

## Want to colonize Mars? Talk to this outer space anthropologist first

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"Before we embark on this new journey to outer space, before we build colonies and extract resources from another planet, we must be intentional about improving our relationship with Earth – and with one another." Credit: Composite by Mary Crawford and photo by Andrew Adkins for Virginia Tech

Maybe infinity and beyond should wait.



Prominent physicists and wealthy tycoons envision life scattered across the solar system. Elon Musk wants humans to become a multiplanetary species. Jeff Bezos pictures floating <u>space</u> colonies home to billions.

Simulated-gravity ecosystems powered by the sun. Giant corporations drilling into moons and Mars. Children born on spaceships. Earth turning into a tourist destination.

Ripped from the pages of sci-fi novels, the future of humanity could exist beyond Earth.

But first, Savannah Mandel would like a word.

"Before we embark on this new journey to outer space, before we build colonies and extract resources from another planet, we must be intentional about improving our relationship with Earth—and with one another."

Mandel is an outer space anthropologist and a doctoral student in the Science and Technology Studies program at Virginia Tech. Her research centers on <u>human space exploration</u>.

She's delivered talks at NASA and the National Air and Space Museum. Connected with colleagues throughout the space industry. Interned with the Commercial Spaceflight Federation. Studied congressional hearings. Researched at Spaceport America, the world's first purpose-built commercial spaceport.

She earned the title of rising star and "the vanguard of researchers looking at the human side of leaving Earth" from Ozy Magazine.

She's worked alongside physicists and space technology scholars with the goal of ensuring humanity stands at the forefront.



On the side, she's a budding novelist.

All this, and yet Mandel's career is still in its early stages. Through her research, Mandel reinforces the concepts of collaboration, <u>social</u> <u>awareness</u>, and reflexivity.

"I want to make sure we explore space responsibly, with equity and a caretaker's mindset," she said. "Is human space travel worth it, right now, when climate change is devastating the natural world? When there's so much social and political turmoil here on Earth? That's a question we must address."

Anthropologists traditionally immerse themselves in a culture with its inhabitants. Some might argue outer space anthropology can only exist aboard the International Space Station.

But the work of Mandel and her colleagues proves outer space anthropology is not only possible—it may be crucial to humanity's survival.

"The prospect of human life in space is a repository for fantasies of leaving behind our terrestrial problems: environmental destruction, violence, inequality," said Daniel Breslau, associate professor in the Department of Science, Technology, and Society. "Savannah's work shows us how space exploration is an extension of humanity as it exists, not an escape."

On Earth, scientists have tried to simulate the experiences of off-world life through projects such as NASA's NEEMO initiative—or the controversial Biosphere 2 experiment enclosing eight humans in an artificial ecosystem for two years.

Rather than build simulations, Mandel suggests studying natural



environments on Earth to better understand life in extreme conditions.

"Most of my love of space has to do with the unknown and the extreme and how we can make connections to pre-existing analog places," said Mandel.

In a 2019 commentary for Physics Today, Mandel proposed researching the culture of Arctic communities.

"The stress levels humans will experience in extraterrestrial environments while participating in long-duration space missions go beyond necessitating thorough psychological and behavioral testing," Mandel wrote.

For instance, she suggests the conflict resolution methods people in the Arctic use could help space scientists better understand how a society develops a fundamentally peaceful social structure without relying on intensive forms of technologies. Life in scorching deserts could also offer insights.

Mandel recognizes the argument against adopting indigenous knowledge for space research.

"I understand the criticism about whether or not anyone has a right to the knowledge Indigenous people possess, and whether indigenous people should be asked to share it," said Mandel. "Considering how different societies function, and connect to nature, demonstrates how the practices of one specific culture are not the only way forward."

Mandel hopes to conduct research on McMurdo Station, a U.S. research station in Antarctica.

"If you were to walk outside your established zone of technology in



McMurdo, you won't survive long due to the extreme cold," Mandel said. "This is a major reason it's an ideal comparative model for understanding the social challenges of isolation in a confined space."

Observing submarine crew members, who spend months aboard a vessel below sea level, could set expectations for a 140 million-mile journey to Mars, Mandel suggested in her commentary. She also proposed studying the culture of oil rig workers.

"Like a spaceship or extraterrestrial outpost, oil rigs are driven by technology that is omnipresent," she wrote. "Employees on rigs rely on their coworkers and the machines around them to work constructively. They possess the ability to handle often unpredictable situations, just as astronauts on space stations do."

As nations push full throttle to Martian and lunar territories, Mandel seeks answers to questions of ethics.

Here's one: Will the wealthy wield power across the universe as they do on Earth?

Commercial interests already dominate segments of space travel.

Since 2021, space tourism has rapidly accelerated. From William Shatner to Richard Branson, celebrities and billionaires buckled into spaceships on suborbital trips amid a global pandemic.

Paying passengers spent as much as \$28 million to fly with Bezos and his company, Blue Origin. Branson's Virgin Galactic is selling space tickets for \$450,000 per person to the <u>general public</u>.

The power dynamics of space exploration interest Mandel. In her article "The Elysium Effect: Space Law and Commercial Space Disparities,"



she describes global superpowers competing for resource acquisition and research development, along with space tourism.

Mandel suggests imbalances in power across our planet are already manifesting in space and could lead to the inequitable distribution of natural resources extracted from Mars and moons. Wealth and privilege would determine which nations benefit.

Mandel advocates for a more equitable and inclusive future in space and on Earth.

Her dissertation focuses on congressional hearings on space. She will draw from her observations in Washington, D.C., interviews with experts and a variety of sources. She plans to "debunk expert witness panels" and examine "who we call an expert and why" in government proceedings.

"Becoming an astronaut doesn't necessarily mean you're an expert on what the human race should be doing on Mars, for example," she said. "Militaristic desires tend to overlay congressional hearings about space, even if the presentations are framed as benign exploration."

Mandel serves as treasurer for JustSpace Alliance, an organization devoted to lifting diverse voices in human space exploration.

"I'm part of the JustSpace Alliance because I believe you can be prohuman space exploration but recognize the need for change and advocate for inclusivity," she said.

She's also worked closely with Humanity in Deep Space, a nonprofit group of space professionals, scholars, and organizations focused on issues and challenges associated with life beyond Earth.

She befriended the organization's founder, Kris Kimel, who touted



Mandel for her efforts in outer space anthropology.

"Our transition off the planet to a deep, spacefaring civilization poses an unprecedented existential challenge to humankind," said Kimel, also the co-founder of aerospace company Space Tango. "Savannah Mandel is pursuing a bold, nontraditional path in recognition of the critical role anthropology—and our understanding of human culture and behavior—will play in the ultimate success or failure of this next great human migration."

For Mandel, the journey to outer space anthropology began during her Florida upbringing.

"Growing up, I developed a deep love for science fiction and anthropology," she said. "Like many kids, I wanted to be an astronaut. But while I loved the thought of working in the <u>space industry</u>, I had little interest in math, and I just rid myself of the idea."

But she carried her passion for space and sci-fi into higher learning.

While completing her master's degree in social anthropology from University College London, Mandel learned about a small but growing field.

"One of my professors told me about outer space anthropology," said Mandel. "I learned about how he and other scholars research topics that are speculative, futuristic, and prophetic while maintaining a solid academic and theoretical grounding."

Mandel said she applied to Virginia Tech's Department of Science, Technology, and Society because of its range of faculty experts and ability to tailor programming to fit her scholarly needs.



"Our graduate program is a learning community," said Breslau, who serves as co-chair of Mandel's dissertation committee. "Faculty learn from our graduate students and students from each other. Having someone with Savannah's unique background and expertise in our program adds value for everyone."

Outside of human space exploration, Mandel's research interests include the study and construction of expertise, power dynamics, and identity. Experiences working in the food and beverage industry sparked her interest.

"Working in restaurants and bars for 10 plus years teaches you a lot about power systems and control," said Mandel. "I couldn't help but want to dig further into those topics. Previously with food studies and now with space exploration and Congressional hearings."

A prolific author, Mandel's work has appeared in <u>academic journals</u> and mass media outlets.

"Savannah truly spans the academic-public divide in her work, seeking out opportunities to bring her insights to a wide range of audiences through academic, public nonfiction, and fiction writing," said Saul Halfon, chair of the Department of Science, Technology, and Society. "This kind of work fulfills the mission of our field to fully engage with real world science and technology concerns."

This summer, Mandel landed her first book deal.

The nonfiction book will focus on the ethics and timing of human space travel, asking if it's truly worth it—socially, politically, and economically—to send humans to <u>outer space</u>.

"My book will be deeply reflective and critical of manned space



exploration," said Mandel. "Should we continue on this path, or should we focus on saving this planet first?"

Provided by Virginia Tech

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