Astrobiology News April 2024:
Experiencing Awe: Reflections on a Total Solar Eclipse

On April 8, 2024, my spouse and son piloted our 70-year old twin-engine Cessna 310 to a small airport in Perryville, MO, enabling five of us to view a magnificent total solar eclipse! Having access to a small airplane is a luxury for such an event, since we had some last-minute flexibility as to which airport to land and we didn't have to make overnight reservations anywhere.[1] A few highlights of our experience of totality included the 360-degree view of "dusk," with Jupiter and Venus both prominent to either side of the eclipsed sun; incredible binocular views of the Sun's chromosphere and corona during totality, plus a breathtaking "diamond-ring effect" just as the total phase ended; and great partial views through my son's telescope (with a solar filter, of course!) As twilight descended, local birds started singing, becoming quiet during totality, and briefly taking up their chorus again during post-totality twilight.

A total solar eclipse may not seem to have much to do with astrobiology; however, the fact that human beings can experience such an event is due to the extraordinarily similar *angular* sizes of the Sun and Moon in the sky – something that was not true when our pre-human ancestors roamed the Earth. As tidal interactions cause the Moon to spiral away from the Earth, any far future observers will see an annular eclipse at best.[2] We live during a remarkable time when it is possible to conduct some unique physics experiments, and to study the impact of eclipses on human and non-human Earth life; including (to name just a few), tests of General Relativity, critical measurements of the Sun's shape and corona,[3] and the effects of eclipses on animals and ecosystems.[4]

To read more about "Science in the Shadow," as well as to submit your own eclipse experiences, take a look at the special series of eclipse articles some of my colleagues at the Planetary Science Institute have assembled for the Bulletin of the American Astronomical Society![5]

Until next month,

Grace

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[1] I posted just a few photos on Instagram, @gwolfchase, more on FB: grace.chase12
[2] https://spacemath.gsfc.nasa.gov/earth/4Page28.pdf
[3] See https://eclipsemegamovie.org/ and https://sunsketcher.org/ for cool citizen-scientist contributions.
[4] https://eclipsesoundscapes.org/
[5] https://baas.aas.org/science-inthe-shadow