

To the Moon

Gary Singh

■ **FOR HER** *Atlas of Space* project, Eleanor Lutz designed ten elaborate astronomical maps, including one of the moon's geological surface, in which she combined six sets of open source moon data for the final map.

Currently a Ph.D. candidate studying the neurobiology of mosquitos at the University of Washington, where she also received her Bachelor of Science degree in biology, Lutz operates a blog, Tabletop Whale, revealing tremendous talents as a graphic designer, a science illustrator, and an infographics specialist. Among many other visualizations on Tabletop Whale, one finds outtakes from *Atlas of Space*. To make the maps, Lutz used preexisting data from sources, such as NASA and the USGS. She says map-making has always been a part of her academic journey, either as part of her research or as a side hustle.

"I started making science infographics right after I graduated from college," Lutz said. "I had always been excited about drawing and design, but after finishing my biology degree I wanted to find a way to combine art with science."

In addition to the astronomical maps on Tabletop Whale, Lutz also shares the open-source Python code for her maps of Mars and the Moon, along with extensive design tutorials,

so that other students, cartographers, or space enthusiasts can recreate her maps, work with the same data, or even expand on her processes to inspire further adventures—all without getting stuck on the same problems she initially faced. The tutorials have become wildly successful.

"The results so far have been much better than I expected," Lutz said. "Many people have downloaded my code to try out the mapmaking themselves, and some people have even helped make my code better by contributing to the projects or sharing other ways of solving the same problem."

The geological map of the moon that Lutz created for *Atlas of Space* graces the cover of this issue, whereas Figure 1 shows the map before she added the final border ornamentation. Respectively, Figures 2 and 3 reveal a zoomed-in shot of the geology and the data sources Lutz used at various stages of the process.

Of all her maps, Lutz said the moon map was one of her favorites. With so many historic maps of the moon to choose from, the inspiration was everywhere. She specifically became enamored with the old scientific maps from the 1970s that featured bright neon color schemes. She kept as many of the same colors as possible, but rearranged them in order to save extreme colors for smaller or more unusual geologic formations.

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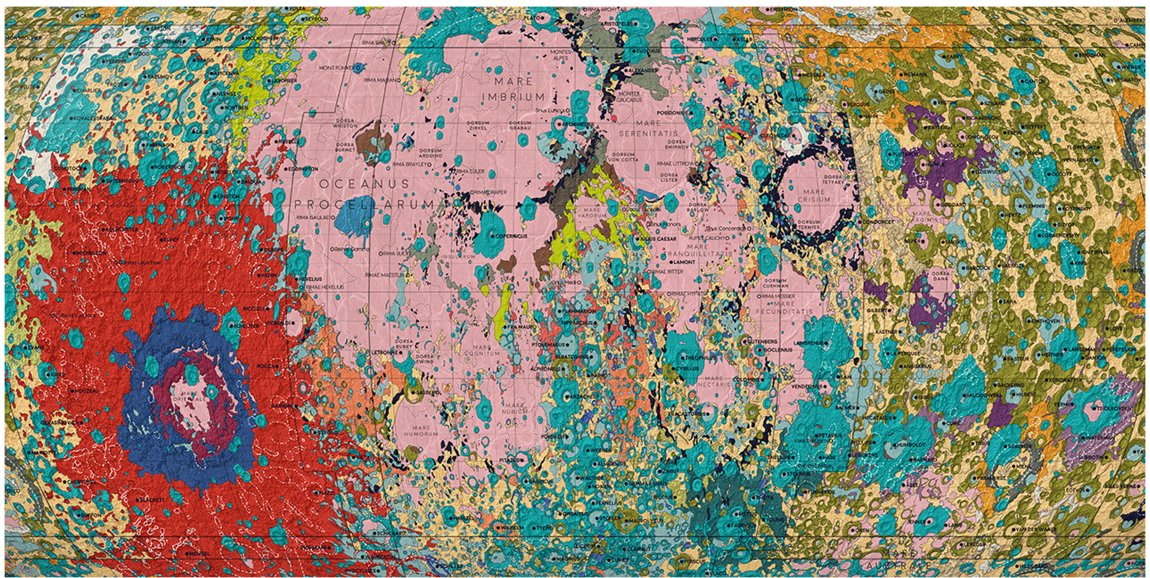


Figure 1. Lutz's moon map without the border ornamentation, used with permission.

For the final product, Lutz wound up using six different geologic datasets to cover the entire surface of the moon. Learning how to merge all the datasets proved to be daunting, but a fun challenge nevertheless. Across the various datasets, some of the data were saved in different types of map projections and distance units, the geographic timescales were not precise, and some of the geologic unit descriptions did not match. Also, the scientific labels in the original maps needed to be translated into more generic

language for lay people, since she was designing the maps for the general public.

"This was one of my first projects working with these types of data files, so it took me a while to figure out how to combine all of these different types of data on the same map," Lutz said. "To work with these discrepancies I combined some types of closely related geologic data into a broader category before assigning a color in the map legend."

For the final product, Lutz merged all the data layers—including geologic units, geologic contacts, hillshade, slope, and nomenclature labels—in Photoshop and Illustrator using blur effects and color overlays to make sure everything went smoothly. As a result, the finished map, while not a precise scientific representation, is still a striking piece of design that succeeds as a brilliant overview of the moon geology.

In order to make the *Atlas of Space* series into a more cohesive project, Lutz incorporated the same design style in each map, replete with ornamental scrollwork illustration that wraps around the map projections. On Tabletop Whale, she provides extensive details on how she created the decorative borders for all the maps, documenting every step in her design process, which she says took just as much time, if not more, then crunching the code and visualizing the data. And just as she does with the open-source Python code, Lutz provides the scrollwork files and original

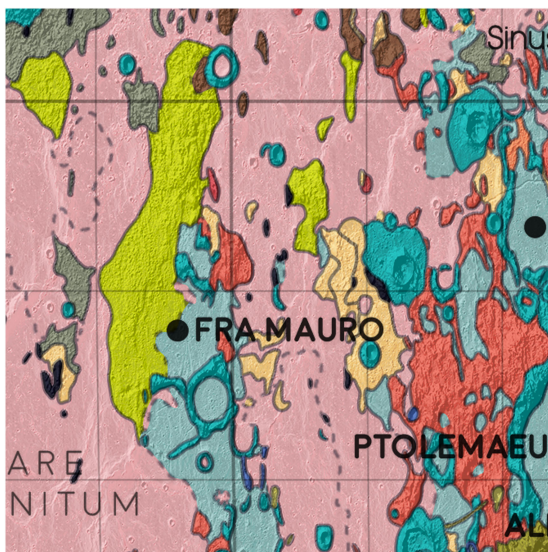


Figure 2. Close-up shot of moon geology, used with permission.

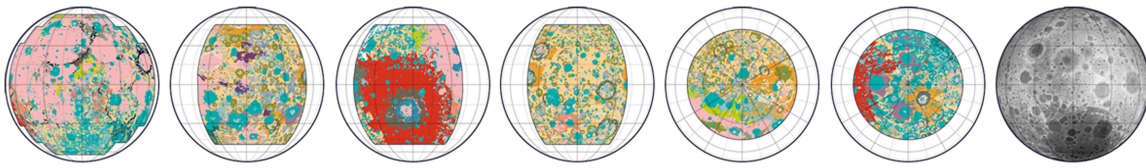


Figure 3. Lutz merged a variety of data sources to compile her map of the moon, used with permission.

illustration layers for anyone that wants to expand on her process or use it as an inspiration for their own work.

What's more, via her Redbubble page, Lutz also sells her map projections in poster form, as well as framed prints, iPhone cases, journal covers, and laptop skins. If you want a Chiffon top, a zipper pouch, or a scarf with the same map as the cover of this issue, Lutz already made them available last summer. If you want her asteroid map of the solar system on a throw blanket, or her topographic map of Mercury on a tote bag, those are likewise available. In this author's view, Lutz' products are a refreshing addition to the goods one normally finds in most science museum gift shops. Even better, you are supporting both a Ph.D. candidate in biology and a data visualization artist in the process, both of whom just happen to be the same person.

"Several teachers have gotten in touch with me to let me know they're using one of my maps

as a decorative poster in their elementary or middle school classrooms," Lutz said. "And many parents have bought my map posters for their kids' rooms, which I think is particularly awesome."

Even though there seems no limit to what Lutz can accomplish with such a huge variety of science design talents and operative infographic endeavors, one would expect something else looming on the horizon. After all, we are only talking about 2D maps here.

"I would love to learn how to design interactive dataviz graphics, or try 3D modeling," she said. "They're both very different skills from what I've used in design work so far, so I think either one would let me explore a much bigger range of fun illustrations."

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