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Author: Ms. Cynthia Hall
NASA Headquarters, United States

NASA'S TRANSFORM TO OPEN SCIENCE (TOPS) INITIATIVE

Abstract

Over the past few years we have learned some valuable lessons as a scientific community: that we are stronger together, that we must uplift one another in order to achieve scientific progress, and that the best solutions are found when we work together. But these lessons will remain unlearned unless we begin to address hesitancy in transitioning towards sharing data/results and the lack of applied experience with tools which make open collaboration easier. Transform to Open Science (TOPS) is a new NASA Science Mission Directorate 5-year initiative designed to spark a cultural shift to collaborative, inclusive science.

Open science increases access to knowledge and expands opportunities for new voices to participate. Sharing the data, code, and knowledge associated with the scientific process lowers barriers to entry for historically-underrepresented communities, enables findings to be more easily reproduced, and generates new knowledge at scale. Success depends on all of us working to change frameworks from which we operate. This is why NASA is pursuing an open-source science ethos; open-source science embraces the principles of open science and activates it in a way that unlocks the full potential of a more equitable, impactful, scientific future.

Opening up the scientific process requires that we shift to a paradigm that encourages open science behaviors and practices. To help catalyze and support cultural change within the scientific community, NASA has launched the Open-Source Science Initiative (OSSI), a long-term commitment to open science. To spark change and inspire engagement, OSSI has created the TOPS mission and declared 2023 as the Year Of Open Science (YOOS).

TOPS looks to enable science that is Accessible, Inclusive and Reproducible via four, overarching activities:

- Providing high-level visibility to open science activities at NASA and beyond;
- Developing an open and free open science curriculum through a collaborative, community-driven model which will be available online, virtually, and at conferences;
- Incentivizing open science activities via partnerships, badging programs, and sponsoring awards; and,
- Instigating a transformation of NASA's culture to better recognize and reward open science activities.

TOPS advocates for open science as it builds trust, advances understanding, and ultimately leads to new knowledge production and important new discoveries. At the IAC, we hope to share NASA's vision for open science, and invite the community to join us to challenge the old norms of scientific research and create a community which designs its scientific endeavors to be open from the start.