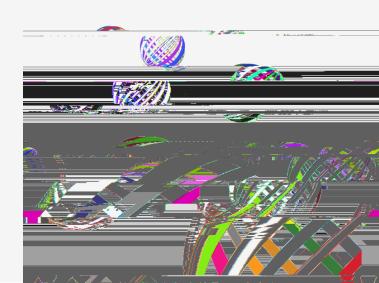


## In Praise of the "Great Open



 $\label{eq:Duringthe} \mbox{During the pandemic, the component of openness in the scientific process achieved criticality. A}$ 

of science and platform-agnostic discovery services, as well as enhanced bibliodiversity<sup>2</sup>, inclusivity, and multilingualism.

This document offers a brief outline of the main ideas, opinions, and suggestions put forward by the Conference speakers and audience members. It is complementary to the video recordings and presentations which are freely available online<sup>3</sup>.

policies alone will not suffice in the face of the dimate crisis, and global cooperation is a necessity. While there have been many positive moves toward Open Science, it has not yet become the new normal. It is still a minority of studies that make data openly available; less than 50% of clinical trials publish their data. Studies and research that were open during the pandemic, may not remain open for long and there is evidence that some have already been sequestered behind paywalls, which raises some concerns as we have not yet overcome the COVID-19 crisis. This indicates that terms are still being dictated by service providers, and not the users. A common theme that emerged: it is not just the final product that needs to be open, but the whole life cycle of the research process which must be and remain open, interoperable, based on the

Professor Geoffrey Boulton brought the conversation on Open Science back to the scientists. The keynote explored the history and traced progress of Open Science, the context we find ourselves in today, and the challenges and opportunities. The goal must be to ensure decisions are made based on evidence for the advancement of human well-being and to find a sustainable path forward as we face climate change, pandemics and other global crises.

The traditional self-organizing model of science comprised of governments, funding agencies and universities motivated by the public good for scientific research, led to academic freedoms that enabled broad spectrum advances based on the curiosity and ingenuity of the researchers. For Open Science to be realized, a similar self-organizing model is necessary. Reform to the current dysfunctional market of research assessment largely based on proxy measures controlled by commercial publishing corporations is essential. If we do not change scientific publishing, we will not change behavior, and Open Science will remain a dream.

Recommendation,7e ing corporations

interface by promoting open dialogue and engagement among social actors, enabling the wider sharing of knowledge and resources, and making research and data collection more transparent. At the same time, the rapid and open dissemination of science has varying results in terms of strengthening or weakening trust in science with subsequent impacts on how science informs policy. Incorporating ethics and integrity in the scientific process, the development of digital trust, privacy protections, and work to build bridges between civil society and governments can enhance trust. Other proposals around Open Science for a stronger science-policy-society interface included: innovating data reporting mechanisms to better connect people with data and to ensure data interoperability; enhancing collaboration between researchers and end users to boost participatory science; improved response mechanisms to improve science and data; efforts to shift incentives towards research that adds public value as with vaccination research during COVID-19; open source repositories that attract good data and content; collaboration between state and non-state actors; and enhanced digital trust policies.

The choices we make in the transition to open system infrastructures for sharing knowledge will affect how equitable Open Science systems will be in the future. Speakers explored the ways in which values like power, greed, exploitation, profit, and expansion result in climate change, racial/dass/global inequalities, and systemic oppression that excludes historically marginalized groups. The recent inequities in global health outcomes and vaccine inequality are an unfortunate reference. Institutions can work towards equity by adopting values

that cycles between two phases: communication (discovery) and publication (justification, selecting out the not good

humanity was very clear, there was no place for the market-based rules and priorities of traditional publishing.

Guédon suggested that libraries and research funding agencies can make a particularly formidable alliance if they work together to disarm the power of the corporate scientific publishers and create new processes of publishing not only because together they control the majority of the funds that currently go to publishers, but also because of the power and potential they hold for development of policies, technologies, and networks needed to re-

The COVID-19 pandemic has made clear the interconnected nature of the systems behind research creation and of the platforms on which this research circulates; it was these transnational systems that allowed us to tap into our collective global capacity in the throes of the pandemic. Speakers warned that the current science system, rooted in proxy metrics, breeds non-collaborative practices, a quality and replication crisis, expensive commercial publication markets, while widely encouraging short-termism, and risk aversion, novelty and quantity over quality, relevance, and impact. In the current reward system in science, society is largely absent from the credibility cycle; a cycle painted with hypercompetition for limited funds, too little room for team-science, most papers still behind paywalls, data not shared, and quality defined in purely quantitative terms (number of articles, journal impact factor, citations, H-index, amount of funding obtained). For science to better reflect societal needs, Open Science principles must be applied to increase the quality, progress, and scientific and societal impact of research and scholarship. This can be achieved through

changing incentives and rewards to better engage with relevant and representative stakeholders, to define problems and discuss ongoing research, share results throughout the work life cycle, and publish openly accessible research results. Such work is already underway in Africa, Europe, Latin and North America. For example, with the pan-African project AfricaConnect in place since 2011 and three regional networks. ASREN, WACREN, and UbuntuNet Alliance that continue to grow, African libraries are now joining the cause through LIBSENSE (Libraries Support for Embedded NREN Services and Einfrastructure) which is an effort to foster collaboration between libraries and research networks.

The road to Open Science in Latin America was spearheaded by a framework of openness and sharing developed since the 1950s. This model can offer lessons for other national and regional frameworks currently in development. The Latin American road included national information systems such as national scientific agencies, megauniversities, public universities with large libraries, documentation centers and professional librarians. It incorporated regional networks, digital libraries, and indexing systems such as Bireme (1967), CLACSO (1967), LATINDEX, SCIELO, REDALYC, and BIBLAT. It included national laws on open access. Argentina (2013), Peru (2013), Mexico (2014), Uruguay (2013) , a result of the first round of Current Research Information System (CRIS) projects, a regional repository federation (LA Referencia), and a regional tradition of university branching. The Latin American approach ensures community-owned and -governed open access to

research outputs (bibliodiversity+), multilingualism, the highest percentage of open access adoption in scholarly journals published, no article processing charges (APCs) and no outsourcing to commercial publishers, university leadership of open access, open access journal and research data platforms, institutional repositories and national and transnational open access policies, prioritizing open access repositories, and co-production of knowledge with other societal actors.

Open Science that is community-led in non-profit public open infrastructures with no paywalls for participants or beneficiaries.

open data and emanate from diverse societal actors. The global dominance of the English language, the monolingualism of scientific output, was raised as a concern for the universal benefit of science. Representatives from LA Referencia

free access to peer-reviewed research on COVID-19 while textbook companies granted universities temporary free access to their electronic collections. Speakers reflected on the successes of Open Science during the pandemic and urged the application of open access principles in the fight against dimate change. The redefinition of science as a public good rather than as intellectual property is necessary for information to be disseminated rapidly to address global emergencies like pandemics and dimate change. To generate a social and cultural shift towards Open Science, speakers encouraged scientists to publish in local open access journals, expand the use of pre-prints and open data and metadata, broaden access to the public and to speakers of all languages, and replace journal-level indicators of prestige with new incentives like social relevance. Investment in infrastructure and the creation of economies of scale will be crucial in generating the human, information technology, and data

All speakers at the Open Science Conference focused on the importance to support the involvement of young researchers in the formation of Open

- Alperin, Juan Pablo.