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## A New Scope and Aims for Perspectives of Earth and Space Scientists

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# Perspectives of Earth and Space Scientists



## EDITORIAL

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### Key Points:

- American Geophysical Union (AGU)'s journal *Perspectives of Earth and Space Scientists* has expanded its aims and scope to include, in addition to its articles, several new formats that include memorials, commentaries, debates, opinion pieces, and news updates
- Perspectives* remains fully open access with publication costs borne by AGU, but is no longer by-invitation-only and encourages article submissions across the full range of diversity in nationality, ethnicity, culture, gender, and career stage of Earth and space scientists
- Perspectives* is a premier choice for Earth and space scientists to record the stories of their science with an eye to both documenting the rich history of our fields and inspiring future generations of scientists

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## A New Scope and Aims for *Perspectives of Earth and Space Scientists*

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**Abstract** The journal *Perspectives of Earth and Space Scientists* has expanded both its aims and its scope to better serve the community of Earth and space scientists and represent its diverse range. *Perspectives* is now adding several new article formats to better meet the needs of the Earth and space science community. These include memorials, commentaries, debates, opinion pieces, and news updates. The journal remains fully open access with publication costs borne by the American Geophysical Union, but is no longer by-invitation-only and welcomes submissions from all segments of the geophysical community to better represent the diversity in nationality, ethnicity, culture, gender, and career stage of Earth and space scientists.

**Plain Language Summary** The journal *Perspectives of Earth and Space Scientists* has expanded its aims and scope to include, in addition to its articles, several new formats that include memorials, commentaries, debates, opinion pieces, and news updates. *Perspectives* remains fully open access with publication costs borne by American Geophysical Union, but is no longer by-invitation-only and encourages article submissions across the full range of diversity in nationality, ethnicity, culture, gender, and career stage of Earth and space scientists. *Perspectives* is a premier choice for Earth and space scientists to record the stories of their science with an eye to both documenting the rich history of our fields and inspiring future generations of scientists.

### 1. Preparing Future Scientists

Scientific journals traditionally play a central role in capturing and recording the scientific content of specific fields, and they also can play a critical role in documenting the *processes* of scientific discovery. Most scientific journals, including American Geophysical Union (AGU) journals, discourage the incorporation of the authors' personal voice within the text of an article in favor of a standardized third-person style. This familiar format has the advantage of being read easily by other scientists, allowing for the straightforward transmission of scientific information from one scientist to another. When it comes to the transmission of the *how* of a scientific field or “scientific process” as opposed to the *what* of a field, the incorporation of the personalized writing style of an author, using a first-person voice, not only becomes acceptable but can be very important in the successful conveyance of information. This is the goal of *Perspectives*.

Incorporating the scientific process into a *Perspectives* article shifts the focus from documenting achievements to preparing future generations of scientists for their own future achievements. There is a parallel here to the training of young scientists that occurs in graduate school or as mentored postdocs. There is, or course, a foundational level of understanding of scientific content that must be learned, often largely through formal in-class study or the reading of the literature, and *Perspectives* articles provide the author (or authors) with the opportunity to share their unique understanding of, or “perspective” on, a particular field of research. Just as important for students, however, is learning the wide array of topics that are part of the largely unwritten body of information that become part of the tradition and lore of the practical aspects of the research, and this learning is usually done in non-formal settings such as over meals, in the coffee room, in hallways at conferences, or during field investigations. These topics of the scientific process include handling failures, overcoming obstacles, navigating department politics, obtaining funding, setting up a lab, working with equipment, doing field work, developing partnerships, mentoring students, teaching classes, establishing collaborations, writing and publishing results, developing effective outreach beyond the academy, and prioritizing research directions, among many others.

Traditional science journals document the evolution of scientific understanding but are less effective in carrying on and conveying these lessons and traditions of the less-tangible aspects of the scientific endeavor. Much of this body of understanding is passed down through the centuries-old process of apprenticeship that is the foundation of graduate and postdoc training. However, this limits the access of a young scientist to the experiences of only a few mentors. *Perspectives* aims incorporate these scientific intangibles into its articles with an eye toward preparing future generations of scientists, asking authors to incorporate the stories of *how* they did their science, overcame their obstacles, dealt with challenges and failures, took advantage of good fortune, shrugged off bad fortune, and at each point, made the decisions that have taken them through their careers up to this point.

Interestingly, the integration of these aspects of the processes of science with the content of science has recently become codified as part of K-12 science education in the U.S. in nearly all states (45 of 50, plus D.C.). In the K-12 Next Generation Science Standards, adopted or adapted by these states, science education must now combine, in a multi-dimensional approach, scientific practices, scientific content, crosscutting themes of natural systems, the nature of science, and societal implications of the scientific endeavor. This approach has not been formalized for post-secondary science education, but authors of *Perspectives* articles are encouraged to take this kind of holistic view of their scientific careers when writing their scientific perspectives.

## 2. Origins of *Perspectives of Earth and Space Scientists*

*Perspectives* was launched in 2019 as part of the AGU Centennial celebrations. Initially organized by AGU's College of Fellows, *Perspectives* aimed to document the research stories and perspectives of AGU's most accomplished scientists. Invitation-only articles were written by senior AGU scientists who discussed and described aspects of their accomplished careers in a first-person format. *Perspectives* papers have so far already addressed a wide variety of Earth and space science topics including atmospheric chemistry, atmospheric physics, climate science, environmental geology, geoeconomics policy, geoeconomics research, geomagnetism, geomorphology, heliophysics, hydrology, marine biology, meteorology, nuclear proliferation, planetary science, ocean science, organic geochemistry, seismology, space exploration, space physics, and tectonics.

Many of the early papers were in the format of a memoir, but by 2021, the journal began asking authors to also provide useful lessons and inspiration for future scientists, as discussed above. Articles more heavily emphasized an author's perspective on a field of expertise while including the lessons they had learned on how to successfully carry out their research.

## 3. Diversifying *Perspectives* Authorship

A problem with drawing stories from only senior scientists is the lack of diversity in this community. Because of historical gender, cultural, and racial biases, access to careers in science has traditionally been limited to a narrow subsection of the population, reflected in the demographics of the College of Fellows. This does not reflect the increasing diversity among young scientists and even more so of current students interested in careers in science. To better engage and inspire younger scientists it is important to publish perspectives that represent a diversity in nationality, ethnicity, gender, and career stage, requiring *Perspectives* to move away from focusing on the careers of senior scientists.

To this affect, *Perspectives* has removed its invitation-only requirement for manuscript submissions. The journal remains open access and the publication costs will continue to be covered by AGU, but anyone can now submit an article for publication. Moreover, articles by authors from traditionally underrepresented communities will be actively sought.

## 4. Developing Stories

We invite all Earth and space scientists to contribute to *Perspectives*. Each author is given great leeway in choosing the format of their paper. Unlike traditional science articles that often follow a familiar structure (e.g., introduction, data, methods, observations, discussion, and conclusions), *Perspectives* articles can and should vary from one paper to the next. An author can choose the format that best allows them to convey their unique message. One effective means of writing a *Perspectives* article is by telling a story, and although there are many ways to tell

a story, most share three characteristics: A basic thesis (or message), an arc of development from start to finish, and some amount of character development.

Humans have evolved to be very good at learning from stories, and stories can be very powerful means of teaching and learning about science. The thesis is the main point of an article, or the message that the author wants the reader to learn from it. Again, imagine a group of graduate students in a department coffee room listening to a scientist tell a story about their research: what is the take-away those students should learn from that story? Because we ask all authors to stay below at target of 12 publishing units (about 6,000 words), there isn't space for recounting an entire career. It is better to focus on a particular arc of development, which can be a particular event in time, a series of events, a process of thought, or the development of scientific ideas.

Lastly, a good story should include some amount of character development: what is it that *the author* has learned from the events of the story that they are now passing on to others? This lesson learned can be both about the scientific field being studied and/or of the scientific processes that have been employed. If the author keeps these three things in mind (important message, development of events, lessons learned), it ensures that the *Perspectives* article will be not only of interest to the reader but also of value to them, even if the reader is unfamiliar with either the author or their specific field of study.

## 5. Supporting the Community of Earth and Space Scientists

*Perspectives* is furthering broadening its scope to include formats that better serve the Earth and space science community itself. In addition to the existing “articles,” *Perspectives* will also begin publishing memorials, commentaries, opinions, debates, regional reports, and news updates. Many of these formats were published in the past within *Eos* when that publication was more of a member newsletter. The aim of these new *Perspectives* formats is to increase and improve communication to and among members of the Earth and space science community.

**Memorials** will follow the existing “article” format but will specifically highlight the scientific accomplishments of a deceased AGU member and can be written by either a single author or, perhaps more appropriately, a group of authors.

**Commentaries** will state brief positions on a scientific or science-related topic, without the full documentation and research expected for a *Perspectives* article. Commentaries may address aspects of geoscience policy, education, and infrastructure, as well as research and may be peer reviewed at the discretion of the editor.

**Opinions** are a sub-category of commentaries. Along the lines of a letter to the editor, an opinion can be used for a single author or group of authors to state a particular viewpoint or opinion without the requirement of referenced documentation.

**Debates** are another sub-category of commentaries, where opinions are expressed by two or more debating individuals or research communities. A debate can originate organically, with an author's response to a previously published piece in an AGU journal or at the initiation of an editor. In the latter case, the debate format provides each opposing side the opportunity to contribute both an initial statement and then a follow-up rebuttal to the other's statement.

**News Updates**, shorter than articles and commentaries, provide authors with a forum to update the geophysical community with timely information about research programs, funding opportunities, conference directions, professional organizational news, etc.

**Regional Reports** are a sub-category of new updates, meeting the specific needs of a particular or unique geographic region or community.

We hope to expand the diversity of authors and content of *Perspectives of Earth and Space Scientists* and challenge all Earth and space scientists to consider contributing your stories, commentaries, opinions, and news items in the updated journal.