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A SPACE VALUE STANDARD TO SUPPORT LIFE IN SPACE: INTRODUCTION TO ASTRAX VALUE

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Abstract

Space travel for the general public has become a reality, and an era in which many people travel to space every year is upon us. For nearly 20 years since 2005, ASTRAX has been preparing for the arrival of the era of private space travel by launching and developing a variety of services and products necessary for the general public to travel to space. As of 2024, we have deployed over 200 space services. Furthermore, we have developed ASTRAX U2U (Universal User Interface), a general-purpose application tool to efficiently provide these services and enable users to use them smoothly, and ASTRAX USP (Universal Service Platform), a platform that integrates various services. We have also proposed and developed the concept of ASTRAX VALUE as a new standard of value essential for using these services.

This paper presents the necessity and role of ASTRAX VALUE, a space value standard required for the preparation, education, and training of space tourists and space residents, as well as for actual spaceflight and space life, and the convenience of a new space economy (living sphere) that it will bring. This will be the foundation for building a sustainable and harmonious space society that is distinct from the conventional terrestrial economic sphere.

Keywords: ASTRAX VALUE, ASTRAX USP/U2U, space economy, space value standard, circular ecosystem, universal human resources

Abbreviation

ASTRAX USP: Universal Service Platform
ASTRAX U2U: Universal User Interface

explode, the needs of life in space will become even more diverse and complex, and a wide range of areas, such as education, health care, and lifestyle support, will clearly become increasingly important.

1. Introduction

Since 2021, private companies such as SpaceX, Virgin Galactic, and Blue Origin have fully launched human spaceflight services for the general public. This has ushered in an era in which diverse people, regardless of nationality, race, gender, age, occupation, or disability, can launch into space. This trend is expected to accelerate, transforming space into a realm accessible to everyone, not just limited experts.

Against this background, ASTRAX has been building a system to efficiently match supply and demand in space. At its core are the ASTRAX USP (Universal Service Platform) (see references [6], [13], [15], and [25] for details) and the ASTRAX U2U (Universal User Interface), a general-purpose application tool that anyone can use intuitively (see references [6], [22], [51] and [95] for details).

ASTRAX has been one of the first to anticipate the arrival of this era of private space travel, developing and providing over 200 space-related services since 2005. At the same time, we have also focused on developing universal human resources capable of thriving in the unique environment of space (see Reference [29]). As the number of people traveling to space continues to

This paper details the necessity and significance of "ASTRAX VALUE," a new space value standard that transcends monetary value and is essential for the smooth operation of USP and U2U, along with its specific framework.

2. The Need for a Value Standard in the Space Economy

Humanity is now expanding its economic activities from the limited space of Earth into outer space. As new industries emerge, such as private space travel, space habitation, and even the development of the Moon and Mars, a number of challenges arise that cannot be addressed with the traditional Earth-centric economic model based on monetary value.

2.1. The Limitations of National Currencies

First, the monetary system on Earth is premised on national sovereignty. However, space is a "borderless space" that does not belong to any specific nation, making it fundamentally difficult to directly apply a specific national currency. For example, if international private companies were to rely on a specific national currency, such as the US dollar or the Japanese yen, when trading land on the moon or resources on asteroids, this would increase the risk of exchange rate risk and political interference, greatly hindering fair transactions. Economic activity in space requires a universal value standard that is not dependent on any specific nation.

2.2. Valuing Values That Cannot Be Measured Monetarily

Second, activities in space contain numerous experiential and existential values that cannot be measured in monetary terms. The experience of working in zero gravity, advanced space-specific technology, and above all, the act of setting foot on the Moon or Mars for the first time, create entirely new value that cannot be measured simply through monetary transactions. To properly evaluate and share these, a multifaceted standard of value that transcends traditional monetary measures is essential.

2.3. Participation and Fairness of Diverse Entities

Third, the space economy will be built by an extremely diverse range of entities, from government agencies and private companies to educational institutions, researchers, and individual travelers. If we rely solely on monetary value, economic disparities on Earth will directly lead to disparities in space utilization, risking undermining the potential of space as a universal space. To make space a place that everyone can access equally, we need to establish multidimensional standards that can also evaluate non-monetary values such as education, social contribution, sustainability, and cultural creation.

2.4. The Demand for Sustainability

Based on the above, ASTRAX believes that a "new standard of value beyond currency" is essential for the

space economy. This is not simply the creation of a new cryptocurrency. It is a framework that systematically incorporates various elements such as experience, contribution, trust, and sustainability into the evaluation and transaction of space activities. These standards will transcend Earth-centric economic logic and become the foundation for building a truly universal and sustainable space economy.

3. Five Value Standards Supporting the Space Economy

ASTRAX has organized new value standards supporting the space economy into the following five categories. Collectively, we call these ASTRAX VALUE, aiming to make them function as a multidimensional evaluation platform that replaces currency.

(1) Existence Value Standard: The value of a person's mere presence.

(2) Knowledge/Technology Value Standard: The skills and expertise a person possesses.

(3) Behavioral Value Standard: Actions such as contribution and cooperation.

(4) Exchange Value Standard: The barter rate for resources and services.

(5) Circulation Value Standard: The degree of contribution to resource reuse and recycling.

3.1. Existence Value Standard

This is the idea that people in space have value in and of themselves. Simply by being there, people create smiles that bring a sense of security and happiness to the community, and the carbon dioxide emitted by breathing contributes to the circulation system of plants and algae. Their "existence" itself is an asset to the space community, and a system is envisioned in which these values are automatically accumulated, much like points. This is a fundamental value standard that ensures that all humans are value creators.

3.2. Knowledge & Skill Value

In the space economy, individual knowledge and skills themselves carry great value. In the closed and extreme environment of space, advanced specialized knowledge and skills are essential for survival within limited resources. For example, medical skills, spacecraft maintenance techniques, closed ecosystem maintenance techniques, and educational abilities could become a much more important means of exchange than traditional currency. This value standard encourages individuals to maximize their abilities and contribute to the survival and development of the entire community.

3.3. Action Value

Human actions and contributions, such as helping others, sharing knowledge, and calm decision-making in times of trouble, are themselves valued. This is similar to "volunteer activity points" and "social contribution scores" on Earth, but in the space economy, these actions are institutionalized as a standard that can be directly exchanged for resources and services. For example, helping other crew members with their work, proposing new ideas, or transporting supplies from one point to another are all considered valuable.

3.4. Exchange Value

As an alternative to currency, the exchange rate used in bartering serves as a standard. For example, one liter of water needed on one space station can be traded for a certain amount of oxygen or electricity provided by another station, thus providing mutually complementary resources and services. This serves as a universal exchange index for facilitating the flow of goods between different entities and forms the basis of a space economy.

3.5. Circulation Value

Outer space is a closed system, and resource reuse and circulation are essential for survival. Technologies and actions that effectively process waste and convert it into reusable resources have value beyond monetary terms. A system for quantifying contributions to resource circulation will also become a new standard of value. This standard will provide an important incentive for minimizing environmental impact and maintaining sustainable space life.

3.6. Multidimensional Value as an Alternative to Currency

In this way, the value standard in the space economy should not be a substitute for "money," but should be constructed from a multifaceted perspective of existence, technology, action, exchange, and circulation. By quantifying and sharing the very existence of people and things, as well as the circulation of resources and actions, a truly sustainable, waste-free, and harmonious economy will be established.

4. ASTRAX VALUE: A New Framework for Value Standards in the Space Economy

The space economy proposed by ASTRAX requires a new system that treats people, things, actions, and

knowledge as value, rather than relying on traditional "money" or "ownership." This system is collectively called "ASTRAX VALUE," and it is envisioned that it will be treated like points.

4.1. From Ownership to Sharing

Space is a "shared space" without specific borders or ownership. People in space are treated like family, living in the same house. Therefore, resources and services are not monopolized, but are treated as mutually usable and exchangeable. This spirit of sharing is the foundation of the space economy.

4.2. ASTRAX VALUE as Points

ASTRAX VALUE is accumulated and used as "points," not as currency. These points and using ASTRAX U2U enable access to various resources and services in space. Importantly, these points are not simply earned as payment for labor, but are automatically generated through human presence and actions.

4.3. A System in which Everyone Can Become a Mint

The most revolutionary aspect of ASTRAX VALUE is that everyone can become a value creator and function as a "mint."

4.3.1. Existence

Humans' mere presence contributes to the community through diversity. For example, Japanese, American, male, female, young, elderly, people with disabilities, school teachers, engineers, and more—the mere existence in space creates value. This value of existence is a system that respects and values individual diversity, and incentives such as higher value for those who have existed earlier are also being considered.

4.3.2. Breathing

In the space environment, carbon dioxide (CO₂) emitted by humans through breathing is a valuable resource for the growth of plants and algae. Therefore, "breathing" is also considered a contribution to the closed ecosystem, and points are automatically awarded.

4.3.3. Smile

The easiest and most direct way to earn ASTRAX VALUE points is through "laughing." Smiles bring peace of mind and happiness to the community in the closed and stressful environment of space. This psychological and social value is automatically

quantified as points through image recognition and wearable devices.

4.4. A Space Economy Where Points Never Run Out

Being, breathing, and laughing—fundamental human actions—automatically generate points, so there's essentially no need to worry about "losing points." This system ensures that everyone living in space is a value creator, ensuring no one is excluded from economic activity. This has the potential to fundamentally eliminate the structural disparity between "haves and have-nots" inherent in capitalism on Earth.

4.5. Significance

ASTRAX VALUE is a system that ensures that everyone remains a value creator, rather than dividing people like a monetary economy. This new value standard, premised on sharing rather than ownership and circulation rather than scarcity, will serve as the foundation for a sustainable and harmonious society in the space economy.

4.6. Key Features of ASTRAX VALUE

- (1) **Use as Points:** Points can be used to access space resources and services.
- (2) **Denial of Ownership:** In space, the concept of "individual ownership" is eliminated, and the idea of family-like sharing is the basis.
- (3) **Everyone's Mint:** Points are automatically generated by simply existing, breathing and laughing.
- (4) **An Economy Where Points Never Disappear:** Value is directly linked to everyday actions, preventing the widening of inequality.

5. How to Use ASTRAX VALUE

5.1. Integration of ASTRAX USP and ASTRAX VALUE

ASTRAX VALUE is intended to be used through the ASTRAX USP provided by ASTRAX. This platform integrates a range of services available both on Earth and in space, including booking space travel, experiencing zero-gravity flight, purchasing land on the Moon or Mars, taking space education courses, and various services provided in space.

In the early stages of the service, payments may primarily be made in Earth currency, but the ASTRAX

VALUE accumulated during this process will gradually be used for bartering and service use in space. In the future, we aim to achieve a smooth exchange of value using ASTRAX VALUE earned by individuals providing value and the VALUE accumulated to date.

Phase 1 (Initial): Use services with Earth currency. ASTRAX VALUE is awarded.

Phase 2 (Mid-term): Use space and Earth services with accumulated ASTRAX VALUE. Barter becomes widespread.

Phase 3 (Long-Term): Astrax VALUE is established as a shared value throughout the solar system. A true circular economy is established.

5.2. Utilization of Blockchain Technology

ASTRAX VALUE is intended to be managed using blockchain technology to ensure transparency and reliability. This prevents unauthorized increases and decreases in points and securely records all value creation and exchanges on a distributed ledger. Specific management methods and protocol details will be further explored in the future.

5.3. ASTRAX U2U Management Tool

ASTRAX U2U will be the primary user interface for saving, using, and managing ASTRAX VALUE. This application is being developed as a universal tool for accessing a variety of space-based services, and will also include features for checking ASTRAX VALUE balances and managing exchange history.

6. Future Plans and Demonstration Experiments

6.1. Development of ASTRAX USP and ASTRAX U2U

ASTRAX USP and ASTRAX U2U are currently in the prototype stage, undergoing phased development. As these platforms and systems become fully operational, we will implement ASTRAX VALUE and expand its functionality.

6.2. Demonstration Experiments and Applications Using SMIRAL

The author of this paper is the representative of ASTRAX and also serves as a director of the One Smile Foundation, a general incorporated association in Japan. This organization has developed a system (app) called "Smiral" (One Smile Foundation System), which

automatically counts smiles and automatically makes donations based on the count (see Reference [21] for details). This system is currently undergoing demonstration experiments across Japan. Smiral's technology will be applied to ASTRAX VALUE's "smile valuation" initiative in the future. This concept of measuring smiles as value and incorporating them into the space economy embodies the fundamental philosophy of ASTRAX VALUE.

7. Conclusion

As human space exploration becomes more commonplace, our living and economic spheres will irreversibly expand into space. Currently, various activities are conducted as an extension of Earth's economic system. However, if new civilizations emerge on the Moon or Mars and the number of people living there increases, the possibility of a struggle for dominance over Earth, the Moon, Mars, and the space between them cannot be denied. If each celestial body were to form its own independent economic sphere, such conflict would be inevitable. However, if we were to treat the entire solar system as a single economic sphere from the beginning and build a system for living within a common economic system, such problems would likely not arise.

Furthermore, because space is a closed system with limited resources, a fully circular ecosystem in which everything is reused, shared, and bartered is essential. This would eliminate concepts such as buying, selling, and ownership, and would also eliminate inequality and excessive competition.

To achieve this, we must fundamentally reconsider what kind of economic, industrial, and social systems are appropriate for space. ASTRAX explores the possibility of building an economic system based on an entirely new concept of universal survivalism, in which all human activities, from birth to death, are not an extension of the monetary economy on Earth. Rather, it is distinct from existing ideologies such as capitalism, socialism, and communism. This concept aims to create an environment in which everyone can equally learn and take on new challenges, while ensuring a minimum standard of living through a universal basic income.

To maintain the universe as a peaceful, free, and equal space, which is yet to be managed or governed by anyone, ASTRAX believes that we must conceive and realize the concept of a new space economic sphere that is completely different from a simple expansion of the Earth's economic sphere. The ASTRAX VALUE

proposed in this paper is the first step toward realizing this grand vision.

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宇宙での生活をサポートするための宇宙価値基準: ASTRAX VALUE の紹介

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Abstract

Space travel for the general public has become a reality, and an era in which many people travel to space every year is upon us. For nearly 20 years since 2005, ASTRAX has been preparing for the arrival of the era of private space travel by launching and developing a variety of services and products necessary for the general public to travel to space. As of 2024, we have deployed over 200 space services. Furthermore, we have developed ASTRAX U2U (Universal User Interface), a general-purpose application tool to efficiently provide these services and enable users to use them smoothly, and ASTRAX USP (Universal Service Platform), a platform that integrates various services. We have also proposed and developed the concept of ASTRAX VALUE as a new standard of value essential for using these services.

This paper presents the necessity and role of ASTRAX VALUE, a space value standard required for the preparation, education, and training of space tourists and space residents, as well as for actual spaceflight and space life, and the convenience of a new space economy (living sphere) that it will bring. This will be the foundation for building a sustainable and harmonious space society that is distinct from the conventional terrestrial economic sphere.

Keywords: ASTRAX VALUE, ASTRAX USP/U2U, space economy, space value standard, circular ecosystem, universal human resources

アブストラクト

世界では、一般市民による宇宙旅行が現実のものとなり、毎年多くの人々が宇宙へと旅立つ時代が到来しています。ASTRAX は、2005 年以来約 20 年にわたり、民間宇宙旅行時代の到来に備え、一般人が宇宙に行く際に必要となる多様なサービスを立ち上げ、商品の開発を進めてきました。2024 年現在、200 以上の宇宙サービスを展開しています。さらに、これらのサービスを効率的に提供し、利用者がスムーズに活用できるようにするための汎用アプリケーションツールである ASTRAX U2U (Universal User Interface) や、様々なサービスを統合するプラットフォームである ASTRAX USP (Universal Service Platform) を開発しています。また、それらを利用する上で不可欠な新しい価値基準として、ASTRAX VALUE の概念を提唱し、その整備を進めてきました。

本論文では、宇宙旅行者や宇宙居住者のための準備、教育、訓練、そして実際の宇宙飛行や宇宙生活に必要な宇宙価値基準 ASTRAX VALUE の必要性、その役割、そしてそれがもたらす新たな宇宙経済圏(生活圏)の利便性について発表します。これは、従来の地球経済圏とは一線を画す、持続可能で調和的な宇宙社会を築くための基盤となるものです。

キーワード: ASTRAX VALUE、ASTRAX USP/U2U、宇宙経済圏、宇宙価値基準、循環型エコシステム、ユニバーサル人材

Abbreviation

ASTRAX USP: Universal Service Platform
ASTRAX U2U: Universal User Interface

1. はじめに

2021 年以降、SpaceX、Virgin Galactic、Blue Origin といった民間企業によって、一般市民向けの有人宇宙飛行サービスが本格的に開始されました。これにより、国籍、人種、性別、年齢、職業、そして障害の有無といったあらゆる垣根を越え、多様な人々が宇宙へと飛び立つ時代が到来しました。この流れは今後さらに加速し、宇宙は限られた専門家だけでなく、誰もがアクセスできる領域へと変貌していくと予想されます。

ASTRAX は、このような民間宇宙旅行時代の到来をいち早く見据え、2005 年から 200 以上の宇宙関連サービスを開発・提供してきました。同時に、宇宙という特殊な環境で活躍できるユニバーサル人材の育成にも力を入れてきました(参考文献【29】参照)。今後、宇宙に行く人々が爆発的に増加するにつれて、宇宙での生活におけるニーズは一層多様化・複雑化し、教育、健康管理、生活支援といった多岐にわたる領域の重要性が増すことが明らかです。

このような背景のもと、ASTRAX は宇宙における需要と供給を効率的にマッチングさせるためのシステム構築を進めてきました。その中核となるのが、ASTRAX USP (Universal Service Platform)(詳細は参考文献【6】【13】【15】【25】を参照)と、それを誰もが直感的に利用できる汎用アプリケーションツール ASTRAX U2U (Universal User Interface)です。(詳細は参考文献【6】【22】【51】【95】参照)

本論文では、この ASTRAX USP や ASTRAX U2U を円滑に運用する上で不可欠となる、貨幣価値を超えた新たな宇宙価値基準「ASTRAX VALUE」の必要性和意義について、その具体的な枠組みとともに詳述します。

2. 宇宙経済圏における価値基準の必要性

人類は今、地球という限られた空間での経済活動から、宇宙空間へとそのフロンティアを拡張しようとしています。民間による宇宙旅行、宇宙居住、さらには月面や火星の開拓といった新たな産業が生まれる中で、従来の貨幣価値を基盤とした地球中心の経済モデルでは対応しきれない課題がいくつも浮上しています。

2.1. 国家通貨の限界

第一に、地球上の通貨制度は国家主権を前提としています。しかし、宇宙は特定の国家に属さない「国境なき空間」であり、特定の国家通貨を直接適用することは根本的に困難です。例えば、月面の土地や小惑星の資源を国際的な民間企業が取引する際に、米ドルや日本円といった特定国家の通貨に依存すれば、為替リスクや政治的干渉のリスクが拡大し、公平な取引が阻害される可能性が極めて高いです。宇宙における経済活動には、特定の国家に左右されない、普遍的な価値尺度が必要となります。

2.2. 貨幣では測れない価値の評価

第二に、宇宙での活動は、貨幣では測ることのできない経験的・存在的価値を数多く含んでいます。無重力での作業経験や、宇宙に特化した高度な技術、そして何よりも月や火星に初めて足を踏み入れるという行為そのものは、単なる金銭取引では換算できない、全く新しい価値を生み出します。これらを正當に評価し、共有するためには、従来の貨幣尺度を超越した、多角的な価値基準が不可欠です。

2.3. 多様な主体の参画と公平性

第三に、宇宙経済圏は、国家機関、民間企業、教育機関、研究者、そして個人旅行者に至るまで、極めて多様な主体によって構築されます。もし貨幣価値のみに依存すれば、地球上の経済格差がそのまま宇宙利用の格差に直結し、宇宙という普遍的な空間が持つ可能性を損なう危険性があります。宇宙をすべての人が平等にアクセスできる場所にするためには、教育、社会貢献、持続可能性、文化的創造といった非金銭的価値をも評価できる、多角的な基準を整備することが求められます。

2.4. 持続可能性の要請

以上の観点から、ASTRAX は、宇宙経済圏には「貨幣を超えた新しい価値基準」が必要不可欠であると考えています。それは単なる新しい仮想通貨の創設に留まるものではありません。経験、貢献、信頼、そして持続性といった多様な要素を体系的に組み込み、宇宙活動の評価や取引に反映させる枠組みです。こうした基準こそが、地球中心の経済論理を超えて、真に普遍的で持続可能な宇宙経済社会を築く礎となるでしょう。

3. 宇宙経済圏を支える 5 つの価値基準

ASTRAX は、宇宙経済圏を支える新たな価値基準を、以下の 5 つのカテゴリーに分類し、体系化しています。これらを総称して ASTRAX VALUE と呼び、貨幣に代わる多次元的な評価基盤として機能させることを目指しています。

- (1) **存在価値基準**: 人が「そこにいること」自体の価値
- (2) **知識・技術価値基準**: その人が持つ技能や専門知識
- (3) **行動価値基準**: 貢献や協力といった行為
- (4) **交換価値基準**: 資源やサービスの物々交換レート
- (5) **循環価値基準**: 資源の再利用やリサイクルへの貢献度

3.1. 存在価値基準 (Existence Value)

宇宙空間に存在する人そのものが価値を持つという考え方です。人はそこにいてだけで、コミュニティに安心感や幸福をもたらす笑顔を生み出し、あるいは呼吸によって排出される二酸化炭素が植物や藻類の循環システムに貢献します。その「存在」自体が宇宙コミュニティにとっての資産であり、まるでポイントのように自動的に蓄積される仕組みが想定されます。これは、全ての人間が価値を生み出す存在であることを保証する、根源的な価値基準です。

3.2. 知識・技術価値基準 (Knowledge & Skill Value)

宇宙経済圏においては、個人の知識や技術そのものが大きな価値を持ちます。宇宙という閉鎖的で極限的な環境では、限られたリソースの中で生き抜くために、高度な専門知識や技能が不可欠です。例えば、医療スキル、宇宙船の整備技術、閉鎖生態系の維持技術、あるいは教育能力は、従来の貨幣よりもはるかに重要な交換手段となる可能性があります。この価値基準は、個人の能力を最大限に活用し、コミュニティ全体の生存と発展に貢献することを促します。

3.3. 行動価値基準 (Action Value)

誰かを助ける、知識を共有する、トラブル時に冷静に判断する、といった人間の行動や貢献がそのまま価値となります。これは地球上での「ボランティア活動ポイント」や「社会貢献スコア」に似ていますが、宇宙経済圏では、その行動が資源やサービスと直接交換可能な基準として制度化されます。例えば、他のクルーの作業を手伝うこと、新しいアイデアを提案すること、あるいは物資をある地点から別の地点へ運ぶといった行為も、すべて価値として評価されます。

3.4. 交換価値基準 (Exchange Value)

貨幣の代替として、物々交換における「交換レート」が基準となります。例えば、ある宇宙ステーションで必要な水 1 リットルが、別のステーションが提供できる酸素一定量や電力と交換されるといった形で、資源やサービスの相互補完が行われます。これは、異なる主体間での流通を円滑にするためのユニバーサル換算指標として機能し、宇宙経済圏の基盤を形成します。

3.5. 循環価値基準 (Circulation Value)

宇宙空間は閉鎖系であり、資源の再利用と循環が生存のための絶対条件です。廃棄物を有効に処理し、再利用可能な資源へと変換する技術や行為は、貨幣以上の価値を持ちます。この「資源循環にどれだけ貢献したか」を数値化する仕組みも、新しい価値基準の一つとなります。この基準は、環境負荷を最小限に抑え、持続可能な宇宙生活を維持するための重要なインセンティブとなります。

3.6. 貨幣に代わる多次元的価値

このように、宇宙経済圏における価値基準は「お金」の代替ではなく、存在、技術、行動、交換、循環という多面的な視点から構築されるべきです。人や物の存在そのもの、そして資源や行動の循環を数値化し共有することによって、真に持続可能で無駄のない、調和の取れた経済圏が成立します。

4. ASTRAX VALUE: 宇宙経済圏における新しい価値基準の枠組み

ASTRAX が提唱する宇宙経済圏では、従来の「貨幣」や「所有権」に依拠するのではなく、人や物、行為や知識そのものを価値として扱う新しい仕組みが求められます。その総称を「ASTRAX VALUE」と呼び、ポイントのように扱うことを想定しています。

4.1. 所有から共有へ

宇宙は特定の国境も所有権も存在しない「共有の空間」です。宇宙に滞在する人々は、皆が一つの家に住む家族のような存在として位置づけられます。そのため、資源やサービスは独占されるものではなく、相互に利用・交換されるものとして扱われます。この共有の精神こそが、宇宙経済圏の根幹をなします。

4.2. ポイントとしての ASTRAX VALUE

ASTRAX VALUE は、貨幣ではなく「ポイント」として蓄積・利用されます。このポイントを使って、ASTRAX U2U を通じて、宇宙に存在するさまざまな資源やサービスへアクセス

セスすることが可能になります。重要なのは、このポイントが、単なる労働対価としてではなく、人間の存在や行為そのものから自動的に生み出される点です。

4.3. 誰もが「造幣局」になる仕組み

ASTRAX VALUE の最も画期的な点は、誰もが価値を創造する主体となり、「造幣局」として機能することです。

4.3.1. 存在すること (Existence)

人間がそこにいだけで、コミュニティに多様性という価値を提供します。例えば、日本人、アメリカ人、男性、女性、若者、高齢者、障がい者、学校の教師、エンジニアなど、あらゆる立場で宇宙に存在していることが価値を生み出します。この存在による価値は、個人の多様性を尊重し、評価する仕組みであり、存在したのが早いほど高い価値が与えられるといったインセンティブも検討されます。

4.3.2. 呼吸すること (Breathing)

宇宙環境では、人間が呼吸によって排出する二酸化炭素(CO₂)が、植物や藻類を育てるための貴重な資源となります。したがって「呼吸」もまた、閉鎖生態系への貢献とみなされ、ポイントが自動的に加算されます。

4.3.3. 笑うこと (Smile)

ASTRAX VALUE の最も簡単で直接的なポイント獲得方法は「笑うこと」です。笑顔は宇宙という閉鎖的でストレスの多い環境において、コミュニティに安心や幸福をもたらします。この心理的・社会的価値が、画像認識やウェアラブルデバイスを通じて自動的にポイントとして数値化されます。

4.4. ポイントがなくなる宇宙経済

存在する、呼吸する、笑う—人間が日常的に行う根源的な行為によって自動的にポイントが発生するため、「ポイントがなくなる」という心配は基本的に存在しません。この仕組みにより、宇宙に生きるすべての人が必ず価値を生み出す主体となり、経済活動から排除されることがなくなります。これは、地球上の資本主義が抱える「持つ者と持たざる者」という構造的な格差を根本から解消する可能性を秘めています。

4.5. 意義

ASTRAX VALUE は、貨幣経済のように人々を分断するのではなく、誰もが価値創造の主体であり続けることを保証する仕組みです。所有ではなく共有、欠乏ではなく

循環を前提としたこの新しい価値基準は、宇宙経済圏における持続可能で調和的な社会の基盤となります。

4.6. ASTRAX VALUE の主な特徴

(1) **ポイントとしての利用**: 宇宙資源やサービスの利用にポイントとして使える。

(2) **所有の否定**: 宇宙では「個別に所有する」概念ではなく、家族のように共有する考え方を基本とする。

(3) **誰もが造幣局**: 存在する、呼吸する、笑うだけでポイントが自動的に発生する。

(4) **ポイントがなくなる経済**: 日常的行為が価値に直結するため、格差の拡大を防ぐ。

5. ASTRAX VALUE の利用方法

5.1. ASTRAX USP と ASTRAX VALUE の連携

ASTRAX VALUE は、ASTRAX が提供する ASTRAX USP を通じて利用されることを想定しています。このプラットフォームは、宇宙旅行の予約、無重力飛行体験、月の土地や火星の土地の購入、宇宙教育の受講、宇宙で提供される各種サービスなど、地球と宇宙の両方で利用できるサービス群を統合します。

サービス開始初期は、地球上の通貨による支払いが主となるかもしれませんが、その過程で蓄積された ASTRAX VALUE は、宇宙空間での物々交換やサービス利用に徐々に活用されます。将来的には、個人が提供する価値によって得た ASTRAX VALUE と、これまでに蓄積した VALUE を使い、価値の交換が円滑に行われる状況を目指しています。

フェーズ 1 (初期): 地球の通貨でサービス利用。ASTRAX VALUE を付与。

フェーズ 2 (中期): 蓄積した ASTRAX VALUE で宇宙・地球のサービスを利用。物々交換が普及。

フェーズ 3 (長期): 太陽系全体の共通価値として定着。真の循環型経済を確立。

5.2. ブロックチェーン技術の活用

ASTRAX VALUE は、その透明性と信頼性を確保するために、ブロックチェーン技術によって管理されることを想定しています。これにより、ポイントの不正な増減を防ぎ、全

での価値創造と交換の記録を分散型台帳に安全に記録することができます。具体的な管理方法やプロトコルの詳細については、今後さらに検討を進めていく予定です。

5.3. ASTRAX U2U による管理ツール

ASTRAX VALUE を貯めたり、利用したり、管理するためのユーザーインターフェースとしては、ASTRAX U2U が主要なツールとなります。このアプリケーションは、宇宙空間の多様なサービスにアクセスするための万能ツールとして開発されており、ASTRAX VALUE の残高確認や交換履歴の管理機能も実装される予定です。

6. 今後の計画と実証実験

6.1. ASTRAX USP 及び ASTRAX U2U の整備

ASTRAX USP と ASTRAX U2U は、現在も段階的な整備を進めている試作段階にあります。今後、これらのプラットフォームとシステムを完全に実用化していく過程で、ASTRAX VALUE の実装と機能拡張を進めていきます。

6.2. SMIRAL による実証実験と応用

本論文の著者は ASTRAX の代表であり、また日本の一般社団法人 One Smile Foundation の理事も務めています。この団体は、笑顔の数を自動的にカウントし、その数に応じて自動的に寄付を行う「Smiral (スマイラル)」(One Smile Foundation System)という仕組み (アプリ) を開発し (詳細は参考文献【21】参照)、現在日本各地で社会実証実験を進めています。この Smiral の技術は、将来的には ASTRAX VALUE の「笑顔の価値化」に応用される予定です。笑顔を価値として計測し、宇宙経済に組み込むというこの構想は、ASTRAX VALUE の根源的な思想を具現化するものです。

7. 結論

人類の宇宙進出が一般化されるにつれて、私たちの生活圏や経済圏は宇宙へと不可逆的に拡大していきます。現時点では、地球の経済システムの延長線上で様々な活動が行われていますが、今後、月や火星に新たな文明が生まれ、そこで生活する人々が増えた時、地球と月と火星、そしてその間の空間に対する覇権争いが起こる可能性は否定できません。それぞれの天体で独自の経済圏が形成されれば、こうした衝突は避けられなくなるでしょう。しかし、最初から太陽系全体を一つの経済圏とし、共通の

経済システムで生活する仕組みを構築しておけば、こうした問題は起こらないと考えられます。

また、宇宙は資源が限られた閉鎖系であるため、あらゆるものが再利用・シェアリングされ、物々交換される完全循環型エコシステムが不可欠となります。これにより、売買や所有といった概念は不要となり、格差や過度な競争も解消されるはずです。

そのために、宇宙ではどのような経済システム、産業システム、社会システムが適切かを根本から考える必要があります。ASTRAX は、人が生まれ、成長し、亡くなるまでの全ての活動が、地球のような貨幣経済の延長ではなく、資本主義や社会主義、共産主義といった既存のイデオロギーとも異なる、全く新しい人類宇宙生存主義 (Universal Survivalism) に基づいた経済システムを構築する可能性を模索しています。これは、ユニバーサルベーシックインカムによって最低限の生活が保障された上で、誰もが平等に新しいことを学び、新しいことに挑戦できる環境を創出することを目指すものです。

まだ誰にも管理・統治されていない宇宙を、平和で自由で平等な空間に維持するために、地球の経済圏の単純な拡大とは全く異なる、新しい宇宙経済圏の理念を考え、実現させていく必要があると ASTRAX は考えます。この論文で提唱した ASTRAX VALUE は、その壮大なビジョンの実現に向けた第一歩となるものです。

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【58】Cleaning Methods for Reusing Clothes in Space,
宇宙で衣類を再利用するための洗浄方法

【59】How to Go to Space with Different Hairstyles,
さまざまなヘアスタイルで宇宙へ行く方法

【60】Research on Psychological Changes and Growth of Children through Education Related to Commercial Space Business,
商業宇宙事業に関連した教育による子どもの心理的変化・成長に関する研究

【61】What do they need for a space museum?,
宇宙ミュージアムに必要なものは？

【62】Establishment and development of a lunar community and activity space by children for children,
子どもによる子どものための月面コミュニティ・活動空間の構築と発展

【63】video editing services for space travellers,
宇宙旅行者のためのビデオ編集サービス

【64】technologies on a transparent restroom could be used for lunar habitats,
透明なトイレの技術は、月面基地にも応用できる

【65】ASTRAX Lunar City Project 2022,
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【66】The need for a space version of hand signals, a communication tool for space travelers,
宇宙旅行者のコミュニケーションツール、宇宙版ハンドシグナルの必要性

【67】Photography services and techniques required for space travel,
宇宙旅行に必要な写真撮影サービス・技術

【68】On images of the universe influenced by manga and anime,
マンガやアニメの影響を受けた宇宙像について

【69】A space education program to solve the shortage of commercial space teachers in Japanese schools,
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【70】How to capture the cosmic diversity that is coming,
これからやってくる宇宙の多様性をどう捉えるか

【71】The Role of Space Flight Attendants in Large, Long-duration Space Travel,
大規模・長期間の宇宙旅行におけるスペースフライトアテンダントの役割

【72】Proposal for a business model that enables and encourages older adults to travel to space,
高齢者の宇宙旅行を実現・促進するビジネスモデルの提案

【73】Development of ASTRAX Zero Gravity Aircraft Education and Training Simulator
ASTRAX 無重力飛行機教育訓練シミュレーターの開発

【74】Developing technology for drinking chilled carbonated beverages in space
宇宙で炭酸飲料を飲むための技術開発

【75】Development of commercial spacecraft education and training simulator using the Metaverse メタバースを利用した民間宇宙船教育訓練シミュレーターの開発

【76】Construction plan of ASTRAX LUNAR CITY Simulation Facility in Japan 日本における ASTRAX 月面シティシミュレーション施設の構築計画

【77】Development of the space toilet called "Space Benking" 2023
宇宙用トイレ「宇宙ベンキング」の開発 2023

【78】Introduction of commercial space R&D center "ASTRAX LAB" in Japan
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【79】Analysis of passengers' needs and demands of ASTRAX Zero Gravity Services and application for space travel services
無重力飛行サービスに対する乗客のニーズ・要望の分析と宇宙旅行サービスへの応用

【80】The senses and creativity that can be achieved by bringing entertainment in space
宇宙空間でエンターテインメントを実現することで得られる感覚と創造性

【81】Technology, problems and solutions for drinking alcohol in space
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【82】Technology, problems, and solutions for space travel meals as represented by "yakitori", grilled chicken
焼き鳥に代表される宇宙旅行での食事に必要な技術と問題点および解決方法

【83】The Possibility of Developing Japanese Culture through "NATTO" in Space
宇宙空間における納豆を通じた日本文化の展開の可能性

【84】Local revitalization project to turn my hometown, Komono Town, into "space town"
故郷の菰野町を「宇宙の町」にする地方活性化プロジェクト

【85】Methods and Practices for Introducing Private Space Education Programs into Japanese Schools
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【86】Astrology in the Space Age: What will happen to the horoscopes of those born on the Moon?
宇宙時代における占星術 月生まれの人のホロスコープはどうなるの？

【87】COMMERCIAL SPACE SUIT R&D CENTER "ASTRAX WAER LAB" 2024
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【88】DEVELOPMENT OF ASTRAX COMMERCIAL SPACECRAFT MISSION SUPPORT CONTROL CENTER IN JAPAN 2024
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【89】ASTRAX LUNAR CITY SIMULATION FACILITY CONSTRUCTION PLAN IN JAPAN 2024
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【90】EXPLORING THE CONCEPT AND POTENTIAL OF SPACE MUSEUMS FOR PRESERVATION, EDUCATION, AND TOURISM
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【91】DEVELOPMENT OF RAMEN EATEN IN SPACE 宇宙で食べるラーメンの開発

【92】THE POTENTIAL OF SPACE NFTS 宇宙 NFT の可能性

【93】UNIFORMS FOR PRIVATE SPACEFLIGHT MISSION COMMANDERS AND SPACE FLIGHT ATTENDANTS 民間宇宙飛行士ミッションコマンダーや宇宙フライトアテンダントの制服

【94】DEVELOPMENT AND EXPANSION OF NEW BEVERAGES FOR THE COMMERCIAL SPACE TRAVEL ERA 民間宇宙旅行時代の新たな飲料開発と展開

【95】A VERSATILE SPACE APPLICATION TOOL TO SUPPORT LIFE IN SPACE: INTRODUCTION TO ASTRAX U2U 宇宙での生活をサポートするための

万能宇宙アプリケーションツール: ASTRAX U2U (Universal User Interface)の紹介

【96】A SPACE VALUE STANDARD TO SUPPORT LIFE IN SPACE: INTRODUCTION TO ASTRAX VALUE 宇宙での生活をサポートするための宇宙価値基準: ASTRAX VALUE の紹介

【97】DEVELOPMENT OF ASTRAX SPACE MISSION SUPPORT CONTROL CENTER 2025ASTRAX 民間宇宙船運用支援管制センターの開発 2025

【98】ASTRAX LUNAR CITY PROJECT 2025ASTRAX 月面シティプロジェクト 2025

【99】CONSTRUCTION PLAN OF ASTRAX LUNAR CITY SIMULATION FACILITY IN JAPAN 2025 日本における ASTRAX 月面シミュレーション施設の構築 2025

【100】IMPLEMENTING A RURAL REVITALIZATION PROJECT TO TURN MY HOMETOWN, KOMONO TOWN, INTO A 'SPACE TOWN' 故郷・菰野町を「宇宙のまち」に変える地域活性化プロジェクトの実施

【101】WHO GOVERNS SPACE MUSEUMS? LEGAL AND POLICY CHALLENGES IN THE NEW SPACE ERA 宇宙ミュージアムは誰が管理するのか？新たな宇宙時代における法的・政策的課題

【102】ESTABLISHING A CULTURE OF DRINKING IN SPACE: REALIZING A BEER EXPERIENCE IN SPACE EQUIVALENT TO THAT ON EARTH 宇宙での飲酒文化の確立: 地上と変わらないビール体験を宇宙で実現する

【103】SPACE BUSINESS DEVELOPMENT EDUCATION AND TRAINING ACADEMY: ASTRAX ACADEMY 2025 民間宇宙事業創造教育訓練機関 ASTRAX ACADEMY について 2025