# NC

## K

#### Subjects are fundamentally unstable because of *evolution*: all subjects fluctuate as they continue to evolve. Babies become toddlers, teenagers become adults, all which prove evolution.

#### Affect is constitutive: it is the capacity to experience and to be experienced. In round, everyone has the capacity to experience each other. There is no way any person or thing can escape affection.

#### [Jones] The 1ACs rhetoric of inclusion via the state reinforces the narrative of a common humanity that oppresses deviant bodies. The aff believes that “passing a policy” is key to solving their impacts – they use legislation to determine what can and can’t be done with property. They use the words “common humanity” in their solvency advocate – the BIGGEST link to the K.

**Jones:** Jones, Henry Craig. [Writer at Society and Space] “Enclosing the Cosmos: Privatising Outer Space and Voices of Resistance” *Society and Space,* 2021. JP

“**Along with increasing interest from private actors, discussions surrounding the enclosure of Outer Space – and asteroid mining more specifically – has seen growing coverage in recent years, several countries having passed legislation to begin legalising and encouraging extraterrestrial extractivism** [5]. Manoeuvres to enclose the extraterrestrial common and begin mining operations necessitate the establishment of a rights regime to ensure any disputes over access and ownership can be resolved. This opens a regulatory ‘frontier’ through which issues of land tenure and ownership can be thrashed out, taking on significance through its ability to greatly influence influxes of capital into these operations and mineralogical deposits (Bridge, 2004). Through the regulatory enclosure of Outer Space, a regime of exclusion can be implemented whereby (il)legitimate forms of use and abuse can be differentiated and associated boundaries inscribed through physical and discursive means (Li, 2014: Steinberg, 2018).” Private NSE actors have sought to influence these legislative processes through lobbying, advertising materials, press conferences, business forums, and public and private talks. **This has culminated in a process of enclosure wherein similar justifications to past enclosures are mobilised and reanimated. Once more, ‘production’ and the ability to ‘work’ a resource are becoming the modus operandi through which ownership over the common is being exerted (Wood, 2017), finding explicit articulation in the US SPACE Act 2015.** The mobilisation and perpetuation of this discourse is coupled with the perversion of the common heritage principle. **To refrain from extracting minerals throughout Outer Space is to (supposedly) ‘waste’ their potential and deprive future generations of the benefits this industry purports to provide (Steinberg, 2018).**

#### [Rodriguez] And colonialism happened in the name of “justice” – it fuels the Western conception of humanism.

**Rodriguez**: Rodriguez, Anthony. [Writer and educator. He has a dual degree in Africana Studies and Modern Culture & Media from Brown University] “Introduction: On Sylvia Wynter and the Urgency of a New Humanist Revolution in the Twenty-First Century” *2018.* JP

Article after article amplifies the critical discourse on humanism that may be more associated with Black Skin, White Masks for some and The Wretched of the Earth for others, although Wynter’s ample corpus would mobilize the complete Fanon for decade after decade. Colonialism practices a “dehumaniza- tion rationally pursued” in “Algeria Face to Face with the French Torturers.”10 He scorns “these humanists” of Europe as they concern themselves with the “souls” and “honor” of the French soldiers who torture, not the actual Algerian men and women whom they torture and massacre historically.11 Fanon disdains “homo occidentalis” explicitly for “First Truths of the Colonial Problem.”12 “**Neo- colonialism,” he observes wryly, “because it proposes to do justice to human dignity in general, addresses itself essentially to the middle class and to the intellectuals of the colonial country.**”13 For his classic critique of the colonized elite famous from The Wretched of the Earth registers here too: Felix Houphouët- Boigny, for example, is not a “Man,” or a “man,” but an odious practitioner of what Fanon more than once mocks as “beni-oui-ouism”:14 “yes-man-ism” obstructing humanism proper. This is how Fanon repudiates the “oppressive” Western “standard” of humanity and the presumed “humanist superiority” of the West—for the vital, anti-colonialist project of “humanization”15—in his El Moudjahid articles that make up the mass of Toward the African Revolution. A profound prefiguration of Louis Sala-Molins’s Dark Side of the Light: Slavery and the French Enlightenment (2006) or Les Misère des lumières: Sous The “Rights of Peoples” against the “Monohumanism” of “Man” | 861 la raison, l’outrage (1992), Fanon’s rhetorical assault (or counterattack) from Algeria on the “Rights of Man” humanism of Franco-Western empire is far from an isolatable moment of these terribly underappreciated texts. The “right of peoples” is reiterated in its fullest form as the right of peoples “to self-determination.”16 The fresh appearance of Ecrits sur l’aliénation et la liberté (2015) / Frantz Fanon: Alienation and Freedom (2018) adds to the mix other El Moudjahid articles uncollected in the Toward the African Revolution collec- tion, such as his “Combat Solidaire” speech for Kwame Nkrumah’s All-African Peoples’ Congress in Accra, Ghana, in addition to his intervention for the Afro-Asian Conference in Conakry: “This is why we Algerians, on the eve of the important conference of this summit, maintain that international détente and the security of the world can only be achieved through national indepen- dence, the recognition in real terms of the right of peoples to self-determination, and the liquidation of the regimes of oppression.” Indeed, Fanon declared in Guinea in opposition to “Man” and its francocentric universalism: “the recovery of Algeria’s national sovereignty will not only be an Algerian victory, but an African victory, an Asian triumph, a step towards the realization of a free and joyful humanity.”17 **The happy, joyful humanity of Fanon should live a “reign of freedom” (and the “unconditional reign of Justice”),18 however resisted by the tacit—“miserable,” “outrageous”—Reign of Terror that French and all Western “revolutions” of slavery and colonialism represent by contrast, from Haiti then (in light of Les Misère des lumières) to Algeria’s Africa and beyond.** Scrupulous in approach, Wynter’s “Novel and History, Plot and Plantation” (1971) essay would start with a series of striking questions seeking to define terms: “What, in our context, is the novel? What, in our context, is history? What is our context?”19 El Moudjahid’s Fanon had rejected the totalizing history of the Republic of France toward a reassumption of history or historicity in the collective person of colonized peoples. He rewrites French-European history from Algeria, Africa, in terms of “130 years of colonialist oppression.”20 He re- casts that official history as “mythic” and a “systematic historical falsification.”21 Its “democracy” is reinscribed as “barbarism” in disguise. Renewed appeals to a false idea of a “common past” between European countries and their colonies (e.g., “French Union,” “Franco-African community,” “Eurafrica”) signfiy a ruse concocted to secure a “rejuvenated colonial pact” and to obscure what should be an authentic “historic process” in tune with the “demands” of “the peoples.”22 Typically, European colonialism claims rights in and over African territory without there being any rights of Africa or Africans to any territory anywhere. This tactic “alienates the African personality,” Fanon cautions in 862 | American Quarterly “Appeal to Africans,”23 continuing his signature quest for dis-alienation here on a macro-historical, geopolitical or political-economic plane. “Mono-historical,” as it were, this false strategy of French colonial “Man” sets the stage for neo- colonialism, propagating those “notorious” “Rights of the former occupant,” which are “wrenched from the people, as the price to be paid for a piece of independence,” a “puppet independence” in point of fact.24 Because he too asked, “What, in our context, is history?”—in El Moudjahid, no less, Fanon could demystify the history of “the Republic” and displace “the Revolution” of France and its “Rights of Man” so that “the Revolution” of world-historical reference becomes “our Revolution” as a rule—the Algerian Revolution, the African Revolution. Speaking of the “Anti-Colonial Revolutions” hailed by Wynter once again in “The Ceremony Found,” Fanon hails their “deeply human inspiration” as a “defeat for racism and for the exploitation of man.”25 **For “what the West has not in truth understood,” he explains in the “political essays” of Toward the African Revolution, “is that today a new humanism, a new theory of man is coming into being, which has its roots in man.”**26 This is the only humanism “that can be considered valid” in his “Letter to the Youth of Africa,” an address that actually embraces those of “Madagascar and the West Indies” in the self- same voice.27 These are texts from 1958. At least three and a half years, then, in advance of his historic proclamations in Les Damnés de la terre, Fanon’s FLN articles persistently echo the Aimé Césaire formulation that would become a familiar chorus for so many statements by Wynter: “**At the very time when it most often mouths the word, the West has never been further from being able to live a true humanism—a humanism made to the measure of the world.”28**

#### [Weheliye 1] Attempts to engage in this form of humanism furthers erasure – it restricts liminality and strengthens the state’s colonialist intentions.

**Weheliye 1**: Weheliye, Alexander. [Associate Professor of African American Studies at Northwestern University] ““Habeas Viscus: Racializing Assemblages, Biopolitics, and Black Feminist Theories of the Human” 2014. BP

Suffering, especially when caused by political violence, has long functioned as the hallmark of both humane sentience and of inhuman brutality. **Frequently, suffering becomes the defining feature of those subjects excluded from the law, the national community, humanity, and so on due to the political violence inflicted upon them even as it, paradoxically, grants them access to inclusion and equality.** In western human rights discourse, for instance, the physical and psychic residues of political violence enable victims to be recognized as belonging to the “brotherhood of Man.” **Too often, this tendency not only leaves intact hegemonic ideas of humanity as indistinguishable from western Man but demands comparing different forms of subjugation in order to adjudicate who warrants recognition and belonging.** As W. E. B. Du Bois asked in 1944, if the Universal Declaration of Human Rights did not offer provisions for ending world colonialism or legal segregation in the United States, “Why then call it the Declaration of Human Rights?”2 Wendy Brown maintains, “politicized identity” operates “only by entrenching, restating, dramatizing, and inscribing its pain in politics; it can hold out no future...that triumphs over this pain.”3 Brown suggests replacing the identitarian declaration “I am,” which merely confirms and solidifies what already exists, with the desiring proclamation “I want,” which offers a Nietzschean politics of overcoming pain instead of clinging to suffering as an immutable feature of identity politics. While I recognize Brown's effort to formulate a form of minority politics not beholden to the aura of wounded attachments and fixated almost fetishistically on the state as the site of change, we do well to recall that many of the political agendas based on identity (the suffragette movement, the movement for the equality of same-sex marriages, or the various movements for the full civil rights of racialized minority subjects, for instance) are less concerned with claiming their suffering per se (I am) than they are with using wounding as a stepping stone in the quest (I want) for rights equal to those of full citizens. Liberal governing bodies, whether in the form of nation-states or supranational entities such as the United Nations or the International Criminal Court make particular forms of wounding the precondition for entry into the hallowed halls of full personhood, only acknowledging certain types of physical violence. For instance, while the United Nations High Commissioner for Refugees passed a resolution in 2008 that includes rape and other forms of sexual violence in the category of war crimes, there are many forms of sexual violence that do not fall into this purview, and thus bar victims from claiming legal injury and/or personhood.4 Even more generally, the acknowledgment and granting of full personhood of those excluded from its precincts requires the overcoming of physical violence, while epistemic and economic brutalities remain outside the scope of the law. **Congruently, much of the politics constructed around the effects of political violence, especially within the context of international human rights but also with regard to minority politics in the United States, is constructed from the shaky foundation of surmounting or desiring to leave behind physical suffering so as to take on the ghostly semblance of possessing one's personhood. Then and only then will previously minoritized subjects be granted their humanity as a legal status.** Hence, the glitch Brown diagnoses in identity politics is less a product of the minority subject's desire to desperately cling to his or her pain but a consequence of the state's dogged insistence on suffering as the only price of entry to proper personhood, what Samera Esmeir has referred to as a “juridical humanity” that bestows and rescinds humanity as an individualized legal status in the vein of property. **Apportioning personhood in this way maintains the world of Man and its attendant racializing assemblages, which means in essence that the entry fee for legal recognition is the acceptance of categories based on white supremacy and colonialism, as well as normative genders and sexualities.**

#### [Ytasha] Thus, the alternative is to reject the aff and instead promote Black liberation through Afrofuturist appropriation of outer space.

**Ytasha**: Ytasha, Womack. [Writer and Advocate] “Afrofuturism : the world of black sci-fi and fantasy culture” *LibGen,* “Afrofuturism : the world of black sci-fi and fantasy culture”, 2013. JP

**Afrofuturism is an intersection of imagination, technology, the future, and liberation. I generally define Afrofuturism as a way of imagining possible futures through a black cultural lens,” says Ingrid LaFleur, an art curator and Afrofuturist. LaFleur presented for the independently organized TEDx Fort Greene Salon in Brooklyn, New York. “I see Afrofuturism as a way to encourage experimentation, reimagine identities, and activate liberation,” she said.1 Whether through literature, visual arts, music, or grassroots organizing, Afrofuturists redefine culture and notions of blackness for today and the future**. Both an artistic aesthetic and a framework for critical theory, Afrofuturism combines elements of science fiction, historical fiction, speculative fiction, fantasy, Afrocentricity, and magic realism with non-Western beliefs. **In some cases, it’s a total reenvisioning of the past and speculation about the future rife with cultural critiques**. Take William Hayashi’s self-published novel Discovery: Volume 1 of the Darkside Trilogy. The story follows the discovery of rumored black American separatists whose disgust with racial disparity led them to create a society on the moon long before Neil Armstrong’s arrival. The story is a commentary on separatist theory, race, and politics that inverts the nationalistic themes of the early space race. Or take John Jennings and Stacey Robinson’s Black Kirby exhibit, a touring tribute to legend Jack Kirby of Marvel and DC Comics fame. The show is a “What if Jack Kirby were black?” speculation depicting Kirby’s iconic comic book covers using themes from black culture. The show displays parallels between black culture and Kirby’s Jewish heritage, explores otherness and alienation, and adds new dimensions to the pop culture hero. Afrofuturism can weave mysticism with its social commentary too. Award-winning fiction writer Nnedi Okorafor’s Who Fears Death captures the struggles of Onyesonwu, a woman in post-nuclear, apocalyptic Africa who is under the tutelage of a shaman. She hopes to use her newfound gifts to save her people from genocide. Whether it’s the African futuristic fashion of former Diddy-Dirty Money songstress Dawn Richard—which she unveiled in her music videos for the digital album Goldenheart—or the indie film and video game Project Fly, which was created by DJ James Quake and follows a group of black ninjas on Chicago’s South Side, the creativity born from rooting black culture in sci-fi and fantasy is an exciting evolution. This blossoming culture is unique. Unlike previous eras, today’s artists lage of a shaman. She hopes to use her newfound gifts to save her people from genocide. **Whether it’s the African futuristic fashion of former Diddy-Dirty Money songstress Dawn Richard—which she unveiled in her music videos for the digital album Goldenheart—or the indie film and video game Project Fly, which was created by DJ James Quake and follows a group of black ninjas on Chicago’s South Side, the creativity born from rooting black culture in sci-fi and fantasy is an exciting evolution**. This blossoming culture is unique. Unlike previous eras, today’s artists can wield the power of digital media, social platforms, digital video, graphic arts, gaming technology, and more to tell their stories, share their stories, and connect with audiences inexpensively—a gift from the sci-fi gods, so to speak, that was unthinkable at the turn of the century. The storytelling gatekeepers vanished with the high-speed modem, and for the first time in history, people of color have a greater ability to project their own stories. This tug-and-pull debate over black people controlling their image shifts considerably when a fledgling filmmaker can shoot his sci-fi web series on a $500.

#### [Wehelieye 2] Deviant bodies are compared against one another under the state as the color line sets the basis for how subjects should be – women, queer folk, and black people stray from the standard conception of the Western Man, and face oppression as a result. Thus, the Role of the Ballot is to deconstruct the western Man.

**Weheliye 2**: Weheliye, Alexander. [Associate Professor of African American Studies at Northwestern University] ““Habeas Viscus: Racializing Assemblages, Biopolitics, and Black Feminist Theories of the Human” 2014. JP

Consequently, **racialization figures as a master code within the genre of the human represented by western Man, because its law-like operations are yoked to species-sustaining physiological mechanisms in the form of a global color line—instituted by cultural laws so as to register in human neural networks—that clearly distinguishes the good/life/fully-human from the bad/death/not-quite-human**. This, in turn, authorizes the conflation of racialization with mere biological life, which, on the one hand, enables white subjects to “see” themselves as transcending racialization due to their full embodiment of this particular genre of the human while responding anti-pathetically to nonwhite subjects as bearers of ontological cum biological lack, and, on the other hand, in those subjects on the other side of the color line, it creates sociogenically instituted physiological reactions against their own existence and reality.40 Since the being of nonwhite subjects has been coded by the cultural laws in the world of Man as pure negativity, their subjectivity impresses punishment on the neurochemical reward system of all humans, or in the words of Frantz Fanon: “My body was returned to me spread-eagled, disjointed, redone, draped in mourning on this white winter's day. The Negro is an animal, the Negro is bad, the Negro is wicked, the Negro is ugly.” **Political violence plays a crucial part in the baroque techniques of modern humanity, since it simultaneously serves to create not-quite-humans in specific acts of violence and supplies the symbolic source material for racialization**. For Wynter, the promise of black studies—and the numerous other ruptures precipitated by the 1960s—lies in its liminality, which contains potential exit strategies from the world of Man. **However, we must first devise new objects of knowledge that facilitate “the calling in question of our present culture's purely biological definition of what it is to be, and therefore of what it is like to be, human.”** We must do so because we cannot fully understand the present incarnation of the human from within the “biocentric and bourgeois” epistemic order that authorizes the biological selectedness of Man and, conversely, the creation of “dysgenic humans” (those who are evolutionarily dysselected), “a category comprised in the US of blacks, Latinos, Indians as well as the transracial group of the poor, the jobless, the homeless, the incarcerated,” the disabled, and the transgendered.43 Within our current episteme, these groups are constituted as aberrations from the ethnoclass of Man by being subjected to racializing assemblages that establish “natural” differences between the selected and dysselected. In other words, black, Latino, poor, incarcerated, indigenous, and so forth populations become real objects via the conduit of evolutionarily justified discourses and institutions, which, as a consequence, authorizes Man to view himself as naturally ordained to inhabit the space of full humanity. **Thus, even though racializing assemblages commonly rely on phenotypical differences, their primary function is to create and maintain distinctions between different members of the Homo sapiens species that lend a suprahuman explanatory ground (religious or biological, for example) to these hierarchies**. As Wynter explains, “all our present struggles with respect to race, class, gender, sexual orientation, ethnicity, struggles over the environment, global warming, severe climate change, the sharply unequal distribution of the earth resources...—these are all differing facets of the central ethnoclass Man vs. Human struggle.”44 Wynter's oeuvre facilitates the analysis of the relay between different forms of subjugation, because in it the human operates as a relational ontological totality. Therefore, the Man versus Human battle does not dialectically sublate the specificity of the other struggles but articulates them in this open totality so as to abolish Man and liberate all of humanity rather than specific groups.

## DA

#### [Gilbert 21] Asteroid mining is starting now.

Space exploration is back. after decades of disappointment, a combination of better technology, falling costs and a rush of competitive energy from the private sector has put space travel front and center. indeed, many analysts (even some with their feet on the ground) believe that commercial developments in the space industry may be on the cusp of starting the largest resource rush in history: mining on the Moon, Mars and asteroids. While this may sound fantastical, some baby steps toward the goal have already been taken. Last year, NASA awarded contracts to four companies to extract small amounts of lunar regolith by 2024, effectively beginning the [era of commercial space mining](https://payneinstitute.mines.edu/wp-content/uploads/sites/149/2020/09/Payne-Institute-Commentary-The-Era-of-Commercial-Space-Mining-Begins.pdf). Whether this proves to be the dawn of a gigantic adjunct to mining on earth — and more immediately, a key to unlocking cost-effective space travel — will turn on the answers to a host of questions ranging from what resources can be efficiently. As every fan of science fiction knows, the resources of the solar system appear virtually unlimited compared to those on Earth. There are whole other planets, dozens of moons, thousands of massive asteroids and millions of small ones that doubtless contain humungous quantities of materials that are scarce and very valuable (back on Earth). Visionaries including Jeff Bezos [imagine heavy industry moving to space](https://www.fastcompany.com/90347364/jeff-bezos-wants-to-save-earth-by-moving-industry-to-space) and Earth becoming a residential area. However, as entrepreneurs look to harness the riches beyond the atmosphere, access to space resources remains tangled in the realities of economics and governance. Start with the fact that space belongs to no country, complicating traditional methods of resource allocation, property rights and trade. With limited demand for materials in space itself and the need for huge amounts of energy to return materials to Earth, creating a viable industry will turn on major advances in technology, finance and business models. That said, there’s no grass growing under potential pioneers’ feet. Potential economic, scientific and even security benefits underlie an emerging [geopolitical competition](https://nationalinterest.org/feature/geostrategic-importance-outer-space-resources-154746) to pursue space mining. The United States is rapidly emerging as a front-runner, in part due to its ambitious Artemis Program to lead a multinational consortium back to the Moon. But it is also a leader in creating a legal infrastructure for mineral exploitation. The United States has adopted the world’s first spaceresources law, recognizing the property rights of private companies and individuals to materials gathered in space. However, the United States is hardly alone. Luxembourg and the United Arab Emirates (you read those right) are racing to codify space-resources laws of their own, hoping to attract investment to their entrepot nations with business-friendly legal frameworks. China reportedly views space-resource development as a national priority, part of a strategy to challenge U.S. economic and security primacy in space. Meanwhile, Russia, Japan, India and the European Space Agency all harbor space-mining ambitions of their own. Governing these emerging interests is an outdated treaty framework from the Cold War. Sooner rather than later, we’ll need [new agreements](https://issues.org/new-policies-needed-to-advance-space-mining/) to facilitate private investment and ensure international cooperation.

#### [Myers 16] Prohibitions on appropriation prevent asteroid mining despite growing space industries

**Myers 16:** Ross Myers (J.D. candidate at the University of Oregon Law School.), The Doctrine of Appropriation and Asteroid Mining: Incentivizing the Private Exploration and Development of Outer Space, 2016, Oregon Review of International Law, https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/19850/Meyers.pdf?sequence=1

Despite a decrease in national space program funding, corporate space missions are on the rise. In 2010, President Obama proposed that NASA exit the business of flying astronauts from Earth to low Earth orbit and move it to private companies.52 Several companies have stepped up to bat, and corporate space programs now include space tourism, supply missions, and in one case a one-way colonization mission to Mars.53 Corporate interest in space tourism and development demonstrates a strong private commercial interest in space as an industry, which could serve to finance the exploration of space in a period where national governments do not have an active financial interest in space. However, under current international treaties, the ownership of asteroids is prohibited, preventing corporations willing to invest in asteroid mining from having a secure claim.

Relegating at least some mining companies to near-Earth asteroids would reduce the negative effects of future mining levels on Earth. The economic benefits of mining need not be sacrificed for the sake of the environment.38

#### [Reich 22] Prohibitions on appropriation prevent asteroid mining despite growing space industries

**Reich 22:** Aaron Reich, 1-6-2022, "Asteroids can destroy the Earth, asteroid mining can help save it," The Jerusalem Post | JPost, https://www.jpost.com/science/article-691731//SJJK

An asteroid impact has the potential to cause worldwide cataclysms and extinction-level events, but they could be mined as an alternative to heavily polluting mining on Earth. [Asteroids](https://www.jpost.com/tags/asteroid) make up one of the most numerous types of objects in the solar system. Currently, 1,113,527 asteroids are known to exist in the solar system, according to NASA, but those are just the ones definitively identified, with experts always finding more. These large space rocks vary in size, some less than a meter wide, others stretching several kilometers. Some of these just orbit around the sun, never approaching anything else. Others skirt dangerously close to planets, including several close brushes with our own planet – and on a few occasions, actually hitting us, causing an impact event. These impacts are incredibly destructive and have the potential to be the cause of major catastrophes, destroying cities, continents or even a global disaster. The destructive nature of asteroids, even small ones, is something well known to experts, with space agencies around the world monitoring for potential catastrophic impacts, as well as researching potential means of identifying them and stopping them. It is something that has also long permeated the realm of popular culture, whether it be from now classic films like Armageddon or the very recent Don’t Look Up. BUT ASTEROIDS are not necessarily just the harbingers of destruction we have long considered them. Rather, they may just be able to help save the Earth. Asteroids are, essentially, rocky remnants of the formation of the solar system. Sometimes called minor planets, these rocks are made of various materials and minerals from those early days. Billions of years ago, many of these asteroids are thought to have collided together to eventually form planets, and the minerals and materials support this. So what kinds of minerals could we find on asteroids? According to the Weizmann Institute of Science’s Dr. David Polishook, who is also a member of [NASA’s Double Asteroid Redirection Test (DART) Mission](https://www.jpost.com/science/nasas-iron-dome-dart-takes-off-to-test-asteroid-deflection-686826) which seeks to test asteroid deflection in order to avert an impact, there are three categories we need to care about. First, he told the Magazine, there are strong metals, such as iron and nickel. These are relatively common on Earth and can be used in a variety of applications. Second, there are the rarer metals such as platinum and iridium. These minerals are very rare and extremely expensive. As such, there is definitely a profit to be made by bringing these to Earth. The third isn’t a mineral exactly but is still something extremely important: water. “Yes, the same H2O we all drink,” Polishook clarified. This itself isn’t unsurprising. Scientists have long known water and ice to be present on various asteroids throughout the solar system. In fact, it is commonly theorized that asteroid impacts are what ended up bringing water to Earth in the first place. The scientific community is well aware of the potential value of this field, as while the collective mass of asteroids may not seem like much compared to a planet – indeed, according to NASA, the combined mass of all asteroids in the asteroid belt between Mars and Jupiter is actually less than the Earth’s Moon – they are still filled with valuable materials in extremely high quantities. Indeed, there is even a large resurgence in asteroid exploration in recent years. Several recent missions have already been launched to bring back samples of asteroids. These include the Hayabusa and Hayabusa2 missions from the Japan Aerospace Exploration Agency (JAXA) and NASA’s ongoing Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer (OSIRIS-REx) mission. Hayabusa managed to bring back a sample from 25143 Itokawa, Hayabusa2 brought back a sample from [162173 Ryugu](https://www.jpost.com/science/article-689341) and OSIRIS-REx is currently bringing back a sample from [101955 Bennu](https://www.jpost.com/health-science/will-500-meter-asteroid-bennu-hit-earth-in-next-century-nasa-investigates-676537). Interest hasn’t waned either. In October, NASA launched its latest probe, known as [Lucy](https://www.jpost.com/science/nasa-to-launch-first-space-probe-to-study-jupiters-trojan-asteroids-682158), to study Trojan asteroids near Jupiter in a first-of-its-kind mission. Later, NASA plans to send a probe to [16 Psyche](https://www.jpost.com/health-science/what-is-a-10000-quadrillion-asteroid-the-size-of-cyprus-really-made-of-676243), a massive asteroid 227 kilometers in diameter – longer than the maximum length of Cyprus – rich in iron and nickel that was once believed to be worth around $10 quintillion, which is more valuable than the entire global economy, though this exact value is still up for debate. Even the United Arab Emirates, coming off the success of its recent Mars mission, is planning to [land a spacecraft on an asteroid](https://www.jpost.com/science/uae-to-launch-mission-to-explore-venus-land-on-asteroid-681622). Ostensibly, these missions are less about mining and more about scientific curiosity, as asteroids hold keys to understanding the formation of the solar system and, by extension, our very planet. However, that is not to say asteroid mining has not generated interest elsewhere. In fact, there are already laws on the books about it. Asteroid mining is specifically mentioned in the United Nations-mediated Outer Space Treaty, signed by over 100 countries worldwide, and some countries like Luxembourg have already legislated local laws about it. Economically, there are other benefits to this as well. “Mining materials rare on Earth could make the miner rich,” Polishook explained, comparing it to the boom of the 19th-century California gold rush. Yes, launching mining missions to asteroids is expensive, but the returns could be worth it. Especially since asteroids have materials there that astronauts could use. This includes water, which can be used for drinking, creating oxygen for astronauts to breathe, or creating hydrogen for spacecraft to use as fuel. It could also be possible to mine a certain type of helium isotope known as helium 3. A thin layer of this light material that originates from the Sun can be found on the surface of any atmosphere-less body, including asteroids, and it could be possible to turn this into energy through nuclear fission. In other words, economically, the cost of these missions could be negligible. There is also great interest in identifying asteroids that would be prime targets for these missions, with many prioritizing large and close-by asteroids. One website, the asteroid value database [Asterank](https://www.asterank.com/), has even begun estimating the value of various asteroids as well as the estimated profit of these missions. Right now, according to Asterank, a number of asteroids are valued over $100 trillion, but in terms of cost-effectiveness, the most profitable is Ryugu, with an estimated value of $82.76 billion and an estimated profit of $30.08b. Another ideal target, though much more difficult, is Ceres, the largest asteroid in the asteroid belt, with a diameter of around 980 kilometers – in fact, it is so large that, according to some scientists, it should actually be considered a planet in its own right – which is rich in ice water. This could serve as an ideal hub of sorts for these mining missions. HOWEVER, THERE are obstacles in the way of asteroid mining succeeding. According to Polishook, there are three major obstacles in the way. “First, identifying the composition of an asteroid using a telescope and determining if it is rich with water, iron or platinum is still not straightforward. This is especially true for platinum, which was only recognized in meteorites that reached the Earth. It is only reasonable you can find these in asteroids, since meteors come from asteroids, but platinum was never seen in them before. “A close look at an asteroid using a spacecraft can identify these materials, but one can’t send thousands of probes to thousands of asteroids to look for platinum while keeping their budget balanced,” he explained. “Second, reaching the relevant asteroid is also a challenge, though it has been done before. To do this commercially, you will have to invest much more in R&D for your vehicles and equipment. “Third, digging in an asteroid or dismantling it or vaporizing it and carefully collecting the ore you need, whether platinum or even water, is not an easy task when you need to work in zero-gravity,” he added. “While it is a lot of material to sift, these bodies are not large enough to have a strong gravity of their own. Thus, you cannot land on them or stand on them and mine. The miners, whether humans or robots, will have to hook themselves in some way to the surface in order to work while the asteroid rotates at a few hours per circle.” And it isn’t as though NASA hasn’t tried to do this before. “Some years ago, NASA developed a tool to capture an asteroid, but with these many hard-to-solve technological issues, this tool became relevant to only lift a 2-meter-wide rock from an asteroid surface, and eventually this program was canceled. So, objectively, this issue is hard to solve,” Polishook said. Even the promise of helium 3 isn’t enough, because while it is theoretically possible to turn it into energy through nuclear fission, scientists currently have no way or even an idea of how to actually do this, putting it firmly in the realm of science fiction at the moment. Despite their further planned asteroid missions, Polishook doesn’t think NASA or other national space agencies will get into mining operations in the near future – they have enough on their plate as it is, he said. Most likely, asteroid mining would fall into the realm of the private sector. However, people have already tried and have paid the price.