Scenario Identifier: S1
Short Description: Big Brother is Watching

Summary (*write this last, 2-4 sentences from Scenario Description and Additional Narrative*):
An autocratic ruler enforces strict resource allocation policies in a civilization strained by deepening scarcity. The biosphere declines dangerously as the technosphere metastasizes outwards. Earth has been transformed into a large interconnected and highly-monitored urban landscape. Large populations of elites live in space settlements.

Unique Inputs for Each Scenario

These are defined from the morphological matrix and cross-consistency assessment. Copy the corresponding GF and TF descriptions into the boxes below.

Global Factors (GF)			Technology Factors (TF)		
Identifier	GF1		Identifier	Cluster 6 (TF5)	
Myth	Philosopher-king		Myth	Earth 2024	
Archetype	Discipline / Collapse		Relationship	A4	Some common elements
Economy	X1	Scarcity	Distribution	B1	Unipolar
Politics	Y1	Rule by one	Development	C1	Evolved and emergent
Society	Z1	Hierarchical	Order	D2	Second-order
			Scale	E2	Nanometer to micrometer

Basic Assumptions

These are fixed for all scenarios. Any changes made here should be propagated to all others.

1. Humans have not gone extinct.
2. Humans have not speciated.
3. Humans are the only terrestrial animal capable of producing technology.
4. No extraterrestrial technology has interfered with human technological development.
5. Future timescale: 1000 years

Scenario Description

This is generated by Claude based on the scenario inputs and basic assumptions.

In this future scenario, an autocratic Philosopher Ruler enforces strict resource allocation policies in a civilization strained by deepening scarcity. As the apex of a rigid social hierarchy, this enlightened despot rations increasingly scarce supplies based on paternalistic visions of the collective good. However, distribution channels misalign with common needs as more flows are redirected upwards to sustain elite extravagance dressed as noblesse oblige.

The biosphere declines dangerously as the technosphere metastasizes outwards, engorged by rapacious extraction systems shuttling vital stocks into fortified elite centers. Wilderness survives only in marginal refugia, while pervasive technospheric dominance severs reciprocal links between people and ecology. Nano-infrastructures penetrate all facets of lived experience, enforcing the Philosopher King's rule down to textured detail.

Technological innovation proceeds under the aligned vision of the Philosopher King actualized through dynastic megaprojects for power projection. Tight central oversight locks away decentralizing technologies in favor of perfecting systems of coercion, surveillance and manufactured precarity keeping non-elites fighting amongst each other to survive. Intricate resource control nano-networks facilitate elite interests but risk systemic cascading collapse unknown to the supreme ruler.

Tensions simmer as masses chafe under dehumanizing technospheric systems benefiting distant elites. Stability reigns but remains fundamentally vulnerable as tensions bubble under the surface. The precarious system runs on the myth of the virtuous Philosopher King who nobly guides collective destiny - yet widening divergence from street realities initiates the cycle of decline that has toppled convinced civilizations.

While crystalline towers and hyperloop vacuum tubes entrance elite habitats, life unfolds down below in creaking communal blocks congested by permanent shortages. Sophisticated AI coordination dynamically rations resources for the greater good, the banner ads proclaim. Citizens would comply if only visions matched ground realities - but when even benevolent systems misalign by wide-enough margins from hopes, rule by philosopher kings cannot escape the tragic arc repeated across millenia. And so in dank alleyways and makeshift undergrounds, whispers spread of another way aligned to human thriving. Networks quietly rewire relationships based on ecology's wisdom - locality, diversity, modularity.

Additional Narrative

Based on the identified myth and archetype, provide any narrative details needed to explain the sequence of events from present-day Earth to the future scenario

Geopolitical and economic power consolidates at a global level, beginning with the dissolution of the UN security council and the expansion of powers of the Secretary-General. Political unification under an expansive UN governance also subsumes control over other large private entities, to the extent that all commerce and political decisions are either decided by or monitored by the global government.

Large technology companies are among the first industries to integrate with the global geopolitical government, which gained popular support under the guise of enabling widespread democratic participation through AI representation in government. The AI governance experiment was adopted too quickly and led to an unforeseen concentration of government power and AI-driven push toward global centralization.

The central governance places heavy investment in spreading the technosphere to the outermost parts of the solar system. Those who travel there are elites who are assigned for such privileged positions by the government, or workers who have demonstrated capability and loyalty.

Earth has been transformed into a large interconnected urban landscape. Almost no one lives in a rural or agrarian lifestyle, even those in active resistance of the global government.

Planetary Bodies

Describe the planetary bodies that are most relevant to the biosphere and technosphere.
This should always include Earth and typically will include the Moon and Mars. Consideration of the Asteroids may be relevant to most scenarios, as well as Venus and the Outer Planets.
Any additional planetary bodies can be added as a new column, but the number of columns should not greatly exceed ten.

Planetary Body	Earth	Moon	Mars	Venus	Asteroids	Outer Planets
Is this a planetary "pole"? (distribution factor B)	Yes	No	No	No	No	No
Is this part of the biosphere, technosphere, both, or neither?	Both	Both	Both	Both	Both	Both
Population of each body	30 billion	300 million	30 million	300,000	3 million	300,000
Additional narrative	Population swells due to increased technological capacities but population levels are tightly controlled. Fertility rates remain constant everywhere, except in areas of active resistance against the global government.	Inhabited lunar settlements with regular flights to/from Earth	Inhabited martian settlements with some industry and tourism	Large floating cities on Venus are maintained as symbols of power projection	AI-driven asteroid mining with human settlements	Inhabited settlements on large moons and on large recreational interplanetary "cruise" spaceships are available for elites and maintained as symbols of power projection

Human Needs

What are the operational dimensions of human needs in this scenario?

Needs may be met at the planetary scale, regional scale, or both. We proceed below by iterating between the tables describing needs that are satisfied/dissatisfied at the planetary scale and the regional scale. Not all boxes in these tables must be completed.
The minimum requirement for completion is for all needs 1 and 2 to be satisfied in at least the planetary scale for each planetary body that is part of the technosphere.

For further detail on the Human Scale Development framework, see:
https://journals.sagepub.com/doi/full/10.1177/00420980211045571 (Table 3)

Planetary-scale satisfaction/dissatisfaction of human needs

Briefly describe any human neets that are met (or unmet) at the planetary scale primarily through the physical part of the technosphere.

Planetary Body	Earth	Moon	Mars	Venus	Asteroids	Outer Planets
1. Subsistence [required] ***(Physiology, Shelter, Mobility).*** *Energy, air quality, food systems, housing, transportation*	Energy infrastructure: fusion (primary) + solar/wind/geothermal and other renewables. Several energy departments are maintained by the central government to account for the needs of different social classes and regions. Power blackouts are more common in lower class urban areas than those for elites. Sufficient food available for elites, produced by high-yield automated agriculture, but some shortages of luxury good are becoming apparent. All citizens are issued government rations for subsistence. Resistance groups maintain illegal indoor agriculture facilities. Little arable land remains.	Fusion power, space-based solar power. Water ice ISRU. Regolith ISRU. Closed-loop life-support systems including food production. Government agencies operating mining and tourism agencies. Transportation from/to Earth of humans and rare resources (e.g., He3 to Earth and Mars).	Fusion power, space-based solar power. Water ice ISRU. Regolith ISRU. Closed-loop life-support systems including food production. Government agencies operating mining and tourism agencies. Transportation from/to Earth of humans and rare resources. Transportation of water ice from the asteroids.	Fusion power, space-based solar power. Government agencies operating tourism for elites in floating cities. Closed-loop life-support systems including food production.	Fusion power. Government agencies operating AI-driven mining with human settlements. Closed-loop life-support systems including food production.	Fusion power. Government agencies operating tourism for elites on moons and on large spacecraft. Closed-loop life-support systems including food production.
2. Protection [required] ***(Health, Security, Safety).*** *Health care, environmental quality, disease transmission, police, safety, communication, defense, resilience*	Everything is under monitoring and surveillance, run by AI and managed by government agencies. The built environment is optimized for air quality and other health factors. AI agents lead police efforts. Formal crime is low (aside from resistance efforts), and consequences are high for illegal activities. Financial crime is almost non-existent due to digitization of all currency and centralization of identity verification. War no longer exists in the modern sense. But resistance groups attempt violent and nonviolent means of gaining autonomy within the urban infrastructure managed by the global government. Space weather monitoring/defense, planetary defense, and space debris monitoring	Everything is under monitoring and surveillance, run by AI and managed by government agencies. The built environment is optimized for air quality and other health factors. AI police enforcement is relaxed compared to Earth, but still present. Space weather monitoring/defense, planetary defense, and space debris monitoring	Everything is under monitoring and surveillance, run by AI and managed by government agencies. The built environment is optimized for air quality and other health factors. AI police enforcement is relaxed compared to Earth, but still present. Space weather monitoring/defense, planetary defense, and space debris monitoring	Everything is under monitoring and surveillance, run by AI and managed by government agencies. The built environment is optimized for air quality and other health factors. AI police enforcement is relaxed compared to Earth, but still present. Space weather monitoring/defense, planetary defense, and space debris monitoring	Everything is under monitoring and surveillance, run by AI and managed by government agencies. The built environment is optimized for air quality and other health factors. AI police enforcement is relaxed compared to Earth, but still present. Space weather monitoring/defense, planetary defense, and space debris monitoring	Everything is under monitoring and surveillance, run by AI and managed by government agencies. The built environment is optimized for air quality and other health factors. AI police enforcement is relaxed compared to Earth, but still present. Space weather monitoring/defense, planetary defense, and space debris monitoring
3. Affection ***(Intimacy, Aesthetics).*** *Isolation/loneliness, meeting spaces, social amenities, build environment, heritage preservation, biodiversity*						
4. Understanding ***(Knowledge, Innovation).*** *Knowledge institutions, entrepreneurship, interaction spaces*						
5. Participation ***(Community, Society).*** *Meeting spaces, community centers, religious spaces, public spaces, symbolic spaces*	Government stadiums to host speeches and global sporting events become central foci in large urban centers. Interfaith religious centers are sponsored by the government to promote cultural unity. Underground religious communities comprise a segment of resistance groups.					
6. Leisure ***(Recreation, Relaxation).*** *Knowledge institutions, entrepreneurship, interaction spaces*	All educational systems are managed by government agencies. All curriculum content is digital and moderated by AI. Resistance groups own the few book collections that remain, aside from stores in government vaults. Digitized collections of government-approved books are widely available. Entrepreneurship only exists in fringe resistance groups, primarily for handicrafts. No business exists outside of a government agency.					
7. Creation ***(Creativity, Productivity).*** *Collective interaction spaces, media outlets, firms, incubators, digital infrastructure, business districts*						
8. Identity ***(Belonging, Recognition).*** *Heritage, monuments, symbols, urban structure, public spaces, public institutions*	Lavish use of resources for power projection in urban spaces. Expansive public parks and monuments are everywhere. Constellations of orbital reflectors form the Ruler's sign of power in the sky.	Lavish use of resources for power projection in urban spaces. Constellations of orbital reflectors form the Ruler's sign of power in the sky.	Lavish use of resources for power projection in urban spaces. Constellations of orbital reflectors form the Ruler's sign of power in the sky.	Lavish use of resources for power projection in urban spaces. Constellations of orbital reflectors form the Ruler's sign of power in the sky.	Lavish use of resources for power projection in urban spaces.Constellations of orbital reflectors around the largest asteroids form the Ruler's sign of power in the sky.	Lavish use of resources for power projection in urban spaces. Constellations of orbital reflectors form the Ruler's sign of power in the sky. An orbiting METI beacon at one of Neptune's Lagrange points is tended to by robotic AI with an encoded self-defining message that declares the greatness of the global government.
9. Freedom ***(Autonomy, Liberty).*** *Welfare systems, social policies, political system, governance institutions, traditional practices*	A global government enforces its codified policies for all aspects of life. Individual freedom of speech and expression are highly suppressed. Traditional practices are only maintained by fringe resistance groups, and only in rudimentary form. Social policies are focused on maintaining order in the global urban landscape.	Inhabitants are all successful government elites or loyal government employees. Local planetary policies are intended to provide a rewarding experience for visitors. Laws remain the same as Earth, but few (if any) resistance members ever visit.	Inhabitants are all successful government elites or loyal government employees. Local planetary policies are intended to provide a rewarding experience for visitors. Laws remain the same as Earth, but few (if any) resistance members ever visit.	Inhabitants are all successful government elites or loyal government employees. Local planetary policies are intended to provide a rewarding experience for visitors. Laws remain the same as Earth, but few (if any) resistance members ever visit.	Inhabitants are all successful government elites or loyal government employees. Local planetary policies are intended to provide a rewarding experience for visitors. Laws remain the same as Earth, but few (if any) resistance members ever visit.	Inhabitants are all successful government elites or loyal government employees. Local planetary policies are intended to provide a rewarding experience for visitors. Laws remain the same as Earth, but few (if any) resistance members ever visit.

Regional-scale satisfaction/dissatisfaction of human needs

This section is optional and should be used if needed to capture sub-planetary scale effects, such as a planet with significant factions.
Briefly describe any human neets that are met (or unmet) at a regional scale primarily through the physical part of the technosphere.

Planetary Body	Earth	Moon	Mars	Venus	Asteroids	Outer Planets
Additional narrative for regions	Resistance groups all live within the global urban landscape. Little arable land exists, and attempts at agriculture have all failed. Most members of resistance groups still rely on government rations for survival.					
Needs for each region						

Land Use and Human Biomes

For each planetary body, describe the relative fraction of land area utilized for each of the purposes below.
Provide any other details needed for understanding the purpose for the allocations.

Reference data for Earth in 2019 is from the UN FAO (link to figure)
Percentages should be calculated based on the total planetary surface, including ice and water.

Planetary Body	Earth	Moon	Mars	Venus	Asteroids	Outer Planets
Agricultural Land Use (9.5% in 2019)	13% (all in urban controlled environment settings)	~22.5% (controlled environment)	~0.063% (controlled environment)	0	~0.003% (controlled environment)	0
Urban Land Use (0.2% in 2019)	16% (global-scale urban landscape, total population 30 billion)	~7.5% (assuming 100 people / square km and a total of 300 million people on the Moon)	~0.021% (assuming 100 people / square km and a total of 30 million people on Mars)	0	~0.001% (assuming 100 people / square km and a total of 3 million people on the largest bodies: Ceres, Vesta, Pallas, and Hygiea)	~10 settlements of 10,000 people in various outer solar system locations. Some are on the surfaces of moons and others are orbiting structures. Land use footprint is negligible
Other Built Structures (0% in 2019) *including aquatic, i.e., floating cities*	2% (aquatic)	~0.75%	~0.0021%	One major floating metropolis in the atmosphere of Venus, land use footprint is negligible.	Close to 0	~100 large recreational spaceships with about 2000 people each, land use footprint is negligible
Wilderness (90.3% in 2019) *Refers to all areas uninhabited by humans and outside the technosphere*	69% (almost entirely ocean)	69.25%	99.9139%	Close to 100%	Close to 100%	Close to 100%

Describing the Technosphere

For each planetary body, describe the physical components of the technosphere. Consider contributions from planetary and regional scales in the tables above.

Planetary Body	Earth	Moon	Mars	Venus	Asteroids	Outer Planets
Urban Technosphere	Large planetary-scale urban landscapes, connecting all continents. All food production is integrated fully within the lived environment. Advanced mass transit systems are widely utilized for regional and global travel. Ground segment of a space elevator that connects the Earth's surface to LEO, facilitating mass transit to and from Earth.	Mining infrastructure and lavish recreational facilities	Mining infrastructure and lavish recreational facilities	NA	Mining infrastructure and lavish recreational facilities	Lavish recreational facilities
Rural Technosphere	Little arable land, attempts at subsistence farming generally fail. Most land is part of the global urban landscape.	Nuclear fusion units, space-based solar power collectors, controlled environmental agriculture domes, ISRU units (incl. He3), localized waste masses relate to the ISRU	Nuclear fusion units, space-based solar power collectors, controlled environmental agriculture domes, ISRU units (incl. He3), localized waste masses relate to the ISRU	NA	Nuclear fusion units, space-based solar power collectors, controlled environmental agriculture domes, ISRU units (incl. He3), localized waste masses relate to the ISRU. AI mining infrastructure	Nuclear fusion units, space-based solar power collectors, controlled environmental agriculture domes, ISRU units (incl. He3), localized waste masses relate to the ISRU
Subterranean Technosphere	Swarms of autonomous robotic patrols preventing the settlement of resistance groups in underground spaces	Protected facilities in lava caves	Protected facilities in lava caves	NA	Protected facilities within asteroid caves	Underground settlement on Triton
Marine Technosphere	Lavish underwater recreational facilities. Extensive deep seabed mining.	NA	Recreational facilities on martian ice caps	NA	NA	Underwater settlement on Europa
Aerial Technosphere	Atmospheric pollution from industry. Drones and high-altitude platform stations. Upper atmospheric aerosol contaminated with heavy metals from deorbited satellites	Atmospheric pollution from industry, leaked gasses (O2), fine regolith aerosol Upper atmospheric aerosol contaminated with heavy metals from deorbited satellites	Leaked gasses (O2), fine regolith aerosol Upper atmospheric aerosol contaminated with heavy metals from deorbited satellites	Large floating metropolis with lavish facilities Upper atmospheric aerosol contaminated with heavy metals from deorbited satellites	NA	NA
Orbital Technosphere	Conventional satellites, Solar power satellites, debris, debris-hunting spacecraft, space stations, planetary defense satellites, defense from solar flares satellites, orbital reflectors that form the Ruler's sign, Space segment of a space elevator that connects the Earth's surface to LEO	Conventional satellites, Solar power satellites, debris, debris-hunting spacecraft, space stations, planetary defense satellites, defense from solar flares satellites, orbital reflectors that form the Ruler's sign	Conventional satellites, Solar power satellites, debris, debris-hunting spacecraft, space stations, planetary defense satellites, defense from solar flares satellites, orbital reflectors that form the Ruler's sign	Conventional satellites, Solar power satellites, debris, debris-hunting spacecraft, space stations, planetary defense satellites, defense from solar flares satellites, orbital reflectors that form the Ruler's sign	Debris, debris-hunting spacecraft, space stations, planetary defense satellites, defense from solar flares satellites, AI mining infrastructure, orbital reflectors that form the Ruler's sign	Large orbiting recreational spacecraft "cruise ships" for elite tourists, orbital reflectors that form the Ruler's sign
Deep Space Technosphere	Interplanetary routes	Interplanetary routes	Interplanetary routes	Interplanetary routes	Interplanetary routes	Interplanetary routes METI beacon: omnidirectional radio signals + directed laser signals toward systems of interest

Technosignature Detectability

For each planetary body, describe the possible detectable technosignatures.
A technosignature is "detectable" if it could theoretically be resolved by known present-day technology (i.e., including unbuilt mission concepts).

Planetary Body	Earth	Moon	Mars	Venus	Asteroids	Outer Planets
Optical / UV Technosignatures	Surface alterations from vast and lavish urban centers, total population of Earth ~30 billion (cities encompass almost land on the entire planet); City lights from urban areas Atmospheric microplastics Laser emissions for communication with satellites and settlements on other planets Reflected sunlight from the Ruler's sign constellation Sulfur dioxide injections for solar radiation management	Leaked O2 in the atmosphere Fine regolith particles from industrial activities Surface alterations from inhabited settlements, population ~300 million total Laser emissions for communication with satellites and settlements on other planets Reflected sunlight from the Ruler's sign constellation	Leaked O2 in the atmosphere Fine regolith particles from industrial activities Surface alterations from inhabited settlements, population ~30 million total Laser emissions for communication with satellites and settlements on other planets Reflected sunlight from the Ruler's sign constellation	Laser emissions for communication with satellites and settlements on other planets Reflected sunlight from the Ruler's sign constellation	Fine regolith particles from industrial activities Surface alterations from inhabited settlements, population ~3 million total across the largest asteroids Laser emissions for communication with satellites and settlements on other planets Reflected sunlight from the Ruler's sign constellation	Surface alterations from inhabited settlements, population ~100,000 total across the largest moons Laser emissions for communication with satellites and settlements on other planets Continuous laser METI signals directed toward a catalog of the 100 nearest planets with possible biosignatures Reflected sunlight from the Ruler's sign constellation
Infrared Technosignatures	Atmospheric pollutants from industry (nearly all products are industrial/technological) Thermal "heat island" signatures of large urban areas covering all continents and some parts of the ocean Infrared excesses from operational satellites Upper atmospheric aerosol contaminated with heavy metals	Atmospheric pollutants from industry (nearly all products are industrial/technological) Thermal "heat island" signatures of settled areas Infrared excesses from operational satellites Upper atmospheric aerosol contaminated with heavy metals	Atmospheric pollutants from industry (nearly all products are industrial/technological) Thermal "heat island" signatures of settled areas Infrared excesses from operational satellites Upper atmospheric aerosol contaminated with heavy metals	Thermal "heat island" signature of the floating metropolis Infrared excesses from operational satellites Upper atmospheric aerosol contaminated with heavy metals	Thermal "heat island" signatures of settled areas Infrared excesses from operational satellites	Thermal "heat island" signatures of settled areas Infrared excesses from operational satellites Upper atmospheric aerosol contaminated with heavy metals
Radio Technosignatures	Solar power satellite transmission microwave beams Directed transmissions from surface stations to Earth-orbiting satellites, as well as drones & high-altitude platform stations, including wireless terrestrial telecommunications Directed transmissions by human operators for communication settlements on other bodies Active radar for planetary defense	Solar power satellite transmission microwave beams Directed transmissions from surface stations to moon-orbiting satellites Directed transmissions by human operators for communication settlements on other bodies Active radar for planetary defense	Solar power satellite transmission microwave beams Directed transmissions from surface stations to Mars-orbiting satellites Directed transmissions by human operators for communication settlements on other bodies Active radar for planetary defense	Solar power satellite transmission microwave beams Directed transmissions from floating metropolis to Venus-orbiting satellites Directed transmissions by human operators for communication settlements on other bodies	Directed transmissions by human operators for communication with settlements on other bodies	Directed transmissions by human operators for communication settlements on other bodies Continuous radio METI signals broadcast omnidirectionally
Artifact Technosignatures	Orbiting satellites ("Clarke exobelt") with density 1 million times greater than Earth 2023 Space elevator Interplanetary spaceflight to other solar system destinations	Orbiting satellites ("Clarke exobelt") with density 100,000 times greater than Earth 2023 Interplanetary spaceflight to other solar system destinations	Orbiting satellites ("Clarke exobelt") with density 10,000 times greater than Earth 2023 Interplanetary spaceflight to other solar system destinations	Large floating metropolis structure visible in the atmosphere, population ~300,000 total Orbiting satellites ("Clarke exobelt") with density about 10 times greater than Earth 2023 Interplanetary spaceflight to other solar system destinations	AI-driven satellites to support mining facilities Orbiting satellites ("Clarke exobelt") around the largest asteroids with density about 1000 times greater than Earth 2023 Interplanetary spaceflight to other solar system destinations	Large recreational spacecraft "cruise ships", population ~200,000 across 100 ships Orbiting satellites ("Clarke exobelt") around the largest moons with density about 100 times greater than Earth 2023 Interplanetary spaceflight to other solar system destinations
Quantum Communication Technosignatures	None	None	None	None	None	None
Gravitational Wave Technosignatures	None	None	None	None	None	None
Other Technosignatures						

Recommendations for Technosignature Detection

Based on the table above, summarize the most salient prospects for detecting technosignatures from any of the planetary bodies in this scenario. In other words, what would the best strategy be to detect technosignatures from a system in the scenario as described above?