

Working in Space: The Final Frontier of Remote Work

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Due to the COVID-19 pandemic, virtual workplaces have become much more common. But while advancements in technology have made remote work more accessible for many employees, jurisdictional confusion and varying state-specific employment regulations have made it extremely difficult for employers to switch from traditional in-person office settings to work-from-anywhere workplaces. In addition, taxation and mandatory workers' compensation insurance requirements mean that employers often need to be registered to do business in any state they have employees in, making a truly remote workforce somewhat of a misnomer. However, as difficult as it might be for terrestrial employers to navigate our patchwork of employment laws, space employers face significantly more hurdles. From increased jurisdictional uncertainty, to the astronomical expenses involved in keeping humans alive in space, to the simple fact that many of the employment relationship norms that endure on Earth simply do not and cannot exist in space. This Article will explore the complex issues faced by employers struggling to create a remote workforce in the United States and then look toward the legal and human capital issues that are arising for private employers involved in the final frontier of remote work, those with employees working in space.

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I. INTRODUCTION

The COVID-19 pandemic forced many employers to reconsider remote working options for their employees who, due to health and safety concerns as well as various state-issued lockdown orders, had to switch from working in-person in a traditional office setting to working from home. In addition, many startups and tech-focused companies have realized the great cost savings that businesses can achieve without formal brick and mortar headquarters and how much easier it can be to attract talent when an employer is not limited to hiring within a specific geographic location. However, this increase in remote work can create numerous compliance and legal worries for employers.

And space is the ultimate remote workplace, given that a space employee may be working hundreds or even millions of miles from Earth itself. This means that space employers share many of the same legal uncertainties that are faced by their virtual terrestrial counterparts, but they also “enjoy” a large number of additional space-specific human capital complications. In large part, this is because of the drastic change in the employment relationship that occurs in the space environment, where an employer literally becomes responsible for keeping their employees alive. Indeed, for space exploration to be truly sustainable, there will have to be equitable employment practices in place because we cannot expand out into the cosmos in any scalable, permanent, or supportable manner if humans are unwilling to live and work in space due to intolerable labor conditions.

II. THE PROBLEMS PLAGUING TERRESTRIAL EMPLOYERS THAT HAVE REMOTE EMPLOYEES CAN FEEL AS EXPANSIVE AS THE MILKY WAY

A. JURISDICTIONAL CONFUSION AND DIVERGENT STATE-SPECIFIC EMPLOYMENT REGULATIONS CAN CAUSE MANY EMPLOYERS TO SHY AWAY FROM HAVING A TRULY REMOTE WORKFORCE

Although there can be many benefits to having remote employees (such as having access to a broader and potentially more diverse and experienced talent base unlimited by geography, being able to significantly reduce overhead costs by no longer renting expensive office spaces, or increasing employee satisfaction by eliminating commute times and allowing for more asynchronous work), our employment law system in the United States is one that is based largely on a patchwork of state and local laws and regulations. While federal rules and regulations often set guidelines for numerous labor issues, such as setting a minimum wage and prohibiting discriminatory employer behavior, states and local governments can create rules that are more protective than these federal minimums.¹ This makes it harder for an employer to be in compliance with the laws that may apply to employees who live and work in states that the employer is not located in, and which the employer may not be familiar with or even aware of.

Typically, one determines the jurisdiction that applies to an employment relationship based on the citizenship of both the employer and the employee and on where the work will be performed. In a traditional work scenario, where an employee works in-person at an employer's facility, this should be one jurisdiction for both parties, and it usually means that the work being performed is also being performed, for the most part, within that same jurisdiction. However, with remote work, often the jurisdiction within which the employer resides (a.k.a. the state or states in which they have offices and corporate presences) is not the same as where the employee resides and performs work for the employer. Such an employee is what

1. See Wage & Hour Div., *Minimum Wage*, U.S. DEP'T OF LAB., <https://www.dol.gov/agencies/whd/minimum-wage> [<https://perma.cc/VVD8-2T7X>]; Drew DeSilver, *When it Comes to Raising the Minimum Wage, Most of the Action is in Cities and States, Not Congress*, PEW RSCH. CTR. (Mar. 12, 2021), <https://www.pewresearch.org/fact-tank/2021/03/12/when-it-comes-to-raising-the-minimum-wage-most-of-the-action-is-in-cities-and-states-not-congress/> [<https://perma.cc/RFH7-TQGU>]; and compare 42 U.S.C. § 2000e(b) (defining employer as anyone who regularly employs fifteen or more persons and including them within federal anti-discrimination laws pursuant to 42 U.S.C. § 2000e-2(a) with CAL. GOV'T CODE § 12926(d) (defining employer as anyone who regularly employs five or more persons and extending anti-discrimination laws to such California employers pursuant to CAL. GOV'T CODE § 12940).

we, prior to the rise of a virtual work environment, would have described as an “out-of-state” employee.

And wage and hour and other labor laws vary drastically from state to state, or jurisdiction to jurisdiction, within the United States. For example, an employee working in-state for an Alabama employer will be governed by entirely different rules than an employee working out-of-state in California for that same Alabama employer, even though the two employees might be doing the exact same work. This is because, for example, Alabama relies almost entirely on federal civil rights protections, as it does not have its own anti-discrimination statutes or laws,² whereas California has more stringent protections than the federal minimum civil rights guidelines.³ Likewise, Alabama does not have any state minimum wage law, so it applies the default federal minimum wage of \$7.25 per hour, and, in contrast, California currently has a state minimum wage of at least \$14.00 per hour.⁴ Not only can this get confusing for an employer who will have to abide by two different sets of laws and regulations for two otherwise identical employees, but given the more protective laws for employees in California and the higher mandated minimum wages, the Alabama employer would likely want the out-of-state employee to be covered by Alabama law.

Thus, some employers will attempt to use employment agreements with choice of law provisions to contract that even if the work is being performed out-of-state and the employee resides out-of-state, they will be deemed to be working in the employer’s state and bound by the labor laws of that jurisdiction. But such an agreement might not be enforceable. A good example of such a scenario occurred in *Oxford Global Resources, LLC v. Hernandez*, where a Massachusetts based company entered into an employment agreement with an employee who was located in and worked exclusively in California.⁵ The company then sued the employee for allegedly violating various provisions of the employment agreement after the employment relationship had been terminated and he went to work for a competitor in California.⁶ Although the employment agreement was conditioned upon the application of Massachusetts law to the employment relationship (including non-compete and non-solicitation provisions that were

2. Lisa Nagele-Piazza, *Not All State Employment Discrimination Laws Are Created Equal*, SHRM (Sept. 15, 2017), <https://www.shrm.org/resourcesandtools/legal-and-compliance/state-and-local-updates/pages/state-employment-discrimination-laws.aspx> [<https://perma.cc/L4N8-G6J8>].

3. CAL. GOV’T CODE § 12926(d) (defining employer as anyone who regularly employs five or more persons and extending anti-discrimination laws to such California employers pursuant to CAL. GOV’T CODE § 12940).

4. See Wage & Hour Div., *State Minimum Wage Laws*, U.S. DEP’T OF LAB., <https://www.dol.gov/agencies/whd/minimum-wage/state> [<https://perma.cc/H44N-GY3L>].

5. See *Oxford Glob. Res., LLC v. Hernandez*, 106 N.E.3d 556, 560 (Mass. 2018).

6. *Id.*

recognized under Massachusetts law but not under Californian law), the Supreme Judicial Court of Massachusetts, Suffolk, held that the choice of law provisions in the agreement, and the application of Massachusetts employment laws, were not enforceable as they “would violate the fundamental policy of California favoring open competition and employee mobility.”⁷

The outcome reached in *Oxford Global Resources* was because, as with any conflict of laws scenario, various factors, including whether the chosen state has a substantial relationship to the parties (in an employment setting the citizenship of the employer and employee), the state where the performance (or the injury) occurred, whether there is indeed a real conflict between the laws in question, and the choice of the contracting parties will be considered in determining what law will eventually be applied.⁸ Additionally, courts will also consider general public policy concerns, such as whether the contracted state’s laws are contrary to a central policy or protection granted by the employee’s resident state and whether the employee’s state’s interest should control.⁹ And, as states have a strong interest in protecting the individuals who live and work within their borders, state labor laws have long been included within a state’s “police powers” and are given more deference than contractual freedoms or other types of regulation.¹⁰ Furthermore, courts will also look at the bargaining power between the parties to determine if employees truly had the ability to voluntarily enter into such contracts, or if they were forced to agree to unconscionable choice of law provisions.¹¹

And then, of course, there are some states that simply do not allow one to contract around state-based employee protections, or they make it very difficult to do so. For example, in California, pursuant to Subdivision (a) of Section 925 of the Labor Code, an employer cannot “require an employee who primarily resides and works in California” to adjudicate any claims related to their employment outside of California or give up any “of the substantive protections of California law with respect to a controversy arising in California.”¹² Furthermore, any provision of an employment contract

7. *Id.*

8. See generally Donald Earl Childress III, *International Conflict of Laws and the New Conflicts Restatement*, 27 DUKE J. COMPAR. & INT’L L. 361 (2017); Christopher A. Whytock, *Conflict of Laws, Global Governance, and Transnational Legal Order*, 1 U.C. IRVINE J. INT’L, TRANSNAT’L, & COMPAR. L. 117 (2016).

9. See, e.g., *Nedlloyd Lines B.V. v. Super. Ct.*, 834 P.2d 1148, 1151-52 (Cal. 1992).

10. See, e.g., *Labor Legislation. Police Power of the State*, 16 YALE L.J. 126, 126-28 (1906).

11. See, e.g., *Samaniego v. Empire Today, LLC*, 140 Cal. Rptr. 3d 492, 497-501 (2012).

12. CAL. LAB. CODE § 925(a).

that violates Subsection (a), “is voidable by the employee” and “the matter shall be adjudicated in California and California law shall govern the dispute.”¹³ The sole exception to this rule is where the employment contract has been negotiated between the employer and an employee’s individual attorney.¹⁴ In such cases, the interests of the employee have been sufficiently protected and negotiated away with full knowledge because they have been represented by their own attorney, something that would likely only arise with highly sophisticated and skilled employees with access to significant resources. And many other states have passed more limited forms of anti-choice of law employment legislation, often focusing on limiting the enforcement of out-of-state non-competition employment agreement clauses.¹⁵

This lack of legal certainty as to what employment laws may apply to any given out-of-state employee can end up discouraging many employers from hiring remote workers altogether, or force employers to limit their potential hiring pool geographically to stay within a specific state’s borders. Thus, while many jobs can be performed entirely without ever stepping foot in an office, this patchwork method of leaving employment regulations up to individual states within the United States makes it much more difficult for employers to take advantage of new technological advancements in the virtual workspace and can end up promoting more traditional employment relationships.

B. IN THIS WORLD OF REMOTE WORK NOTHING CAN BE SAID TO BE CERTAIN, EXCEPT TAXES AND WORKERS’ COMPENSATION INSURANCE

Another significant hurdle for employers with remote employees is the state-specific tax and insurance burdens that the employer must bear. With the exception of independent contractors, which are defined differently from state to state,¹⁶ employers must pay or withhold any applicable payroll taxes for all their employees based on both the state citizenship of the employee and where the work is generally performed.¹⁷ These can include state unemployment insurance, state disability insurance, and state personal income tax, but the amounts and type of taxes an employer may need to pay

13. *Id.* § 925(b).

14. *See id.* § 925(e).

15. *See, e.g.*, MASS. GEN. LAWS ch. 149, § 24L(e); WASH. REV. CODE § 49.62.

16. Compare CAL. LAB. CODE §§ 2775-2787 with *Common Law Factors With Examples*, ALA. DEP’T OF LAB. https://labor.alabama.gov/uc/COMMON_LAW_FACTORS_WITH_EXAMPLES.pdf [https://perma.cc/X445-5ANZ].

17. *See, e.g.*, CAL. REV. & TAX. CODE § 18551; CAL. UNEMP. INS. CODE § 13020.

or withhold differ from state to state.¹⁸ And, to be able to pay state payroll taxes, the employer must be registered to do business in that state. In addition, most states mandate that employers provide workers' compensation insurance for any individuals that are employed by them within that state, although some states require a threshold number of employees for this requirement to kick in.¹⁹

The result is that an employer seeking to have a truly remote workforce must either create or register business entities in multiple states or hire a professional employer organization ("PEO") to directly employ its workforce in any states in which it does not have a business presence. PEOs act as the employer of record for an employer's remote employees and charge fees, usually a percentage surcharge based on wages paid, to the entity that the employee is actually working for, on top of the wages, taxes, and other costs associated with the employment relationship.²⁰ However, this type of contractually defined "employer" status does not always pass muster, as often the "actual" employer will be held liable for any failures by the PEO to properly pay taxes or for other employment law violations.²¹

So, can an entity truly be a remote employer if it has to establish a legal presence in every state that it must run payroll in or have a third-party act as the employer for its employees in the states it chooses not to register in? And that is one of the major problems with our current tax systems and insurance processes. This may have made sense in a pre-internet world where it was impossible for most white-collar employees to work from virtually anywhere, but now this creates a true hindrance for the employer trying to accommodate talent that may not want to live and work in a particular location or within the same state in which a company is headquartered.

18. See, e.g., *California State Payroll Taxes – Overview*, EMP. DEV. DEP'T (Sept. 9, 2021), https://edd.ca.gov/Payroll_Taxes/What_Are_State_Payroll_Taxes.htm [<https://perma.cc/AE4P-495V>]; Kemberley Washington, *Texas State Taxes 2020-2021*, FORBES ADVISOR (Nov. 15, 2021), <https://www.forbes.com/advisor/taxes/texas-state-tax/> [<https://perma.cc/WUT3-KX27>].

19. See, e.g., CAL. LAB. CODE § 3700 (mandating workers' compensation insurance for all employees); ALA. CODE § 25-5-50(a) (exempting from the workers' compensation insurance mandate employers "who regularly employ[] less than five employees.").

20. See *How "Professional Employer Organisations" Are Moving with the Times*, ECONOMIST APPLIED (Oct. 26, 2020), <https://applied.economist.com/articles/how-professional-employer-organisations-are-moving-with-the-times> [<https://perma.cc/QX9F-UV7A>].

21. See, e.g., CAL. UNEMP. INS. CODE § 606.5 (West 2022); 29 C.F.R. § 825.106 (2022); *Amarnare v. Merrill Lynch, Pierce, Fenner & Smith Inc.*, 611 F. Supp. 344 (S.D.N.Y. 1984).

III. SPACE EMPLOYERS FACE EVEN MORE PROBLEMS WITH THEIR REMOTE EMPLOYEES THAN TERRESTRIAL EMPLOYERS

A. JURISDICTIONAL ISSUES ONLY GET MORE COMPLICATED FOR SPACE EMPLOYERS

Employers in space face an extra complication to the remote worker jurisdictional issues that plague terrestrial employers, because current international space law is focused largely, if not exclusively, on national or nation-controlled space exploration and does not discuss, adopt, or create any employment laws, rules, or regulations for private employers. This is not an oversight, but rather results from the intention of the original drafters to keep space exploration for States and not to promote the commercialization of space by private companies.²² And despite the fact that private companies are presently driving much of our current race to return to space, even more recent attempts to create international arrangements among spacefaring nations, such as the Artemis Accords, once again focus on nationally controlled space agencies and are mute on setting ground rules for private entities or citizens living and working in space.²³ However, despite the lack of clarity, there are some good arguments that jurisdiction in space may end up looking a lot like current terrestrial maritime law.

As a starting point, we can look at the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (the “Outer Space Treaty”), under which nations are responsible for activities that occur in space “whether such activities are carried on by governmental agencies or by non-governmental entities,” which would include private entities, such as companies that are “citizens” of those nations.²⁴ The Outer Space Treaty also requires nations to both authorize and supervise their non-governmental entities that are acting in outer space.²⁵ This idea of national control and national responsibility for private actors in space is also supported by the Convention on the International Liability for Damage Caused by Space Objects (the “Liability Convention”), which holds nations liable for any objects they launch into space, thus creating jurisdiction, albeit limited in

22. See U.N. ESCOR, 17th Sess., 1294th mtg., U.N. Doc. A/C.1/PV.1294 (Dec. 7, 1962).

23. See generally Artemis Accords, *Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes*, NASA (Oct. 13, 2020), <https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf> [<https://perma.cc/C8BB-EMM3>].

24. G.A. Res. 2222 (XXI), art. VI, annex, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Dec. 19, 1966) [hereinafter Outer Space Treaty].

25. See *id.*

nature, which is tied entirely to the location of launch.²⁶ Under this approach, jurisdiction would be based on what country a “space object” (a term which includes even a landed facility or a portion of an orbital installation) was originally launched from. Of course, the problem with this approach is that different parts of an installation, like the different modules of the International Space Station, could be multi-jurisdictional. Different component parts would be governed by completely different jurisdictions based solely on their original launch locations. One can only imagine the confusion for an employer if half of an installation was governed by one set of employment law rules and the other half by a completely different set of rules.

But one of the interesting aspects of space is that there is already a well-established consensus that we should treat space, and to some extent other celestial bodies, like an international commons. This is clearly seen in the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the “Moon Agreement”), which prohibits the ownership of the surface or subsurface of any celestial body, but allows nations to “retain jurisdiction and control over their personnel, space vehicles, equipment, facilities, stations and installations,” including those of non-governmental entities under their jurisdiction.²⁷ However, although the Moon Agreement best lays out this concept of space as essentially, “international waters,” the agreement has very little support amongst spacefaring nations.²⁸ The Outer Space Treaty, on the other hand, has wide international support, and contains similar provisions preventing countries from appropriating or claiming sovereignty over any part of outer space.²⁹

If we then go a step further, and extend current terrestrial-based law on international waters to space, similarly to how existing international conventions and law have been given extraterritorial force outside of the physical jurisdiction of specific nations,³⁰ we could adapt the current maritime registration system, wherein the owners of a seafaring ship “pick” the jurisdiction of the country that they want to be bound by in international waters and register their vessel with that country,³¹ and expand upon the Conven-

26. See G.A. Res. 2777 (XXVI), art. III, annex, Convention on International Liability for Damage Caused by Space Objects (Nov. 29, 1971).

27. See G.A. Res. 34/68, art. 11-12, 14, annex, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Dec. 5, 1979).

28. See Comm. on the Peaceful Uses of Outer Space, Rep. of the Legal Subcomm. on Its Sixtieth Session, U.N. Doc. A/AC.105/C.2/2021/CRP.10 (2021).

29. See *id.*; Outer Space Treaty, *supra* note 24, art. II.

30. See generally Ralph Wilde, *Human Rights Beyond Borders at the World Court: The Significance of the International Court of Justice's Jurisprudence on the Extraterritorial Application of International Human Rights Law Treaties*, 12 CHINESE J. INT'L L. 639 (2013).

31. See U.N. Convention on the Law of the Sea, art. 91-92, Dec. 10, 1982, 1833 U.N.T.S. 397.

tion on the Registration of Objects Launched into Outer Space (the “Registration Convention”).³² The Registration Convention requires a nation to register any space object they launch into space in a national registry which is shared internationally.³³ And registered space objects can be, and have previously been, transferred between countries by one country removing an object from their registry and another country adding it to their registry.³⁴ However, it is not entirely clear as to whether jurisdiction under the Liability Convention transfers with registration.³⁵ Moreover, the Registration Convention does not appear to apply to private entities, and the system, to date, has not been used by private companies in the same way that they currently utilize traditional seafaring ship registries.³⁶ But as commercial enterprise becomes more common in space, the likelihood that countries and private parties will start using these space object registries like maritime registries is particularly likely. And the result of this could be that space employees would be treated much akin to sailors, meaning that many employment law matters would be resolved by defaulting to federal rules, versus the unique rules of the different states within the United States. Additionally, state-specific taxation and withholdings would be largely transferred from the employer to the individual employee.³⁷

Of course, without specific legislation establishing that space employees are going to be treated like sea employees, private parties may be forced to attempt to establish norms and create certainty via detailed contracts that establish jurisdictional issues. As discussed above, these contracts may end up not being enforceable if employers attempt to jurisdiction shop and choose the most favorable laws for themselves. But in theory, detailed employment agreements could be used to determine which, if any, state’s laws might apply, determine safety or workplace guidelines, and determine the venue for the potential enforcement of any employment law claims. And there is some precedent for employers and employees resolving these issues by contract when there is no clear answer or applicable jurisdiction. For example, seventeenth-century pirate ship crews would create detailed con-

32. See G.A. Res. 3235 (XXIX), annex, Convention on Registration of Objects Launched into Outer Space (Nov. 12, 1974) [hereinafter Registration Convention]; see also Outer Space Treaty, *supra* note 24, art. VIII.

33. See Registration Convention, *supra* note 32, art. II(1).

34. See generally Frans von der Dunk, *Transfer of Ownership in Orbit: From Fiction to Problem*, in 9 LUXEMBOURG LEGAL STUD., OWNERSHIP OF SATELLITES 29 (Mahulena Hofmann & Andreas Loukakis eds., 2017).

35. See generally *id.*; Registration Convention, *supra* note 32, art. VII(1). See Outer Space Treaty, *supra* note 24, art. VIII.

36. See generally von der Dunk, *supra* note 34; Registration Convention, *supra* note 32, art. VII(1).

37. See 29 C.F.R. § 783.0 (2022); 46 U.S.C. § 11108 (2021).

tracts laying out both pay and other rights and duties.³⁸ Thus, until we have specific space labor legislation, the best practice would be to have employers and employees, each with their own counsel, draft employment agreements that define these foundational labor issues based on either the state in which the employee lives or the state in which most of the pre-launch work and training will be done. Further, employers should try to keep all pre-launch employment activities within the same state that the launch will occur in.

B. THERE ARE SIGNIFICANTLY MORE COSTS AND HEADACHES FOR SPACE EMPLOYERS THAN TERRESTRIAL EMPLOYERS

Space exploration is expensive, but one of the things that makes it so expensive is the sheer cost of maintaining life support systems.³⁹ Unlike most traditional terrestrial employers, space employers will have to provide a place to live, food, water, and oxygen to their employees and none of this is easy to source or find in space at this point in time. This raises the question of who will bear the cost of these necessary “benefits”? Will shelter and food be included as a term of employment, or will that come out of an employee’s pay?

Although only fifty-six nations are parties (and the dominant spacefaring nations are not parties) to the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (the “Migrant Workers’ Rights Convention”), it remains the authoritative international agreement related to the protection and establishment of basic norms for individuals working abroad or onboard vessels registered to nations which they are not nationals of.⁴⁰ Among the Migrant Workers’ Rights Convention’s core protections are the rights to life and health.⁴¹ And we can pull from these most fundamental rights a requirement that employers provide their space employees with the rudimentary staples of human life, including oxygen, food, water, an atmosphere and habitable environ-

38. *Pirate Code*, WIKIPEDIA, https://en.wikipedia.org/wiki/Pirate_code#Articles_of_Bartholomew_Roberts [https://perma.cc/3HYS-ZEPE].

39. See generally HARRY W. JONES & GRANT ANDERSON, NEED FOR COST OPTIMIZATION OF SPACE LIFE SUPPORT SYSTEMS (2017); Jeff Foust, *NASA Increases Prices for ISS Private Astronaut Missions*, SPACE NEWS (May 7, 2021), <https://spacenews.com/nasa-increases-prices-for-iss-private-astronaut-missions/> [https://perma.cc/TMB4-P2W4].

40. See G.A. Res. 45/158, International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (Dec. 18, 1990) [hereinafter Migrant Workers’ Rights Convention]; *Status of Ratification Interactive Dashboard*, U.N. HUM. RTS. OFF. HIGH COMM’R, <https://indicators.ohchr.org> [https://perma.cc/G8X7-CG83].

41. Migrant Workers’ Rights Convention, *supra* note 40, art. 9, 70. https://edd.ca.gov/Payroll_Taxes/What_Are_State_Payroll_Taxes.htm

ment, and some sort of physically adequate living space. Because, without such basic life-supporting assets, neither the life nor health of a space employee would be protected. And since employees would be unlikely to be able to afford these necessities, a requirement that they pay for their oxygen or food would, in essence, recreate a system similar to a modern but much more authoritarian “company town,” where an employee would have no choice but to comply. As this could border on involuntary servitude, such employment practices would likely not be permissible.⁴² In addition, it is unlikely that any court would uphold an employment contract with such potentially unconscionable and coercive terms that would require an employee to pay their employer for their right to live.

And this highlights the unique change to the employment relationship that occurs in space. Neither the employer, nor the employee, can easily end the employment relationship, especially as we get farther away from Earth and it can take months and years for a return to the home planet with no potential areas to offload a former employee along the way. Imagine a scenario where an employee quits halfway to Mars. The employee cannot simply leave the workplace, nor can the employer stop providing them with life support, yet a disgruntled employee could create safety concerns for the rest of the crew and potentially endanger the mission. Similarly, how can an employer attempt to resolve a complaint of sexual harassment or assault when crew members are all forced to live together in tight quarters and separation of the complainant from the alleged perpetrator is physically impossible? Employers are going to have to reevaluate all of their human resource protocols, procedures, and trainings and carefully consider the makeup of their crews and how they treat their employees in order to ensure that human capital problems are as unlikely as possible to occur during the course of a mission.

And there is also a unique shift in the power dynamic between employers and employees in space. While employers literally hold the lives of their employees in their hands, and could potentially permanently “terminate” their employees, employees are going to be the ones who will determine the success of a mission and the well-being of their employer’s space infrastructure, both of which may cost employers millions or billions of dollars. In essence, there is what we might call a “mutually assured destruction” scenario if either party demands too much from the other or behaves in an unreasonable manner.

Indeed, we might have one historical example of a so-called “space mutiny” which allegedly occurred on Skylab in late December of 1973.⁴³

42. *Id.* art. 39.; U.S. CONST. amend. XIII.

43. See John Uri, *The Real Story of the Skylab 4 “Strike” in Space*, NASA HIST. (Nov. 16, 2020), <https://www.nasa.gov/feature/the-real-story-of-the-skylab-4-strike-in->

Although both NASA and the astronauts involved in this incident have rejected describing this event as some sort of unauthorized strike, what we do know is that after multiple complaints about unreasonable working conditions were ignored, the Skylab 4 crew “missed” a call from mission control and did not respond for a full orbit.⁴⁴ And after that pause in contact, positive changes were made to their work schedule, including having one day off every ten days and reduced scheduling of activities before and after periods of sleep.⁴⁵ Thus, space employees who feel they are being forced to work in unacceptable working conditions might simply hold a spaceship or installation hostage, or hold the completion of a mission as collateral during labor negotiations. Of course, the employer maintains a similarly strong bargaining position because they certainly control the survival of the crew, and any mutinous employees may face severe repercussions for their actions upon their return to Earth.

In other words, a lot of what are currently considered normal human resource practices cannot be transitioned “as is” to space. Nor can employers ignore the additional necessary “benefits” they will have to provide to their space employees. Rather, employers will need to be significantly more cautious in their hiring, put considerably more emphasis on anti-discrimination and anti-harassment trainings, take a much more employee-focused approach toward creating a positive working environment, and be prepared to shoulder substantial costs that one would never incur on Earth, all just to create the bare minimum of an acceptable space workplace.

C. WHAT IS A WORKDAY OR A WORKWEEK IN SPACE?

In the United States we structure work, even salaried work expectations, around how we compensate employees who are paid on an hourly basis. A normal workweek is defined as forty hours of work per week.⁴⁶ Therefore, if an hourly employee works more than forty hours in a workweek, they must be paid overtime of at least a 50 percent premium.⁴⁷ Many states take this even further, requiring overtime if an hourly employee works more than eight hours in a single day and requiring double overtime in various circumstances.⁴⁸ These specific hourly cutoffs are based on the fact that working over a certain number of hours in a day or week can result

space; Doug Adler, *Was There Really a “Mutiny” Aboard the Skylab Space Station?*, ASTRONOMY (June 12, 2020), <https://astronomy.com/news/2020/06/was-there-really-a-mutiny-aboard-the-skylab-space-station> [https://perma.cc/9SVX-Q52S].

44. Uri, *supra* note 43; Adler, *supra* note 43.

45. Uri, *supra* note 43; Adler, *supra* note 43.

46. 29 U.S.C. § 207(a) (2021).

47. *Id.*

48. *See, e.g.*, CAL. LAB. CODE § 510 (West 2022).

in negative health impacts, endanger the safety of other employees, and decrease overall productivity.⁴⁹

And across the planet, the concept that there are twenty-four hours in a day, seven days in a week, and fifty-two weeks in a year is nearly universal. However, as we leave Earth and move away from its orbit, what constitutes a day and a week will change. For example, a “day” on the Moon is over seven hundred Earth hours long,⁵⁰ and a “day” on Mars is twenty-five Earth hours long,⁵¹ but a Martian “year” is six hundred and eighty-seven Earth days.⁵² This means that we may need to reassess what a working day is and how we will determine overtime, if that even exists. And there is a serious question as to whether “overtime” will truly exist in space, or whether one will simply be “on call” all the time given the inherent dangers involved in living and working in space and the unpredictability of when one may be called into action.

Nonetheless, there may be some existing limitations which can be used to prevent employers (who may attempt to create potentially exploitative working conditions) from simply rewriting these terrestrial concepts of what a “workday” and “workweek” constitutes. For example, Article 25 of the Migrant Workers’ Rights Convention requires that migrant workers enjoy employment circumstances “not less favorable” than those enjoyed by nationals of the employer’s nation, including “overtime, hours of work, weekly rest, [and] holidays with pay.”⁵³ And one is not allowed to contract these rights away.⁵⁴ Thus, this Convention might be used to create a requirement that employers treat space “migrant” workers on equal footing with their counterparts on Earth and provide them with the same basic work and rest “hours.”

While we do not know what time keeping system will be used on Mars, or how we will eventually account for time as humanity cuts more and more ties with Earth, we do know that there are limits to human productivity. Thus, no matter how we define a workday or workweek in the future, space employers must be mindful not to create working conditions that are worse than those on Earth. Instead, they should attempt to create

49. U.S. DEP’T OF HEALTH & HUM. SERV., OVERTIME AND EXTENDED WORK SHIFTS: RECENT FINDINGS ON ILLNESSES, INJURIES, AND HEALTH BEHAVIORS (2004).

50. *100 Lunar Days – Parts I and II*, NASA GODDARD MEDIA STUDIOS (Oct. 6, 2017), <https://svs.gsfc.nasa.gov/12739> [<https://perma.cc/BG7Q-ABUZ>].

51. *How Long Is One Day on Other Planets?*, NASA SCI. SPACE PLACE: EXPLORE EARTH AND SPACE! (Feb. 9, 2021), <https://spaceplace.nasa.gov/days/en/> [<https://perma.cc/CA57-FLMV>].

52. *Mars in a Minute: How Long Is a Year on Mars?*, NASA SCI.: MARS EXPL. PROGRAM (Dec. 14, 2017), <https://mars.nasa.gov/resources/21392/mars-in-a-minute-how-long-is-a-year-on-mars/> [<https://perma.cc/ZX4U-5ZWM>].

53. Migrant Workers’ Rights Convention, *supra* note 40, art. 25.1(a).

54. *Id.* art. 25.2.

working norms that are equivalent to what similar workers would experience back on terra firma.

IV. CONCLUSION

The past few years have been marked by a drastic change in the workplace as the number of remote and virtual employees has grown exponentially. Likewise, the space industry has changed largely from being controlled by national governments to being driven by commercial enterprise. In both cases, our foundational employment law systems have not kept up.

Terrestrial employers are fettered by a complex jurisdictional system with minimum guidelines, duties, and obligations that can differ radically from state to state. Space employers, on the other hand, do not even know what employment laws might apply to them as current international space laws are effectively silent on the issue of labor and even on the legal status of private entities in space. However, if we want to build permanent facilities and installations on other celestial bodies, we will have to figure out what ground rules are going to exist between employers and employees, and we will have to make sure that these laws and regulations that we have yet to draft will result in healthy and happy workers. For without a healthy and reliable space workforce, we cannot create a sustainable off-world home for humanity, and we will, at best, remain nothing more than space tourists.