# "Slow science" concept: first insights of perceptions and suggestions in an oceanography laboratory



communal subject

new ways of

collaboration

self-discipline

more review presentations





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### 1. The debate

### Scientist sample

•  $\frac{1}{3}$  of the lab participate to the discussion (~45 out of 150)

- All carrier stage and education
- No administrative staff

### **Perceived environment**

- Surprising excitement
- No stigmatization for such questioning (no taboo anymore)
- Stimulating ambiance that raise a lot discussions
- Free speaking of everyone

(Park et al., 2023)

over time.

increases.

efficiency.

academic environment.

different rhythm and efficiency.

Reconsideration of the environmental scientist's roles and duties

• « Disruptive index » of papers and patents

becoming less disruptive over time

Amount of material and energy throughput

(e.g. computational resources, observational systems)

Alike several dynamical systems, the return-on-

Need to increase to achieve new scientific results

investment drop when the complexity of the system

As we celebrate the 200 year of the second principle in

thermodynamics, we would like to remind that a larger

energy input do not necessary imply a larger outcome

(work produced) by the system, especially if the energy

input is of high entropy or if the system has reduced

If the research system happened to be in a falling

return-on-investment scheme, it would also be likely

trapped in the so-called red queen effect (Van Valen,

1973), where it would be necessary to increase material

and energy throughput just keep in pace with the

Thus, such as falling return-on-investment trap should

be an additional motivation to rethink the quality, more

than the quantity, of the research organization. The

second law of thermodynamics should motivate us to

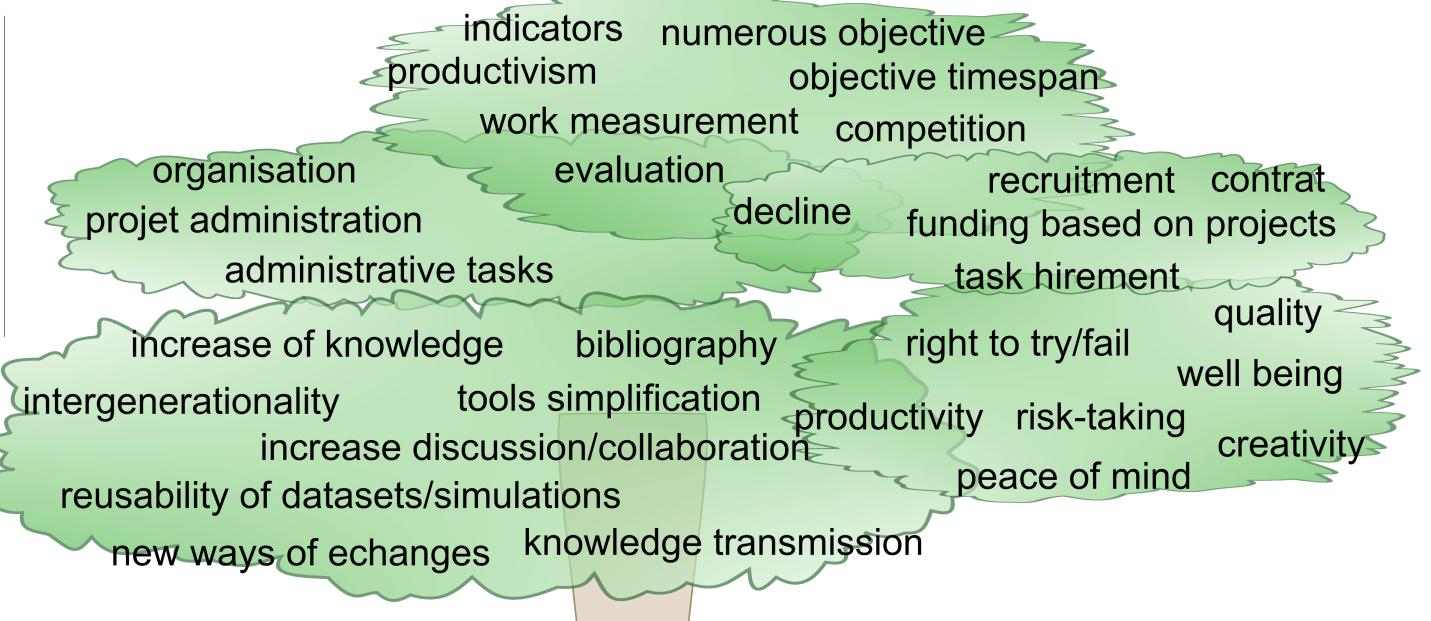
bifurcate to another research system based on a

2. Where did the disruptive

science go?

### Fig. 1 Word map of inspiration to « slow science » term. Below general idea is reworked as the science selection criteria following the actual context and following the slow

science idea.



## What is a good researcher?

### current standards

- Productivism

- Large community
- Prices

- Emphasis on individuals
- Great mobility
- # of citation (publicity)

- (# of articles)
- High indexes
- Attractive results
- Funding amount

### slow science alternative

- Emphasis on teams
- Productivity (quality enhancement)
- Questions relevance
- Community tasks (pearreview, transmissions, ...)

- Scientific watch
- Outreach
- Reduced ecological footprint

### hirements from in-place scientists reuse datasets ⇒ evaluation fundings/hirement and simulations separated from projets changing work pace new indicators: rethink the status objectives days without happyness (PhD students ≠ short-term employee) phone/mail/agenda/meeting ⇒ GES do not split on *├*⇒ outreach "working" differently/less: multiple projects - thinking time promote all scientific contribution Decisions: review time Institution (article/dataset/codes/per-review,...) Individual/Communal Fig. 2 Collective proposals made to slower the science habits of the community (sorted by difficulty).

difficulty in implementing proposals

less search

for funding

bigger projects

that federate

lab funding without

changing the mindsets

requirements

Flourishing propositions, many already feasible.

You want to act? Initiate the discussions in your own department/university as well!

### 3. Slow science meets the Slow science actions doughnut model

(Urai & Kelly, 2023)

- Current academic system pushes too much on the
- ecological (e.g. CO2, plastic, computers)
- Social (e.g. overwork, competition, stress, reporting)
- Proposed changes:

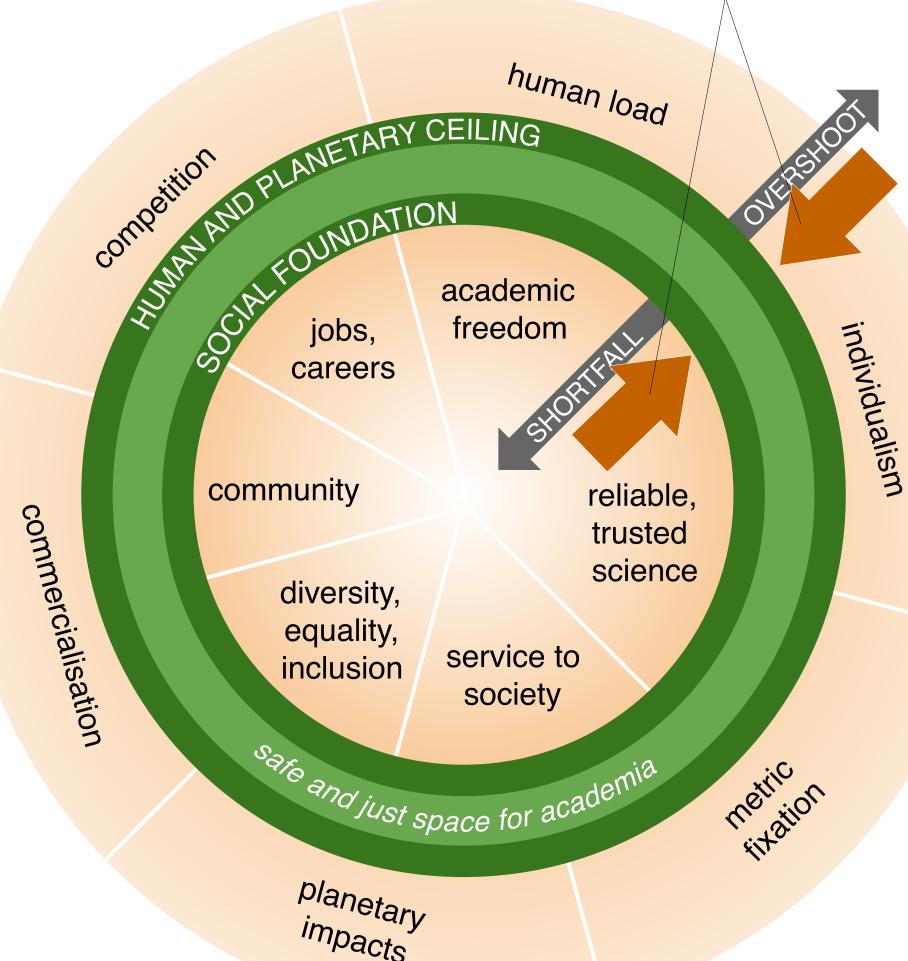
Individual

Change our mindset. What is a successful carrier? Promote quality over quantity, slowness over speed. More care on our educational mission on ecological crisis and prepare the students for action and adaptation.

Collective: funding, hiring.

### **Transformative role**

Researchers must go beyond alerting and monitoring: "Addressing the climate and biodiversity crisis demands transformative changes in our economies and societies. Academics, both as inhabitants of planet Earth and in their professional roles, should take a leading role in this transformation".



# 4. How to promote early career scientists beyond indicators?

Your call! Add your propositions on a sticky note! The changes need Focus on to be supported by Educate questions rather the in-place that expected researchers to community (team, impact the department, (Stengers, 2018) recruitment university at once)

need to initiate and support institutional evolution of science recruitment and findings

Jury, chair and

Fig. 3

Doughnut academia. Adapting the "doughnut" model of economics to the academic world enables us to visualize the inner social foundations that universities should provide, and the outer human and planetary boundaries that universities need to avoid overshooting. Note that the ordering of elements within the inner and outer rings is random; there is no direct pairing between foundations and ceilings. From Urai & Kelly (2023), adapted from Raworth (2017), under a CC-BY-SA license.

Park, M., Leahey, E. & Funk, R.J. (2023) Papers and patents are becoming less disruptive over time. Nature 613, 138-144. https://doi.org/10.1038/s41586-022-05543-x

Raworth K. (2017) Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist

Urai, A.E., Kelly, C. (2023) Point of View: Rethinking academia in a time of climate crisis. eLife. https://doi.org/10.7554/eLife.84991 Van Valen, L. (1973) A new evolutionary law. Evol Theory 1:1-30

Stengers, I. (2018) Another Science is Possible: A Manifesto for Slow Science

Wilson, L. (1995) The Academic Man: A Study in the Sociology of a Profession (1st ed.). Routledge. https://doi.org/10.4324/9781315130804