



Open Science and Misinformation

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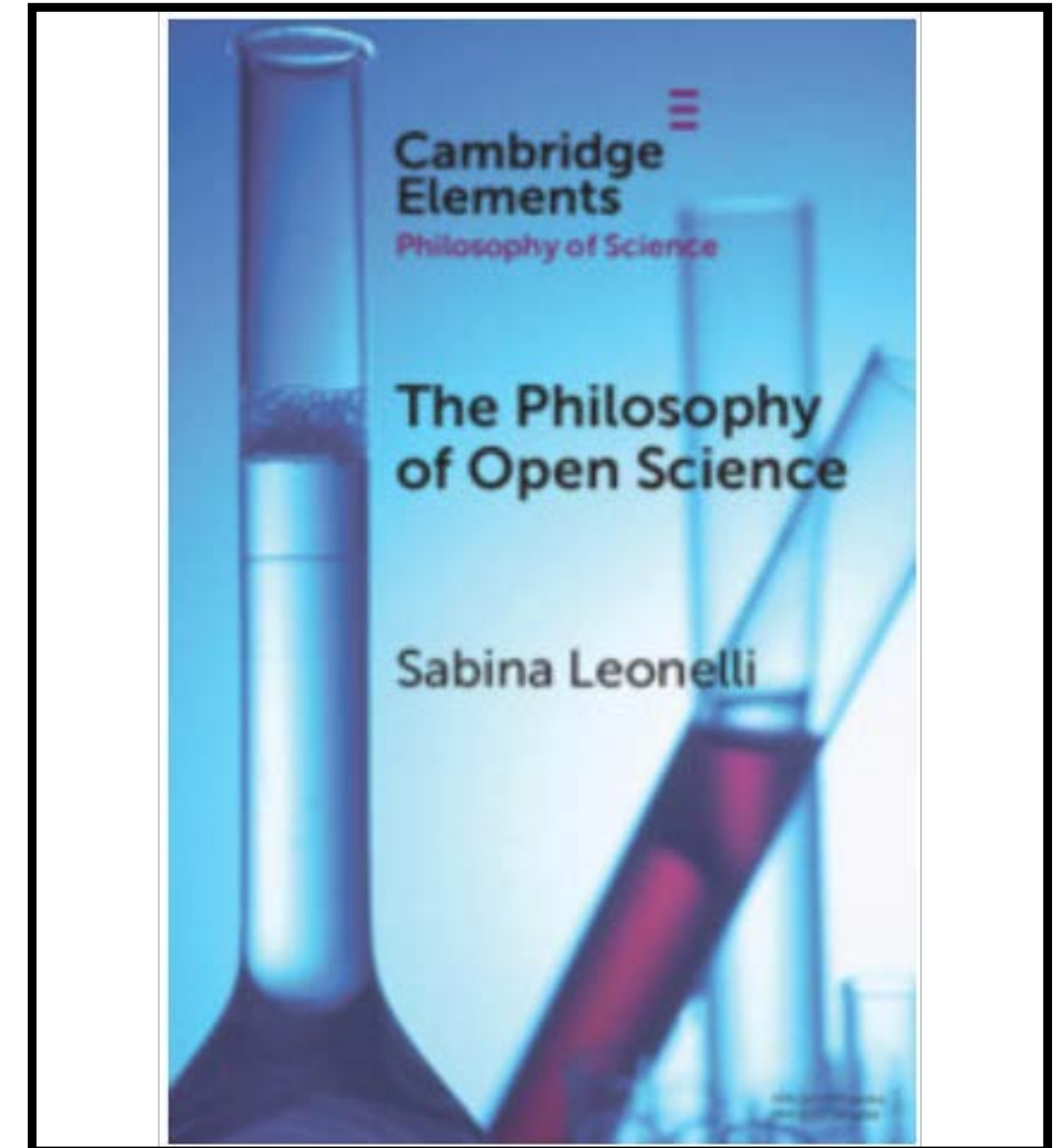
Overview

- Open Science:
 - Object-Oriented View (Status Quo)
 - Process-Oriented View (Improvement?)
- Misinformation:
 - Internal/External Trust
 - Open **processes** may better help enable **external** trust in scientific information



Openness: Two Approaches

- **“Object-Oriented” View**
 - Openness as sharing scientific outputs with others
- **“Process-Oriented” View**
 - Openness as others participate in the research process



Object-Oriented OS: What is it?

- Openness as **sharing** scientific outputs with others
 - Open Access: articles, data
- The primary value of scientific research is the 'final outputs'
- It is better for **science** (reproducibility) and **society** (trust) to share them
- Open Access as **Free Access**
 - converts a **commodified product** into a **public good**



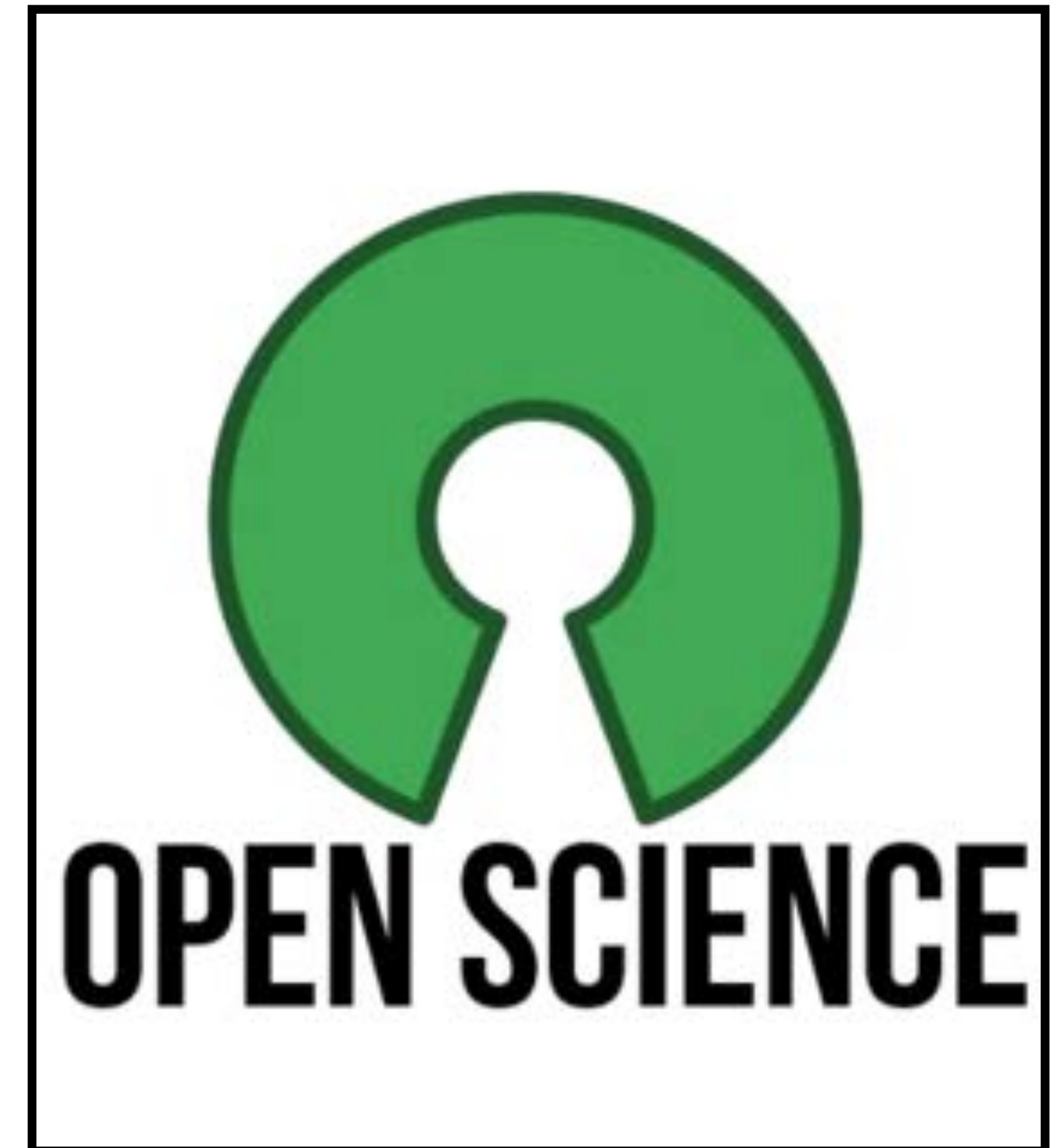
Object-Oriented View: What is good about it?

- In theory, Object-Oriented OS intends to promote:
 - **Unlimited access:** making any research element available at any time for everyone
 - **Quality Science:** it automatically improves the content of science as well as researchers' working conditions
 - **Global/Cosmopolitan Science:** it can reach everybody with an interest in research, no matter where they are based
 - **Facilitate Equity:** it makes previously inaccessible resources available to those who may wish to use them



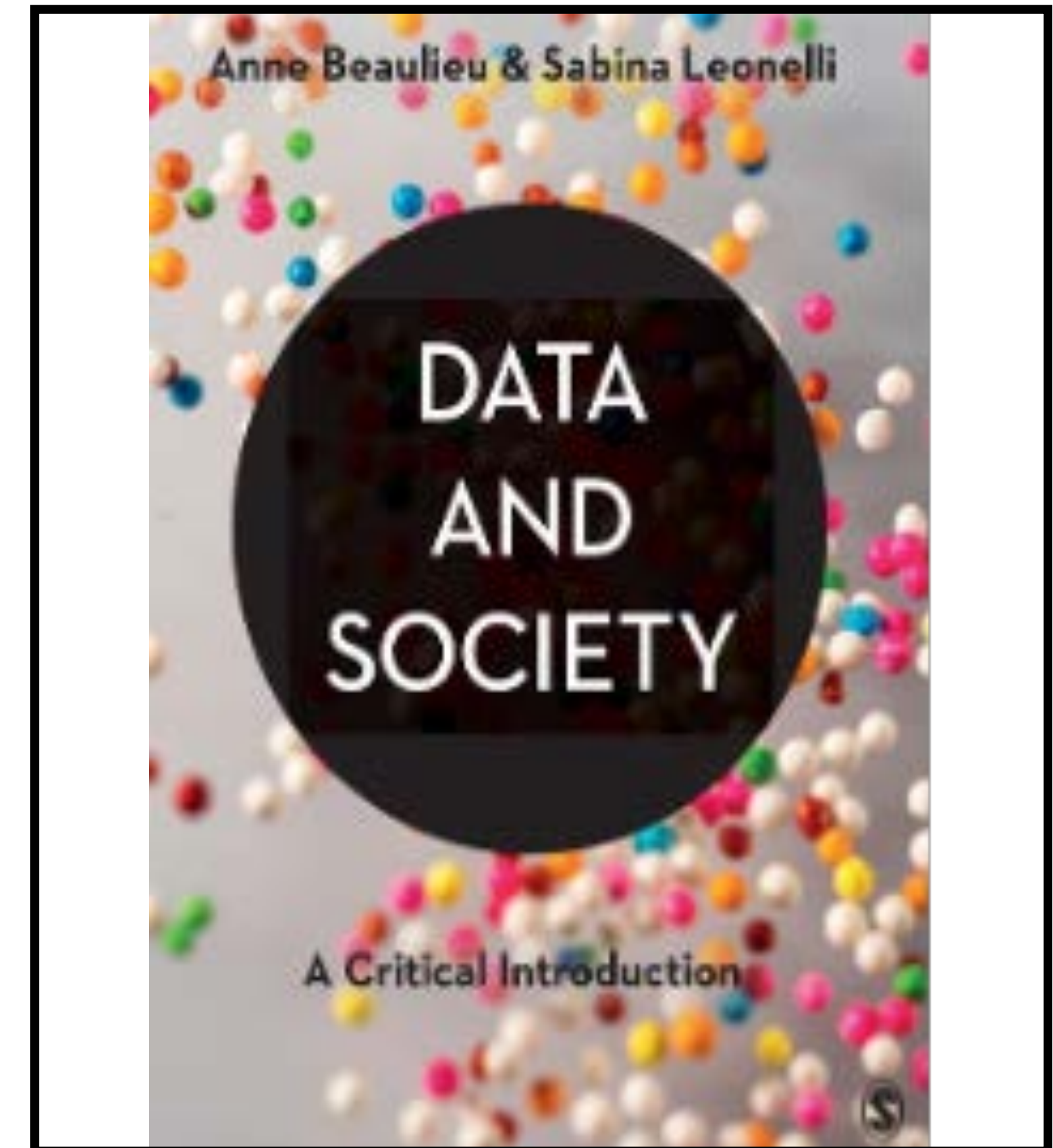
Object-Oriented View: Is it enough?

- What happens when an Object-Oriented Ideal comes into contact with the complex realities of scientific research?
 - When the **final outputs** are foregrounded, the **research process** is backgrounded
 - May science remain closed if processes are closed?
 - May demands to **open the final outputs** unintentionally but foreseeably **close the research process**?
 - In practice, science must manage **research diversity** and **social inequity**



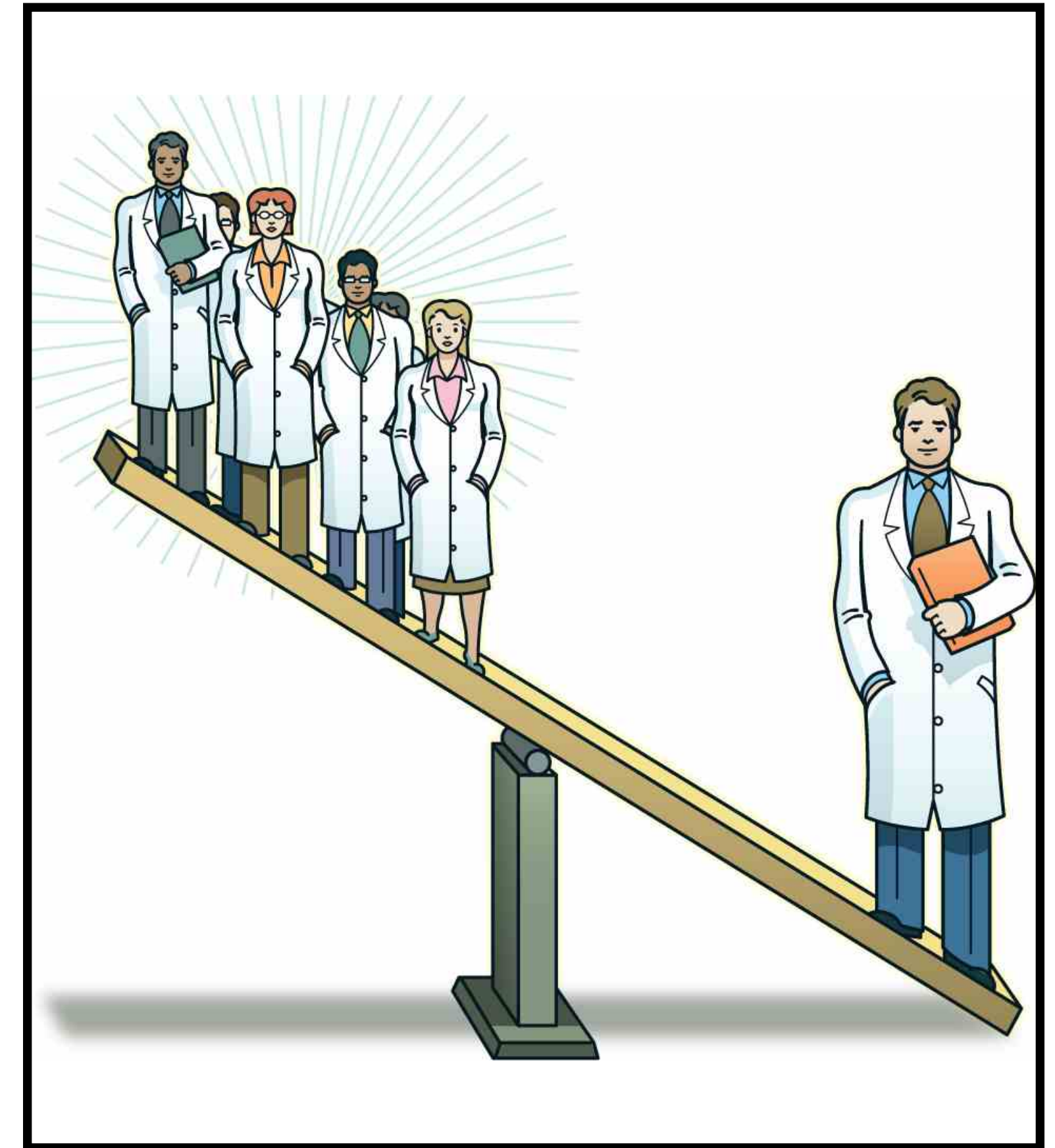
Fact One: Research Diversity

- Object-Oriented View drives **standardisation** efforts to enable sharing
 - Useful for reproducibility, re-use and interoperability
- Problem One: an ideal of one gold standard is misaligned with the fact of **research diversity**
- In practice, research communities develop very good scientific reasons for **domain-specific**, system-specific methods, standards, and evaluative criteria
 - **Not just culture wars** – specialised knowledge and widely different ways of knowing!
 - ... grown from a long history of engagement with phenomena within specific institutional and social settings (Leonelli 2017)
- So, **research diversity** can motivate **justified noncompliance** with ideal standards
 - **Justifiably unwilling to comply**



Fact Two: Social Inequity

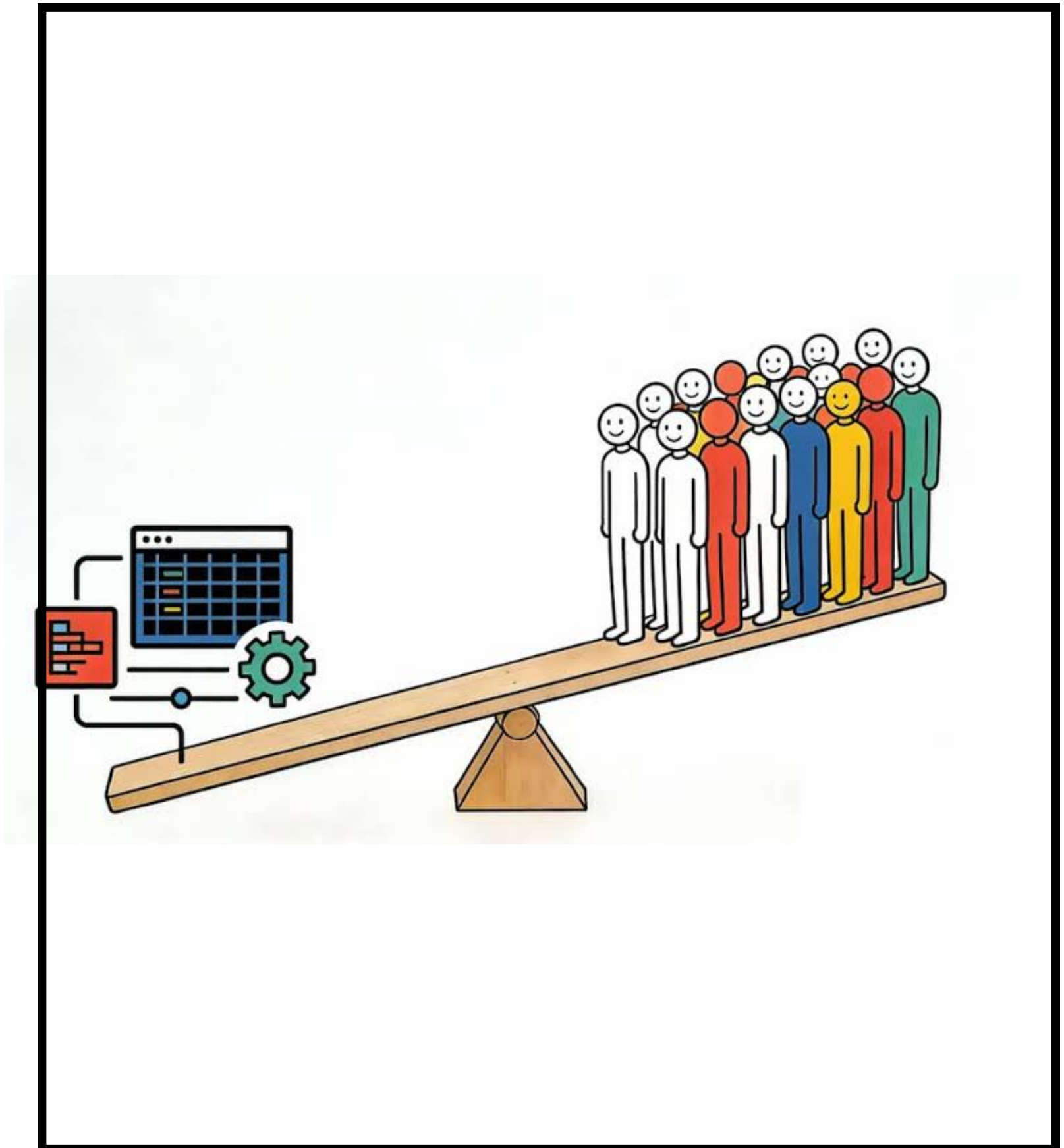
- Problem Two: an ideal of one gold standard is misaligned with the fact of **social inequity**
- So, **social inequity** can motivate **justified noncompliance** with ideal standards
 - **Justifiably unable to comply**
- Core Inequities: Resources (allocation, access), Research Goals (resource-feasibility), Labour Conditions



Resource Inequity

(1) Inequity in resource allocation, access and deployment

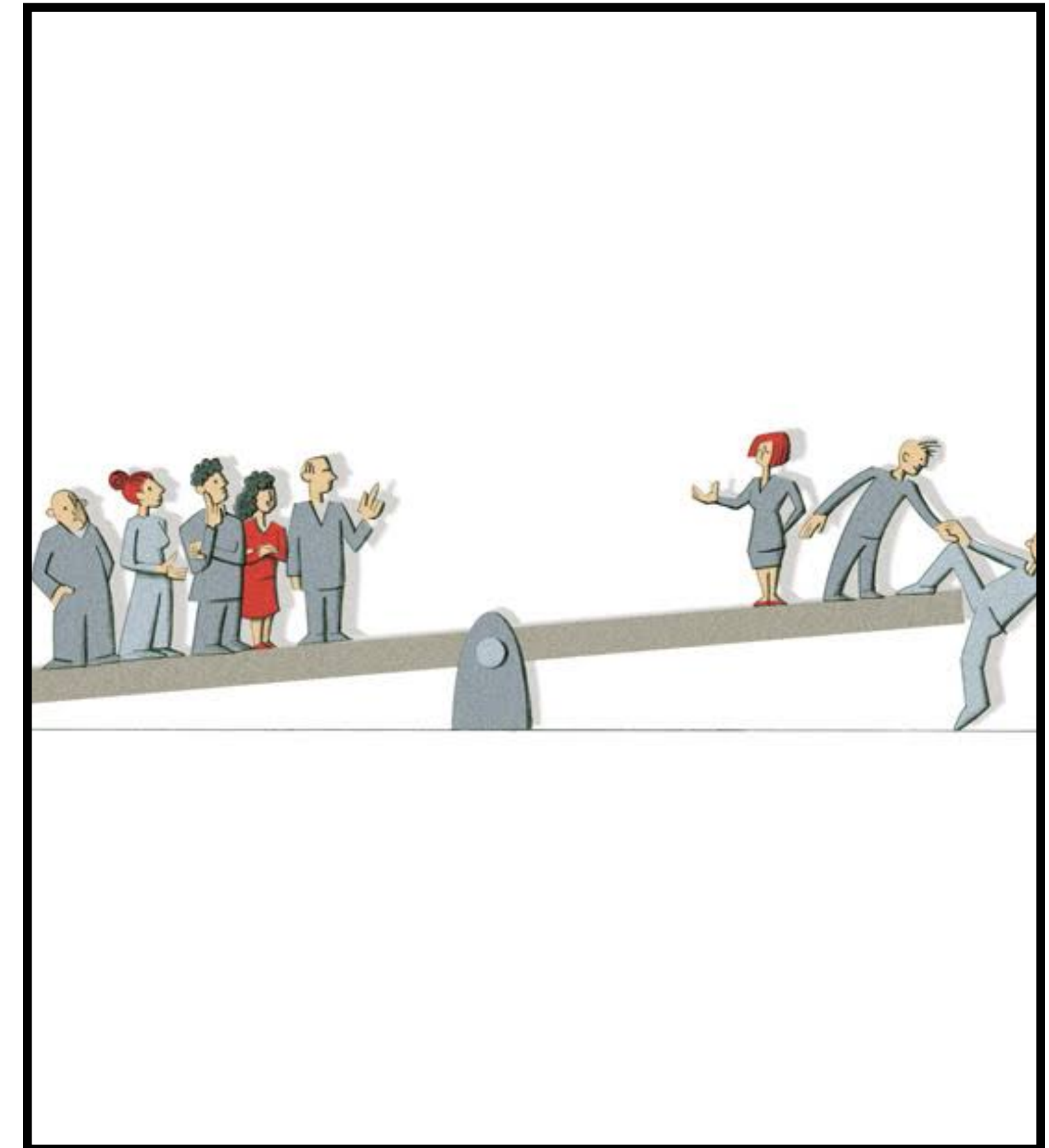
- Resource: ‘anything that can serve as a source of power in social interactions’ (Giddens 1979, cited in Haslanger 2024; e.g. technology, infrastructure, training, institutions)
- Resourcing not grounded on **merit** or **scientific relevance**
 - worthy of investment, availability of training in research/related skills, use for commercial-military enterprises, national income, socio-economic disparity between rural and urban areas, pre-existing institutional support
- **Short-term availability** is privileged over **capacity-building**
- Post factum training and tech adoption – little if any involvement in design and governance



Goal Inequity

(2) Misalignment between resourcing and scientific goals

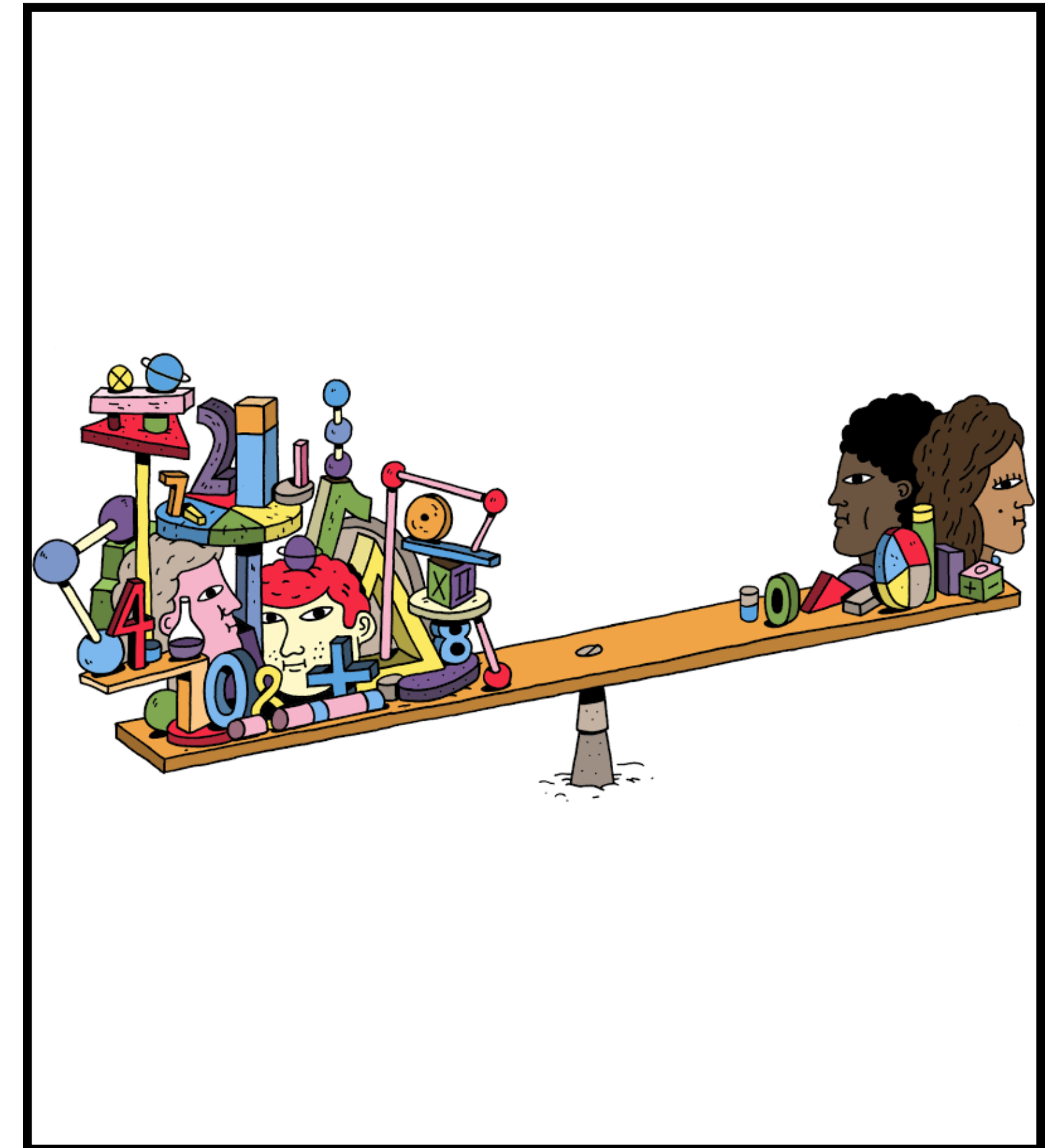
- **Local** constraints, practical needs, and socio-political agendas shape research directions, sometimes in tension with scientific interests
- **Digital divide** is also a divide in **epistemic power**: those who can shape the research agenda vs those who cannot



Labour Inequity

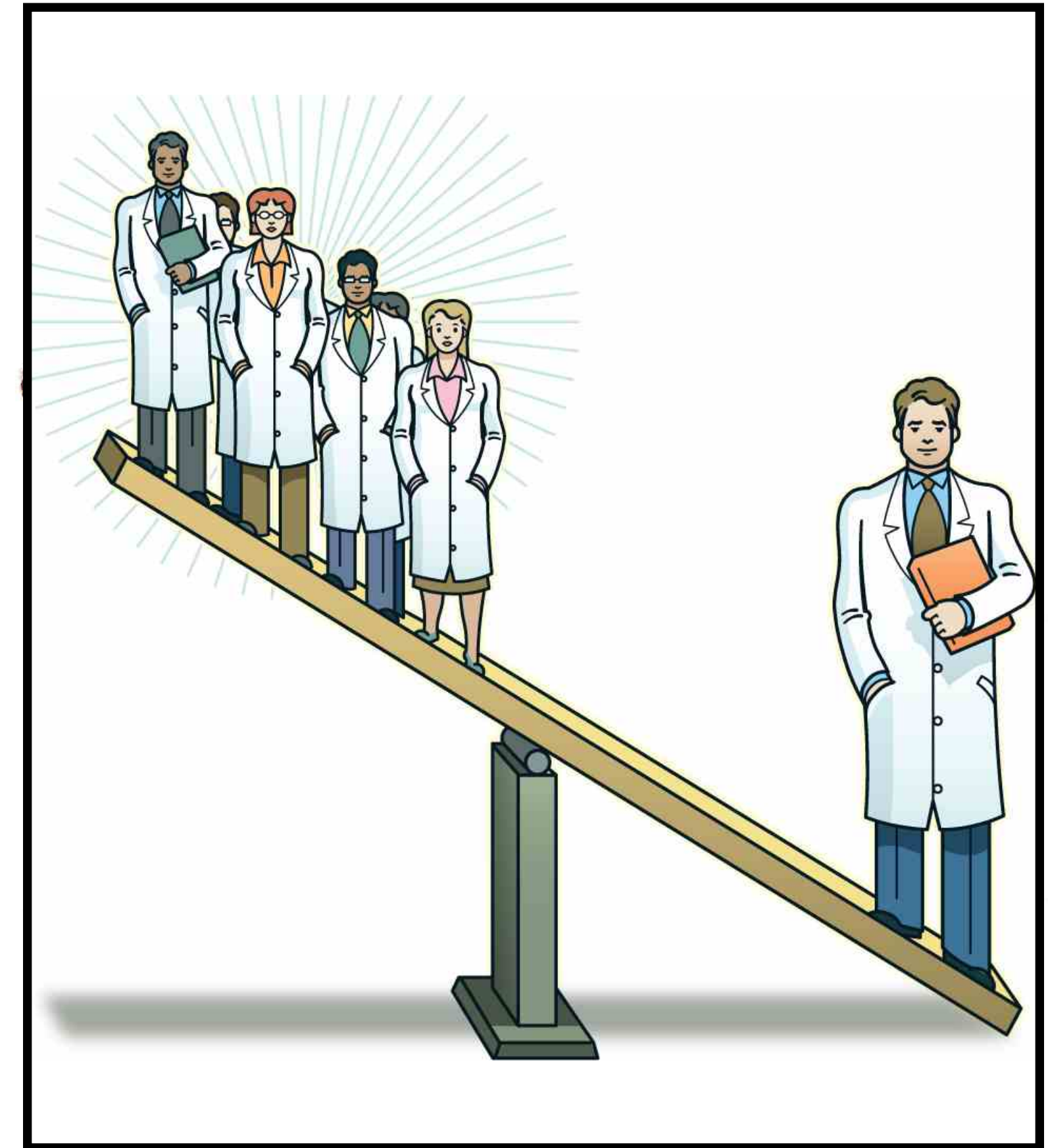
(3) Misalignment between scientific goals and labour conditions

- Divide sharpened by what counts as **credit** for whom and within which system (local, national, global)
- Publishing, patenting, outreach to various publics
- **Future employment** expectations shape goals, including expected and valued outcomes (often NOT those associated with academic excellence)



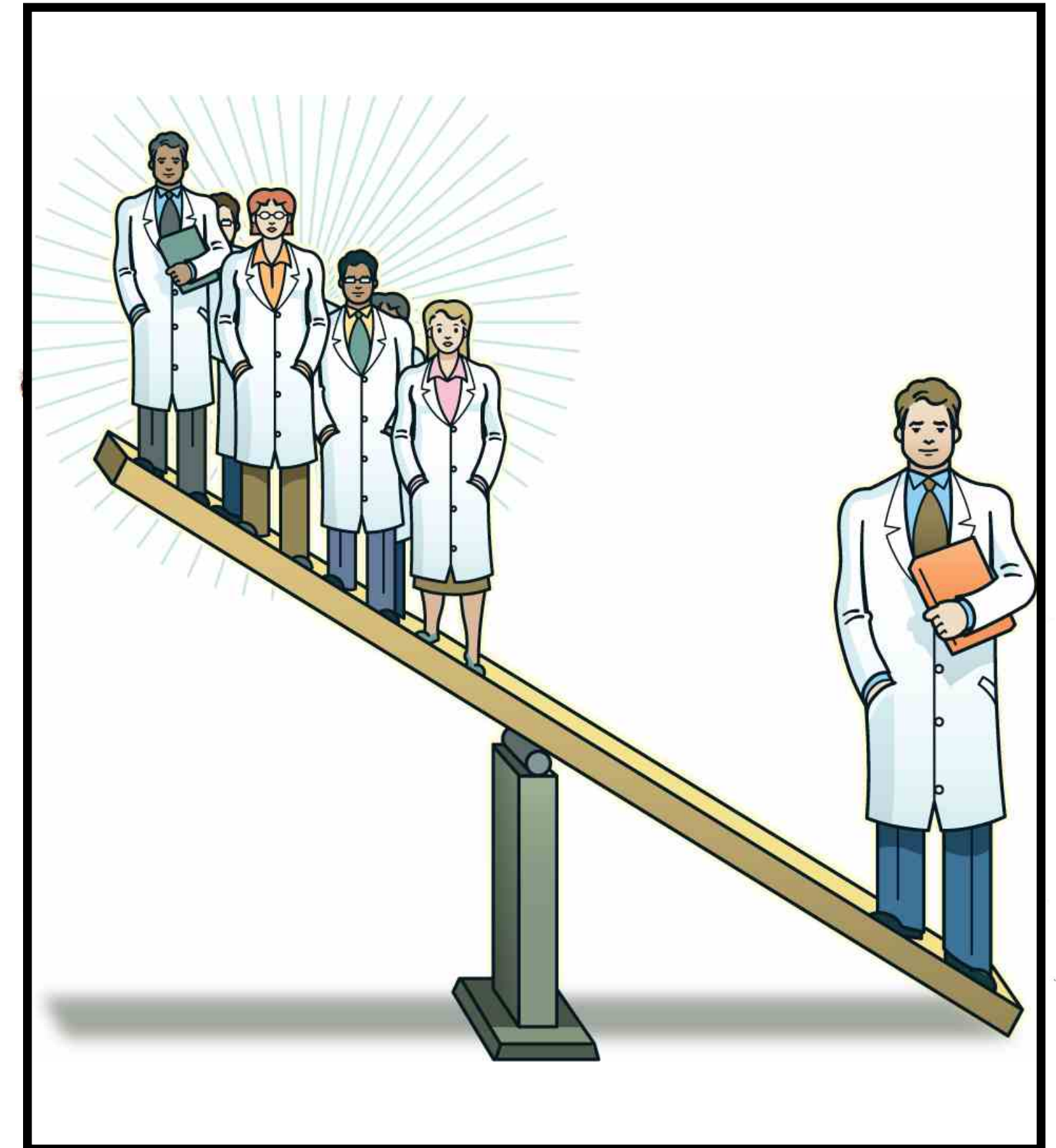
Managing Social Inequity

- Rather than aspire for **inequity-free OS**, aspire to better manage an **inequity-laden OS**
- Risks presenting an inequity-laden OS as an inequity-free OS
- Risks less visible inequities going unmanaged



Managing Social Inequity

- **Shifts in research content:** existing constraints shape research directions, limiting focus on issues most relevant to vulnerable scientists and their contexts
- **Exclusion of researchers:** Large parts of the scientific community are unable or unwilling to fully contribute to global knowledge
- **Exclusion of methods/data:** Significant methods and sources of evidence undermined or excluded from global scientific discourse
- **Diminished research quality:** loss of quality and reliability in processes and outcomes of inquiry
- **Ineffective Open Science:** sometimes implemented, yet not fully

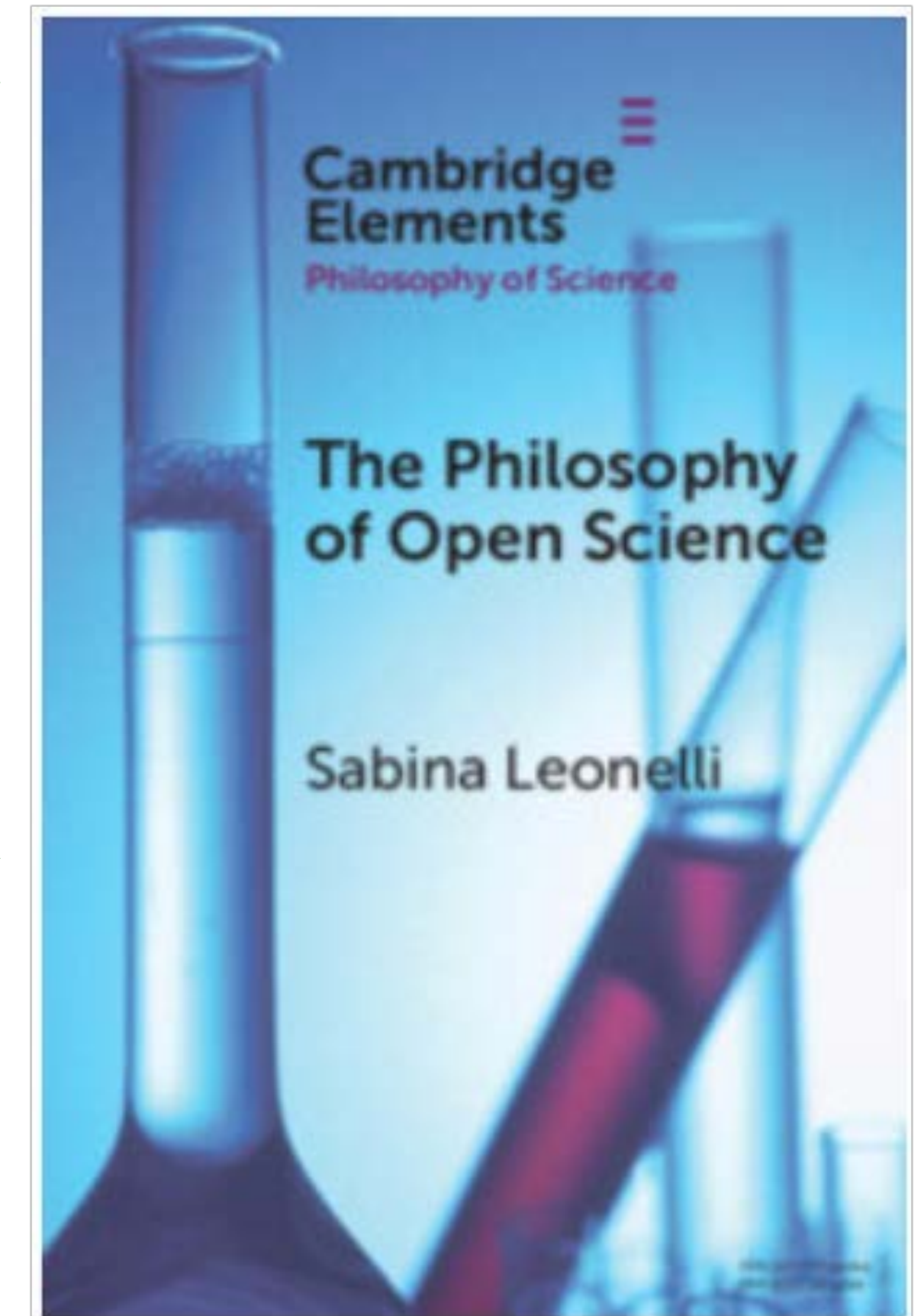
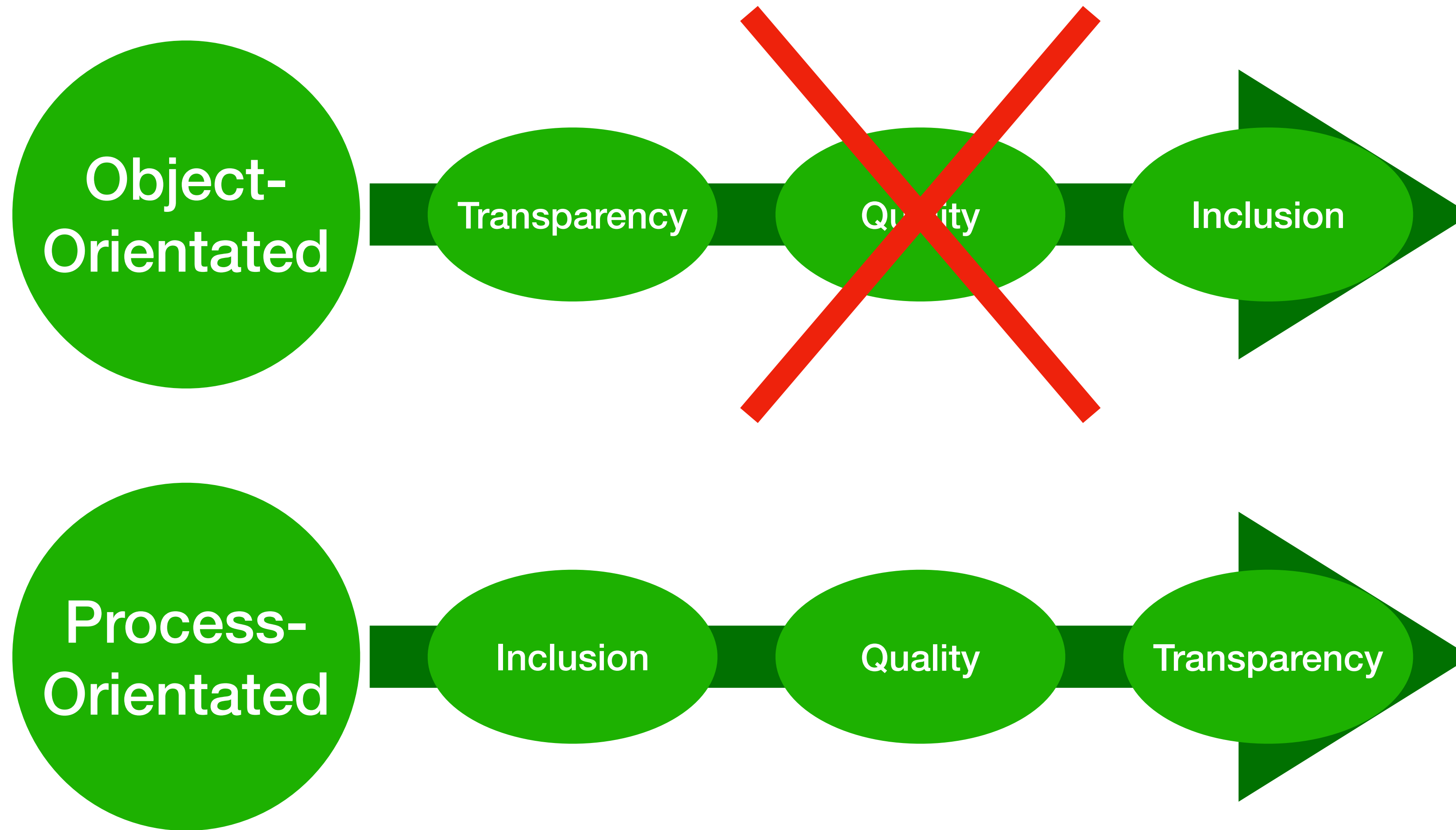


Object-Oriented OS: What is bad about it?

- The Core Problem: **open** access to scientific **objects**, **closed** access to the research **process**
- **Limited access**: making research participation conditional on specific research practices, resources, infrastructures, databases, etc
- **Sometimes Bad**: it may worsen the content of science as well as researchers' working conditions
- **Local**: it can only reach those with the resources
- **Facilitating inequity**: while the **outputs** are accessible, the **process** is often inaccessible to those with diverse research agendas or with limited research resources to participate in Open Access



Prioritising Inclusion?



Process-Oriented OS: What is it?

- Openness as others participate in the research process
 - Open Collaborations
- The primary value of scientific research is the **collaborative process**
- It is better for **science** (robustness) and **society** (trust) to collaborate
- Openness as the **coproduction** of scientific knowledge rather than as the **sharing** of scientific knowledge



OS: Judicious Connection

- Scientific Discovery: as skilled, distributed **interaction** with the world
 - Focus on **social agency**: creating new intimacies, facilitating trust and collaboration
 - **Research diversity** as a crucial condition for inquiry
- Connection needs to be **judicious**:
 - **Situated** and responsive to context
 - Identifying what constitutes relevant context is key part of any investigation



Diversity as a starting point: What now?

- How to build OS with diversity as a starting point, rather than an as obstacle?
 - Beware of **centralised assessment criteria**: science populated with multiple perspectives and well-established (but diverse) cultures of openness
 - **Consult** with relevant communities of practice for answers & questions
 - Support openness across **publicly and privately funded institutions**, taking care not to single out publicly funded institutions as the only conceivable target for OS policies and assessment
 - Invest in **understanding scientific motivations** for specific habits and preferences *beyond* conformity to problematic assessment/credit systems:
 - a ‘culture problem’ is not necessarily a ‘people problem’



Diversity as a starting point: What now?

- Beware of attempts to interpret openness as **disregard for expertise** and know-how
 - Build in methods to **identify and value expert knowledge**
- Attention to ECRs is key, e.g. Global Young Academy activities in this space since 2012
- **Support researchers' transition** to OS: cannot simply be delegated down, especially as researchers are already overwhelmed by admin and management
 - Structural change in **hiring** and **credit** practices is needed
 - Narrative CVs, publications on repositories, open code, data management plans, evidenced engagement beyond academic publics



Towards Inclusive OS: Some Steps

- Critical and constructive scrutiny of how **digital platforms** can support existing and future work
 - Encouraging the **development of relationships** that can sustain and nurture scientific research in the long term
- Decisions seen as **good for some** and not others:
 - **Value judgments** and choices are unavoidable when developing open research and infrastructures
- **Accessible to some** and not others:
 - **Transparent criteria** for which users are privileged can be a platform for trustworthiness



Table 3. Synoptic comparison of the main features of the two interpretations of openness I have discussed in this book.

Openness as sharing	Openness as judicious connection
Unlimited	Relational
Digital	Social
Good	Divisive
Global	Situated
Equal	Equitable
Focused on itemized outputs (objects that can be shared)	Focused on social agency (ways of doing and being with others)

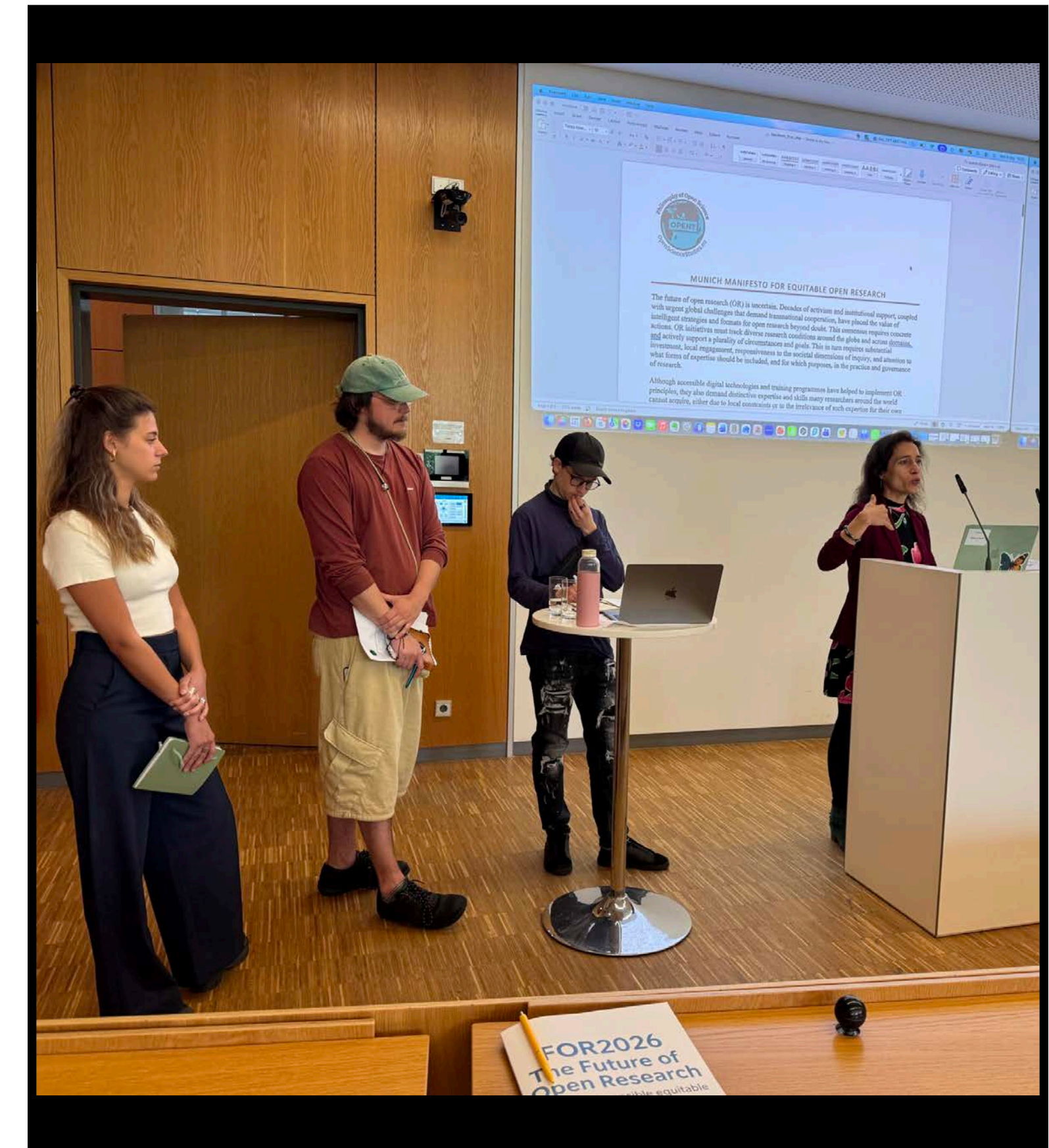
FOR2026-Munich Conference (4-6 May, 2026)

- **Equity As Neglected Aspiration** In Open Research:
 - Research practices should make contributors, methods and findings visible and valued regardless of geography, resources, institutional status or background.
- Current OR risks **reinforcing inequalities**:
 - top-down policies, digital infrastructures and AI tools often reflect the priorities of well-resourced institutions, marginalising less visible forms of expertise and widening global disparities
- Make OR **responsive** and **inclusive**:
 - Researchers and communities should have meaningful input into OR design and governance
 - supported by domain- and location-specific engagement and institutional mechanisms that ensure diverse needs shape research infrastructure and policy



Munich Manifesto (PHIL_OS, June 2026)

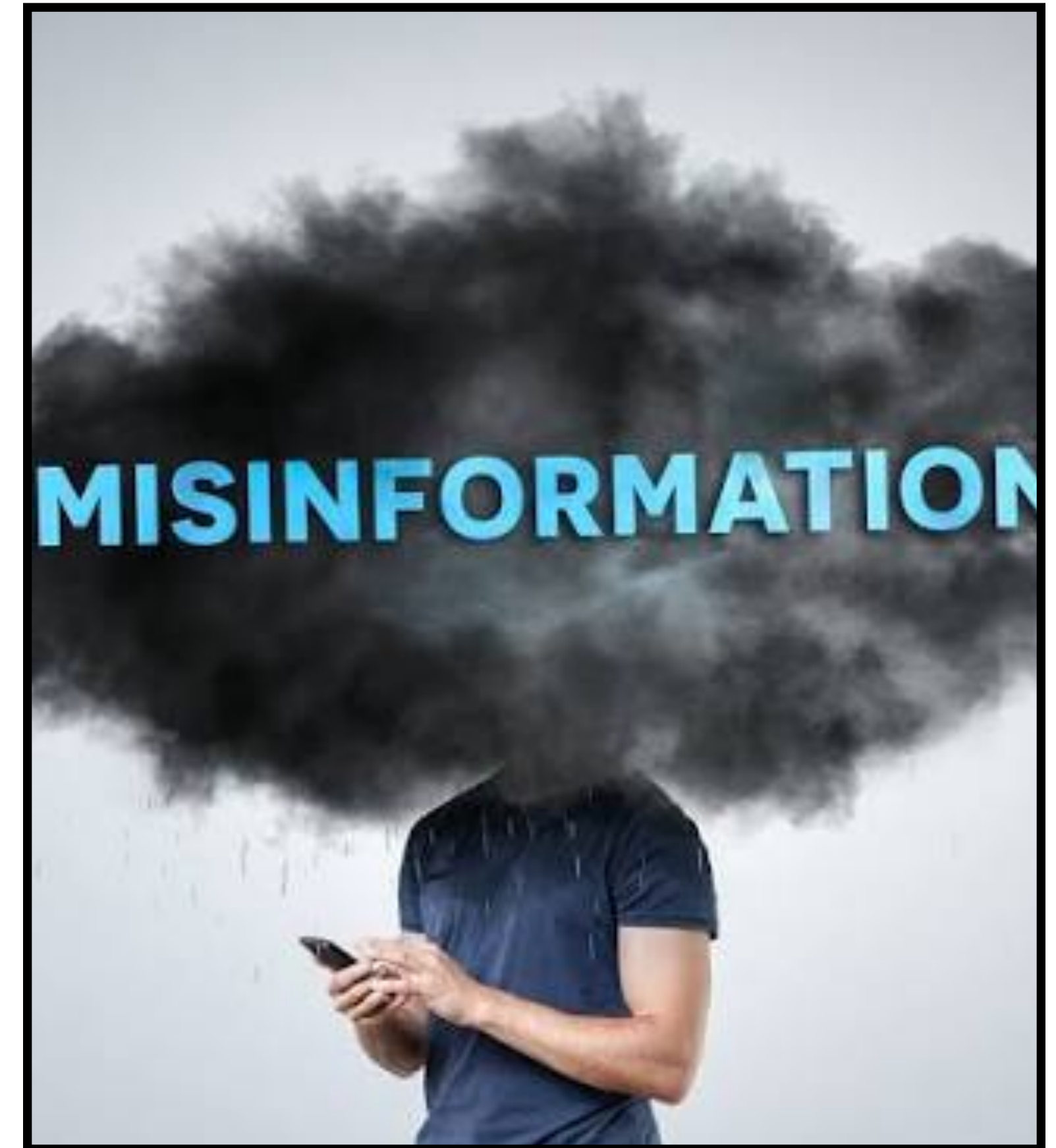
- <https://opensciencestudies.eu/for-2026-conference/munich-manifesto/>
- Five key priorities for OR initiatives:
 - DIVERSITY: research contributors' capacity to be different or varied in ways that affect the development and/or understanding of knowledge
 - RESILIENCE: the long-term dependability and sustainability of OR initiatives
 - ENGAGEMENT: regular and consequential dialogue with a wide range of stakeholders
 - JUSTICE: the moral framework through which rights, duties and resources are distributed and deployed by researchers and research institutions
 - HONESTY: the ability and willingness to candidly and explicitly articulate the fragilities, vulnerabilities and limits of OR systems and procedures, including security concerns, inequity, exclusions, possible misuse, and constraints on format and interoperability



OS and Society: Misinformation

Misinformation

- In politics, citizens rely on science to develop informed judgments
 - Informed judgments promise intended benefits
- However, misinformation derails sincere efforts to become informed
 - Misinformed judgments risk unintended consequences
- So, how can science help citizens to gain reliable information and resist misinformation?



The Problem of Expertise: The Expert/Nonexpert Gap

- **Novice/Expert Problem:** How do nonexperts know who the experts are?
- **Novice/2 Experts Problem:** How do nonexperts know which expert to trust when experts disagree?
 - Credentials, Track Record, Reputation (Goldman 2001)
- **The core problem:** nonexperts lack the expertise to know
 - Experts **directly**
 - Experts **indirectly** through whatever the marker of expertise might be



The Problem of Expertise: Sliding Scale

- What if the expert/nonexpert distinction is **too binary**?
- What if we think of an expert/nonexpert **sliding scale**?
 - Experts **produce** scientific information
 - Citizens **use** scientific information
 - How does information travel from A to B?



The Problem of Expertise: Knowledge Intermediaries

- Knowledge Intermediaries **transmit** information from experts to citizens (Boumans et al Forthcoming)
- mainstream news media, news stations, newspapers, journalists, new online media, podcasts, blogs, researchers, think tanks, opinion leaders, 'issue publics', libraries, museums etc.



Trust In Science: Internal and External

- **Internal trustworthiness:** experts may produce information that is trustworthy among fellow experts in specific contexts



- **External trustworthiness:** experts may not

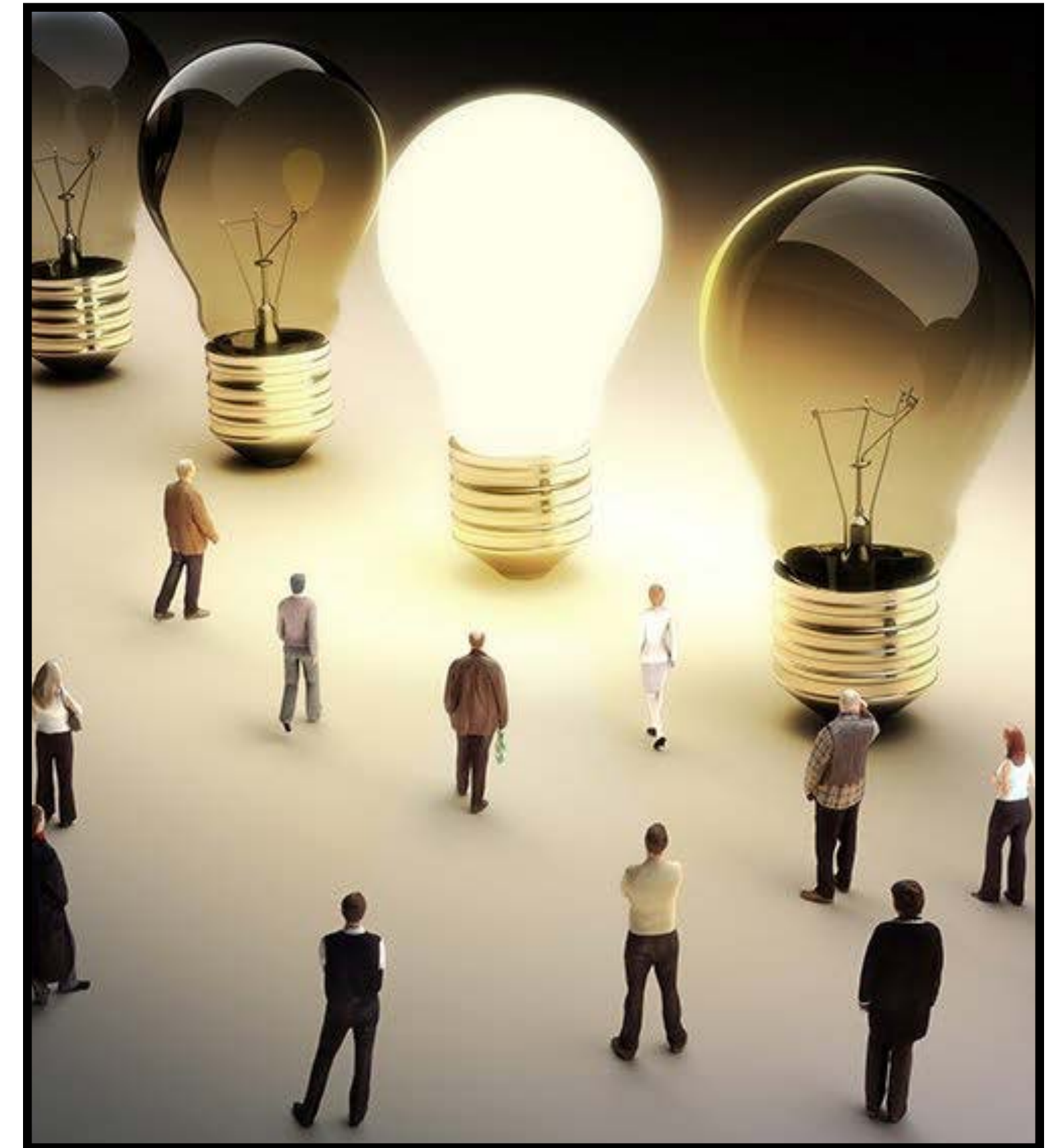
The division of epistemic labour may privilege experts for internally trustworthy information, but privilege intermediaries for externally trustworthy information

- **Epistemic inequality** among experts and nonexperts results in them using **different signs** of trustworthiness



Trust In Science: Knowledge Intermediaries

- Experts develop **expert-oriented** abilities (Croce 2018):
 - The virtues that empower experts to use their expertise to find and face new problems within their field.
 - So, expert-oriented abilities may largely promote reliable research (internally trustworthy)
- Intermediaries develop **novice-oriented** abilities:
 - The virtues that empower intermediaries to address a layperson's epistemic dependency on them properly.
 - So, novice-oriented abilities may better promote socially responsible research (externally trustworthy)
 - Novice-oriented intermediaries may be sensitive to lay needs, intellectually generous, intellectually empathetic, and sensitive to lay epistemic resources



Bottom Up: Intermediaries Approach

- Seek a **reflective equilibrium** between:
 - the information that peer deliberation judges as trustworthy
 - knowledge intermediaries judge as trustworthy
 - without any fixed authority adjudicating between them
- An intermediaries approach does not put an unchecked confidence into either peer deliberation or into human intermediaries.
 - Any confidence in peer deliberation is **contested** with knowledge intermediaries
 - Any confidence in knowledge intermediaries is **contested** with peer deliberation



Meta-Deliberation to the Rescue!

- What regulates deliberation?
 - A plausible answer is: more deliberation!
 - “Meta-deliberation” — or, deliberation about deliberation — facilitates a reflective type of deliberation (Dryzek 2010)



Meta-Deliberation to the Rescue!

- Self-correction: reviews the human intermediaries that inform public deliberation (Christiano 2012)
- The aim is to contest and resist misinformation within the deliberative process with meta-deliberation!
- This promotes a system-level robustness:
 - An intermediary embedded in a process of deliberation may become trustworthy because it survives the strongest contestation available



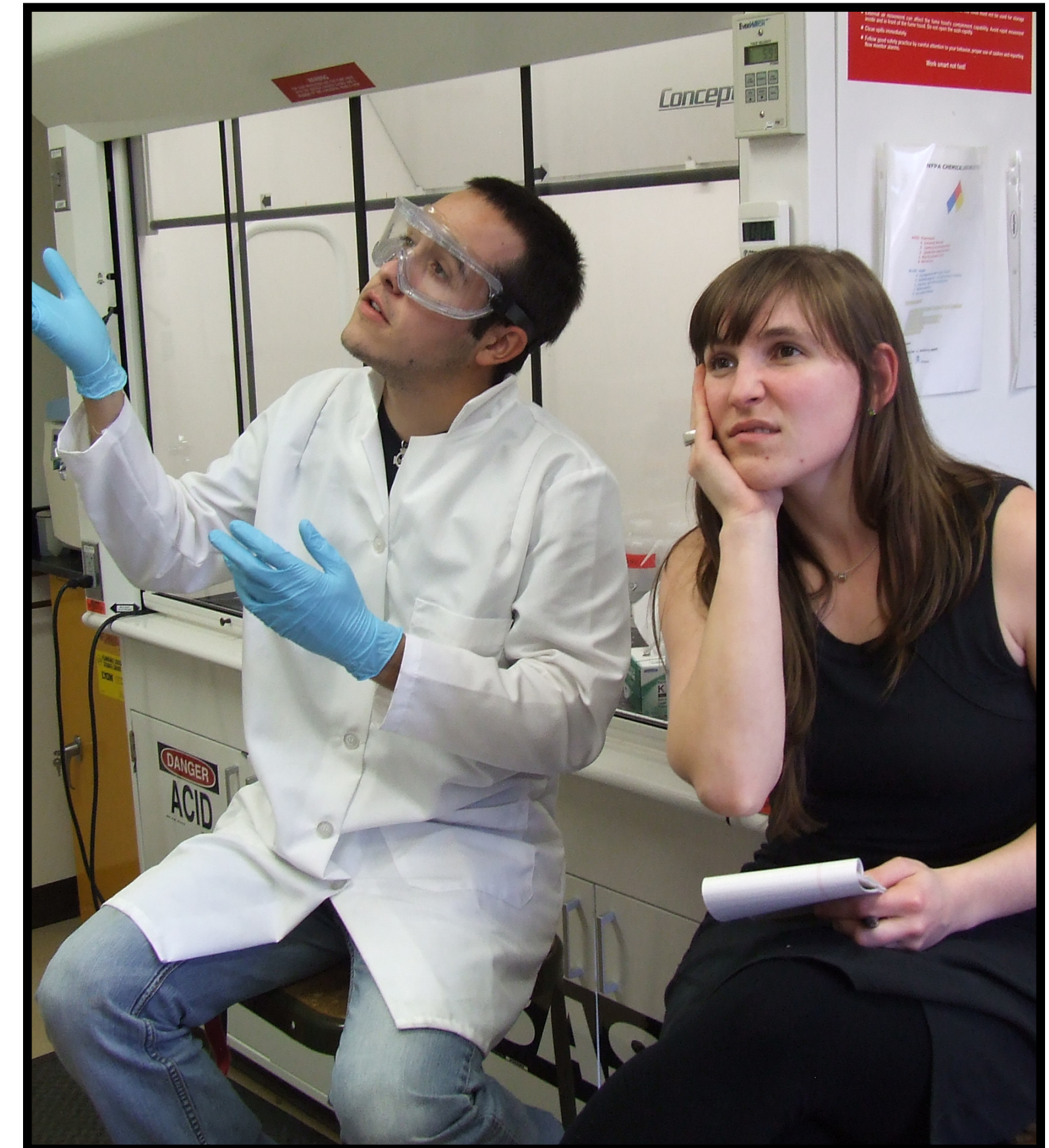
Meta-Deliberation And Judicious Connections

- No universal answer to what counts as reliable/unreliable information
- So, knowledge intermediaries rely on **judicious connections** to guide context-specific judgements
 - Is this information trustworthy, given research diversity and the kinds of questions a specific research community aims to answer?
 - Is this information trustworthy, given social inequity and the kinds of resources a specific research community could use to answer it?



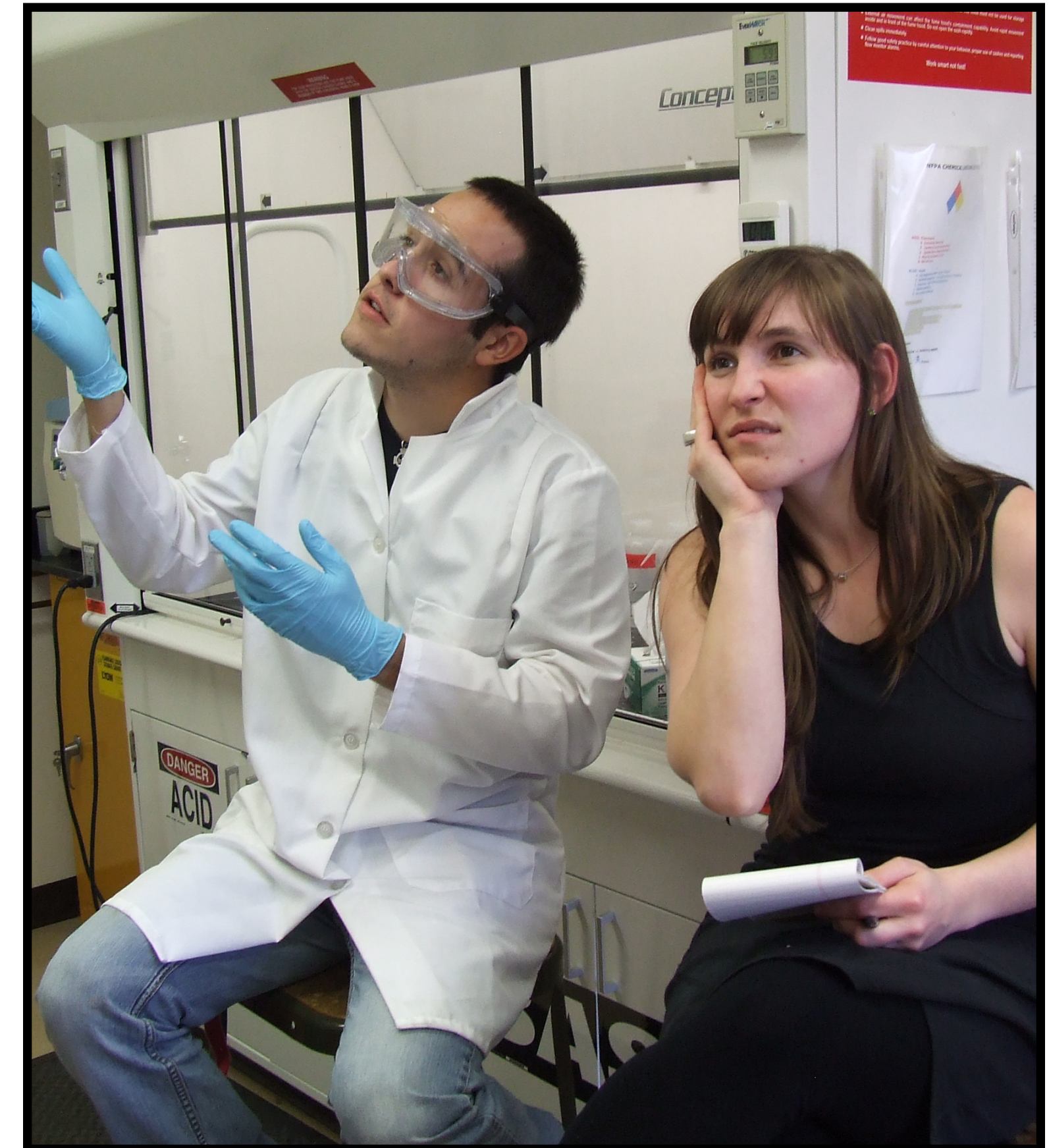
Meta-Deliberation And Judicious Connections

- Philosophers should retreat from **grand answers** about misinformation
- Philosophers should turn towards how to support others to give **context-specific answers**
- A ‘Process-Oriented’ view of Open Science may cultivate the **judicious connections** that **knowledge intermediaries** need to find those answers on behalf of nonexpert citizens



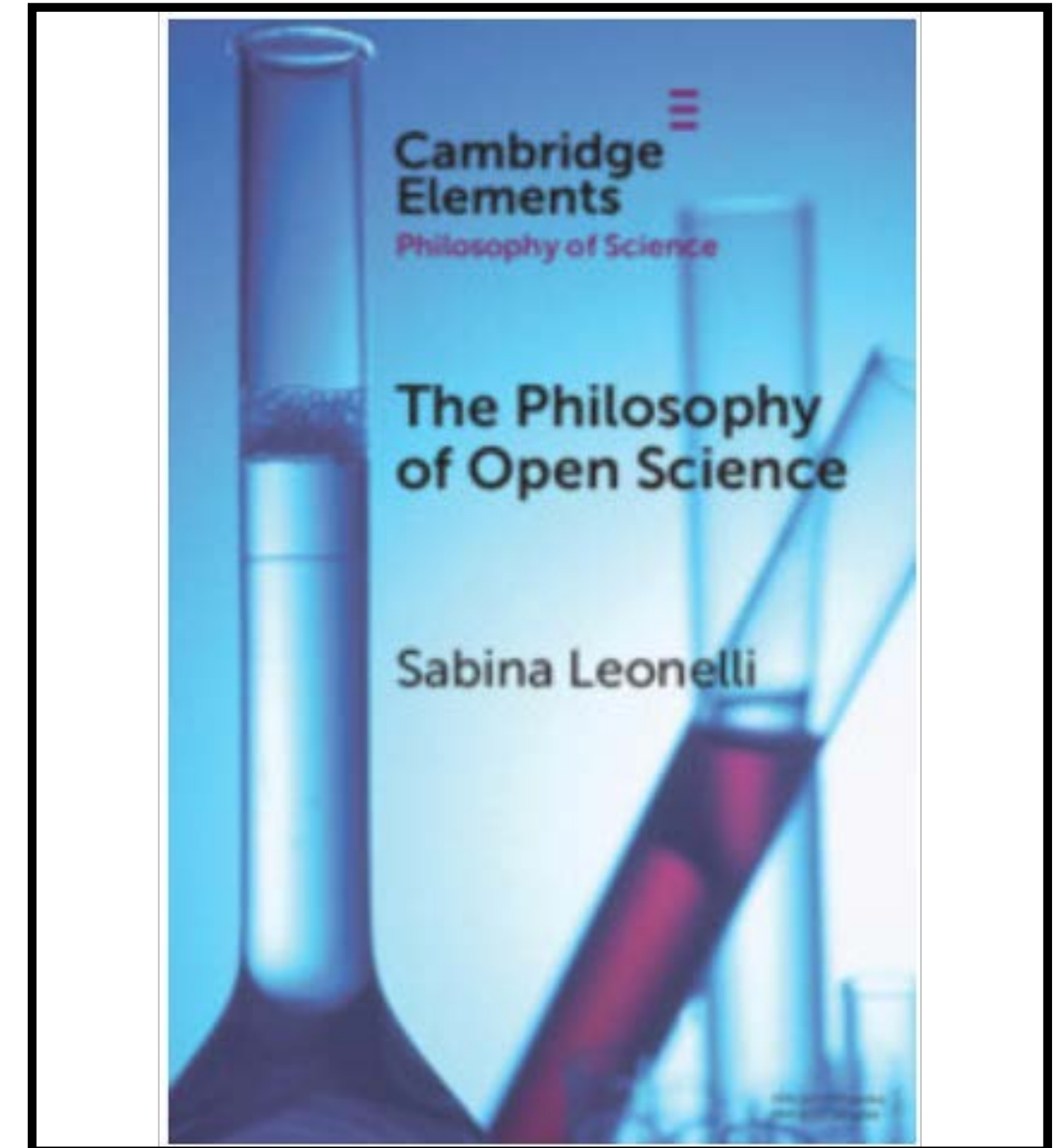
The Social Responsibility of OS

- A Process-Oriented OS enables **judicious connections** among research communities that can make **context-specific** judgements sensitive to research diversity and social inequity
- In turn, judicious connections enable **knowledge intermediaries** to evaluate scientific information on behalf of ordinary citizens
- So, a Process-Oriented OS develops the **social relationships** critical to bridge the **expert/non-expert gap**



Summary

- Object-Oriented OS vs Process-Oriented OS
 - Object-Oriented neglects and may close research practices to diverse and poorer research communities
 - Process-Oriented promotes collaboration and context-specific solutions
- Misinformation
 - Good information is not a simple gift from experts to nonexperts
 - Judicious connections enable **knowledge intermediaries** to better **transmit** good information from experts to nonexpert citizens



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