オープンサイエンスの先にあるもの
“Beyond” Open Science Is What?

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Why is "open science" good? For two reasons:

1. Because scholarly knowledge advances itself in better ways than otherwise once made universally sharable, and
2. because the public deserves to appreciate the results of the research it funds.

But

- publicly funded research shares only a small part of all research done, and does the "international" public deserve?

  Si la science n'a pas de patrie, l'homme de science doit en avoir une, et c'est à elle qu'il doit reporter l 'influence que ses travaux peuvent avoir dans le monde.(L. Pasteur, 1888)
- knowledge requires training to appreciate, and indeed science has been "esoteric" and successful
- it is not the case that everbody has be able to have access to all knowledge.
- But what is "Open" Science anyway?

"Components" of Open Science, partily à la FOSTER

- Open source: Apache License, BSD license, GNU General Public License, and many more, since a long time ago;
- Open access: "free and unrestricted online availability" of "peer-reviewed journal literature" (BOAI, 2002);
- Open data: "Data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike" (Open Data Handbook, 2011-2012);
- Open reproducible research: "The act of practicing Open Science to enable the independent reproducibility of the research results" (Stodden, 2009); and a
- Open educational resources(OER) and "MOOC"s: "materials offered freely and openly to use and adapt for teaching, learning, development and research" (Commontwealth of Learning)

Naive quesitons(1): Is open science a better science?

1. Open access: "Accelerates research, enrich education, share the learning of the rich with the poor and the poor with the rich"
2. Open data: Decreases costs, promotes new research, facilitates education of future researchers, expands unnoticed possibility *etc*
3. Open source: "Given enough eyeballs, all bugs are shallow," (*i.e.* the more widely available the source code is for public testing, scrutiny, and experimentation, the more rapidly all forms of bugs will be discovered.)
4. Open reproducible research: Improves reliability of scientific research
5. Open educational resources: Promotes education

Naive quesitons(2): Is "Open science" a scholarly communication concept, or a science practice concept?

1. Is open science cheaper?
   Good science does not have to be cheap
2. Is open science "innovative"?
   Probably NO
3. Is open science consistent with industrial innovations?
   Industry does not pay if it does not have to, and pays more than the public if only just for their own purposes
4. Is open science sustainable?
   Who pays for science?

Everything ending up with, or starting with MONEY!

Open access in near past and future

- Funders emerging
  - RCUK/HEFCE/JISC
  - NWO
  - Global Research Council
- Open access is easy to achieve when it is tied up to "research assessment, " a lesson from UK's REF2014, 2020, but "research assessment" is for resource allocation, not for the promotion of science
- Open access secularized into business models
  - "Cascade" editing may be going to be prevalent with publishers with quality journals
  - No sales to libraries necessary any more
  - The Second Flipping ▸ Picture
- "Predatory" publishers emerging anyway, with dubious quality assurance

Flipping for the second time

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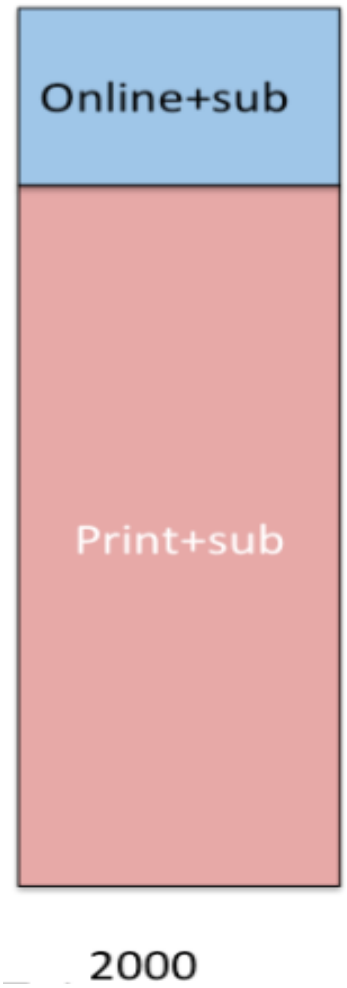

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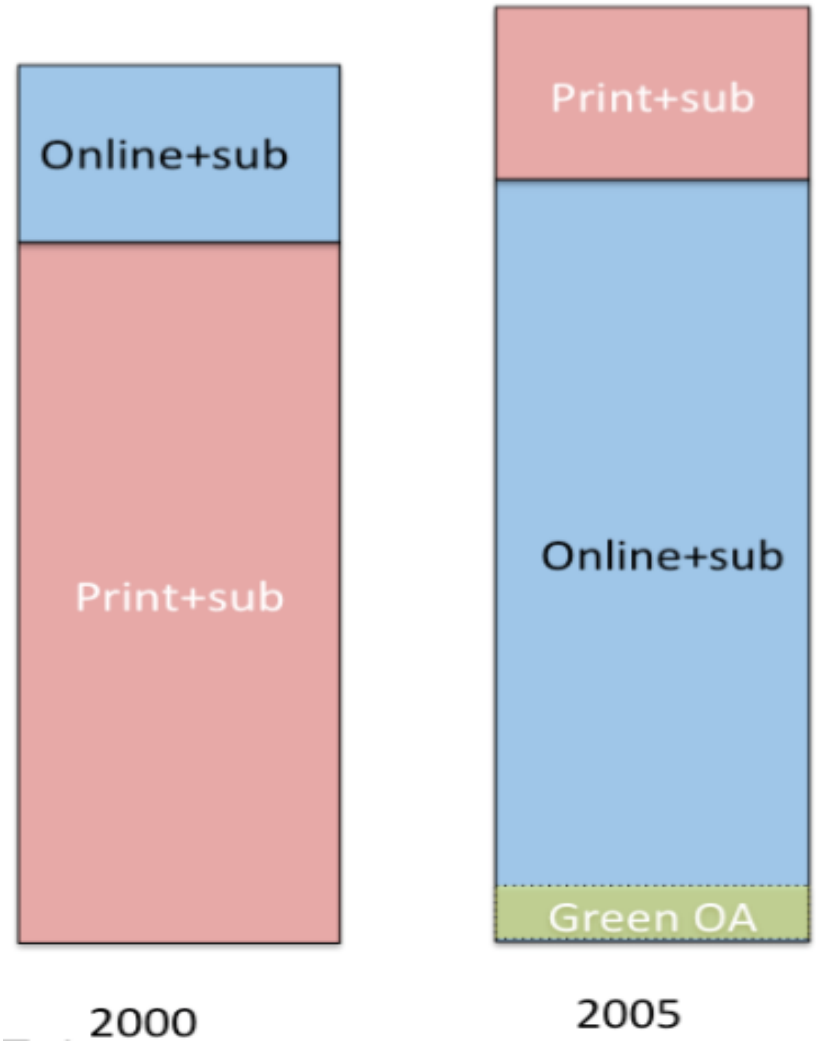

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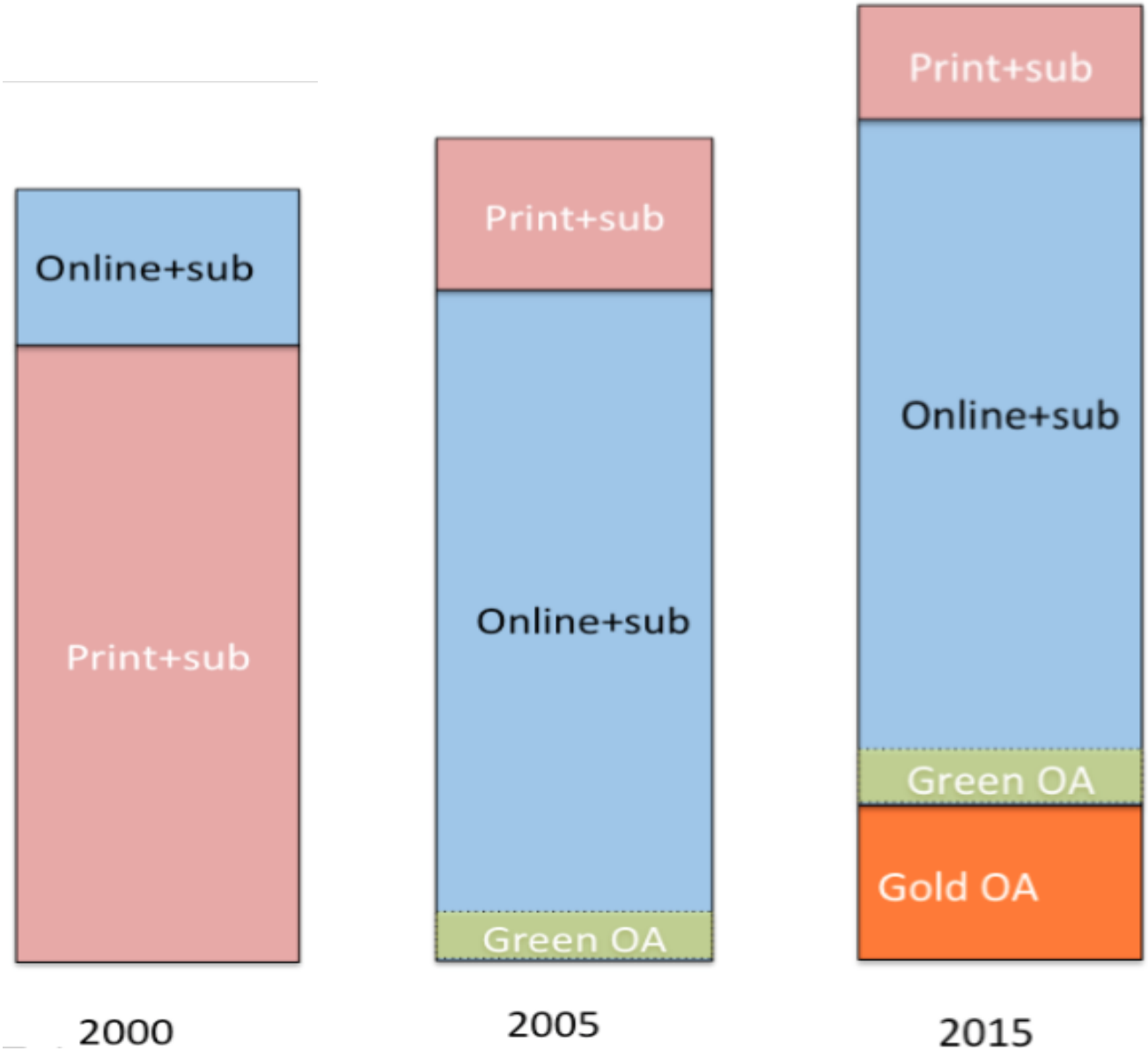

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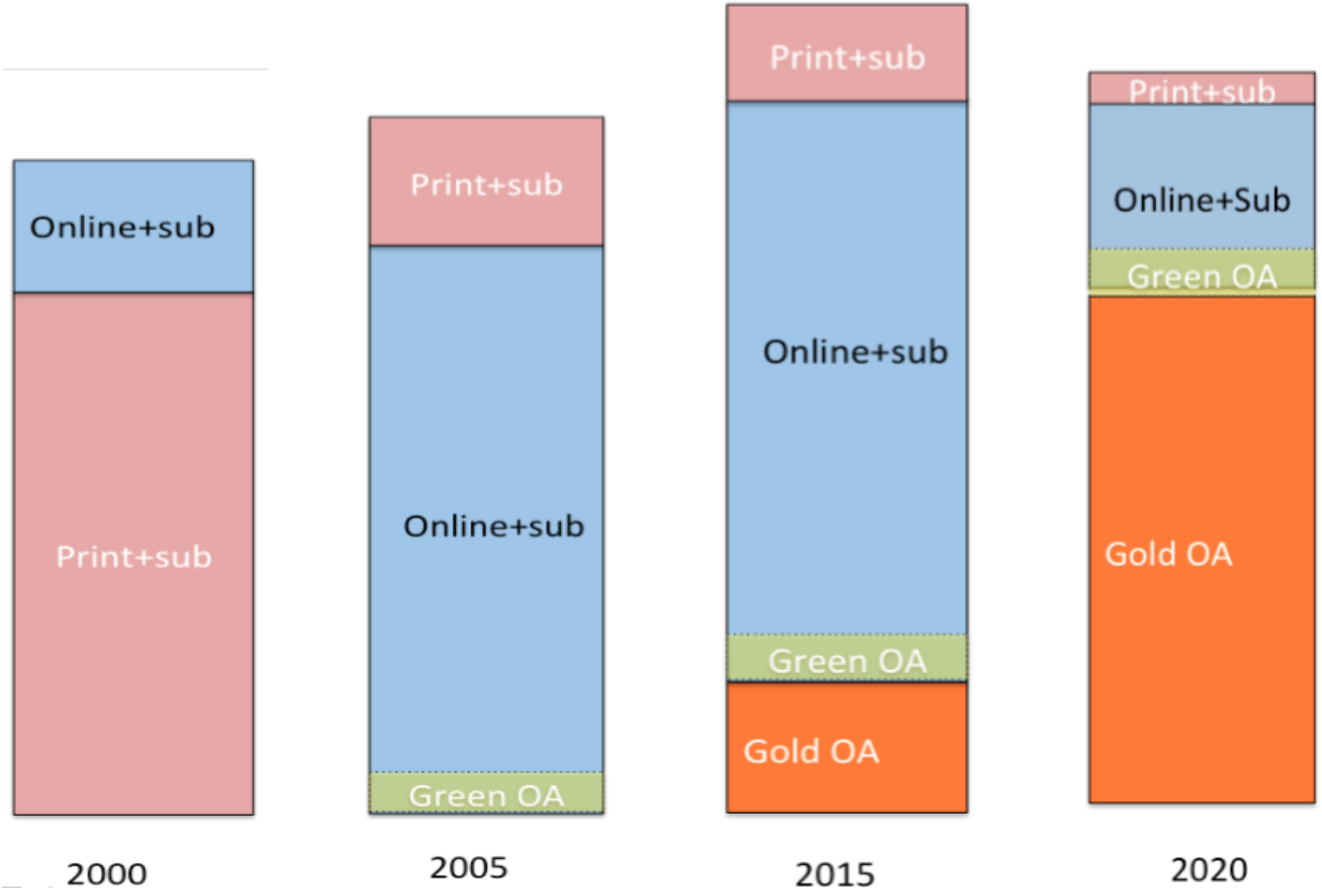
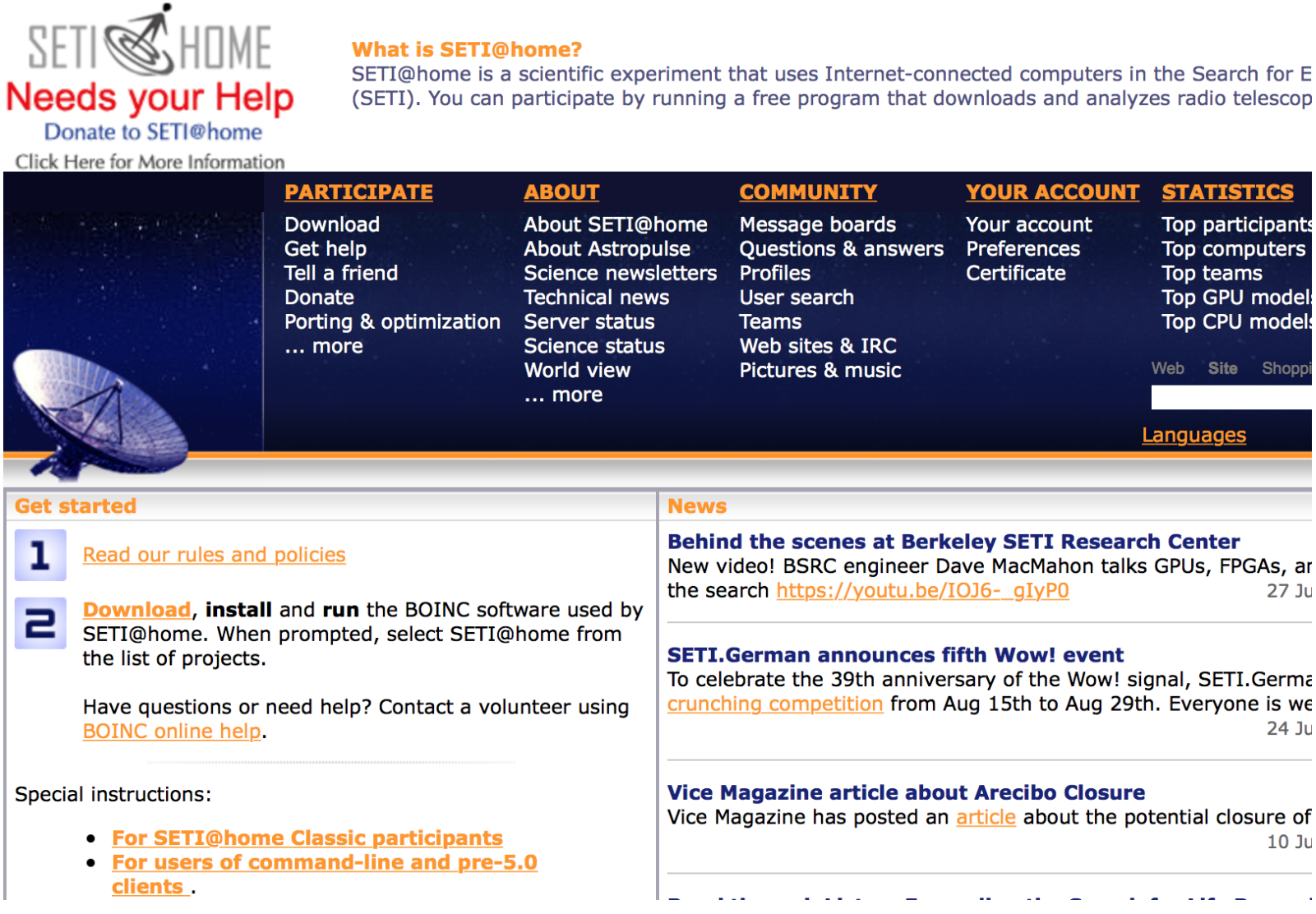


Will open science make citizens more educated and "scientific"?

- This is not new, or no need for "policies"
  - William Whewell's tidal research 1833 – 1840, made possible by British Association for Advancement of Science(currently, British Science Association)
  - SETI@Home, SOHO, Galaxy Zoo, The Great Sunflower Project, FoldIt, Polymath *etc.* ▸ SETI ▸ Sunflower ▸ Foldit ▸ Galaxyzoo
  - *Lorenzo's Oil*(1992), *Extraordinary Measures*(2010), *etc.* ▸ Movies
  - Archaeology, astronomy, botany, entomology etc in Japan
- Citizens are tools, not really beneficiaries
- If citizen science is confined to data collection and puzzle solving, which are both features of "normal science," à la Kuhn, few if any innovations from citizen science

SETI@Home



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The Great Sunflower Project

Welcome to the Great Sunflower Project!

IDENTIFYING WHERE POLLINATORS NEED HELP.
AND HELPING!

We are the largest citizen science project focused on pollinators with over 100,000 members. To say thank you to our members for all you have done for pollinators, we have a present for you, **Bee Identification Cards!** You can download them by logging in and then clicking here. We hope you will use them in your garden this year!

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FoldIt


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What's New
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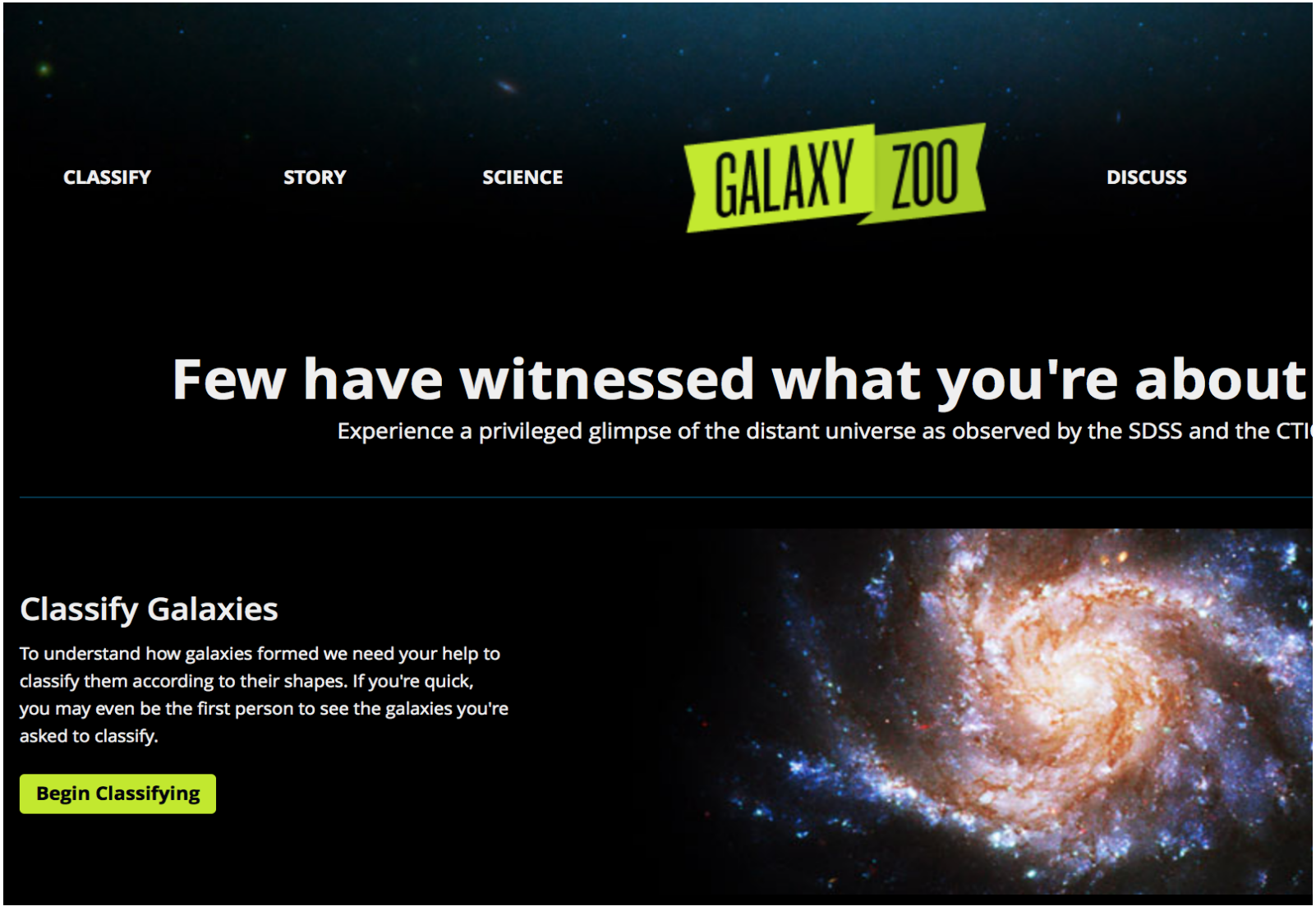
GalaxyZoo



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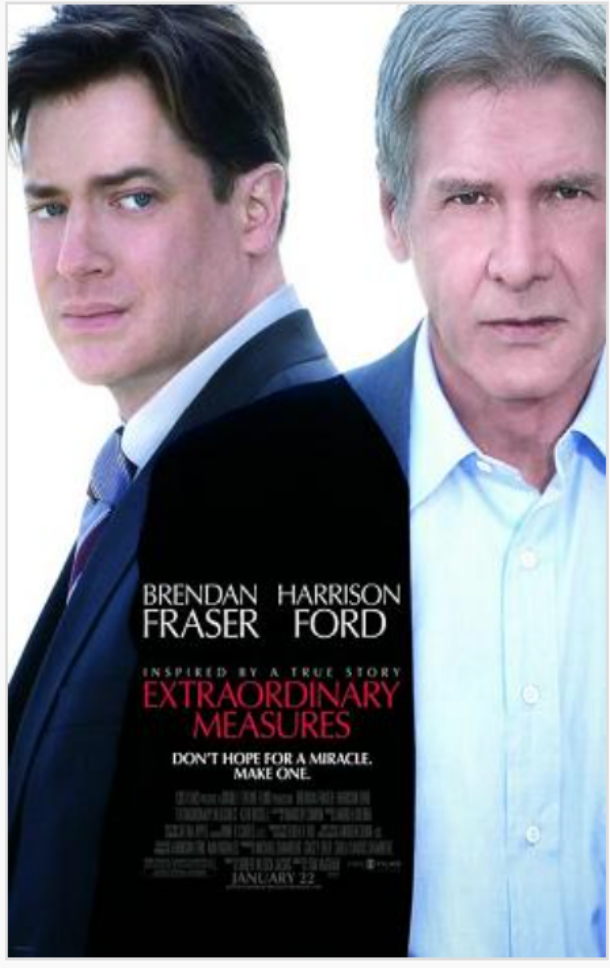
Movies

Lorenzo's Oil

Theatrical release poster

Extraordinary Measures



Theatrical poster

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Data is tough to make open

- Data sharing is necessary for sure
  - Explosion of data creation/generation
  - Size
  - Reproducibility
  - Constraints on resources. Budget.
- However,
  - Are seemingly "all-purpose," though actually article-oriented, "institutional" repositories tough enough?
  - Cybersecurity on campus generally tends to be miserable world wide
  - What is the "given"(=datum) anyway? Isnt' it that all observation is theory-laden?
  - "Open" means "Unwarranted," a forgotten principle, *i.e.* who curates?
  - Whoever cares will curate and share, but that's what we do now

Changes apparently, but nothing is new except for "digital"

- "Big science" funding since the mid-20th century, and "science for progress and prosperity" since the 19th century
- Scientists since the early 19th century
- Mondern university à la Humboldt with higher education and research for "the country"
- Scholarly society/associations since the early 19th century
- International collaboration by scientists across borders since a long time ago
- employment and promotion based on research performance in research institutions since nobody knows when

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Is "digital" ominous for an overall restructuring?

Or will the changes be assmilated into the scientific establishment?

Conclusions for now

- Open access to articles is the only "serious" openness $\Rightarrow$ When open access is the rule, libraries will be publishers of locally generated knowledge, where do "conventional publishers" go, or nowhere?
- Data sharing is necessary and vital, and has to be supported by the communities, just because science has long since been a community activity, which simply means that data was not, is not and will not have to be open, though "digital" has made it easier
- Open source will be the norm in various ways
- Open reproducible research will be more appreciated than before in the sense that research will be more "ethical." But ironically data sharing is more important in UNreproducible research,like geosensing, ecology, *etc.*
- Higher education as a place for research, why? $\Rightarrow$ The question will still remain.

Possible impacts on research journals and scholarly societies, though in the form of questions

- **Definition issue** Will the idea of journals as collections of "articles" as research results survive?
- **Quality issues, descriptive and normative** Will only those research results worth publishing be published? ORCID as a exemplary practice of good "closed" science, due to "membership"
- **Sustainability and Financing issue** Will membership still pay?
- **Why open now?**

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