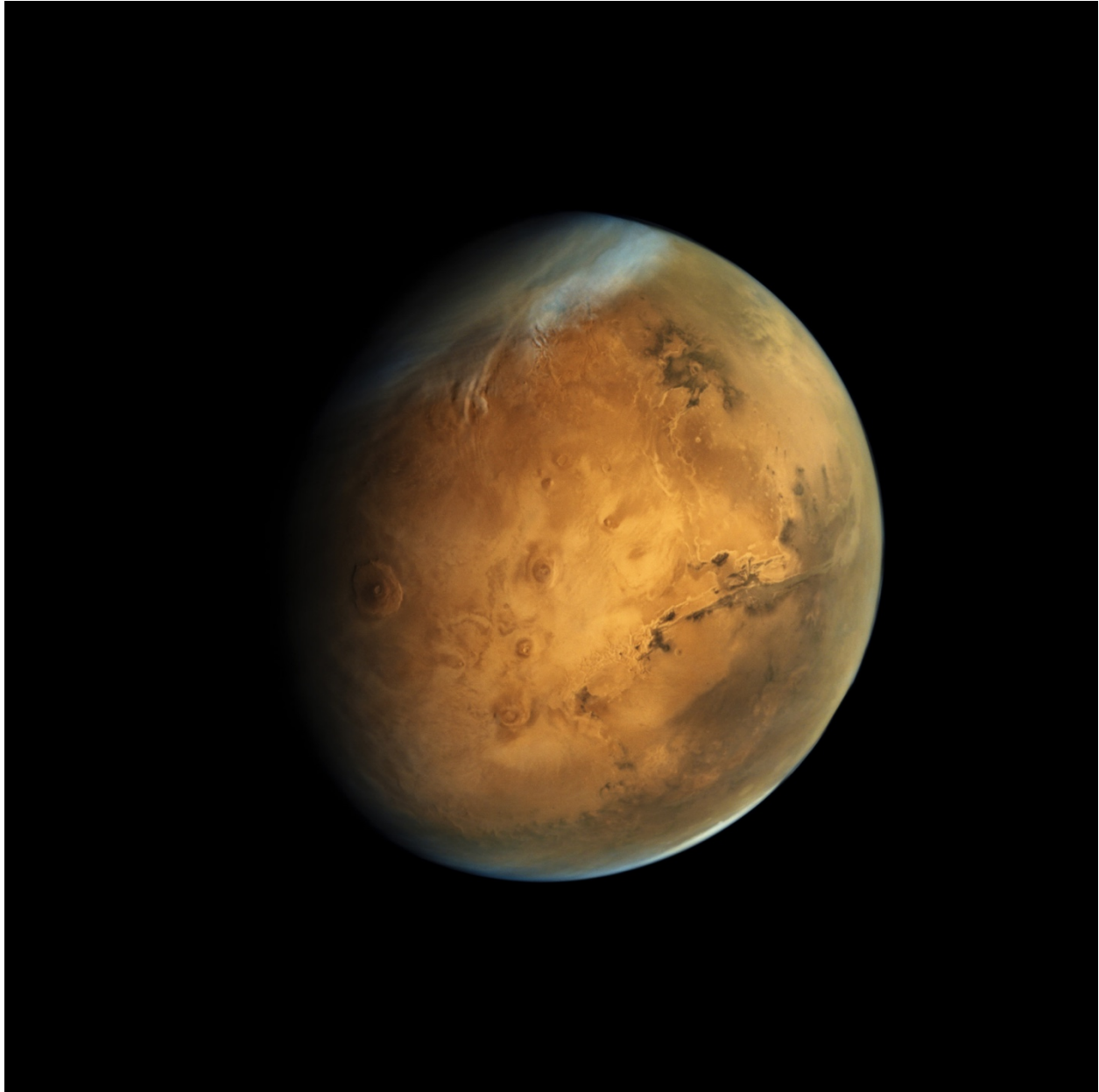


HIST 405: MARS AND THE MOON

IN SCIENCE, SCIENCE FICTION, AND SOCIETY



Essential Information:

Lectures: Tuesdays and Thursdays, 3:30-4:45, ICC 231.

Office Hours: Wednesdays, 1:00-3:00, ICC 617B.

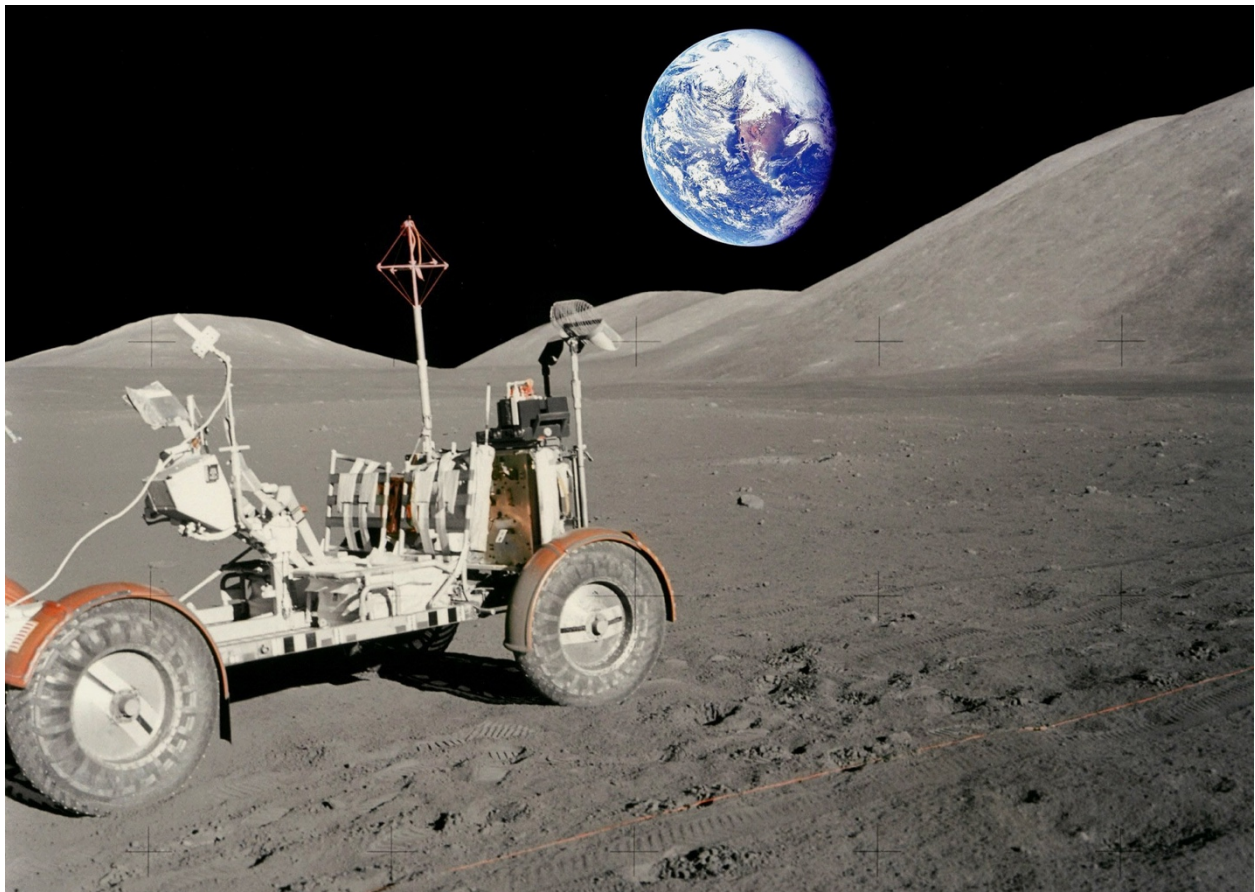
Professor: Dr. Dagomar Degroot. Email: dd865@georgetown.edu. Web: DagomarDegroot.com.

Course Website: MarsandtheMoon.weebly.com

Course Description:

We may be on the verge of a new era in humanity's expansion into outer space. Space agencies in the United States, China, and Russia have all committed themselves to establishments settlements on or near the Moon, and are building or designing enormous rockets to make that possible. A growing number of space agencies have now dispatched satellites or rovers to the Moon and Mars, which have revealed that both worlds are more dynamic places – with more dynamic histories – than scientists previously imagined. Companies led by ambitious tycoons have introduced revolutionary technologies that may allow them to reach, and perhaps even colonize, the Moon and Mars.

This course will guide you through the long and often surprising history that has led us to this new era. You will discover, among other topics, how the Moon and Mars have helped shape life on Earth; how early astronomers mapped and often misinterpreted environments on the both worlds; and how sudden environmental changes on Earth and on Mars provoked sightings of canals – and fears of alien invasions – across the western world. You will learn about the two “space races” that led humans to the Moon and robots to Mars; the plans to establish military bases on the Moon; the Martian dust storm that inspired the idea of nuclear winter on Earth; and the history of a radical ambition to turn Mars into a world like Earth. You will also study the history of the quest for life on Mars and the Moon, and the schemes to “live off the land” on both worlds.



Course Goals:

Like other courses offered by the Department of History, this course will help you:

1. Gain a deeper appreciation of the nature and practice of history as a discipline, and as the study, based on evidence, of human experiences, interactions, and relationships as they change over time.
2. Learn that history does not consist of a simple succession of self-evident facts, and that evidence-based interpretation and analysis are central to all historical work.
3. Hone reading, writing, and oral communication skills.
4. Develop your capacity to think historically: to situate events and developments in their historical context for the purpose of critical analysis.
5. Expand your ability to engage with complex causal analysis, and to articulate arguments that integrate supporting evidence and analytical commentary.
6. View the world from perspectives other than your own.

This course in particular will also help you:

1. Understand how different academic disciplines approach the human past, and what their distinct methods and sources can tell us.
2. Learn the history that will help you make sense of how space agencies and companies are exploring, and plan to exploit, the worlds closest to Earth.

Breakdown:

Participation:	30%
Telescope Essay on the Moon:	10%
Environmental History Essay Annotated Bibliography:	10%
Environmental History Essay First Draft:	10%
Environmental History Essay Final Draft:	40%

Evaluation:

Participation:

You will earn a third of your participation grade for attending class. Another third will reflect both the quantity and especially the quality of your comments. If we break into groups for debates and primary source exercises, I will evaluate your group participation. If you want top grades, I strongly encourage you to keep notes from your readings. You should aim for at around two pages of single-spaced notes per week. You will earn the last third of your grade by giving a short presentation on your primary source essay (see below).

Telescope Essay on the Moon:

I'll set up at least one telescope on campus. Sometime in the evening, you'll join me and peer through the telescope, which should give you a striking view of the Moon. You will then write a five-page essay that will:

1. Tell me a particular feature on, or aspect of, the Moon that struck you.
2. Explain what that feature or aspect actually is, and how it was formed.
3. Describe how it has factored in human history, considering *for example*: how early astronomers understood it, how robotic or crewed missions to the Moon attempted to study it, or how plans to colonize the Moon might exploit it.

To write your essay, draw on peer-reviewed scholarship on the Moon and its scientific and human histories.

Environmental History Essay:

Write a 15-page, primary-source essay on a topic that has some relation to the *environmental history* of Mars. Remember: environmental history explores the reciprocal relationships between humanity and the non-human universe through time. This essay assignment consists of three steps, each of which will help you craft the best paper you can.

Annotated Bibliography:

Find a *primary source* that will help you compose an argument relevant to your topic. For a guide to reading primary sources, click [here](http://users.clas.ufl.edu/sterk/junsem/reading.html) (if you've printed out this syllabus, the link is: <http://users.clas.ufl.edu/sterk/junsem/reading.html>). Your interpretation of your primary source, and your investigation of the history it allows you to examine, should be supported by *secondary sources*: that is, scholarship written about your topic. Be sure to place your argument in a historiographical *and* scientific context (that means, in the context of arguments made by scientists and other historians)!

Now, plan out your essay in an annotated bibliography. In your first page, list and provide a description of your primary source. Then, give me a hypothesis that will structure your approach to your primary source. Explain how you hope to answer this hypothesis using your source.

List your secondary sources on the following pages. These sources should cover an issue relevant to the hypothesis you have presented. They should be written after 1960, unless I approve of an older source. You should use no fewer than seven books, with one book equal to two articles (in other words, you can use four books and six articles). Each secondary source citation should be accompanied by a short paragraph clearly stating its argument, the strengths and weaknesses of that argument, and how it compares to the positions taken in your other secondary sources. You should also describe how your secondary sources might frame your investigation of the primary source you selected.

Contact me at least one week before the due date to confirm your topic with me. I am happy to offer suggestions for where you might look for primary sources.

Rough Draft:

Once you I grade your annotated bibliography and offer my suggestions, you will start working on a rough draft of your paper. Your rough draft should represent your very best work, though of course it will not be the final iteration of your paper.

On the day you submit your rough draft, you will give a short (5-minute) presentation about your paper. Your peers will then have a chance to ask you questions about your presentation.

Final Draft:

After I return your rough draft with my grade and comments, you will have a chance to revise the draft in light of my suggestions, and your own ideas about what you could improve. Even if you received an A on your rough draft, you will need to make some revisions, because nobody's first draft is ever perfect. If you do not make any revisions, you will receive a much lower grade on the final product.

When you submit your final draft, include a brief (no more than one page) summary of the revisions you made. If you disagreed with a recommendation and therefore did not follow it, use your summary to explain your reasoning. If your explanation makes sense to me, your grade will not suffer.

Grading Criteria:

Each of these criteria will be worth approximately a third of your grade:

Clarity:

Are you using words that appropriately and formally express your meaning? Are your points sourced correctly? Do your sentences precisely express your meaning, and are they grammatically correct? Is there a clear thesis that presents an argument and outlines how that argument will be defended? Is there a coherent organization that culminates in a conclusion that references the thesis?

Research:

Are your secondary sources serious works of scholarship, and are they relevant to your argument? Do your primary sources illuminate the issue you are investigating, and to what extent? Are those primary sources relevant to your argument, and do you present them in the context of your secondary sources?

Ideas:

How creative and nuanced are your arguments? Are you merely repeating the claims of other scholars, or are you evaluating them in the context of other arguments and concepts? To what extent can you develop fresh ideas?

Required Course Texts:

David Rothery, *Planets: A Very Short Introduction*. Oxford: Oxford University Press, 2010.

David Rothery, *Moons: A Very Short Introduction*. Oxford: Oxford University Press, 2016.

Robert Markley, *Dying Planet: Mars in Science and the Imagination*. Durham: Duke University Press, 2005.

Davis Scott and Richard Jurek, *Marketing the Moon: The Selling of the Apollo Lunar Program*. Cambridge: MIT Press, 2014.

Michael J. Crowe, *The Extraterrestrial Life Debate 1750-1900: The idea of a plurality of worlds from Kant to Lowell*. Cambridge: Cambridge University Press, 1986.

Steven J. Dick, *The Biological Universe: The Twentieth Century Extraterrestrial Life Debate and the Limits of Science*. Cambridge: Cambridge University Press, 1999.

Important Notes:

House Rules:

You may use your laptops or tablets to take notes or to look up information in class. However, you may **not** use your phones, and you may **not** record your professor's lectures. You may not access social media in class, which is distracting both for you and for your classmates.

Do not show up late to class. This detracts from your learning and disturbs your classmates. If you are repeatedly late, I may lower your participation grade without informing you.

Submitting Assignments:

Assignments are due **at the beginning of class**, including assignments you need to email to me. Any assignment submitted after the first 15 minutes of class is late. Late assignments will receive a 5%/day penalty. We will not grade assignments that are more than one week late, unless you have negotiated an extension with us (see below).

Extensions:

You may ask me for a **short** extension *before an assignment is due*. I am more likely to grant your request if you A) give me a convincing explanation for your tardiness; B) give me a roadmap that outlines how you will complete your assignment; and C) propose a new due date.

I will only grant requests for an extension on or after the assignment due date in truly exceptional circumstances (a death in the family, for example, or a very serious illness). In such cases, I may ask for written verification.

Be sure to contact your deans in case of absences, difficulties meeting due dates, and other problems.

Missing Assignments:

If you fail to hand in an assignment, you will receive a zero for that assignment. You will not fail the course, but your ability to pass the course will be in serious jeopardy. You will **not necessarily** receive a message from me that asks you about your missing assignment. I expect you to handle your obligations yourself.

Missing Class:

You have only **one** excused absence per term. If you think that you will need to miss several classes for significant and predictable reasons (such as religious observances, or University-sponsored athletic events), you must inform me of the specific circumstances and dates **at the start of the term**.

I will try to accommodate requests for a reasonable number of such absences. You must make sure that the details of the situation are clear to me early on, so that you may have a chance to enroll in a different class if I cannot accommodate your circumstances. Note that the short length of this module will make it hard for you to do well if you must miss more than two classes.

You receive a grade for every class you attend. If you do not attend a class and you have already had your one excused absence, you will receive a grade of **zero** for the class you missed. This will significantly lower your overall grade.

Academic Honesty:

Plagiarism is not just about copying someone else's writing. Any time you present ideas without correctly citing them, you are committing plagiarism. This is the most serious intellectual offense you can commit in academia, so your professors take it very seriously.

It is **your** responsibility to familiarize yourself with the [Georgetown University Undergraduate Honor System](#). It is your professor's duty to refer academic misconduct - including plagiarism - to the Georgetown Honor Council. If the Council decides that you have plagiarized, you will fail this class and suffer additional penalties.

Beyond the Course:

I am committed to supporting survivors of sexual misconduct, which includes relationship violence, sexual harassment and sexual assault. However, university policy requires faculty to

report any disclosures about sexual misconduct to the Georgetown Title IX Coordinator, who directs the University's response to sexual misconduct.

Georgetown has a number of fully confidential professionals who provide support and assistance to survivors of sexual assault and other forms of sexual misconduct. They include:

Jen Schweer, MA, LPC, Associate Director of Health Education Services for Sexual Assault Response and Prevention. Contact: (202) 687-0323, jls242@georgetown.edu.

Erica Shirley, Trauma Specialist, Counseling and Psychiatric Services (CAPS). Contact: (202) 687-6985, els54@georgetown.edu.

More information about campus resources and reporting sexual misconduct can be found at: <http://sexualassault.georgetown.edu>.

Schedule:

- *This schedule may be changed by your professor. You will usually have at least one week's notice.*
- *Complete all weekly readings by Tuesday.*

Week 1: The Planets in Science and Culture

January 11

Readings:

1. Rothery, *Planets: A Very Short Introduction*.

Week 2: Moons in Science and Culture

January 16

January 18

Readings:

1. Rothery, *Moons: A Very Short Introduction*.

Week 3: Discovering New Worlds: Alien Environments in the Age of Exploration

January 23

January 25

Readings:

1. Michael Rawson, "Discovering the Final Frontier: The Seventeenth-Century Encounter with the Lunar Environment." *Environmental History* 20:2 (2015): 194-216.
2. Crowe, *The Extraterrestrial Life Debate*, Preface, Chapter 1 ("The Plurality of worlds debate before 1750"), Chapter 2 ("Astronomers and Extraterrestrials").

Week 4: The Rise and Fall of Lunar Life

January 29

February 1

Readings:

1. Crowe, *The Extraterrestrial Life Debate*, Chapter 4 ("The Intensification of the Plurality of Worlds Debate"), Chapter 5 ("The Decades Before Whewell").
2. "Great Astronomical Discoveries Lately Made by Sir John Herschel." Available at: <https://babel.hathitrust.org/cgi/pt?id=mdp.39015063939055;view=1up;seq=1>.

Week 5: Mars as an Alien Earth

February 6

February 8

Readings:

1. Markley, *Dying Planet*, 1-114.
2. Crowe, *The Extraterrestrial Life Debate*, Chapter 8 ("New Approaches to an Ancient Question"), Chapter 10 ("The Battle Over the Planet of War").

Week 6: "Mars Mania" and the Canal Controversy

February 13

February 15

Readings:

1. K. Maria D. Lane, "Geographers of Mars: cartographic inscription and exploration narrative in late Victorian representations of the red planet." *Isis* 96:4 (2005): 477-506.
2. Joshua Nall, "Constructing Canals on Mars: Event Astronomy and the Transmission of International Telegraphic News." *Isis* 108:2 (2017): 280-306.
3. H. G. Wells, *War of the Worlds*. EITHER:
 - a. Read the original version: <https://www.gutenberg.org/files/36/36-h/36-h.htm>.
 - b. Listen to the radio broadcast: <https://www.youtube.com/watch?v=Xs0K4ApWl4g>.

4. Percival Lowell, *Mars as the Abode of Life*. Find it here: <https://archive.org/details/marsabodeoflife00loweiaia>. Now read EITHER:
 - a. Chapter IV, “Mars and the Future of the Earth.”
 - b. Chapter V, “The Canals and Oases of Mars.”
 - c. Chapter VI, “Proofs of Life on Mars.”

Week 7: The Space Race to the Moon

February 20

February 22

Readings:

1. Hersch, Matthew H. “Space madness: the dreaded disease that never was.” *Endeavour* 36:1 (2012): 32-40.
2. “Geologic Characteristics of the Nine Lunar Landing Mission Sites,” 1968. Available at: <https://www.hq.nasa.gov/alsj/EIBazTR68-340-1NineSiteGeologies.pdf>
3. Read any THREE chapters in *Apollo Expeditions to the Moon*. Find them here: <https://permanent.access.gpo.gov/lps70290/lps70290/www.hq.nasa.gov/office/pao/History/SP-350/toc.html>.

Week 8: Getting to the Moon: Cultural Consequences and Confluences

February 27: MOON ESSAY DUE

March 1

Readings:

1. Scott and Jurek, *Marketing the Moon*.
2. Holly Henry and Amanda Taylor, “Re-Thinking Apollo: Envisioning Environmentalism in Space.” *The Sociological Review* 57 (2009): 190-203.

Week 9: The Space Race to Mars

March 13

March 15: ANNOTATED BIBLIOGRAPHY DUE

Readings:

1. Markley, *Dying Planet*, 150-268.
2. Lawrence Badash, *A Nuclear Winter’s Tale: Science and Politics in the 1980s*. (Cambridge: MIT Press, 2009), pages 3-6; 49-58; 65 (from “Halloween 1983”)-68. Available as a free e-book through the library.

Week 10: Life on Neighbouring Worlds

March 20

March 22: NO CLASS

Readings:

1. Selections from Dick, *The Biological Universe*.

Week 11: Colonizing Mars (by Proxy)

March 27: NO CLASS

April 3

April 5

Readings:

1. Markley, *Dying Planet*, 303-354.
2. Chris Impey and Holly Henry, *Dreams of Other Worlds: The Amazing Story of Unmanned Space Exploration*. (Princeton: Princeton University Press, 2016), 13-73. Available through Georgetown library as a free e-book.

Week 12: Terraforming and Living off the Land

April 10: COLONIZING MARS EXERCISE

April 12: MARS ESSAY ROUGH DRAFT DUE

Readings:

1. Either:
 - a. Kim Stanley Robinson, *Red Mars*. New York: Bantam Spectra, 1993. OR:
 - b. Andy Weir, *The Martian*. New York: Broadway Books, 2014.

Week 13: Final Frontiers (of Capitalism?)

April 17

April 19

Readings:

1. Selections from Alexander MacDonald, *The Long Space Age: The Economic Origins of Space Exploration from Colonial America to the Cold War*. New Haven: Yale University Press, 2017. Available through Georgetown library as a free e-book.

Week 14: The Future

April 24

April 26: MARS ESSAY FINAL DRAFT DUE

Readings:

1. Steven Johnson, "Greetings, E.T. (Please Don't Murder Us)." *New York Times*, June 28, 2017. Available at: <https://www.nytimes.com/2017/06/28/magazine/greetings-et-please-dont-murder-us.html>.
2. Ross Anderson, "What Happens If China Makes First Contact?" *The Atlantic*, December 2017. Available at: https://www.theatlantic.com/magazine/archive/2017/12/what-happens-if-china-makes-first-contact/544131/?utm_source=atfb.
3. Explore SpaceX's plans for Mars: <http://www.spacex.com/mars>.
4. JoAnna Wendel, "Lunar Lava Tubes Could Offer Future Moon Explorers a Safe Haven." *EOS*. Available at: <https://eos.org/articles/lunar-lava-tubes-could-offer-future-moon-explorers-a-safe-haven>.