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## First version of the open science code of conduct

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## Report Approval Status

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## Content list

<b>1</b>	<b>Preamble</b>	<b>5</b>
<b>1.1</b>	<b>Purpose</b>	<b>5</b>
<b>1.2</b>	<b>Society and open science</b>	<b>5</b>
<b>1.3</b>	<b>Science and open science</b>	<b>5</b>
<b>1.4</b>	<b>Scope</b>	<b>6</b>
<b>1.5</b>	<b>Status and Implementation</b>	<b>6</b>
1.5.1	Normativity and conflicting principles	6
1.5.2	Our principles and current law	6
1.5.3	Project contractual agreements	6
<b>2</b>	<b>Principles of open science</b>	<b>8</b>
<b>2.1</b>	<b>Principle 1: OPENNESS AND OPEN COMMUNICATION</b>	<b>8</b>
<b>2.2</b>	<b>Principle 2: TRANSPARENCY</b>	<b>8</b>
<b>2.3</b>	<b>Principle 3: REUSABILITY AND INCLUSIVENESS</b>	<b>8</b>
<b>2.4</b>	<b>Principle 4: REPRODUCIBILITY AND ROBUSTNESS</b>	<b>8</b>
<b>2.5</b>	<b>Principle 5: FAIRNESS AND RESPONSIBILITY</b>	<b>8</b>
<b>3</b>	<b>Enforcement</b>	<b>9</b>
<b>3.1</b>	<b>Misconduct</b>	<b>9</b>
<b>3.2</b>	<b>Correction</b>	<b>9</b>
<b>4</b>	<b>Appendix</b>	<b>10</b>
<b>4.1</b>	<b>Definition of open science</b>	<b>10</b>
4.1.1	Categories of open science	10
4.1.2	Open science: five schools of thought	10
4.1.3	Information on open science	11
<b>4.2</b>	<b>Adopters</b>	<b>11</b>
<b>4.3</b>	<b>Other codes of conduct</b>	<b>11</b>
<b>4.4</b>	<b>References</b>	<b>12</b>

# Disclaimer

**The document at hand is the first version of the open science code of conduct. This document is a living document to be updated in the course of the OSCAR project. At this stage (2020-07-29) the code of conduct may still contain some inconsistencies and errors. In the further course of the project, this document may therefore be subject to further changes.**

## **1 Preamble**

### **1.1 Purpose**

The purpose of this open science code of conduct is to foster the ethos of open scientific practices, open scientific collaboration and communication as well as a culture of joint open, transparent, responsible, inclusive, robust and fair research endeavours. This open science code of conduct aims to make the global scientific community as open, transparent diverse, inclusive, robust, appreciative, responsible and fair as possible. Thus, it expresses high ethical values, rules, norms, standards and ideals and codifies them in a tangible form.

For the sake of simplicity and readability, henceforth we will at certain points in this code of conduct speak only of principles, and by that, we also mean to include ethical values, principles rules, norms, standards, ideals and important categories of science and open science.

In section 4 a list of other codes of conduct, literature on the subject and example implementations are presented. As well, list of adopters of this code of conduct (which needs to be populated after publication of this document) is foreseen.

### **1.2 Society and open science**

Open science is a way of doing science. One of the main goals of open science is to open up the entire scientific process including initial hypotheses, planned research endeavours, peer reviews, data, publications etc. as much as possible and to as many as possible.

In society, we have ethical values, principles, rules, norms, standards and ideals that encompass economy, society, politics and other systems. Science is embedded in these normative systems and forms a constructive interdependent relationship with them. In this sense, open science bears a great responsibility towards other parts of our society as a whole. Furthermore, as part of our society, science is also subject to its moral principles.

It is up to science to take its responsibility, fulfil its duties and obey ethical norms, especially when it acts on behalf of society. This is where open science can make a difference and connect science with society: making scientific processes transparent helps science to take responsibility towards society.

### **1.3 Science and open science**

Some of the general principles and characteristics of open science are openness and open communication, transparency, reusability and inclusiveness, reproducibility and robustness, fairness and responsibility. Some of the best practices and indicators of open science are open access, open data, open peer review, open methodology, open education, citizen science and open source.



The principles of open science overlap in many aspects with the general principles of good scientific practice. For example, openness and transparency is the condition for the possibility of objectivity, reliability, reproducibility and verifiability in the first place. In this sense, every good scientific practice is also automatically open science. Open science supports good scientific practice.

Furthermore, the principles of open science also overlap with the paradigms of responsible research and innovation (RRI). The interaction between open science and RRI is fruitful for both.

## **1.4 Scope**

The present open science code of conduct offers the opportunity to voluntarily commit to the ethical values, principles, rules, norms, standards and ideals expressed. Thus, scientists and research organizations are invited to incorporate this open science code of conduct in their daily professional scientific practise.

The present open science code of conduct may be integrated into existing Grant Agreements and research contracts, best practices or workflows, for example in the context of international research projects.

## **1.5 Status and Implementation**

### **1.5.1 Normativity and conflicting principles**

The principles presented in this open science code of conduct may be considered intrinsic or inherently valuable, or as principles serving a higher purpose. The normative or motivational character of the principles formulated here is primarily due to individuals voluntarily committing to them.

With the selection of the principles made here, no claim to completeness is made. The principles given are intertwined and do overlap in their nature and meaning. They can contradict each other and it is important to deal with them pro-actively and bring them into harmony with each other constantly in daily practice. It is incumbent upon each individual scientist to shape their own activities and interactions with others and to bring to life the voluntary commitment to these principles.

### **1.5.2 Our principles and current law**

Compliance with the principles formulated here is entirely voluntary and the sole responsibility of the individual scientist. The principles set forth in this open science code of conduct do not have any legal power per se and they do not substitute or rescind any existing law or contract. This open science code of conduct and the accompanying principles address all individuals engaged in research or scientific activity, including citizen scientists and affiliated scientists. The adherence to the principles formulated here does not release the individual scientist from the obligation to adhere to the existing moral or legal norms or laws.

### **1.5.3 Project contractual agreements**

#### **Example: Consortium agreements**

If one wants to include this open science code of conduct in their project, they could incorporate a reference in their consortium agreement. Such a reference may have the following form: "We hereby declare that we commit ourselves to the open science code of conduct and its underlying principles."





## **2 Principles of open science**

### **2.1 Principle 1: OPENNESS AND OPEN COMMUNICATION**

Our research and scientific practice is characterized by openness and open communication. By openness we mean the habits of thought and action that emphasize the plurality of perspectives, inclusiveness and free sharing. In the pursuit of our activities as scientists and researchers, we commit ourselves to be as open as possible.

### **2.2 Principle 2: TRANSPARENCY**

Our research and scientific practice is characterized by transparency. By transparency we mean the behaviour of being explicit on all levels of communication with the aim of traceability and comprehensibility. In the pursuit of our activities as scientists and researchers, we commit ourselves to be as transparent as possible.

### **2.3 Principle 3: REUSABILITY AND INCLUSIVENESS**

Our research and scientific practice is characterized by reusability and inclusiveness. By inclusiveness we mean the behaviour of equally including a plurality of different people and their social background and worldviews into our social and professional practices. In the pursuit of our activities as scientists and researchers, we commit ourselves to be as inclusive as possible and make our research as reusable as possible.

### **2.4 Principle 4: REPRODUCIBILITY AND ROBUSTNESS**

Our research and scientific practice is characterized by reproducibility and robustness. By robustness we mean the quality of our actions, methods and results of withstanding perturbations and stresses over time. By reproducibility we mean one outcome of doing robust research. In the pursuit of our activities as scientists and researchers, we commit ourselves to thrive for reproducibility and robustness.

### **2.5 Principle 5: FAIRNESS AND RESPONSIBILITY**

Our research and scientific practice is characterized by fairness and responsibility. By fairness we mean the general validity of rules, duties and rights for all individuals in the same manner. By responsibility, we mean the behaviour of accepting the consequences of her or his own actions and to act accordingly. In the pursuit of our activities as scientists and researchers, we commit ourselves to proactively exercising fair and responsible behaviour.





### **3 Enforcement**

#### **3.1 Misconduct**

The community or research or project group will punish misconducts like conscious or wilful false statements, intellectual property infringement or plagiarism, spoofing of data, etc. with fair and corrective action.

#### **3.2 Correction**

Important principles for the prosecution of suspected cases are integrity, transparency in evaluation and measurement, fairness and objectivity. The process should be confidential in order to protect affected persons as long as the proceedings are ongoing, since innocence is always presumed until the refutation of the accusation.

## 4 Appendix

### 4.1 Definition of open science

Open science can be understood in a narrow sense and in a broader sense. In a narrow sense, open science denotes a *certain way* of doing science. In this narrow sense, open science can be understood as a specific way of conducting research. In a broader sense, open science denotes a scientific-political movement (Fecher and Friesike 2014). In this broader sense, open science can be understood not only as an scientific activity but also as a school of thought that has a certain agenda (Fecher and Friesike 2014). In both cases, open science focuses on the sustainable opening of as many dimensions and aspects of science as possible to as many people as possible (Bezjak et al. 2018)

#### 4.1.1 Categories of open science

Different authors define open science differently. In general, open science can be understood as a certain type or kind of science that follows certain criteria or principles that can be formulated as rough and ready rules or categories. Important categories among others are (Bezjak et al. 2018; Wikipedia 2020a):

1. **Open access** Make your scientific publications freely available. There are different strategies for publishing according to the Open Access principle, two of them are: Gold Open Access and Green Open Access.
2. **Open data** Make your research data freely available. (In the narrower sense, the concrete data records on which the published works are based on). See, for example, the FAIR Data principles (Findable, Accessible, Interoperable, Reusable).
3. **Open source** Make the software that is created and used in the research process freely available.
4. **Open notebooks** Make your scientific notebooks freely available.
5. **Open peer Review** Make the peer review process openly available.
6. **Open educational Resources** Make your teaching and training materials freely available.
7. **Open methodology** Make your scientific methods freely available.
8. **Citizen science** Open your research to people who are not full-time or professional scientists.
9. **Open infrastructure** Make the infrastructure of your research freely available.
10. **Open metrics** Make the metrics with which you measure the scientific impact freely available.

#### 4.1.2 Open science: five schools of thought

According to Fecher and Friesike (2014) open science can be understood as a political movement. This political movement can be divided into five schools of thought (Fecher and Friesike 2014):

1. **The democratic** aim of this school of thought is to make knowledge accessible to as many people as possible.
2. **The pragmatic** goal of this school of thought is to open up the process of knowledge production.
3. **The infrastructural** goal of this school of thought is to develop platforms, tools and services that are freely available.
4. **Public aim** of this school of thought is to make science freely available to citizens.
5. **Measurement** The aim of this school of thought is to develop freely available metrics.



### 4.1.3 Information on open science

<https://www.fosteropenscience.eu/node/1420>

<https://ec.europa.eu/research/openscience/index.cfm?pg=home>

<https://www.openaire.eu/open-science-europe-overview>

<https://www.oecd.org/science/inno/open-science.htm>

<https://www.fosteropenscience.eu/taxonomy/term/7>

<https://book.fosteropenscience.eu/>

<https://www.oana.at/en/about-open-science/>

<https://ag-openscience.de/open-science/>

<https://openscience.uni-bielefeld.de/>

<https://impakter.com/open-science-a-review-of-definitions-with-a-regional-perspective/>

## 4.2 Adopters

(list to be added and kept up to date)

## 4.3 Other codes of conduct

- **The European code of conduct for research integrity**

<https://allea.org/code-of-conduct/>

- **Singapore statement on research integrity**

<https://wcrif.org/guidance/singapore-statement>

- **Contributor Covenant**

A code of conduct for open source projects, with many well-known adopters

<https://www.contributor-covenant.org/>

- **German good research practice**

Guidelines for safeguarding good research practice

[https://www.dfg.de/en/research\\_funding/principles\\_dfg\\_funding/good\\_scientific\\_practice/index.html](https://www.dfg.de/en/research_funding/principles_dfg_funding/good_scientific_practice/index.html)



- **Netherlands code of conduct for research integrity**  
<https://www.nwo.nl/en/policies/scientific+integrity+policy/netherlands+code+of+conduct+for+research+integrity>
- **French National Charter for Research Integrity**
- **Universal ethical code for scientists**  
<https://www.gov.uk/government/publications/universal-ethical-code-for-scientists>
- **Statement of ethical principles / engineering ethics**  
Engineering Council and Royal Academy of Engineering  
<https://www.raeng.org.uk/policy/supporting-the-profession/engineering-ethics-and-philosophy/ethics>  
<https://www.engc.org.uk/standards-guidance/guidance/statement-of-ethical-principles/>
- **NSPE (National Society of Professional Engineers) – Code of Ethics for Engineers**  
<https://www.nspe.org/resources/ethics/code-ethics>
- **Fraunhofer Scientific Integrity**  
<https://www.fraunhofer.de/en/about-fraunhofer/corporate-responsibility/research-and-development/scientific-integrity.html>

#### 4.4 References

Bezjak, Sonja, April Clyburne-Sherin, Philipp Conzett, Pedro Fernandes, Edit Görögh, Kerstin Helbig, Bianca Kramer, et al. 2018. *Open Science Training Handbook*. Zenodo.  
<https://doi.org/10.5281/ZENODO.1212496>.

Ehmke, Coraline. Contributor Covenant. 2020. <https://www.contributor-covenant.org/>

DFG. 2020.  
[https://www.dfg.de/en/research\\_funding/principles\\_dfg\\_funding/good\\_scientific\\_practice/index.html](https://www.dfg.de/en/research_funding/principles_dfg_funding/good_scientific_practice/index.html)

Fecher, Benedikt, and Sascha Friesike. 2014. 'Open Science: One Term, Five Schools of Thought'. In *Opening Science: The Evolving Guide on How the Internet Is Changing Research, Collaboration and Scholarly Publishing*, edited by Sönke Bartling and Sascha Friesike, 17–47. Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-00026-8\\_2](https://doi.org/10.1007/978-3-319-00026-8_2).

FOSTER. 2020. <https://www.fosteropenscience.eu/>

Open Science Training Handbook. 2020. <https://open-science-training-handbook.gitbook.io/book/>



Wikipedia. 2020a. 'Open Science'. In *Wikipedia*.  
[https://en.wikipedia.org/w/index.php?title=Open\\_science&oldid=937016095](https://en.wikipedia.org/w/index.php?title=Open_science&oldid=937016095).