. It has been stated that “cross-examination is the greatest legal engine ever invented for the discovery of truth”,<sup>69</sup> and, therefore, it can be assumed

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<sup>67</sup> N. Tilman, D. Dobrijevic, ‘How long does it take to get to Mars?’ <https://www.space.com/24701-how-long-does-it-take-to-get-to-mars.html> (accessed 8 June 2022).

<sup>68</sup> H. Patrick Glenn, ‘Legal Traditions of the World’, 2<sup>nd</sup> edition, Oxford 2004, 228.

<sup>69</sup> *John H. Wigmore, Lilly v. Virginia*, 527 U.S. 116 (1999).

that there may be a need for some form of cross-examination in determining the truth of a matter involving an astronaut or crew member. Should a crew member or the Commander find themselves party to ground-based proceedings requiring cross-examination, the trial process itself will be fatally undermined owing to the time-delay factor previously outlined. As Lord Denning stated in a case involving an appeal against the actions of a judge, whereby the judge was accused of having asked the witness too many questions:

The very gist of cross-examination lies in the unbroken sequence of question and answer...excessive judicial interruption inevitably weakens the effectiveness of cross-examination in relation to both the aspects which we have mentioned, for at one and the same time it gives a witness valuable time for thought before answering a difficult question.<sup>70</sup>

Light, and hence a question from a lawyer or other judicial actor carried by radio waves, can take up to 22.5 minutes to get to Mars from Earth. Any such answer to the question would take the same amount of time to get to Earth. Any subsequent question would take the same amount of time again. Those under cross-examination from a representative based on Earth would have ample time- up to 45 minutes on the above estimation – to ponder upon, and anticipate the nature of the subsequent question. This undermines what Lord Denning heralded as ‘the very gist’ of cross-examination and could lead to decisions based on such evidence being overturned as was evident from the case of *Jones v National Coal Board*,<sup>71</sup> where excessive judicial interference rendered the trial unsafe for similar reasons.

Prior to departure on a long-range mission, therefore, the most sensible arrangements would be for an inquisitorial style of investigation to be adopted and agreed between all the states party to the mission and relevant space authority – most likely NASA – regarding situations whereby the Commander would not be the most suitable individual to make a decision, and a similar arrangement to be made vis-à-vis astronauts and other personnel and their state of origin regarding disputes arising on Earth. Witness depositions should be given in writing as opposed to verbal answers given to questions via radio and any questions regarding the depositions should be returned with a strict time-frame as regards the forthcoming answers. It would be wise for a system of case management to be devised which specifies the processes required and associated timeframes in a similar way to the Civil Procedure Rules 1997.<sup>72</sup> Part 7 on starting a claim and Part 9 on response both set out key timeframes.

As has been mentioned elsewhere in this article, there are some analogies to be drawn between seafaring and star voyaging. Before any deep-space venture involving human beings is launched it may be wise to establish procedures for individual dispute mechanism. This could be outlined above by Treaty in a similar way to which the UN Convention on the Law of the Sea provides for dispute mechanisms under Article 287,<sup>73</sup> so that a uniform approach is adopted. At the very least, the states of origin for all of the Astronauts and personnel ultimately involved in deep-space missions should be notified of these potential problems so that their respective legislators can arrange for effective procedures to be brought into law on a local basis to avoid potential problems.

### **Alternative propositions**

Given the problems outlined, if any particular jurisdiction is adamant that deep-space faring personnel should be subjected to cross-examination, one alternative solution could be to simply grant an automatic stay of proceedings until the personnel involved return to Earth and, ultimately, to their jurisdictions of origin. Some national legislation already allows for flexibility in certain instances. In the United Kingdom, the Limitation Act 1980 provides for an extension of the limitation period for which to bring

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<sup>70</sup> *Jones v National Coal Board* [1957] 2 Q.B. 55 at p65.

<sup>71</sup> *Ibid.*

<sup>72</sup> As laid down under the Civil Procedure Act 1997 c. 12. <https://www.justice.gov.uk/courts/procedure-rules/civil/rules> (accessed 8 June, 2022).

<sup>73</sup> The United Nations Convention on the Law of the Sea [https://www.un.org/Depts/los/convention\\_agreements/texts/unclos/unclos\\_e.pdf](https://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf) (accessed 8 June, 2022).

claims for personal injuries in particular circumstances. Therefore, there is no reason why existing legislation could not allow for a range of domestic proceedings to be delayed pending return to Earth.

There are, however, two major problems with such an approach. First, as any trial lawyer knows, delays to any kind of legal proceedings inevitably leads to a degradation in the quality of any oral evidence as memories of certain events fade over time. In respect of a journey to Mars, a stay thereon and a journey back, such a delay in this case could mean a matter of years. Secondly, it does not seem wise to keep personnel in a state of suspense over such matters when they are already performing unprecedented, demanding and often dangerous tasks in what should be regarded as a high-pressure and high-stress environment. The stress could foreseeably affect the state of mind and concentration of any given crew member and, therefore, for a variety of reasons, jeopardise mission safety.

A parallel could be drawn at this stage with armed forces personnel facing legal disputes unrelated to their service in their home jurisdictions whilst serving overseas in the most trying conditions. In that case, they would at least have the luxury of periodic leave and it would be much more practical for Commanding Officers to authorise specific leave in respect of any hearings which may arise. This would not be practical on Mars or even *en-route* to or from.

## Conclusions

Deep space travel by human beings at some stage is inevitable. Should the forthcoming Artemis missions to the Moon prove to be successful, this time may come sooner than we realise. Such missions will involve long and stressful periods of travel in environments more isolated and dislocated from planet earth than ever previously experienced by human beings. The potential for legal disputes to arise amongst any given group of individuals is ever-present, and such will be the case for those bound for Mars. As has been evidenced, regardless of the levels of professionalism of those chosen few, legal problems can still arise, be they between individual crew members or between crew members and parties based on earth. Moreover, absent the ‘continuous monitoring’ faculty discussed by de Roos,<sup>74</sup> there is arguably less deterrence in such scenarios, and, resultantly perhaps, more potential for misconduct should surveillance actually have such an important effect on crew behaviour.

The present legal framework - essentially that the Commander is vested with near absolute authority - may be sufficient for contemporary orbital operations where recourse to mission control is a more realistic option. However, as has been discussed, this is not fit for purpose when considering more complex individual legal problems which may arise during deep-space travel. Firstly, as has been outlined, to vest the Commander with absolute authority in these circumstances risks offending the *nemo iudex in causa sua* limb of natural justice – that one should not be judge in one’s own cause – should a dispute arise involving the Commander themselves. Second, vesting ultimate authority in the Commander could impact the other limb of natural justice, *audi alteram partem*, as there is the very real potential for legal problems to arise that would be beyond the levels of competence or knowledge of the Commander as previously detailed. This would be most acutely felt in cases involving disputes between crew members and parties based on earth which, unless - as would be a most unlikely instance - the Commander happens to be a qualified lawyer or judge in the precise legal field the dispute arises within, the individual crew member would certainly not have their case heard, at least not competently or effectively. Third, a crew member may wish to appeal a disciplinary decision made by the Commander or, indeed, the fairness of the process the Commander followed in reaching such a decision. In this case, an appeals process must be established and enshrined in law.

Such rules of natural justice and procedural fairness are part of the fabric of humankind’s common legal heritage and the first envoys of humankind to journey into what can truly be described as ‘deep space’ should take them forward in much the same way that Buzz Aldrin carried a copy of the 1967 Outer

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<sup>74</sup> N.3 above at 11

Space Treaty to the surface of the Moon in 1969.<sup>75</sup> Sentimentality aside, the very real human consequences of a failure to allow a right to be heard could severely undermine morale in such circumstances. Revisiting the words of Megarry LJ in the case of *John v Rees*:<sup>76</sup>

...Nor are those with any knowledge of human nature who pause to think for a moment likely to underestimate the feelings of resentment of those who find that a decision against them has been made without their being afforded any opportunity to influence the course of events.

Not only is a failure to follow rules of natural justice or procedural fairness likely to constitute a moral wrong, there is also the very real possibility of undermining crew performance as a result of a hit to morale should a crew member(s) feel aggrieved by any such failure as was within the contemplation of Megarry LJ. Such an undermining of performance could, in such pressurised conditions, prove dangerous and potentially terminal.

For these reasons, ahead of humankind's initial journeys into deep space, it is incumbent upon the contracting authorities to discuss and implement a robust mechanism for individual dispute resolution which, owing to the law of physics, must also take account of the time delay associated with long range space travel. Such dispute mechanisms must contemplate, as a minimum, situations where the Commander may be a party to a dispute, situations where a Crew member may wish to raise an appeal against a disciplinary decision of the Commander and situations where any Crew member may be involved in a dispute with a party based on planet earth.

The common denominator in these three scenarios is that an effective procedure for communicating with ground-based authorities and parties to a legal dispute must be established which respects the integrity of the legal process, particularly as regards the third scenario. In all cases, the contracting authorities must take into consideration the fact that, whilst it may well have been heralded as "...the greatest legal engine ever invented for the discovery of truth,"<sup>77</sup> cross-examination will lose much of its effectiveness with substantial time delay owing mainly to the fact that those subject to it will have much more time to contemplate the likely course of questioning and may be able to anticipate what will be asked next.

Ultimately, the state of origin of each astronaut may wish to determine their own procedural rules as regards dispute resolution when it comes to a dispute between a Crew member and a party based on earth. However, owing to complex choice of legal questions it may well be that the state of origin is not necessarily the best jurisdiction to hear the dispute. What if the Japanese husband of a German crew member wishes to obtain a divorce in the United States where both parties were married and presently 'reside'? Or if the same German crew member is sued by a Belgian party in the English Courts in a commercial dispute as a result of a clause in their contract? A choice of law hearing may well determine that Germany would not be the best jurisdiction to hear such a dispute, thus rendering any German procedural rules academic.

It is submitted that the optimum solution would be for all contracting parties to establish a multilateral framework for individual dispute resolution which would have the effect of binding all potential earth-bound parties. This could be done via a treaty or via a protocol to be adopted at the United Nations ahead of any such deep space journeys, whereby all states agree to follow the framework in the event of such a dispute arising.

Due to the fact that cross-examination has the potential to be significantly undermined by time delay, the multilateral framework should prescribe that dispute resolution involving earth-based authorities

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<sup>75</sup> Sothebys, *FLOWN to the Moon on Apollo 11 — Buzz Aldrin's United Nations "Outer Space Treaty*  
"<https://www.sothebys.com/en/buy/auction/2022/buzz-aldin-american-icon/flow-n-to-the-moon-on-apollo-11-buzz-ald-rins-flown> (accessed 15 August 2022)

<sup>76</sup> [1970] Ch 345, at 402.

<sup>77</sup> *John H. Wigmore, Lilly v. Virginia*, 527 U.S. 116 (1999).

and crew-members should be carried out via written deposition as previously proposed, with written questions and answers being tendered, in place of in-person questioning if done by way of cross-examination. As mentioned, the English Civil Procedure Rules could be influential in the development of such a protocol as regards time-limits for responses and other related matters. It is further submitted that such a system should also be implemented as regards appeals against disciplinary decisions and for disputes to which the Commander themselves are a party.

Implicit in the above is the fact that such measures would also apply to permanent or, as would be more likely in the first instance, semi-permanent settlements on Mars and not just the intervening period of time spent travelling there. Thinking even further into the future, it is perhaps inevitable that a system of 'private interplanetary law' will have to be devised in respect of relations between earth-based entities and those on Mars. Moreover, the peculiarities of space and time will no doubt have consequence as regards the precise timing of certain events. This could cause some not-insignificant problems in contractual matters. For example, when did the acceptance of a contract between a crew member and an earth based entity occur? At the moment the contracted crew member spoke the words into the microphone/sent the communication by other means or when the words themselves arrived on earth in whatever format 15 minutes later? The English authority of *Brinkibon Ltd v Stahag Stahl und Stahlwarenhandels-gesellschaft mbH*,<sup>78</sup> would hold that formation of a contract will generally occur where acceptance is received. So what about the state of contractual limbo that exists for the 15 minutes in these such cases? Could the postal rule in *Adams v Lindsell*<sup>79</sup> end up making some sort of 'intergalactic revival' in such circumstances? Contracts where time is stipulated to be 'of the essence'<sup>80</sup> will surely have to be considered in a new light or be drafted in such a way as to factor in respect for the time factor issue. Expressions such as 'a response must be received by 1200 Earth Time' may become commonplace in certain future agreements with space farers. Moreover, how, in theory, will rules evolve in respect of an offer in contract law being revoked through lapse of time? Take, for example, the purchasing of shares or stocks- 22.5 minutes can be a long time in such environments and the authority of *Ramsgate Victoria Hotel v Montefiore*<sup>81</sup> would say that revocation of an offer through lapse of time can arise dependant on the subject matter. Would an offer to buy 100 shares at \$20 per share be valid if, five minutes later, the same share value had risen to \$500 per share? What would be the implications of time delay in such transactions? Could the offer be said to be validly revoked through lapse of time in such circumstances? As things stand, revocation is only generally valid upon receipt by the would-be offeree but it be fair for such rules to operate in this fashion with the involved time delay? Perhaps it will be inevitable that business dealings of such a nature will only be conducted by earth-based representatives through devices such as power of attorney or a brokerage. At the very least, any transactions of such a nature involving a volatile subject matter between earth based-entities and crew members in situations involving time delay will probably have to carry a caveat acknowledging that all such transactions are subject to the implications of general relativity.

Returning to the immediate problem of legal procedure in a deep space setting, the alternative prospect - rather than penning any such regulatory framework - may be to set the course and blindly hope that the good sense of the Commander and the ancient provisions of maritime law are to keep the operation afloat. Given the overall importance of such a mission to the future of humanity and the range of problems which could arise – both legal and, more crucially perhaps, operational, contingent procedural rules must be drafted, agreed, and put in place before humankind sets sail for deep space. Perhaps just as seriously, if humanity wishes to make another giant leap, it is equally important that the next crucial small step gets off on the right foot.

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<sup>78</sup> [1983] 2 AC 34

<sup>79</sup> (1818) 1 B & Ald 681

<sup>80</sup> See *Union Eagle Ltd v Golden Achievement Ltd* [1997] UKPC 5

<sup>81</sup> (1866) LR 1 Ex 109