Crisis
Asteroid Mining
Delegate Background Guide
Dear Delegates,

Welcome to the Asteroid Mining Crisis! My name is Daria Plotz, and I will be your crisis head. I am a sophomore at Commonwealth, and this is my second year assisting with COMMUN. This crisis will be chaired by Ben Mawn-Mahlau and Ayla Denenberg. It is set in 2050 after the development of advanced asteroid mining technology. As a delegate, you will have to navigate the complex issues surrounding the rights of corporations, the distribution of resources for scientific advancement, and even climate change, all issues that are applicable to modern-day society. If you have any questions, especially about research and position papers, always feel free to contact me at dplotz@commschool.org. I believe this crisis is going to be interesting and informative, and I am looking forward to some engaging debate!

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Introduction

In the many years since people first realized the potential resources stored in asteroids, companies and countries have been fighting tooth and nail to be the first to create working miners. Finally, in 2045, the Cooper Mining Company (CMC) achieved that goal and successfully started bringing samples back to Earth. In 2048, samples CMC retrieved from the asteroid 1933-FE included trace quantities of a new element, hephaestium. Based on initial experiments run by CMC’s chemistry team, hephaestium is a radioactive element that acts similarly to uranium but produces powerful nuclear fission reactions. This means hephaestium could be invaluable in the development of nuclear power but could be used for dangerously powerful nuclear weapons if in the wrong hands. Last week, CMC’s first large shipment of hephaestium arrived back on Earth. The United Nations and CMC have called a summit of country and industry leaders to discuss hephaestium and other future results of asteroid mining. However, on the eve of the summit, the secretive Chinese-state-operated company MineChina released its first public statement in over a year. It revealed that they had been collecting their own hephaestium from another asteroid for over 6 months. In fact, they already have a first prototype of a nuclear bomb using hephaestium that would be powerful enough to destroy an area the size of Florida before they had a chance to retaliate.

History

Early Development

For thousands of years, people have wondered what great resources space contains. The first asteroid mining companies formed in the 2010s, most notably Planetary Resources and Deep Space Industries, were unsuccessful and quickly dissolved. However, the industry still lived on through the Asteroid Mining Corporation. It lay the foundation for later companies through their data-gathering satellites, which identified near-Earth asteroids with potentially valuable mineral resources. Many of these asteroids identified decades ago are now being used by successful companies today. The final, and perhaps most significant, event in the 2010s was the passage of the SPACE Act by the US Congress. It allows “a company working under a US license the ability to own resources that they might obtain from celestial bodies.” This measure designated the US as the hotbed of commercial space mining that it is today.
Cooper Mining Company Development
The Cooper Mining Company (CMC) was founded 15 years ago in 2035 by Clive Cooper, then an eager 20-year-old undergrad at MIT studying aerospace engineering. Starting from a basement office with three employees in Cambridge, CMC quickly grew into a thriving startup through its innovations in efficiently transporting samples to Earth. CMC targets near-Earth asteroids with potentially valuable precious metals. It sent out its first probe to asteroid 2654-KO to collect element samples in 2045. Last year (2049), CMC sent out another probe to metallic asteroid 1933-FE. The results they received shocked the scientific community: the samples contained trace amounts of a new element, later named hephaestium, that could be used in extremely powerful nuclear fission reactions. Since then, CMC has rushed the development of its large-scale probe in order to harvest significant quantities of hephaestium. Last week, the first delivery from the probe loaded with hephaestium landed on Earth.

Other Mining Companies
While CMC has been the industry leader since its founding, other US companies have piggy-backed off its success. The most prominent of these companies is Miners Inc., which was founded soon after CMC in 2037. Miners Inc. also focuses on metallic near-Earth asteroids. As of 2050, Miners Inc. has landed probes on two near-Earth asteroids, 3294-WA and 7521-DE, but so far has been unsuccessful in landing any loaded probes back to Earth.

Legal Decisions Around Asteroid Mining
Over the past decade, there have been numerous conflicts in the United States about company rights to specific asteroids that have resulted in legal action in the US jurisdiction. This culminated in the 2042 Supreme Court ruling Cooper v. Miners, which established a “open to all” policy for acquiring asteroid resources in space. This means that companies are not legally allowed to prevent other companies from accessing asteroids, a major victory for Miners Inc. This was consistent with the United States’ historical values of free markets and rights to private property. This policy was later ratified by the United Nations in the 2046 update of the Outer Space Treaty from 1967 that was accepted by all 193 member states. The updated Outer Space Treaty of 2046 clarified property rights to materials acquired in space. It states that while countries and corporations cannot lay claim to any real estate on an asteroid, they have legal ownership of any materials they extract from the asteroid.

Issues with the Industry
While the asteroid mining industry could unlock the next level of scientific achievement, some groups object to its existence altogether. As climate change
has become an issue with a greater and greater effect on daily life, many activist groups have been fighting against any “non-essential” industry that may be affecting climate change. As asteroid mining became more prominent, the United Nations commissioned a study in 2036 about its climate effects. The results, released in late 2038, confirmed activists’ worst fears: rocket launches produce emissions, specifically particulate emissions that could damage the atmosphere. Rocket engines emit amounts of soot (black carbon) and alumina into the stratosphere. Because these particles are small, they remain in the stratosphere for three to four years. The black carbon absorbs sunlight, which heats the upper stratosphere, changing chemical reaction rates and potentially damaging the ozone layer. Furthermore, the alumina particles absorb outgoing radiation, warming the planet. The first big protest against asteroid mining for climate reasons was in 2039 at CMC’s initial public stock offering. It was organized by United Climate Allies, a climate activist organization that is still active today. As a result, CMC pledged five million dollars to various climate charities, which only slightly appeased the protesters. Since then, through legal action and civil disobedience, climate change organizations have continued to fight against asteroid mining for the potentially drastic effects that frequent rocket launches could have on the Earth’s climate. However, with the new announcements about hephaestium, some climate organizations have shifted their position on asteroid mining, hoping that nuclear power from hephaestium would be the solution to sustainable energy the world needs.

**Possible Uses of Hephaestium**

Hephaestium could be a valuable element for nuclear power and weapons because each fission event (individual reaction of an atom) releases more energy and more neutrons than uranium fission events. These neutrons continue the chain reaction, triggering more fission events. Since hephaestium releases more neutrons per reaction, this means that the nuclear fission of hephaestium grows faster than the nuclear fission of uranium. Since the nuclear fission of hephaestium is so much more powerful than the nuclear fission of uranium, hephaestium could be used to develop nuclear weapons thousands of times more powerful than current technology. Hephaestium could also be used to develop significantly more efficient nuclear power. This would provide an invaluable source of clean energy that could help the world continue to lessen its reliance on fossil fuels and help combat climate change.

**Timeline**

Year Of Crisis: 2050
2010s Planetary Resources and Deep Space Industries, the first asteroid mining companies, formed and dissolved.

2015 SPACE Act passed by the US Congress, stating that materials found on asteroids belong to their finders.

2035 Cooper Mining Company (CMC) founded.

2037 Miners, Inc. founded.

2039 First large public protest against asteroid mining, at CMC’s initial public offering.

2042 Cooper v. Miners, a Supreme Court ruling that established a “open to all” policy for asteroid material.

2045 CMC sends out its first asteroid probe to 2654-KO.

2046 The United Nations added the ideas established in the Cooper v. Miners ruling to their updated Outer Space Treaty.

2049 AMC sends out its second asteroid probe to 1933-FE, discovering the element hephaestium!

2050 The first return shipment from AMC’s second probe, containing large amounts of hephaestium.

Country positions

China
Until the day before the summit, it was thought that China had an early stage asteroid mining operation. It is now clear that they have the most advanced technology of any company or country, but not much else about their program is known.

North Korea
North Korea is interested in mining hephaestium for purposes of developing their own nuclear technology. As an ally of China, they also hope to use this relationship to help them acquire their own hephaestium.

Russia
Home to many spaceports and rocket launches, it would be an obvious choice of base for the mining corporations, but Russia is unwilling to host American commercial operations. There are currently no large asteroid mining programs in Russia, state nor corporate run, because Russia has instead established itself as the go-to country for
sending humans into space, leaving few resources to devote to asteroid mining.

Iceland
Iceland has long been at the forefront of renewable energy research, so they are eager to develop hephaestium as a nuclear power source. However, they are still wary of the climate impact of the rocket launches, having already witnessed melting glaciers and the devastation of climate change.

India
India has an asteroid mining program that is not reliant on other countries or companies for launches. It is very close to developing their own successful miners but so far have no successfully landed any miners on asteroids. India has a nuclear weapons program with around 200 warheads (though it is not an official nuclear weapon state), but it has also been significantly impacted by climate change. It is unclear what India would use hephaestium for if it had access to it.

Roles

Clive Cooper
Cooper is the CEO and Founder of Cooper Mining Company, and he wants to maximize profit off miners.

Portfolio Powers: Cooper has control over distribution of CMC’s hephaestium, and he also can decide where to deploy CMC’s miners.

Brett Lester
Lester is the CEO of Miners Inc., a rival company with non-operational miners parked on asteroids 3294-WA and 7521-DE. He wants to maximize profit on his miners, which requires getting his miners working and making sure he will also be able to mine and sell hephaestium.

Portfolio Powers: Lester can use Miners Inc. funds for lobbying to change the positions of governments as well as hiring more scientists to help with his miners. If the miners do get working, he will also be able to control the miners.

Vishnu Bhogal
Bhogal leads the Indian Space Agency. He wants to acquire as many resources as possible for India through mining.

Portfolio Powers: Bhogal has working rockets for launches, which can be offered to other countries/companies. If his miners get working, he can control the miners.
Carlos Silva
Silva is the Brazillian Foreign Minister. After the decimation of the majority of Brazil’s rainforests in the 2020s, Brazil has pivoted its environmental position, doubling down on climate change. It is concerned about rocket emissions and pollution and does not believe the possible nuclear power benefits of hephaestium would outweigh the climate effects. Silva wants to restrict rocket launches related to asteroid mining.

Portfolio Powers: Brazil has an active manufacturing industry. It produces complex electronic systems and industrial robots used by Rocket Materials LLC and SpaceX. Silva could restrict or halt exports of these materials, severely hampering the operations of both companies.

Ana Lopez
Lopez is the Venezuelan Foreign Minister. Venezuela has a large oil industry that could lose a lot of business if hephaestium was developed for nuclear power. She wants to limit asteroid mining.

Portfolio Powers: Venezuela is trade partners with the US, so it can cut off oil to the US, which it is currently very dependent on.

Henry Reed
Reed is the US Secretary of Energy. He wants to gain access to hephaestium (preferred through non-aggressive measures) for the development of nuclear weapons and energy.

Portfolio Powers: Reed has the power to seize hephaestium samples located in the United States. If he manages to acquire any hephaestium, he has plentiful resources available to develop technology from hephaestium.

Samantha Barnes
Barnes is the NASA Chief Administrator. She wants to get more resources for development of NASA programs as well as access to hephaestium for nuclear-powered rockets.

Portfolio Powers: Barnes controls landing and take-off points of CMC. She can ground CMC launches.

Kate Lee
Lee is the US Secretary of Defense. She first and foremost wants to prevent China from getting more powerful weapons than the United States. She also wants to acquire hephaestium for government use to develop more powerful nuclear weapons
to match China’s.

Portfolio Powers: Lee can use Department of Defense (DoD) funds to try to acquire hephaestium. She can also distribute DoD funds for scientific research.

**Griffin Musk**

Musk is the CEO of SpaceX, which does not have an asteroid mining division. He wants to maximize SpaceX’s profit.

Portfolio Powers: SpaceX provides rockets to CMC, so Musk can stop CMC launches. He can also offer launches to other companies/countries.

**Sarah Philips**

Philips is the CEO of Rocket Materials LLC, which is used as a subcontractor by both SpaceX and CMC for their rockets and miners. She wants to maximize Rocket Materials LLC’s profit.

Portfolio Powers: Rocket Materials LLC provides materials to SpaceX and CMC. Philips can cut off both companies’ supplies, which would limit and maybe even stop their operations. She can also provide materials to other companies/countries.

**Lincoln Stewart**

Stewart is the Chief Scientific Officer (CSO) of Cooper Mining Company. His priority is to back up Cooper, his boss. However, he also wants the miners he helped develop to contribute to the greater scientific community.

Portfolio Powers: Stewart can determine what areas of research CMC should focus on.

**Eliza Walker**

Bio: CEO Eversource, a US energy company

Goal: Walker wants access to hephaestium for development of nuclear power.

Portfolio Powers: Walker has a 70 million dollar budget for use in lobbying to change government regulations as well as to make deals with mining companies. Eversource also provides power to about half of Rocket Materials LLC’s plants, so Walker can greatly restrict their production capability by cutting off their power.

**Hansel Brooks**

Bio: CCO (Chief Change Officer -- in charge of organizing activist causes) of United Climate Allies (UCA)
Goal: Brooks would like to halt all asteroid mining because of the possible climate effects of large number of rocket launches found in the UN report of 2038.

Portfolio Powers: Brooks can make press releases and organize protests, which affect public opinion.

Jessica Parker
Bio: CEO Environment International
Goal: Parker wants hephaestium to be provided to Eversource or some other energy company to develop hephaestium-based nuclear power.

Portfolio Powers: Parker has lobbying power in Washington to influence US government position and can also make press releases to sway public opinion.

Jacob Michaels
Bio: Nuclear power and weapons researcher
Goal: Michaels supports the development of hephaestium-based nuclear power. However, he knows how dangerous hephaestium-based nuclear weapons could be, so he wants to limit its distribution as much as possible

Portfolio Powers: Michaels can release scientific reports to affect public opinion

Bloc Positions

These blocs are meant as an outline of delegates with similar positions. Individual delegates should feel free to align themselves with a different bloc that assigned here based on what they believe is in their position's best interests.

Hard Restrictions on Asteroid Mining: Brooks, Prince Muhammad, Silva
Limited Regulations on Asteroid Mining: Cooper, Lester, Bhogal, Philips
Hephaestium Access for Governments Only: Barnes, Reed, Lee

Definitions

Hephaestium: a newly discovered element, which can only be found on asteroids, that is potentially invaluable in the development of nuclear power and weapons.

Miner: a spacecraft sent from Earth to collect materials from an asteroid and then send them back to earth.
Help in Research

Websites
2. https://kiss.caltech.edu/final_reports/Asteroid_final_report.pdf pg 7-13
4. http://chview.nova.org/station/ast-mine.htm very basic overview

Endnotes
9 Chemistry expertise provided by John Wolff of Commonwealth School.
