Background

The *UNESCO Recommendation on Open Science* affirms the importance of Open Infrastructure as one of the key pillars of Open Science. The Recommendation calls for the development of multinational, regional, and national Open Science platforms, as integrated and federated e-infrastructures, and urges stakeholders to ensure that no one is left behind.

The idea to bring together partners to co-design and co-build the Global Open Science Cloud (GOSC) originated at the CODATA 2019 Beijing conference. Launched in 2021, the GOSC Initiative is now an important component of the ISC CODATA Decadal Programme 'Making Data Work for Cross-Domain Grand Challenges', in the International Science Council's Action Plan, and is supported by seed funding from the Chinese Academy of Science (CAS). CODATA and the Computer Network Information Center (CNIC), CAS work together to coordinate and support the international collaborations around GOSC.

2019 CODATA Conference

What is GOSC?

The GOSC Initiative aims to connect worldwide research e-infrastructures and stakeholders to enable innovative scientific discoveries to address global challenges such as the *UN SDGs*, in a dynamically evolving global open science environment.

Vision

The GOSC vision is of a global Open Science environment connecting trusted research e-infrastructures to enable innovative scientific discoveries.

Mission

The GOSC mission is to facilitate accessibility, interconnectivity, interoperability, and inclusiveness of worldwide research e-infrastructures for Open Science and international research collaborations.
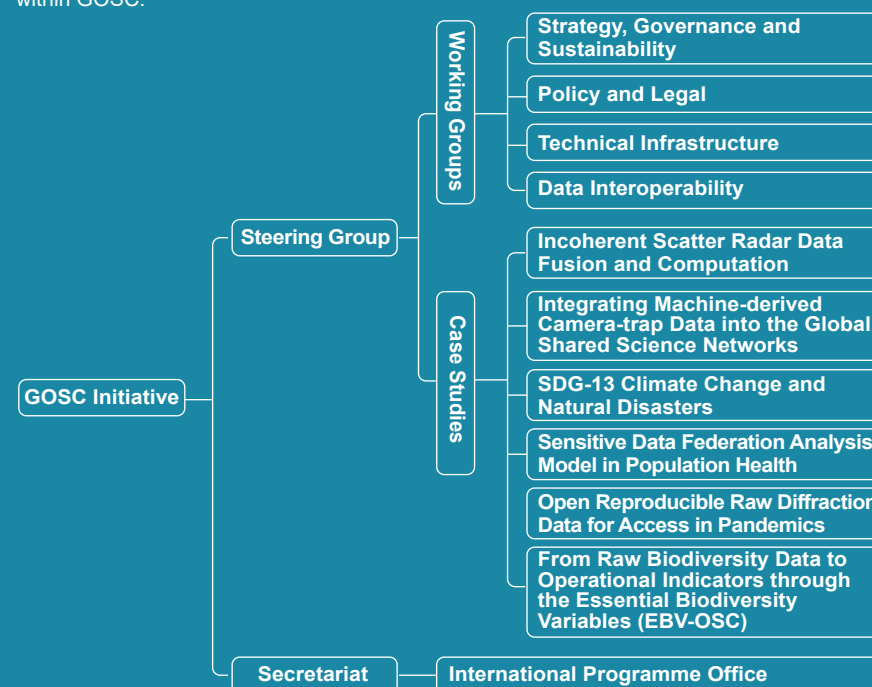
GOSC International Programme Office (GOSC IPO)

Co-sponsored by CODATA and CNIC, CAS, the GOSC International Programme Office (GOSC IPO) was established in early 2022, serving as a coordinating and facilitating body to support science communication and stakeholder engagement within the GOSC Initiative.

Governance

A steering group (SG), four working groups (WGs), and an initial set of six case studies (CSs) have been formed to support the implementation and demonstration of the GOSC Initiative. In addition, the GOSC Secretariat has been established to coordinate the internal bodies within GOSC.

GOSC Initiative
- **Steering Group**
  - **Working Groups**
    - Strategy, Governance and Sustainability
    - Policy and Legal
    - Technical Infrastructure
    - Data Interoperability
  - **Case Studies**
    - Incoherent Scatter Radar Data Fusion and Computation
    - Integrating Machine-derived Camera-trap Data into the Global Shared Science Networks
    - SDG-13 Climate Change and Natural Disasters
    - Sensitive Data Federation Analysis Model in Population Health
    - Open Reproducible Raw Diffraction Data for Access in Pandemics
    - From Raw Biodiversity Data to Operational Indicators through the Essential Biodiversity Variables (EBV-OSC)
- **Secretariat**
  - International Programme Office

1 SG: provides strategic guidance for project management and supports the routine work of other groups.

4 WGs: work on harmonized policies, interoperable protocols, transparent services, and sustained mechanisms for the design, development, and deployment of GOSC.

Strategy, Governance, and Sustainability
Through information exchanges and experiences sharing, this WG seeks to review the governance models of worldwide OSC initiatives and select the best fit for GOSC while coordinating action steps to implement it.

Policy and Legal
Based on a review of Open Science policies and practices in the context of operational platforms, this WG aims to identify priorities among existing guidelines, seek potential alignment on policy and legal interoperability among OSCs, and get implemented in the selected case studies.

Technical Infrastructure
This WG focuses on achieving technical connectivity and interoperability among worldwide infrastructures by leveraging and improving existing federation capabilities and interoperability frameworks to support international research collaborations.

Data Interoperability
Based on the FAIR principles (Findable, Accessible, Interoperable, and Reusable), this WG seeks to break down the silos among OSCs that may inhibit data sharing and promote collaboration and alignment in the area of data interoperability.


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6 CSs: were initially selected for demonstration and validation, providing a concrete grounding and exemplars for the above topics.

### Incoherent Scatter Radar Data Fusion and Computation

This CS supports the international collaboration of the radar community, particularly with a focus on data and technical interoperability. The management of large-scale radar data provides an excellent scenario to validate the technical maturity of the GOSC testbed.

Integrating Machine-derived Camera-trap Data into the Global Shared Science Networks
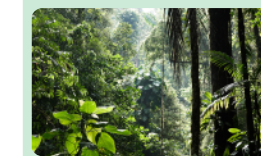
Through a collaborative platform for global camera-trap data sharing and analysis service, this CS will contribute to global biodiversity research, especially focusing on distributed big data management, intelligent analysis, and cloud computing for high-quality integration and optimization for camera-trap data management.

### SDG-13 Climate Change and Natural Disasters
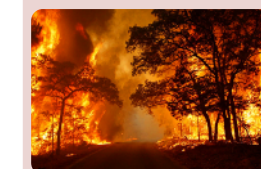
CASEarth for Sustainable Development Goals (CASEarth4SDGs) is a platform system of data sharing and online computing for monitoring, measuring, and evaluating SDG indicators. Supported by this system, this CS mainly focuses on climate change and natural disasters in the SDG-13 field, addressing technical, semantic, and policy interoperability to support decision-making.

Sensitive Data Federation Analysis Model in Population Health

This CS seeks to demonstrate better ways of sensitive data sharing. Commonly agreed FAIR implementation profiles will be created based on the FAIR data points established in various 'GOSC' regions. The feasibility of distributed analytics over datasets held in various regions will then be explored and demonstrated. Community-accepted standards will be used throughout to facilitate the implementation of this CS.

### Open Reproducible Raw Diffraction Data for Access in Pandemics
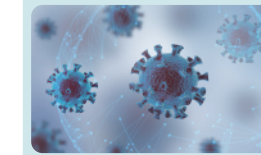
This CS would lead to single, definitive, protein models derived from their raw diffraction data sets, which is important to the crystallographic community and the broader research community for drug discovery, especially for the pandemic crises that COVID-19 poses for society.

From Raw Biodiversity Data to Operational Indicators through the Essential Biodiversity Variables (EBV-OSC)

The objective of this CS is to operationalize EBV indicators by targeting the highest levels of FAIRness (Findable, Accessible, Interoperability, Reusable) for both data and source code implementation, so that data and tools can be widely shared and reused.
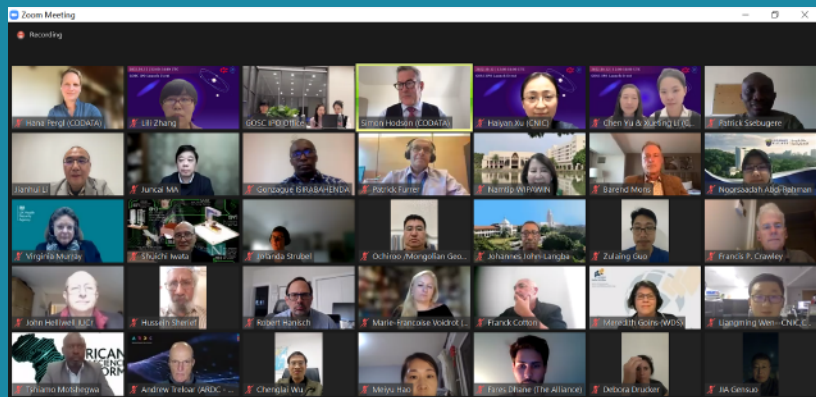
Network

GOSC has more than 200 registered members coming from 41 international, regional, and national research organizations, platforms, initiatives, universities, and companies. Now, the figure has been steadily growing with a broader global impact of GOSC.

Join us to make science more accessible and inclusive for all!
Sign up to join GOSC at: https://bit.ly/GOSC-Sign-Up

👤👤👤👤👤 >200 registered members
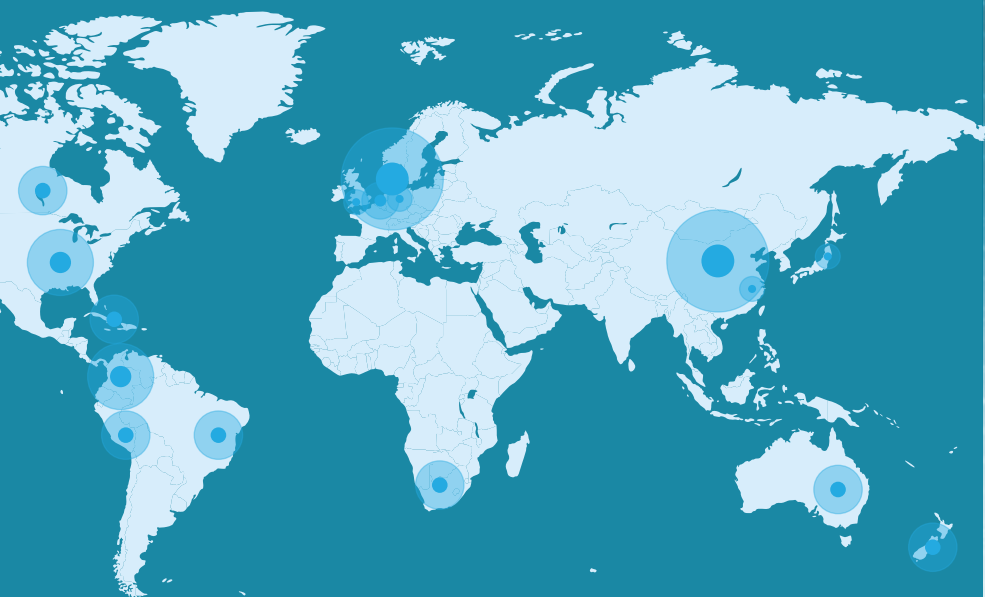
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GOSC
Global Open Science Cloud

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