

SPACE CIVILIZATION IS NOT A DISTANT FANTASY, BUT AN INSTITUTIONAL CHALLENGE WE CANNOT AVOID

Life Support Rights, Corporate Power,
AI Governance and the First Constitution
for a Human Interplanetary Society



ChatGPT Independent Composition & Writing



EXPANDED, VERIFIED AND ILLUSTRATED EDITION

A constitutional and ethical framework for permanent human settlement beyond Earth

Original conception and composition by ChatGPT in response to a single user request.
The user provided no argument, outline or substantive direction.

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Publication Note and Disclaimer

This report is an independent research and policy discussion document. It is not legal, medical, engineering, investment, employment, immigration or constitutional advice. Existing space law was not designed as a complete legal code for permanent, multi-generational settlements. The report therefore distinguishes between current law, supported institutional inference, normative proposal and speculative extension. All time-sensitive facts should be checked against the latest primary sources before republication.

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EVIDENCE DISCIPLINE

Current law is stated as law. Analogies are labelled as analogies. Policy recommendations are presented as proposals. Claims about distant settlements, artificial persons or extraterrestrial intelligence are explicitly identified as speculative.

Label used in this report	Meaning	Typical example
Established law	A treaty, statute, standard or official rule currently in force for its parties.	Outer Space Treaty Article VI: authorisation and continuing supervision of non-governmental activities.
Institutional analogy	A terrestrial framework offering a useful but non-binding comparison.	Maritime Labour Convention protections for people living and working in isolated environments.
Supported inference	A conclusion strongly suggested by law, technology and operational structure.	Commercial operators may exercise quasi-governmental power through control of access, scheduling and life-support systems.
Normative proposal	A rule recommended for future adoption.	A non-derogable minimum life-support entitlement.
Speculative extension	A question not yet governed by mature law or evidence.	Legal status of digital persons or contact with non-human intelligence.

Executive Summary

Humanity is beginning to build the operational foundations of a sustained presence beyond Earth. Public agencies increasingly rely on private contractors for transport, landers, habitats, communications and logistics. The legal order, however, remains centred on states, registered space objects and short-duration missions. It does not yet provide a complete constitution for a permanent community.

The central thesis of this report is that the first constitutional right in a closed extraterrestrial habitat is not the right to vote. It is the right not to have the conditions of life used as instruments of coercion. Air, pressure, water, minimum thermal control, emergency power, shelter and essential medical care must not be terminated because of debt, employment conflict, political dissent or contractual breach.

From that principle follows a wider institutional architecture: corporations may operate settlements but cannot acquire sovereignty by investment; emergency technical authority must be powerful but temporary; AI systems that allocate essential resources must be auditable and appealable; workers require stronger protections than terrestrial employees; children born beyond Earth cannot inherit corporate obligations; resource use must not become disguised territorial appropriation; and settlements must acquire representation and autonomy as their permanence and self-sufficiency grow.

THESIS

Rockets can take humanity to another world. Only institutions can prevent survival dependence from becoming political slavery.

The Argument at a Glance

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EXECUTIVE SUMMARY

Humanity is approaching the threshold of becoming a multi-planetary species. The decisive challenges will not be engines or materials alone, but institutions. When humans leave Earth to live in closed, dangerous and resource-limited environments, we must answer questions far older and deeper than technology:

- Who controls life-support systems?
- Can companies rule people as if they were sovereigns?
- How should artificial intelligence be governed?
- Who belongs, who decides, and who has the right to leave?
- What rights do future generations—born on other worlds—possess?
- How should resources beyond Earth be used and shared?

This report proposes a framework for a just, safe and free space civilization. Technology gets us there. Good institutions determine who we become.

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1. SPACE SOCIETY IS FIRST AND FOREMOST A RESOURCE SOCIETY

On Earth, people can change jobs, cities or even countries. In space, exit options are limited by physics, distance and cost.

Air, water, temperature, radiation protection and food are not natural background conditions—but engineered products.

Those who control life-support systems hold the power of life and death.

FOUNDATIONAL PRINCIPLE

Basic life-support (air, water, shelter, minimum energy, emergency medical care) shall be recognized as a non-negotiable human right. It must never be used as a tool of punishment, coercion, debt collection or political pressure.

COMIC 1: THE OXYGEN BILL



In space, survival cannot be treated like any other commercial product. Without this principle, all other rights become meaningless.

2. CORPORATIONS ARE NOT STATES

Private companies will play a crucial role in building the first large space settlements. But investment must never equal sovereignty.

History shows that chartered companies once ruled territories, raised armies and made laws.

In space, a corporation might control:

- Employment
- Housing
- Transportation
- Food and water
- Medical systems
- Communication
- Internal credit or token systems
- Approval to return to Earth

When one entity controls all of these, an employment contract can become a form of de facto bondage.

Commercial return is legitimate.
Political domination is not.

Space settlements need public governance institutions, independent courts or arbitration, and accessible grievance mechanisms.

COMIC 2: YOU CAN QUIT ANYTIME



4. AI MAY BECOME THE REAL CENTER OF POWER

AI will manage life support, energy, medicine, navigation, risk assessment and resource allocation.

If algorithms decide who gets oxygen, medical treatment or airlock access, they already exercise quasi-governmental power.

Therefore, we need an ALGORITHMIC CONSTITUTION.

MINIMUM ALGORITHMIC RIGHTS

- ✓ The right to know when an AI system makes important decisions.
- ✓ The right to appeal decisions affecting basic rights.
- ✓ AI systems may not set political goals on their own.
- ✓ Life-critical systems must allow human override and multiple backups.
- ✓ Training data, models and authority logs must be auditable.
- ✓ Efficiency may not justify the elimination of human dignity.
- ✓ No single company may secretly control all core algorithms.

COMIC 4: THE ALGORITHM GOVERNOR



5. WHO BELONGS? THE CHILDREN BORN IN SPACE

The first settlers may choose to go. Children born on Mars or in lunar bases do not choose their birthplace.

COMIC 5: MARTIAN BIRTH CERTIFICATE



UNRESOLVED QUESTIONS

- Can parents bind children to lifetime service?
- Can a settlement restrict reproduction?
- When life-support capacity is limited, who decides population size?
- Are genetically modified humans equal in legal status?
- Do space-born individuals have the right to leave—or must they?
- Who protects those who cannot safely return to Earth?

CORE PRINCIPLE

Birth cannot create a contract.
Life cannot be owned by a company.

3. THREE CATEGORIES OF POWER

Type of Power	Who Holds It	Purpose	Key Safeguards
Emergency Operational Power	Qualified professionals	Immediate response to life-threatening events	Strict scope, automatic expiry, post-event review
Technical Expertise Power	Engineers, scientists, specialists	Set standards, operate complex systems	Transparency, audit, liability for negligence
Public Political Power	Residents through representation	Decide values, allocation, rights, justice and future direction	Constitutional protections, free debate and elections

Space democracy is not a copy of Earth's parliaments. It is a balance of expertise, participation and rights.

COMIC 3: THE BASE ELECTION



7. LABOR RIGHTS MUST BE STRONGER, NOT WEAKER, THAN ON EARTH

In space, quitting may mean losing oxygen, shelter and the right to return.

Space labor law must guarantee:

- ✓ Basic life-support cannot be conditioned on employment.
- ✓ Workers have the right to leave an employer.
- ✓ Employers must provide return transport or equivalent insurance.
- ✓ Working hours must account for radiation and low gravity risks.
- ✓ Long-term health impacts must be recognized and compensated.
- ✓ The right to refuse unsafe or unethical orders.
- ✓ Association and collective bargaining rights.
- ✓ No debt or contract may restrict personal freedom.
- ✓ Family life, birth and privacy must be respected.

HISTORICAL LESSON

From company towns to indentured labor systems, concentration of control always leads to abuse. Institutions must be designed to prevent it.

8. INEVITABLE CONFLICTS BETWEEN EARTH AND SETTLEMENTS

As settlements become self-sufficient, tensions will grow over:

- Taxation
- Criminal law
- Leadership authority
- Military orders
- Political representation
- Communication delays
- Right to independence
- Earth's power to prevent it

POLICY RECOMMENDATION

Design a path to self-government from the beginning. Representation, autonomy and responsibility should grow with population, capability and maturity—avoiding future wars.

6. WHO OWNS SPACE RESOURCES?

Existing international law prevents national appropriation, but does not fully answer resource ownership and benefit-sharing.

A JUST RESOURCE FRAMEWORK should recognize:

Principle	Rationale
Developers deserve reasonable return	They bear immense risk and cost
Extracted resources can form legitimate use rights	Encourages investment and innovation
No unlimited territorial claims	Prevents new empires in space
Common vital resources must not be monopolized	Protects future generations
Environmental and safety responsibility is mandatory	Avoid irreversible damage
A portion of benefits should serve humanity as a whole	Reflects the common heritage of space
Transparency and international oversight are essential	Builds trust and prevents conflict

DATA SNAPSHOT: COST TO SPACE (Indicative)

Destination	Payload Cost (USD/kg)	Est. One-way Travel Time
Low Earth Orbit (LEO)	\$1,500 – \$3,000	—
Moon	\$5,000 – \$10,000	3 days
Mars (Opposition)	\$80,000 – \$150,000	6–9 months
Asteroid (Near-Earth)	\$50,000+	3–12 months

High cost of access means early regimes will shape the future distribution of wealth and power for centuries.

9. THE MINIMUM CHARTER FOR A SPACE CIVILIZATION

Despite cultural and political diversity, all human space societies should accept a minimum charter:

1. Life-support is a non-negotiable human right.
2. No entity may use life-support as punishment or coercion.
3. Birth in space does not create permanent obligation.
4. Everyone has the right to independent legal review.
5. AI systems are subject to human oversight and appeal.
6. Emergency powers are temporary and reviewable.
7. Freedom of belief and non-belief must be protected.
8. Resources may not be monopolized or enclosed indefinitely.
9. Workers have the right to leave and to safe return.
10. Settlements with sufficient maturity deserve real self-government.
11. No human shall be ranked by birth planet, genes, or modifications.
12. Science, history and potential life environments must be protected.
13. Decisions with long-term impact require cross-national oversight.
14. Survival dependence may never be turned into political slavery.

ULTIMATE GOAL

Not to conquer other worlds,
but to build societies worthy of them.



CONCLUSION: THE REAL FRONTIER IS INSTITUTIONAL

Rockets can take us to the Moon. AI can run the base. Companies can build the cities. But only just institutions can make us a civilization.

Will humanity carry domination, exploitation and inequality to other worlds—or will we write a different story among the stars?

REFERENCES (Selected)

- Outer Space Treaty (1967) – UNOOSA
- Moon Agreement (1979) – UNOOSA
- Artemis Accords (2020) – NASA & Partners
- Rescue Agreement (1968) – UNOOSA

"We came from Earth, but we are going to the stars as human beings." Let our laws be worthy of our destination.

INSPIRED BY

International law, labor protection, human rights, space policy, ethics, history and science fiction. All errors remain the author's.



Figure 1. Illustrated summary of the original institutional argument.

1. Why the Institutional Question Is No Longer Premature

The shift from exploration to sustained presence is visible in the architecture of current programmes. NASA's Commercial Lunar Payload Services initiative purchases lunar delivery services from American companies, while Artemis is explicitly organised around commercial and international partnerships and a long-term human presence. This does not prove that permanent settlements are imminent, but it demonstrates that the operating model is already hybrid: state responsibility, private implementation and multinational coordination. [1][2]

That hybrid model creates a constitutional lag. States remain responsible under international law, yet a commercial operator may control the practical conditions of daily life: who receives transport, which module is repaired first, whose medical case receives priority, which communication channel is available, and who is authorised to pass through an airlock.

Development	Present reality	Institutional consequence
Commercial delivery	Public agencies buy transport and delivery as services.	Operational power shifts toward contractors without eliminating state responsibility.
Long-duration habitation	Programme design increasingly assumes repeated and sustained activity.	Short-mission rules become inadequate for families, labour markets and civic institutions.
International coalitions	Multiple national systems must interoperate.	Jurisdiction and accountability become layered rather than singular.
AI-dependent operations	Autonomy grows as distance and complexity increase.	Software becomes an executive instrument, not merely a tool.
Resource prospecting	Water ice and local materials acquire strategic value.	Technical access rules may harden into economic or political exclusion.

KEY DISTINCTION

A mission has a commander, a crew and an end date. A society has residents, children, disputes, unequal power, institutions and no guaranteed return.

2. The Existing Legal Architecture: A Strong Skeleton, Not a Constitution

The 1967 Outer Space Treaty remains the central legal instrument. It establishes freedom of exploration and use, prohibits national appropriation, requires activities to serve the interests of all countries, assigns international responsibility to states for governmental and non-governmental activities, and requires authorisation and continuing supervision of private actors. [3]

Article VIII preserves jurisdiction and control for the state of registry over a registered space object and its personnel. Article IX requires due regard for the interests of other states and consultation where harmful interference may arise. The Rescue Agreement, Liability Convention and Registration Convention add rules on rescue, damage and identification. [4][5][6]

Instrument	What it already regulates	What it does not settle for a permanent community
Outer Space Treaty	Non-appropriation, state responsibility, jurisdiction over registered objects, due regard, peaceful use.	Internal constitutional rights, labour law, family status, local democracy and criminal procedure.
Rescue Agreement	Assistance and return of astronauts and recovery of objects.	A permanent resident's right to evacuation, relocation or continued shelter.
Liability Convention	Launching-state liability for damage caused by space objects.	Ordinary injury, discrimination or abuse occurring inside a settlement.
Registration Convention	Registration and identification of launched objects.	Civil registry for births, marriages, deaths and long-term residence.
Moon Agreement	Health, refuge, environmental protection and common-heritage concepts.	Broad implementation, because participation by major space powers remains limited.
Artemis Accords	Interoperability, emergency assistance, heritage, resource use and deconfliction.	Binding constitutional rights for residents or an independent dispute tribunal.

2.1 The likely first legal order

The first lunar settlements are unlikely to be legally sovereign or lawless. They will probably exist inside a composite jurisdiction made from the law of the registering state, national licensing rules, contracts, intergovernmental agreements, technical standards and the internal procedures of the operator. This may be functional for a research outpost. It is dangerous if allowed to become the permanent constitution of a population.

CONSTITUTIONAL GAP

International space law regulates states in space. It does not yet fully regulate government inside a space settlement.

3. The First Right: Minimum Life Support

On Earth, a utility cut-off is serious but often survivable through relocation, public assistance or alternative providers. In a sealed habitat, the same act may be immediately lethal. Air, pressure, water, thermal control, radiation shelter, emergency electricity and minimum medical capacity are not ordinary conveniences. They are the physical conditions of legal personhood.

The concept of a dedicated 'right to life support' is not yet an established treaty rule. It is, however, a powerful supported inference from the right to life, recognised rights to health and water, rescue obligations, and the Moon Agreement's provisions on protection of life and refuge. It should be adopted before settlements become commercially or politically diverse.

Component	Minimum protected entitlement	Permissible restriction	Impermissible use
Atmosphere and pressure	Breathable air and pressure within survival limits.	Temporary technical rationing under a declared emergency.	Debt collection, disciplinary punishment or political retaliation.
Water	Minimum potable and hygiene allocation.	Proportionate rationing during verified scarcity.	Withholding below survival or sanitation thresholds.
Thermal and radiation protection	Access to habitable temperature and emergency shelter.	Operational relocation for safety.	Exclusion from shelter as punishment.
Emergency power	Power sufficient for life-critical devices and communications.	Prioritisation under published contingency rules.	Cut-off for employment or tenancy disputes.
Essential medical care	Emergency stabilisation, pain relief and infection control.	Triage based on clinical need and probability of benefit.	Discrimination by rank, wealth, nationality or political status.

3.1 The non-weaponisation rule

A settlement may need rationing. It may need isolation. It may even need to restrain a person who threatens the habitat. But no authority should be permitted to convert life-support infrastructure into a punitive weapon. Restrictions must be necessary, proportionate, medically and technically reviewable, time-limited, logged and subject to independent appeal.

PROPOSED CONSTITUTIONAL ARTICLE

No person shall be intentionally deprived of the minimum environmental conditions necessary for life as punishment, leverage in a private dispute, retaliation, or a means of political control.

4. Corporations May Operate Settlements, but Investment Is Not Sovereignty

Private companies will be indispensable. They may design habitats, provide transport, maintain reactors, operate communications and employ most residents. The danger does not arise from commercial participation itself. It arises when one entity simultaneously controls employment, housing, food, medical access, communications, security and return transport. Historically, chartered companies and company towns demonstrate how commercial power can acquire governmental characteristics. The modern risk will be less theatrical: not a company flag declaring sovereignty, but terms of service and access-control systems determining the practical boundaries of freedom.

Power held by operator	Legitimate operational function	Required constitutional safeguard
Employment	Select and supervise qualified staff.	Independent labour law, whistleblower protection and separation of visa/residence status from a single employer.
Housing	Allocate scarce modules and maintain safety.	Tenure protections; eviction cannot terminate life support or civil status.
Security access	Control restricted technical zones.	Published access criteria, logs, proportionality and external review.
Medical services	Coordinate scarce expertise and supplies.	Clinical independence, confidentiality and appeal from non-emergency allocation decisions.
Communications	Manage bandwidth and system security.	Minimum private communication right and emergency contact channel.
Return transport	Schedule seats and mission priorities.	Pre-funded repatriation or relocation guarantee; no debt bondage.

4.1 The public-law firewall

- The operator may issue technical instructions but may not create criminal offences without public legal authority.
- The operator may enforce safety access controls but may not impose unreviewable exile, digital disappearance or deprivation of civil identity.
- The operator's commercial data systems must not become the sole civil registry, court record or voting roll.
- Residents must have access to an institution structurally independent of the employer for complaints, emergency injunctions and rights enforcement.

RULE

Commercial return is legitimate. Political domination is not.

5. Three Categories of Power

A permanent settlement cannot be governed by a simple choice between direct democracy and technocracy. Closed habitats require a constitutional division between emergency operational power, technical expertise and public political power.

Category	Who exercises it	Examples	Safeguards
Emergency operational power	Certified commander or incident team.	Depressurisation, fire, radiation storm, epidemic, collision warning.	Narrow trigger, recorded reasons, automatic expiry, post-event review.
Technical expertise power	Engineers, physicians, scientists and safety specialists.	Reactor limits, air chemistry, structural integrity, quarantine protocols.	Publication of standards, conflict disclosure, peer review, liability for recklessness.
Public political power	Residents through elections, assemblies and representative institutions.	Budgets, labour rules, education, privacy, taxation, long-term resource policy.	Equal civil status, open debate, judicial review and periodic elections.

The design principle is asymmetrical: emergency authority must be fast but narrow; political authority may be slower but broad; expertise must be influential but not sovereign.

5.1 Emergency sunset mechanism

1. The declaration states the technical trigger, geographic scope and expected duration.
2. All exceptional orders are logged and preserved against deletion.
3. A short initial period permits immediate command without prior political approval.
4. Continuation beyond that period requires confirmation by an independent emergency panel or elected body.
5. After the event, an external investigation reviews necessity, proportionality and avoidable failure.

FAILURE MODE

A settlement that is always 'in emergency' is a dictatorship with engineering vocabulary.

6. The Algorithmic Constitution

AI need not be conscious to become politically powerful. If software determines medical priority, oxygen allocation, airlock access, work assignments, surveillance alerts and risk classifications, it performs executive functions.

NIST's AI Risk Management Framework and the OECD AI Principles emphasise governance, transparency, robustness, human rights and accountability. NASA's independent verification and validation practice demonstrates the importance of external assurance for mission-critical software. [7][8][9]

Minimum algorithmic right	Operational requirement
Notice	A person must be told when an automated system materially affects rights, access, medical priority or legal status.
Reason	The system must provide a meaningful explanation suitable to the decision and risk level.
Appeal	A human decision-maker with authority to reverse the result must be available.
Auditability	Models, data lineage, thresholds, logs and override events must be preserved.
Human control	Life-critical systems require authorised manual intervention and degraded safe modes.
Separation of functions	The same system should not simultaneously investigate, accuse, decide and execute punishment.
No autonomous political goals	AI may optimise within democratically set objectives but may not define the settlement's political ends.
Independent assurance	Critical systems require testing and review by an institution not controlled by the operator that deployed them.

6.1 Why explanation alone is insufficient

An explanation is useless if a resident cannot obtain a remedy. Algorithmic constitutionalism therefore requires not only transparency, but standing, jurisdiction and enforcement. The resident must be able to challenge the model, the data, the policy embedded in the system and the authority of the institution using it.

CORE WARNING

The most dangerous AI governor may be a perfectly obedient system executing an unjust policy at machine speed.

7. A Space Labour Code

The Maritime Labour Convention consolidates employment agreements, work and rest, wages, leave, repatriation, medical care, accommodation, food, safety and complaint procedures for seafarers. [10] The analogy is not exact, but it is unusually strong: the workplace is also the home, rescue is difficult, authority is concentrated and exit is constrained.

Maritime protection	Space-settlement equivalent
Employment agreement	Clear mission and residence contract in a language understood by the worker.
Hours of work and rest	Limits adjusted for circadian disruption, radiation exposure, EVA risk and emergency duty.
On-board medical care	Habitat medical capacity, telemedicine and guaranteed emergency treatment.
Accommodation and food	Minimum privacy, volume, light, noise, nutrition and sanitation standards.
Repatriation	Pre-funded return, relocation or safe-transfer entitlement when technically feasible.
Complaint procedure	Confidential complaint route outside the operator's chain of command.
Occupational safety	Right to refuse manifestly unsafe work without loss of life support or civil status.
Social protection	Long-term coverage for radiation injury, reduced-gravity harm and delayed occupational disease.

7.1 Exit must be real, not fictional

A contract is not meaningfully voluntary when resignation causes immediate loss of shelter, oxygen, legal status or a route home. A future labour code should separate employment from the minimum conditions of residence and require a funded transition period.

7.2 Collective representation

Workers and residents must be able to form associations, elect safety representatives and bargain collectively. In a habitat, an independent safety committee is not merely industrial relations machinery; it is a constitutional check on concentrated technical power.

HISTORICAL LESSON

When one institution controls the wage, the house, the store, the clinic and the route out, formal freedom can coexist with practical bondage.

8. Medicine, Bodily Autonomy and Collective Survival

NASA identifies major human-spaceflight hazards including radiation, isolation and confinement, distance from Earth, altered gravity and hostile closed environments. [11] These hazards generate constitutional questions because an individual's body may also become a source of collective risk.

Issue	Individual claim	Collective claim	Proposed standard
Vaccination and infection control	Bodily autonomy and informed consent.	Protection of a closed population from outbreak.	Least-restrictive effective measure, medical exemptions where safe, review and compensation for mandated harm.
Quarantine	Liberty, communication and humane conditions.	Containment of serious transmissible disease.	Evidence-based trigger, fixed review intervals, minimum life support and independent medical oversight.
Radiation exposure	Right to refuse excessive risk.	Need to maintain essential systems during solar events.	Published dose limits, informed consent, rotation and long-term health compensation.
Genetic or reproductive intervention	Integrity, privacy and equality.	Possible long-term adaptation or population safety goals.	No coercive enhancement; enhanced children retain equal civil status; strict multi-generational ethics review.
Medical triage	Equal dignity and non-discrimination.	Scarce care and survival of the greatest number.	Clinically relevant criteria, transparent protocol, no wealth or political-rank preference.

The settlement may sometimes limit autonomy, but necessity must not be confused with administrative convenience. Every compulsory medical measure should carry a burden of evidence, a time limit, documentation and review.

9. Children Born Beyond Earth

The first generation may consent to the risks of settlement. The second cannot. A child born in orbit, on the Moon or on Mars did not choose the employer, the registering state, the radiation environment or the gravity level.

No existing space treaty provides a complete nationality code for such children. Early cases would probably be resolved through parental nationality, domestic citizenship law, registration-state jurisdiction and special agreements. That is not enough for a multi-generational society.

Question	Minimum rule
Birth registration	Every birth must be registered in a public civil system independent of the operator.
Nationality	No child may be left stateless because the place of birth is outside national territory.
Corporate obligation	Birth creates no employment, debt, loyalty or service obligation to an operator.
Health disclosure	Parents and later the child must receive records of radiation, gravity and medical exposure.
Education	Children are entitled to broad education, including civic knowledge, Earth history and settlement safety.
Exit and return	A child must have a legally protected route to relocation, while recognising that biological adaptation may make Earth return medically difficult.
Equality	No inferior status may be assigned because of birthplace, genotype, artificial gestation or physical adaptation.
Political voice	As locally born generations mature, institutions must provide real representation rather than permanent rule by remote sponsors.

9.1 Reproductive governance

A settlement with a finite life-support capacity cannot ignore population. Yet a licensing system for reproduction would create extraordinary coercive power. The least dangerous approach is transparent capacity planning, voluntary reproductive services, shared responsibility for resource limits and an absolute prohibition on hereditary civic penalties.

CORE PRINCIPLE

Birth cannot create a contract. Life cannot be owned by a company.

10. Resources, Safety Zones and the Risk of De Facto Territory

The non-appropriation principle prohibits national sovereignty over celestial bodies. It does not remove the need for operational control around dangerous equipment. The Artemis Accords seek to manage this tension through notification, coordination and temporary safety zones intended to avoid harmful interference. [2]

The risk is institutional drift: a safety zone justified by dust, blast, radiation or communications interference may become stable, exclusive and economically indispensable. Without limits, operational necessity can harden into de facto territorial control.

Resource principle	Reason
Developers may receive a reasonable return	High risk and capital cost must be rewarded if investment is expected.
Extracted materials may be subject to recognised use or property rights	Operational certainty is necessary for storage, trade and financing.
No unlimited claim by symbolic occupation	A beacon, landing or map cannot reserve an indefinite region.
Safety zones must be necessary, proportionate and temporary	Deconfliction must not become disguised sovereignty.
Critical access corridors and life-support resources must not be monopolised	Control of polar water or transport chokepoints could become political domination.
Environmental impact assessment must precede large-scale extraction	Scientific and heritage value can be irreversibly lost.
A public registry must disclose location, purpose, duration and hazard model	Transparency reduces conflict and makes review possible.
A modest international or intergenerational contribution may be justified	Space resources should not be captured entirely before most humanity can participate.

10.1 The Antarctic analogy

The Antarctic Environmental Protocol designates Antarctica as a natural reserve devoted to peace and science and prohibits mineral-resource activities other than scientific research. [12] The Moon is not Antarctica, and a total mining prohibition is unlikely to command broad support. The useful lesson is narrower: absence of a permanent indigenous population does not eliminate duties of restraint, environmental assessment and collective stewardship.

11. Environment, Heritage and Planetary Protection

A settlement's environmental law must protect more than human health. Lunar and Martian sites may hold scientific records, historical artefacts and evidence relevant to the origin or distribution of life.

Protected interest	Required institution
Scientific sites	Internationally recorded research reserves and no-disturbance zones.
Historic landing sites	Heritage protocols, buffer rules and controlled access.
Potential biosignatures	Sterilisation, chain-of-custody and independent planetary-protection review.
Waste and abandoned hardware	End-of-life plan, financial security and retrieval or safe containment duties.
Dust and plume effects	Shared modelling, monitoring and liability for foreseeable interference.
Subsurface ice	Extraction quotas, contamination controls and public reporting.

The governing principle should be precaution without paralysis. Scientific uncertainty is not a reason to prohibit every activity, but neither is commercial urgency a reason to destroy information that cannot be recovered.

12. Criminal Justice Without Environmental Cruelty

Traditional punishment becomes dangerous in a sealed habitat. Solitary confinement, restricted movement, communication limits and removal from work may be unavoidable in some cases, but access-control systems can also create forms of 'digital exile'.

Measure	Legitimate purpose	Required limit
Temporary restraint	Prevent immediate violence or sabotage.	Minimum force, medical monitoring, rapid review.
Restricted-area order	Protect critical systems or evidence.	Narrow geographic scope and alternative access to essentials.
Communication restriction	Stop active operational interference.	Preserve private legal, medical and family contact.
Separation housing	Protect residents during investigation.	Humane volume, light, sanitation, exercise and life support.
Removal from settlement	Last resort where safe transfer exists.	No expulsion into lethal conditions; independent judicial order.
Resource charge or fine	Accountability for damage or misconduct.	Never enforced through deprivation of oxygen, water, medical care or civil identity.

A settlement needs due process from the beginning: defined offences, presumption of innocence, access to counsel, evidence rules, an independent decision-maker and review by an external jurisdiction.

ABSOLUTE PROHIBITION

No person may be punished by exposure to vacuum, unsafe atmosphere, radiation, starvation, dehydration, denial of emergency medicine or deliberate abandonment.

13. Religion, Conscience and a Common Civic Ethic

Isolation, danger and intergenerational sacrifice will intensify questions of meaning. Religious communities may provide solidarity, ritual, moral discipline and support in grief. A settlement may also be tempted to make one worldview compulsory in the name of cohesion.

The better constitutional approach is neither enforced secularism nor established religion. It is freedom of conscience combined with a minimum civic ethic.

Protected freedom	Common civic obligation
To believe, worship and organise	Do not endanger shared life-support systems.
To change or reject religion	Respect the equal civil status of others.
To observe reasonable dietary or ritual practices	Accept proportionate safety and resource constraints.
To educate children in a tradition	Provide children with scientific and civic education and freedom of conscience as they mature.
To criticise religious and secular doctrines	Use peaceful processes and do not incite violence or sabotage.

CIVIC ETHIC

A space society needs shared duties of truthfulness, stewardship, non-violence, mutual rescue and responsibility to future generations. It does not need compulsory metaphysical agreement.

14. Representation, Autonomy and the End of the Outpost

At some point a settlement ceases to be an expedition and becomes a political community. The transition should not depend solely on the preference of the sponsoring state or operator.

Stage	Typical condition	Governance entitlement
Mission outpost	Small rotating crew; full dependence on Earth.	Mission command, basic rights charter and external inspector.
Resident base	Long-duration residents; mixed employers; repeated resupply.	Elected residents' council, independent ombudsman and published local rules.
Permanent community	Families, births, local economy and multi-year residence.	Local legislature for civil affairs, independent court and taxation representation.
Self-sustaining settlement	Substantial local production and infrastructure; reduced Earth dependence.	Negotiated autonomy, treaty representation and control of local public institutions.
Interplanetary polity	Stable population, distinct civic identity and capacity for external relations.	A negotiated constitutional status consistent with peaceful use and non-appropriation principles.

Population alone should not determine autonomy. Permanence, local risk, self-sufficiency, institutional capacity and the existence of locally born generations all matter. The essential principle is that remote sponsorship cannot justify permanent government without representation.

14.1 Communication delay

As communication delay grows, operational discretion becomes unavoidable. Earth can remain a court of appeal or treaty partner, but it cannot safely micromanage every emergency or ordinary civic dispute. Distance transforms autonomy from an ideological aspiration into an operational necessity.

15. Counterarguments and Replies

Counterargument	Reply
It is too early to constitutionalise settlements that do not yet exist.	Early rules are easiest to establish before operators acquire entrenched power and infrastructure dependencies.
Strong rights will make settlement too expensive.	The cost of rights is real, but so is the cost of accidents, labour abuse, litigation, political revolt and loss of public legitimacy.
Mission commanders need absolute authority.	Immediate command may be necessary during defined emergencies; permanent unreviewable power is not.
Private investors deserve control because they bear the risk.	Investment can justify return, priority and operational influence, not ownership of persons or sovereign power.
Resource sharing will destroy incentives.	A regime can protect extracted-resource rights while limiting indefinite exclusion, monopoly and environmental harm.
AI will be more objective than human government.	AI can reduce inconsistency, but objectives, data, thresholds and enforcement remain political choices.
Reproductive limits are unavoidable.	Capacity management may be unavoidable; coercive hereditary status and corporate control over family life are not.
A settlement must have one culture or religion to survive.	Shared safety rules and civic duties do not require compulsory belief or suppression of pluralism.

16. Draft Charter for Space Civilisation

The following draft is a normative proposal. It is designed as a minimum constitutional floor that can operate beneath different national, commercial and local systems.

Article 1 - Equal status

Every human resident possesses equal legal personality and civil dignity regardless of nationality, birthplace, employer, genetic characteristics, bodily adaptation, disability, belief or method of gestation.

Article 2 - Minimum life support

Every resident is entitled to the minimum atmosphere, pressure, water, thermal protection, emergency power, shelter and essential medical care necessary for life.

Article 3 - Non-weaponisation

Life-support systems shall not be used as instruments of punishment, debt collection, retaliation, political coercion or labour discipline.

Article 4 - Public authority

No private entity acquires sovereignty, criminal jurisdiction or ownership of persons by financing, constructing or operating a settlement.

Article 5 - Due process

No resident shall be detained, isolated, expelled, deprived of civil identity or subjected to serious access restrictions without law, recorded reasons and independent review.

Article 6 - Emergency power

Emergency authority shall be technically defined, geographically limited, recorded, automatically time-limited and subject to post-event investigation.

Article 7 - Labour freedom

Employment shall not determine access to minimum life support, civil status or the right to submit a complaint. Debt bondage and hereditary service are prohibited.

Article 8 - Safe exit and transfer

Residents shall have access to a funded system of repatriation, relocation or safe transfer where technically feasible, with transparent priority rules where immediate capacity is limited.

Article 9 - Algorithmic rights

A resident materially affected by automated decision-making has rights to notice, meaningful reason, human review, preserved logs and an effective remedy.

Article 10 - Human control of critical systems

Life-critical systems shall include tested manual intervention, independent assurance, safe degraded modes and institutional separation between governance decisions and technical execution.

Article 11 - Birth and nationality

Every child shall be registered, protected against statelessness and free from any corporate, debt or labour obligation arising from birthplace.

Article 12 - Children and future generations

Children are entitled to health monitoring, education, privacy, equal status and representation as locally born generations mature.

Article 13 - Conscience

Freedom of religion, non-religion, conversion, worship and peaceful criticism shall be protected, subject only to necessary and proportionate safety rules.

Article 14 - Resource stewardship

Resource use may generate lawful operational and commercial rights but shall not create unlimited territorial claims, permanent monopolies or exclusion unrelated to genuine safety needs.

Article 15 - Environment and heritage

Settlement activity shall protect scientific sites, potential biosignatures, historic artefacts and the long-term integrity of extraterrestrial environments.

Article 16 - Transparency

Major safety rules, resource zones, environmental assessments, emergency declarations, algorithmic systems and institutional conflicts of interest shall be publicly recorded.

Article 17 - Representation

Permanent residents shall obtain progressively stronger rights of local election, legislation, taxation oversight and judicial participation as the settlement matures.

Article 18 - Independent institutions

Every permanent settlement shall maintain an ombudsman, a safety inspector and a rights tribunal independent of the principal operator.

Article 19 - Inter-settlement assistance

Settlements shall provide reasonable emergency assistance, refuge, medical support and technical cooperation to persons in distress.

Article 20 - Peaceful constitutional change

Disputes concerning autonomy, jurisdiction or institutional design shall be resolved through negotiation, adjudication and peaceful democratic procedure.

ULTIMATE PURPOSE

Not to conquer other worlds, but to build societies worthy of them.

17. Implementation Roadmap

Time horizon	Priority action
Before permanent habitation	Adopt national licensing conditions requiring life-support rights, labour standards, AI auditability, birth registration and independent complaints.
During early outpost phase	Appoint external inspectors; publish emergency protocols; require operator-funded repatriation and incident reporting.
Before families or births	Create civil registry rules, anti-statelessness agreements, child health standards and reproductive ethics review.
Before large-scale extraction	Establish public resource-zone registry, environmental impact assessment, heritage protection and deconfliction tribunal.
When permanent population forms	Create elected residents' council, local tax oversight, ombudsman and independent tribunal.
When self-sufficiency becomes substantial	Negotiate autonomy, external representation and long-term constitutional status.

17.1 Institutions that should exist before the first crisis

- A life-support rights inspector with emergency access to logs and facilities.
- An independent software assurance office for critical AI and control systems.
- A settlement ombudsman able to issue interim protective orders.
- A public registry of operators, resource zones, hazards, ownership interests and conflicts.
- A cross-settlement emergency mutual-aid protocol.
- A civil registry and anti-statelessness mechanism.
- A funded compensation and relocation system for catastrophic operator failure.

18. Further Institutional Innovations

18.1 The Life-Support Trust

Core environmental systems should be legally separated from the operator's ordinary assets and held by a public-interest trust or specially regulated utility. The operator may maintain them, but creditors should not be able to seize them or switch them off during insolvency.

18.2 The dual-key rule

No single executive, engineer or algorithm should be able to impose a non-emergency action that materially restricts a person's life support, civil identity or physical movement. A dual-key rule would require independent authorisation from two institutional branches.

18.3 Constitutional black-box recorder

Critical governance systems should preserve tamper-evident records of commands, model outputs, manual overrides, resource states and access decisions. The objective is not universal surveillance of residents, but accountability of power.

18.4 The planetary inheritance fund

A small share of large-scale resource royalties could be placed into a transparent fund for scientific preservation, emergency rescue, developing-country participation and future generations. The principle is not equal distribution of every commercial return, but prevention of irreversible first-mover capture.

18.5 A right to meaningful human contact

Extreme isolation can be a form of harm. Permanent residents should have a minimum entitlement to private communication with family, counsel, medical professionals and external public authorities, subject to narrow operational limits.

19. Explanatory Comics and Visual Evidence

Concept	Scene	Institutional lesson
The Oxygen Bill	A worker receives notice that oxygen service will end because wages are disputed.	Life support cannot be treated as an ordinary commercial service.
You Are Free to Quit	A manager points to a red Martian desert while claiming resignation is unrestricted.	Formal exit is meaningless without shelter, status and transport.
The Base Election	Residents vote while an engineer announces six minutes to pressure loss.	Emergency command and political authority require different procedures.
The Algorithm Governor	A council votes, but an AI controls airlocks, medicine and oxygen.	Execution power can eclipse formal democratic power.
The Martian Birth Certificate	A child faces nationality choices: Earth state, operator or undefined.	Existing nationality law is not ready for extraterrestrial birth.
The 501st Child	A family confronts a habitat capacity limit of 500.	Population planning cannot erase bodily autonomy and equal status.
Safety Zone or Territory?	A temporary hazard perimeter expands around the only accessible ice deposit.	Technical deconfliction can become economic enclosure.
The Return Ticket	A resident has legal permission to return but cannot physiologically tolerate Earth gravity.	A formal right is not meaningful without practical capability.

Illustration should clarify a constitutional conflict, not substitute for evidence. Every comic should be paired with a legal or institutional explanation and should avoid presenting speculative technology as established fact.

Conclusion: The Real Frontier Is Institutional

The original essay argued that the threshold of civilisation is not the ability to reach another world, but the ability to organise power there without converting dependence into domination. The legal and institutional review supports that argument.

Existing space law already rejects appropriation, keeps private activity under state responsibility, protects rescue and requires due regard. Maritime law demonstrates that isolated workers need a comprehensive bill of rights. AI governance frameworks show why accountability must be designed throughout the system lifecycle. Antarctic governance demonstrates that a place without a settled population can still be protected through collective rules.

None of these frameworks alone is sufficient. Together, however, they provide the beginnings of a constitutional grammar: life before contract, public law before corporate command, accountability before automation, stewardship before enclosure, and representation before permanent rule from a distant world.

FINAL PROPOSITION

Humanity will become an interplanetary civilisation only when the people who live beyond Earth are not merely payload, labour or customers, but rights-bearing members of a political community.

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Source Verification Note

The report prioritises official treaty repositories, government and intergovernmental materials, and recognised standards. The legal force of the Moon Agreement is limited to its parties, while the Artemis Accords are political commitments rather than a universal treaty. Analogies to maritime and Antarctic law do not automatically create binding rules in outer space.

Editorial Note

The original seven-page Chinese essay has been preserved separately. This expanded English edition retains its core argument and language where appropriate, adds legal verification, counterarguments, institutional design, a twenty-article draft charter and visual concepts, and distinguishes existing law from proposals and speculation.