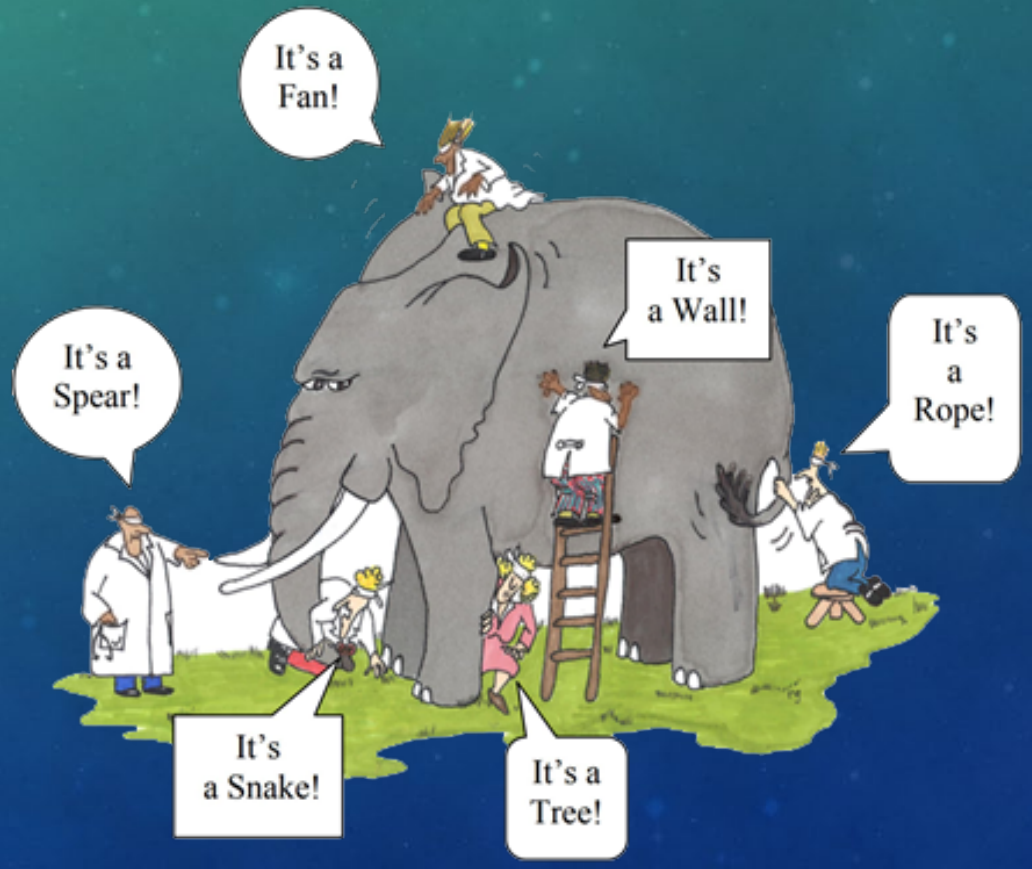
BETTER SCIENCE COMMUNICATION

FOR A WORLD THAT NEEDS BETTER SCIENCE

WHAT IS SCIENCE COMMUNICATION?

HOW WE DEFINE IT DEPENDS ON OUR PERSPECTIVE

- **MANY PARTICIPANTS:** Individual researchers, research groups, journalists, IGOs, governments, universities, informal educators, tech transfer offices, industry, science writers, policy activists (NGOs), and more.
- **MANY SKILLSETS:** From subject-specific expert work like study design, study communication, grant writing, technical writing, and journal editing, to multidisciplinary work like media outreach, informatics, business development, and marketing.



WHAT IS THE GOAL?

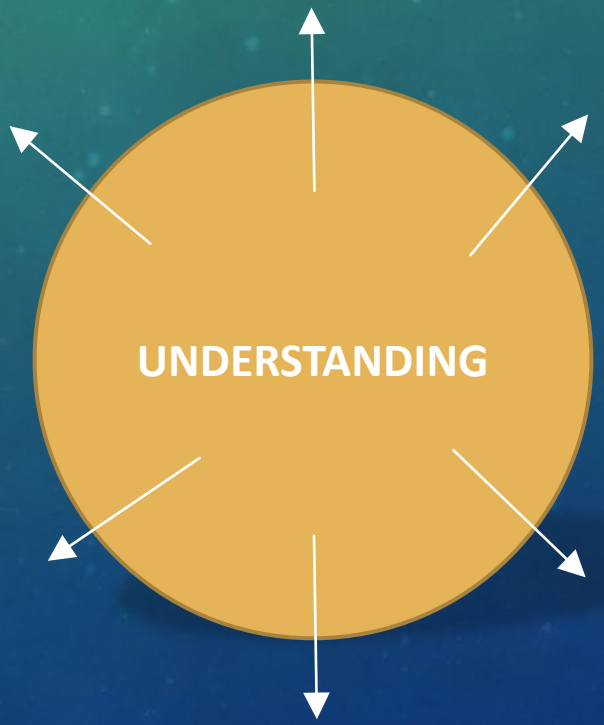
THERE ARE MANY GOALS, IN FACT, SHAPED BY OUR NEEDS

These goals include (but are not limited to) improving the readability and clarity of science, maintaining the integrity of important communication tools like journals, evolving these communication tools and publishing methods, improving collaboration and interdisciplinary engagement, improving openness and transparency in science (with an eye toward improving information access and reuse, and also improving reliability and replicability), improving science outreach and literacy, making issue advocacy and awareness more effective, improving policy development and compliance (e.g., vaccines), and more.

THE HIGH LEVEL VIEW

MOST SCIENCE COMMUNICATION FALLS INTO THESE TWO CATEGORIES

THERE AREN'T MANY SOLID CONNECTIONS EITHER WITHIN OR BETWEEN THESE TWO CATEGORIES. There are practitioner networks that share best practices and lessons of experience and issue recommendations. There IS NOT, however, widespread recognition (especially at the funder level) that all of this work involves the same basic activities, and would therefore benefit from being more connected.



GENERALLY INWARD-FOCUSED WORK
like journal publishing, analysis, study support (e.g., grant writing), and tech transfer.

GENERALLY OUTWARD-FOCUSED WORK
like science writing, STEM education, science marketing, issue advocacy and policy development.

SO, HOW DO WE IMPROVE THIS BROAD FIELD?

OR ARE WE ONLY INTERESTED IN CERTAIN GOALS AND PROCESSES?

SINCE SCIENCE COMMUNICATION IS SUCH A BROAD FIELD, how we see it will guide how we focus our reform efforts.

- Do we see science communication as a tool to help improve public policy?
- Or is it primarily a tool to help improve education?
- What about helping science become more accessible to other scientists?
- Or helping improve the reliability and replicability of science through greater transparency?

While it's fine to just tackle one goal at a time, **ARE WE ALSO LEAVING TOO MANY OTHER GOALS UNADDRESSED, AND LEAVING TOO MUCH POTENTIAL VALUE ON THE TABLE?**

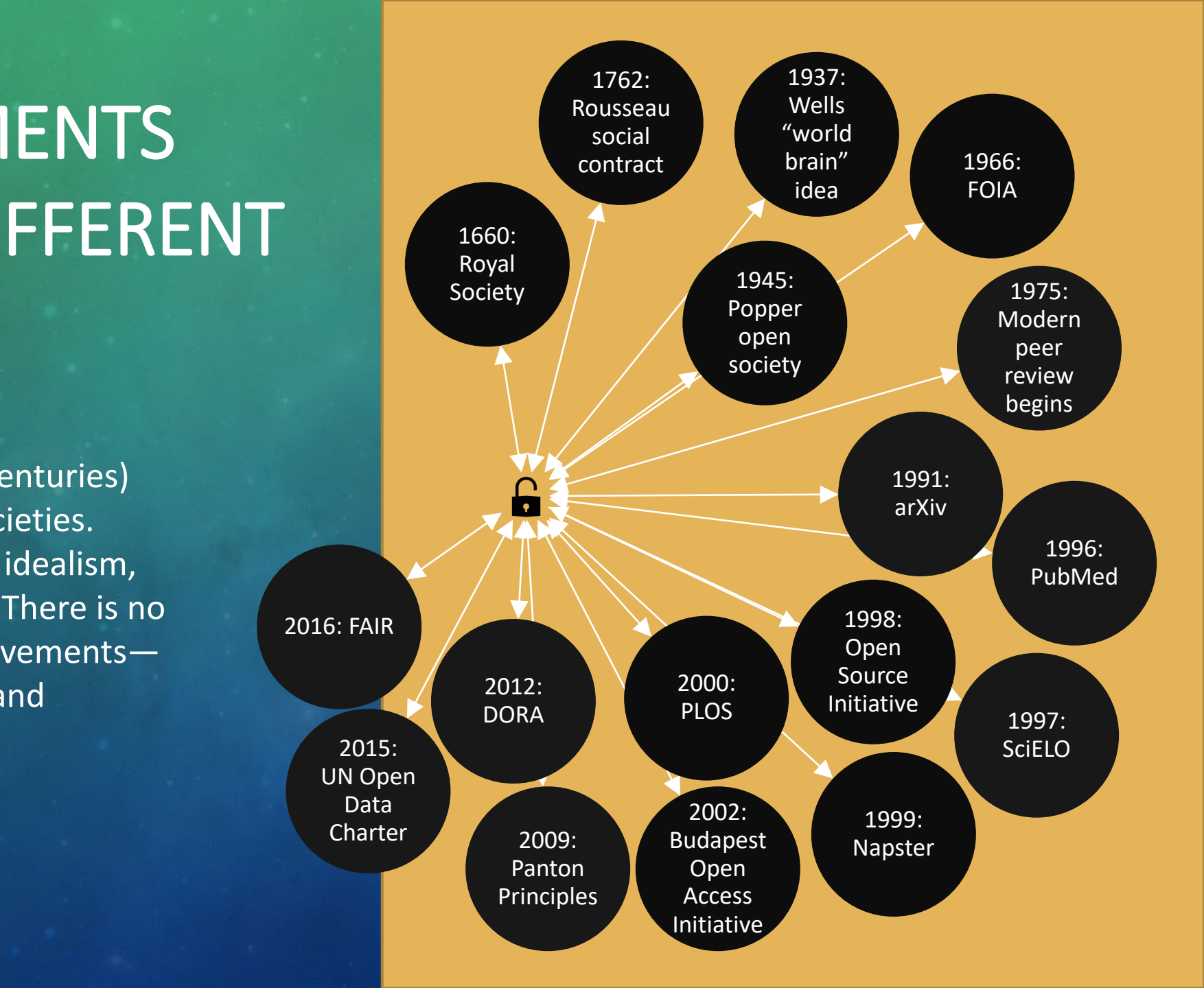
A PARALLEL CASE:

TODAY, WE HAVE SEVERAL SEPARATE AND DISTINCT "OPEN" MOVEMENTS

- OPEN ACCESS
- OPEN DATA
- OPEN SOURCE/CODE
- OPEN SCIENCE
- OPEN GOVERNMENT
- OPEN EDUCATIONAL RESOURCES
- OPEN METHODS, PRACTICES

THESE MOVEMENTS HAVE MANY DIFFERENT ORIGINS

All evolved for decades (even centuries) from many corners of many societies. Some were originally fueled by idealism, others by need or opportunity. There is no starting point for any single movements—this growth has been iterative and cumulative.



AND OVER TIME, THEY ALL FOLLOWED DIFFERENT EVOLUTIONARY PATHS

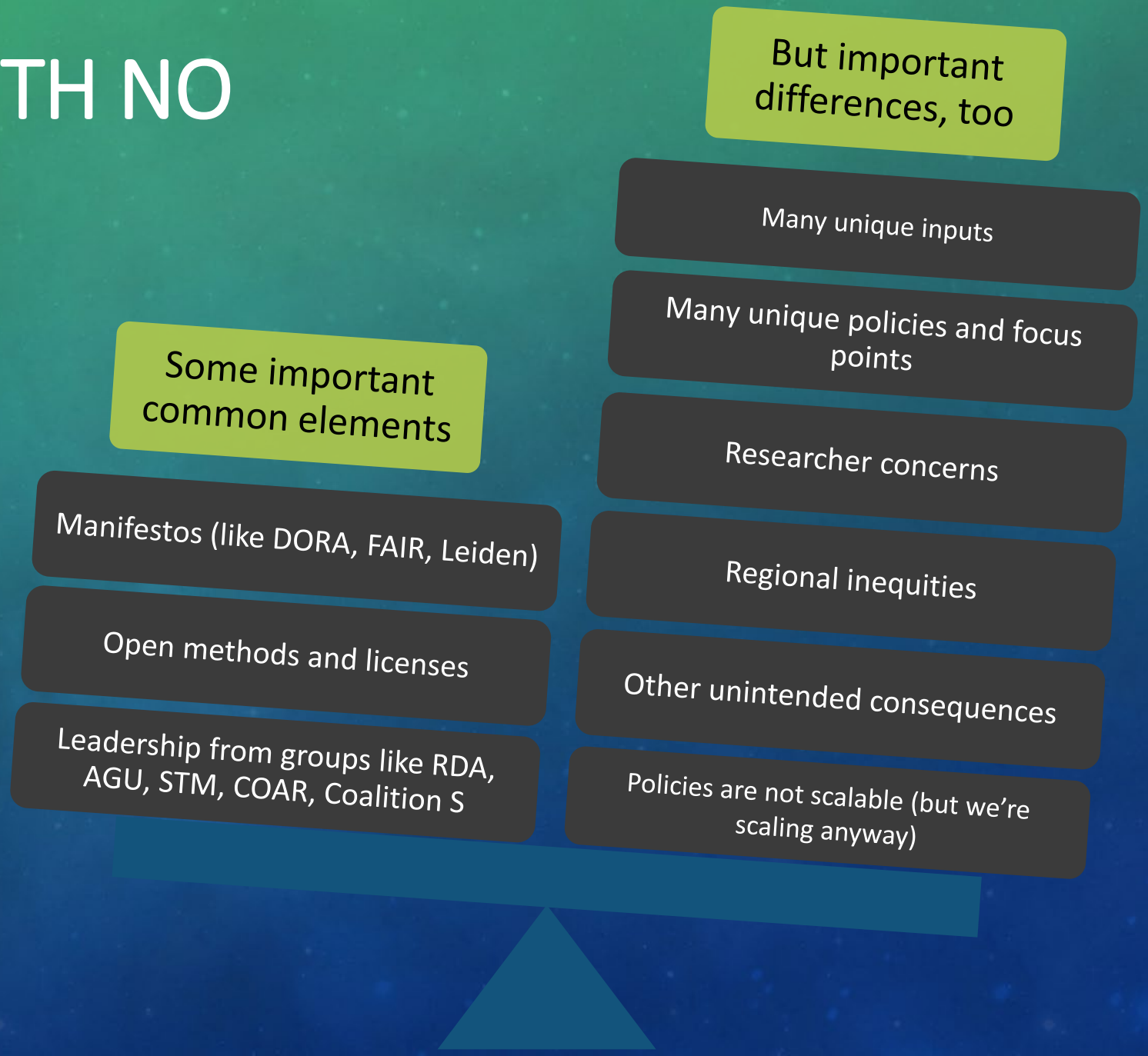
LEAVING THEM WITH NO CENTRAL FOCUS

EVEN INTERNALLY

This array of open solutions can use similar methods and practices, but they are mostly similar in name only due to:*

- Many different inputs (definitions, goals, needs, perspectives, etc.)
- Many different focus points
- Researcher concerns
- Regional inequities and other unintended consequences, and
- Limited scalability and interoperability.

Exception: Large researcher institutions often do admirable work integrating open access and open data.



OSI & UNESCO HAVE BEEN STUDYING THIS SITUTATION SINCE 2014

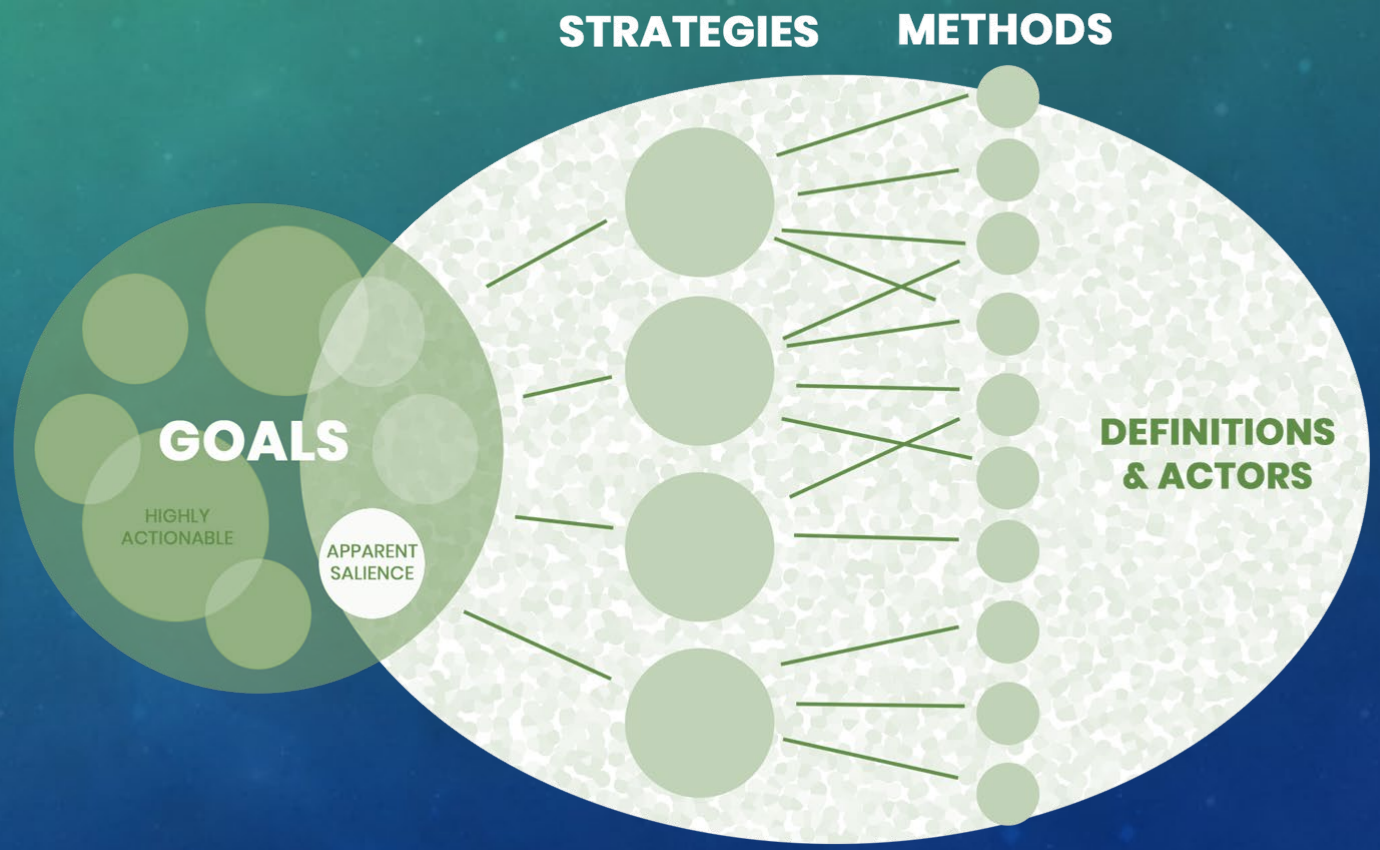
OSI (the Open Scholarship Initiative) is a diverse, inclusive, global network of high-level experts and stakeholder representatives, working together and in partnership with UNESCO to develop broadly accepted, comprehensive, sustainable solutions to the future of open scholarship that work for everyone everywhere. For more information, see osiglobal.org.

- OSI includes about 450 participants, alumni and observers, representing over 250 institutions from 30 countries, and 18 stakeholder groups (see chart, left)

RECENT PAPER: FOCUS ON COMMON GOALS

ALSO KNOWN AS A "THEORY OF CHANGE" APPROACH

A goals-based approach identifies the long-term changes our broad community desires, and then works backward, together, to map out the actions and policies we need to create this change. By focusing on common goals first, we work together in ways that maximize our mutual benefit across our many differences. The goals-based (Theory of Change) approach is widely used in business, governments, and the United Nations.



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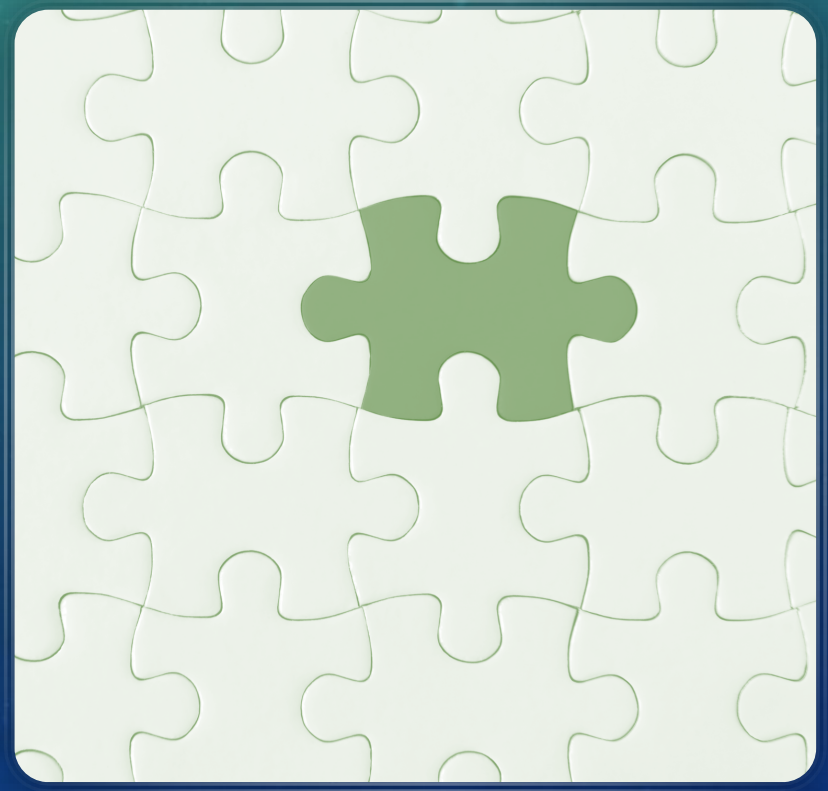
WHAT MIGHT BE OUR COMMON GOALS FOR SCIENCE COMMUNICATION?

Do we really "just" to help scientists communicate more clearly, or more broadly, do we really all want to help:

- **MAKE RESEARCH MORE POWERFUL** (with more connections and more understanding),
- **SPUR INNOVATION**
- **ACCELERATE DISCOVERY**
- **IMPROVE THE SOCIAL IMPACTS OF SCIENCE** (including science literacy, public policy, education, more)



WHERE TO BEGIN? MAHA'S RECOMMENDATIONS

THESE ACTIONS ARE SPECIFIC AND ACHIEVABLE

- Establish Science Communication Office in all universities and research institutes
- Introduce science communication modules in all STEM programmes in the universities
- Include laymen abstract in all journals
- Allocate a small percentage of grant for science communication/society engagement
- Training for scientists on science communication
- Science journalism as a degree programme in the universities

MORE BROADLY, SCIENCE COMMUNICATION SHOULD BE DEVELOPED AS AN ECOSYSTEM

SEE THE BIG PICTURE AND THE BROAD POTENTIAL BENEFITS

- Improve our understanding of the many participants in this space
- Better understand the many different perspectives in science communication
- Better understand the different needs and goals
- Improve our understanding of the different skillsets needed and used
- Improve coordination, both within and between science communication categories
- Improve the sense of community in this space
- Improve training standards and curricula (including creating a global standard science communication PhD program and global standard science communication offices/capacities at research universities)
- Improve the uptake of science communication best practices, especially between categories

FOR NOW, HOW DO WE IMPROVE POLICY?

HOW DO WE START ON THIS JOURNEY?

1. **HELP IMPROVE "DISCOVERY" ORIENTED SCIENCE COMMUNICATION PROCESSES:** These processes ("inreach") are an essential part of the science communication infrastructure that support science itself. Volunteer to help—with peer review, journal editing, data sharing, conference hosting, etc.—because "inreach" is essential to science, and because scientists, funders, and policymakers all pay close attention to these communications.
2. **HELP IMPROVE "UNDERSTANDING":** For some researchers with the time, skill and desire, this means engaging with the public (media interviews, blog posts, etc.; many universities have training and resources available to help with this). For other researchers, this means helping improve the research information custody chain. For example: (1) Improve access to your research (paywalls, licensing, reusability, etc.), (2) Ensure that your research is valid (and help journalists understand the difference between preprints and peer reviewed articles), and (3) Ensure that translations of your work are accurate and unbiased (which they often are not).
3. **HELP INTEGRATE MORE SCIENCE COMMUNICATION WORK:** Help encourage working groups of outreach specialists, journal editors and more at your university. Relatively few of these activities are coordinated or structured to help each other. They mostly co-exist, using their own processes, and with their own goals in mind.

TOP 10 CHALLENGES (1-4)

THINGS TO WATCH FOR AS WE MOVE FORWARD

1. **FUNDING:** Compared to other parts of science, science communication is starved of funding. It mostly continues to be funded as an afterthought or "feature," not as a central and essential part of science. Externally, this is because no urgent need has been effectively articulated. Internally, this is because there is no sense that science communication is a single field with many different branches.
2. **DEVELOPMENT:** Science communication needs more centralized development so we can apply lessons of experience, best practices, and so on, and also more effectively train the next generation of science communicators.
3. **DIVERSITY:** We need to diversify our approaches to science communication reform and not just think in terms of solutions that put more demands on scientists, but rather develop solutions that helps science succeed.
4. **FOUNDATIONS:** We need to do a better job of tapping into the vast expertise of established disciplines like communications and marketing rather than thinking of science communication as some new and novel undertaking (e.g., the science of science communication branch).

TOP 10 CHALLENGES (5-8)

THINGS TO WATCH FOR AS WE MOVE FORWARD

5. **ARROGANCE:** Policy development is a complex process and needs to consider a great many different needs and perspectives, not just science. There's always a balancing act. Science needs to do a better job of understanding how to talk policy and have more effective influence, not just have "more" influence.
6. **BRANDING:** Science has a branding problem. Over the long run, we need to reclaim and de-politicize the science brand. Policymakers and the public need to better understand what science is and how it works.
7. **PERCEPTION:** Within science, there is a widespread perception that "promotion" is unprofessional and distasteful—that scientists should focus on science and not on marketing.
8. **PRECISION:** Science needs precise language, so not all forms of science communication can be reformed with the same one-size-fits-all approach of making everything simple and easy to understand. Different areas of science communication need different solutions.

TOP 10 CHALLENGES (9-10)

THINGS TO WATCH FOR AS WE MOVE FORWARD

9. **TECHNO-UTOPIANISM:** We are constantly pushing “techno utopian” solutions that claim free and “democratized” information are the cure to our information problems. But is this necessarily true (as we’ve seen with the demise of newspapers)? Gatekeepers play an important role, especially in science, where “democratized” information can also be less reliable (as we saw during the pandemic). Can we develop better communication models that have the benefits of both democracy and gatekeeping?
10. **INCENTIVES:** Academic promotion, retention and tenure committees generally don’t reward science communication work. These attitudes are changing slowly in some parts of the world, but for now, we’re still stuck in the mindset that the most important metric of academic “worthiness” is to publish a lot in high impact journals.

IN CLOSING

Our future has never been more dependent than now on science. Coupled with this, the challenges of transforming our science communication practices into the modern age are significant.

But if we can start seeing science communication as a unified field, and also start creating and empowering more, and more diverse, science communication efforts, then we can usher in a new era of discovery for science, and more science benefit for all of society. There are small steps we can take now, and more ambitious steps we can take over time. The key is to get started, and not wait for the next global crisis to realize (again) that we need better science communication.

Thank you, and good luck with your science communication projects.

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