

EOS

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Astronomers for Planet Earth



NASA astronaut Karen Nyberg enjoys a view of Earth from the windows of the International Space Station in 2013. Credit: NASA

There is no escaping the reality of the climate crisis: There is no Planet B. A group of astronomers, united under the name Astronomers for Planet Earth (A4E), are ready to use their unique astronomical perspective to reinforce that important message.

A good number of exoplanets may potentially be habitable, but humans cannot simply cross the vast distances required to get there. And other planets of the solar system, although accessible, are all inhospitable. “Like it or not, for the moment the Earth is where we make our stand,” Carl Sagan famously wrote in his 1994 book *Pale Blue Dot*. The book’s title is based on the eponymous image showing Earth as small, fragile, and isolated. Sagan’s reflection on the image shows that astronomers can have a powerful voice in the climate debate.

“Let’s get real, and let’s figure out how to make sustainability the key part of what our institutions do in addition to astronomy.”

Astronomy, a Field with a Reach

The beginnings of A4E go back to 2019 when two groups of astronomers, one from the

United States and the other from Europe, decided to join forces. Today the network numbers over a thousand astronomers, students, and astronomy educators from 78 countries. “We’re still trying to get ourselves together,” said Adrienne Cool, a professor at San Francisco State University. “It’s a volunteer organization that’s grown rapidly.”

Astronomy, its practitioners note, has a surprisingly wide earthly reach. “We teach astronomy courses that are taken by, just in the U.S., a quarter million students every year,” said Cool. “That’s a lot of students that we reach.”

And their influence goes way beyond students. Each year about 150 million people visit planetariums around the world. Astronomers also organize countless stargazing nights and public lectures. Perhaps more than any other discipline, some researchers think, astronomy has the opportunity to address masses of people of all ages and occupations.

Toward Sustainable Science

There is no guide for how best to incorporate climate science into an astronomy lecture. A4E works as a hub of knowledge and experience where astronomers can exchange teaching and outreach material. Members also learn about climate science and sustainability from regularly organized webinars.

However, although astronomers are spreading their message, they also acknowledge the need to address the elephant in the room: Astronomy can leave a significant carbon footprint. “I don’t feel comfortable tell-

ing the public, ‘Look, we really need to make a change,’ and the next moment I’m jumping on a plane for Chile [to use the telescopes],” said Leonard Burtscher, a staff astronomer at Leiden University in the Netherlands. “That’s a recipe for disaster in terms of communication.”

On average, an astronomer’s work-related greenhouse gas emissions are about twice as high as those of an average citizen in a developed country. The emissions per person are many times above the goal set by the Paris Agreement to limit the global increase in average temperature to less than 1.5°C relative to preindustrial levels.

At a recent virtual conference of the European Astronomical Society, hosted by Leiden University, A4E organized a session in which astronomers and climate crisis experts discussed the measures that would help reduce the carbon footprint of astronomy. Observatories and institutes are moving toward a greater reliance on renewable energy, and plans for future facilities take carbon assessment into account.

Perhaps the most contentious topic of discussion in academia is air travel. One solution is to hold fewer in-person conferences, as studies have shown that moving conferences to a virtual setting dramatically reduces the carbon footprint. “Good things [come] out of virtual meetings,” said Burtscher. “Better inclusivity, lower costs, often a higher legacy value, recordings of talks and discussions.” On the other hand, proponents of face-to-face meetings argue that a virtual setting impedes the fruitful collaborations and networking that are especially important for young scientists. In the end, the community will likely have to make a compromise.

The impetus for change is strong. More than 2,700 astronomers signed an open letter released on Earth Day 2021 in which they recognized the urgency of the climate crisis and called for all astronomical institutions to adopt sustainability as a primary goal (bit.ly/astronomer-letter). But this is just the beginning, and the time for action is ticking away. “So let’s get real, and let’s figure out how to make sustainability the key part of what our institutions do in addition to astronomy,” said Cool.

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