



Science as a public good: open science and scientific integrity

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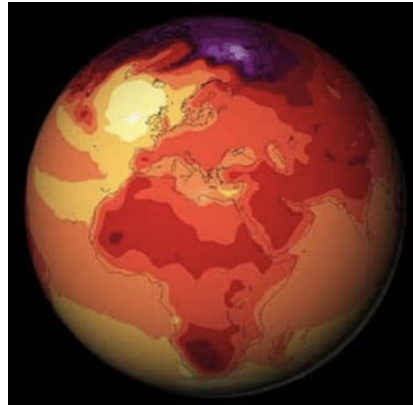
The Integrity of Science
Edinburgh, May 2023



- **Key issues for Modern Science**



navigating the wave of new technologies



tackling the sustainable development goals as blueprints for collective commitment to the global public good



The Essential Processes of Science

that the results of scientific inquiry are communicated promptly into the public sphere and circulated efficiently to maximise their availability to all who may wish or need to access them

that knowledge claims and the evidence on which they may be based are made openly available to be tested against reality and logic through the scrutiny of peers

and



SCIENCE AS A GLOBAL PUBLIC GOOD

A POSITION PAPER OF THE
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**International
Science Council**
The global voice for science

From “simple” to complex: from uncoupled to highly coupled systems

Uncoupled systems

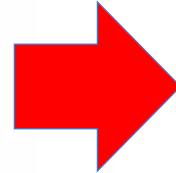
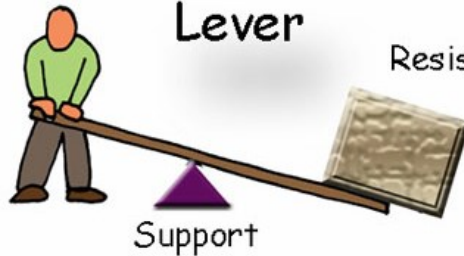
Slope



Power

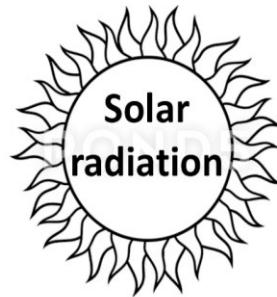
Lever

Resistance

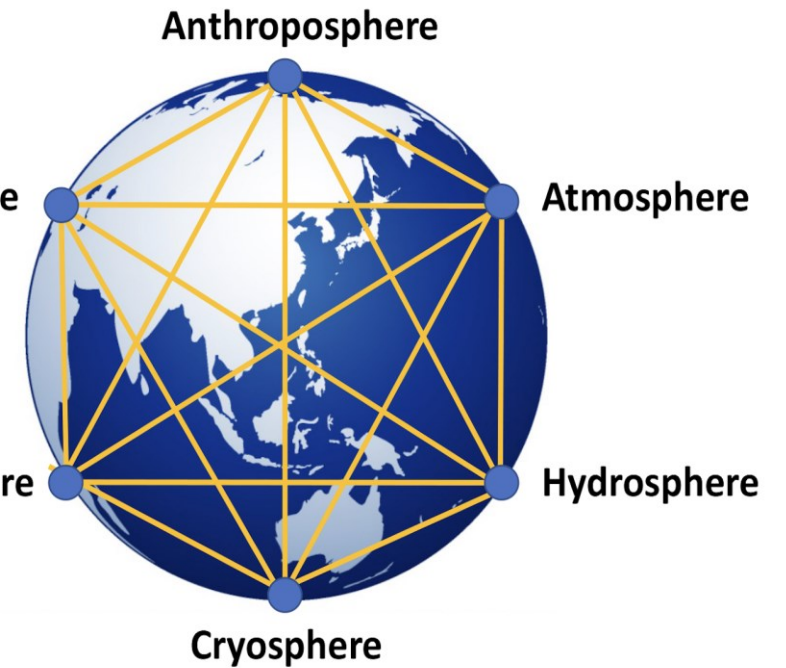


Highly coupled systems

THE COUPLED EARTH SYSTEM



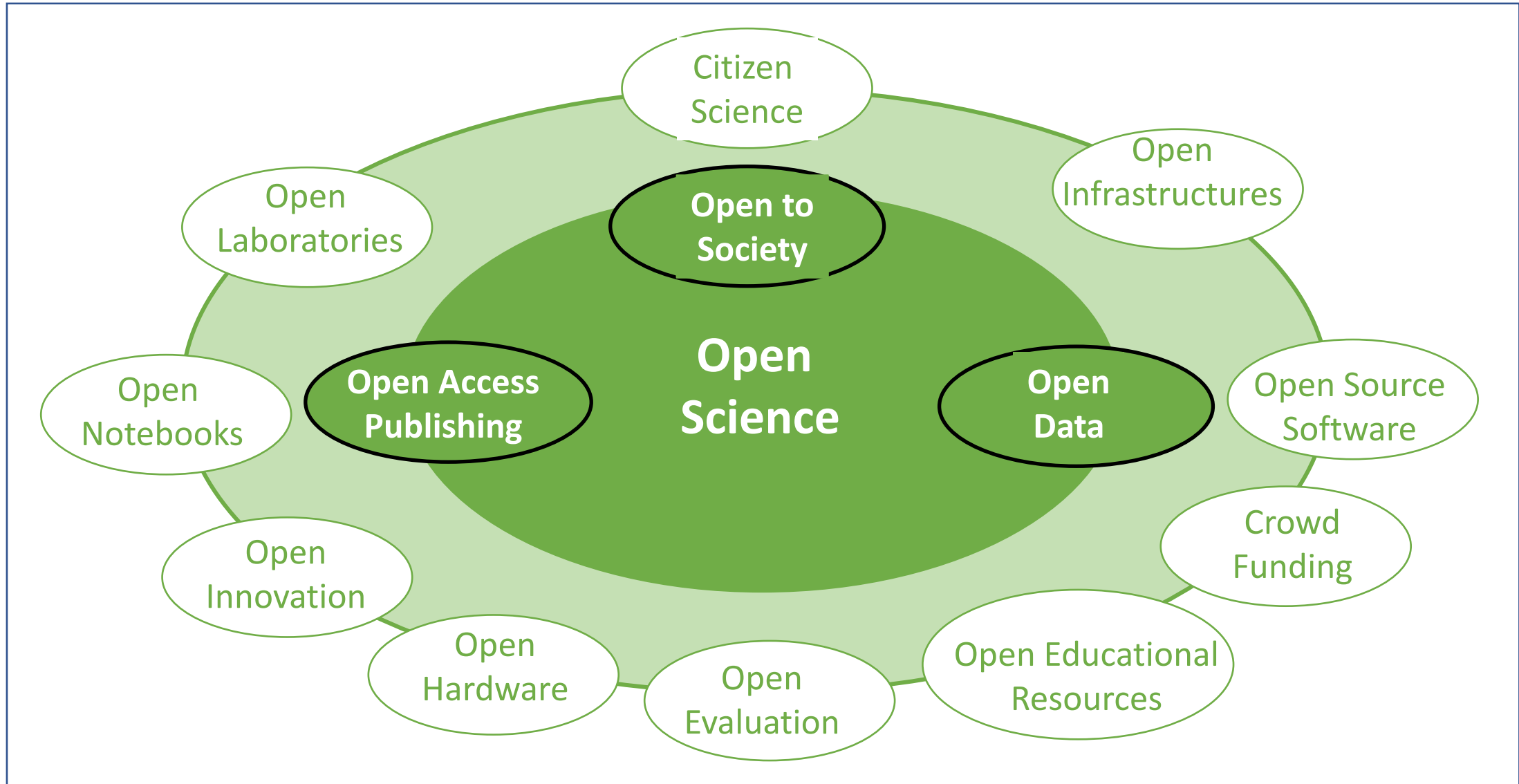
Incoming
Outgoing



Why Open Science?

- 1) Improving the rigour, integrity and efficiency of science**
- 2) Implementing globally affordable and accessible communication**
- 3) Exploiting cross-disciplinary data to explore complexity**
- 4) Engagement with society (in the transdisciplinary mode)**
- 5) Creating a global science commons**

The Open Science Constellation



Broad responsibilities of scientists and their institutions

- Expose the evidence for the truth claims that they make
- Disseminate their results in the public domain
- Act to mitigate significant potential for hazardous use
- Be responsive to the needs of their societies
- Find ways of robustly defending science and scientists against abuse and mis- and dis-information

INTEGRITY

&

RESPONSIBILITY

	Individual Scientists/Groups	Science Systems/Institutions
Internal	<ul style="list-style-type: none">• Openness of Method• Rigour of Method• Openness to Scrutiny• Exposure of Evidence (data & metadata)• Open access publication• Exposure of Coupling• Automated Validation	<ul style="list-style-type: none">• Exposure of Ethical Priorities• Funding of Ethical Priorities• Public Goods Imperative• Appropriate Evaluation Criteria
External	<ul style="list-style-type: none">• Open access publication• Exposure of Coupling• Readiness to Engage Publicly• Support against harassment• Combat mis-/dis-information	<ul style="list-style-type: none">• Open Science• Combat mis- /dis-information• Defending science & scientists• Scientists/science in Peril• Readiness to Engage Publicly• Having a sense of itself• Internationalism