Astrobiology News February 2021: Mars, MOXIE, and Malvern

February has been an eventful month for all of us, making it difficult for me to focus on a single news topic. One of this month's highlights is (possibly "was" by the time this goes out in the CLP e-news) the landing of *Perseverance* on Mars. You can stay up-to-date on exciting news about this mission, both before and after landing, on NASA's Mars website.¹ This website provides live landing commentary, news briefings, Q & A, virtual watch parties, and activities for students, as well as great information on past and future Mars missions.

Missions flown by NASA's Mars Exploration Program over the past two decades have provided evidence that billions of years ago, Mars was not the cold, arid planet it is today and might have supported life. The search for signs of ancient microbial life on Mars is a key science objective of *Perseverance*'s mission. The rover will characterize the planet's geology and past climate, and it will be the first mission to collect and cache Martian rock and sediment for later return to Earth. *Perseverance* will carry seven primary instruments, one of which, the Mars Oxygen In-Situ Resource Utilization Experiment (or MOXIE), will demonstrate how oxygen can be produced from Mars' carbon-dioxide atmosphere, paving the way for a future human presence on Mars. The production of oxygen could help support the breathing air supply of humans as well as provide liquid oxygen propellant for a return trip. Many technologies developed for *Perseverance* and other Mars missions have also produced spinoff technologies that have improved life on planet Earth.²

As the new rover explores the Martian surface, this is a great time to participate in the Zooniverse project *Planet Four*,³ which needs a lot of help from citizen scientists in order to accomplish its goal of understanding how the Martian climate changes over time. The images for this project come from the HiRISE instrument on the Mars Reconnaissance Orbiter, and they provide an important complement to the work of *Perseverance* and other Mars rovers. During the recent online meeting of the American Association for the Advancement of Science, the folks at the Dialogue on Science, Ethics, and Religion announced the launch of a new webpage dedicated to our joint project *Engaging Faith-based Communities in Citizen Science through Zooniverse*.⁴ This site provides some useful resources that I hope you'll check out!

By now, many of you have probably already held *Evolution Weekend* events; however, if you'd like to participate in another event that has its roots in the Clergy Letter Project, check out the *Malvern Festival of Ideas*.⁵ The theme for this year is, appropriately, *Unity and Diversity*. I'll be leading a Zooniverse workshop on Saturday, March 6th, so if you'd like to learn how to use this platform, please see the website for information on registering and the event schedule.

¹ https://mars.nasa.gov/

² https://mars.nasa.gov/news/8848/nasas-perseverance-pays-off-back-home/

³ https://www.zooniverse.org/projects/mschwamb/planet-four

⁴ https://sciencereligiondialogue.org/projects/zooniverse/

⁵ http://www.malvernfestivalofideas.org.uk/

In other news, *Covalence* editor Susan Barreto has written a piece on the new book *Intersections of Religion and Astronomy* for the *Lutheran Alliance for Faith, Science and Technology*.⁶ Whether or not you're Lutheran, the Alliance website has many great faith and science resources, as well as youth curricula that can be adapted for different traditions.

Until next month,

Grace

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⁶ https://luthscitech.org/new-book-explores-the-intersection-of-religion-and-astronomy/