

Importance & benefits of

Open Science

for ubiquitous,

sharing,

dissemination &

IMPACT

Ivo Grigorov & FOSTER Consortium Members



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DiPP2014 Veliko Tarnovo, Sept 2014



Open Research: Can you afford not to

Ivo Grigorov & FOSTER Consortium Members



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- *PhD Marine Science*
- *Data Journal Editorial Team*
- *Open Science advocate*
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“Open science (research) is the umbrella term of the movement to make scientific research, data and dissemination accessible to all levels of an inquiring society, amateur or professional.”



WIKIPEDIA
Source: Wikipedia, Aug 2013

"The currency of researchers is really about making sure their work can be read and can be cited"

*Robert Kiley,
Wellcome Trust*

"Researchers job is to change the world, not get tenure"

*Mike Taylor
ESOF2014
Should Science Be OPEN?*



@fosterscience

***"Focus on Impact (Factor)
distorts what matters in
science"***

***Dr. Alan Leshner,
CEO AAAS &
Publisher of
"Science" journal***



***#esof2014 pic.twitter.com/M9D0rVtggl
24/06/2014 16:53***

*3 reasons to use
Open Science by default:*

1

*Multiply
Collaborations*

3

*Greater
funding
success*

2

*Stronger
Research
Profile*

Barriers to Open Science:



PolyMath Project

Open Source Malaria

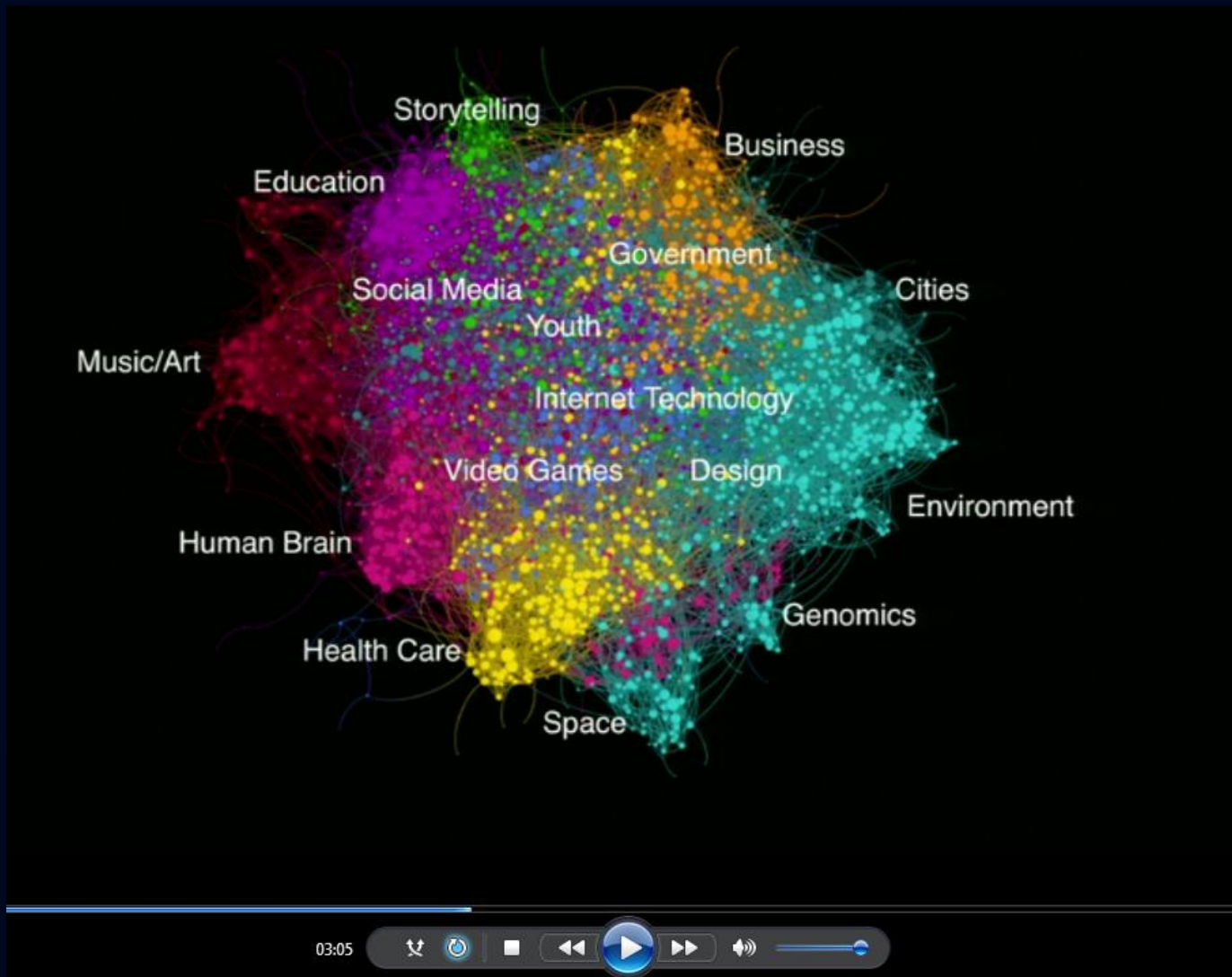
1

*Multiply
Collaborations*

Amateur Astronomy

Jellyfish Invasions

*Genetics Analysis
Open Source*



https://www.ted.com/talks/eric_berlow_and_sean_gourley_mapping_ideas_worth_spreading

 *Open Science networks research ...*

**“At scale you can have
serendipity by design,
not by blind luck.”**

Source:

<http://cameronneylon.net/blog/network-enabled-research/>

Open Science engineers serendipity ...

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'This is a Cinderella moment for a science nerd like me' The high school student who devised a cure for cancer (that we could be using in as little as 15 years)

By HANNAH ROBERTS
UPDATED: 17:07 GMT, 15 January 2012

53 View comments

Most teenage girls spend their free time gossiping with their friends and figuring out how to outwit their parents. But Angela Zhang spends her time somewhat more productively-the 17-year-old has found a possible cure for cancer.

The extraordinary high school senior from Cupertino has now been rewarded with a scholarship for \$100,000.



Prodigy: 17 year old **Angela Zhang** has found a possible cure for cancer

At first glance the first generation Chinese schoolgirl, who is learning to drive, seems in many ways an average Californian teenager, CBS

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US teen invents advanced cancer test using Google

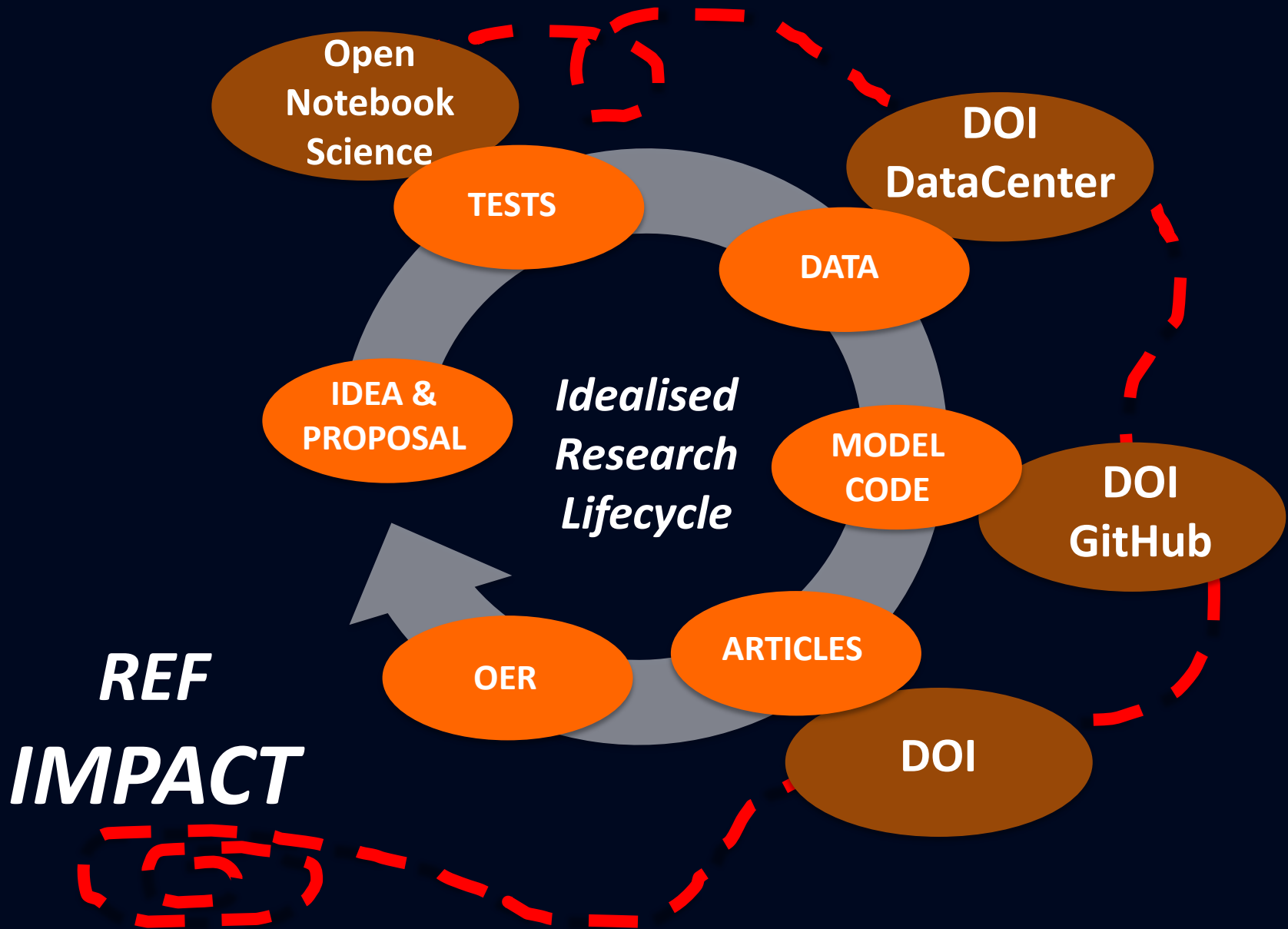


20 August 2012 Last updated at 23:34 GMT

Fifteen-year-old high school student Jack Andraka likes to kayak and watch the US television show Glee.

And when time permits, he also likes to do advanced research in one of the most respected cancer laboratories in the world.

2 *Stronger Research Profile*










“Research Cycle” adapted from Tenopir C, Allard S, Douglass K, Aydinoglu AU, et al. (2011)

doi:10.1371/journal.pone.0021101 <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0021101>

Consolidate your findings, and link them to each other...

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... for IMPACT!

30 July 2013

[Journal article](#)
[Open access](#)

Pelagic community production and carbon-nutrient stoichiometry under variable ocean acidification in an Arctic fjord

Silyakova, A.; Bellerby, R. G. J.; Schulz, K. G.; Czerny, J.; Tanaka, T.; Nondal, G.; Riebesell, U.; Engel, A.; De Lange, T.; Ludvig, A.

[\(show affiliations\)](#)

Net community production (NCP) and carbon to nutrient uptake ratios were studied during a large-scale mesocosm experiment on ocean acidification in Kongsfjorden, western Svalbard, during June–July 2010. Nutrient depleted fjord water with natural plankton assemblages, enclosed in nine mesocosms of 50m³ in volume, was exposed to pCO₂ levels ranging initially from 185 to 1420 μatm. NCP estimations are the cumulative change in dissolved inorganic carbon concentrations after accounting for gas exchange and total alkalinity variations. Stoichiometric coupling between inorganic carbon and nutrient net uptake is shown as a ratio of NCP to a cumulative change in inorganic nutrients. Phytoplankton growth was stimulated by nutrient addition half way through the experiment and three distinct peaks in chlorophyll a concentration were observed during the experiment. Accordingly, the experiment was divided in three phases. Cumulative NCP was similar in all mesocosms over the duration of the experiment. However, in phases I and II, NCP was higher and in phase III lower at elevated pCO₂. Due to relatively low inorganic nutrient concentration in phase I, C:N and C:P uptake ratios were calculated only for the period after nutrient addition (phase II and phase III). For the total post-nutrient period (phase II+phase III) ratios were close to Redfield, however they were lower in phase II and higher in phase III. Variability of NCP, C:N and C:P uptake ratios in different phases reflects the effect of increasing CO₂ on phytoplankton community composition and succession. The phytoplankton community was composed predominantly of haptophytes in phase I, prasinophytes, dinoflagellates, and cryptophytes in phase II, and haptophytes, rasiophytes, dinoflagellates and chlorophytes in phase III (Schulz et al., 2013). Increasing ambient inorganic carbon concentrations have also been shown to promote primary production and carbon assimilation. For this study, it is clear that the pelagic ecosystem response to increasing CO₂ is more complex than that represented in previous work, e.g. Bellerby et al. (2008). Carbon and nutrient uptake representation in models should, where possible, be more focused on individual plankton functional types as applying a single stoichiometry to a biogeochemical model with regard to the effect of increasing pCO₂ may not always be optimal. The phase variability in NCP and stoichiometry may be better understood if CO₂ sensitivities of the plankton's functional type biogeochemical uptake kinetics and trophic interactions are better constrained.

 Existing approvals

EURO-BASIN, North Atlantic Marine Ecosystem Research

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Publication date:

30 July 2013

DOI:

10.5194/bg-10-4847-2013

Report number(s):

OpenAIRE-EPOCA-2013-001 OpenAIRE-EURO-BASIN-2013-010 OpenAIRE-MEECE-2013-004

Keyword(s):
[Ocean Acidification](#)
[carbon-nutrient stoichiometry](#)
Published in:

Biogeosciences (Online); 10 (2013) pp. 4847–4859

Grants:

 EPOCA - European Project on Ocean CO₂ and Acidification (211384)
 EURO-BASIN - European Basin-scale Analysis of the Oceanic Integration (EURO-BASIN)

EPOCA - Marine Ecosystem Evolution in a Changing Environment (212085)

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Research Impact Vs Societal Impact

01 August 2014 **Journal article** **Open access**

A cascade of warming impacts brings Greenland waters


MacKenzie, Brian R. ; Payne, Mark R. ; Boje, Jes

Rising ocean temperatures are causing marine distributions and ranges, and are altering predator webs. Most documented cases of species shifts so far involve relatively small species at lower trophic ...

Uploaded by vthome on 25 August 2014.

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06 July 2012 **Journal article** **Open access**

The Seasonal Smorgasbord of the Seas


Martin, Adrian

The spring bloom of phytoplankton—an annual population explosion poleward across much of the open ocean and spills across the continental shelves—is a seasonal bounty for the marine ecosystem. As it wanes, its annual legacy is a flux of ...

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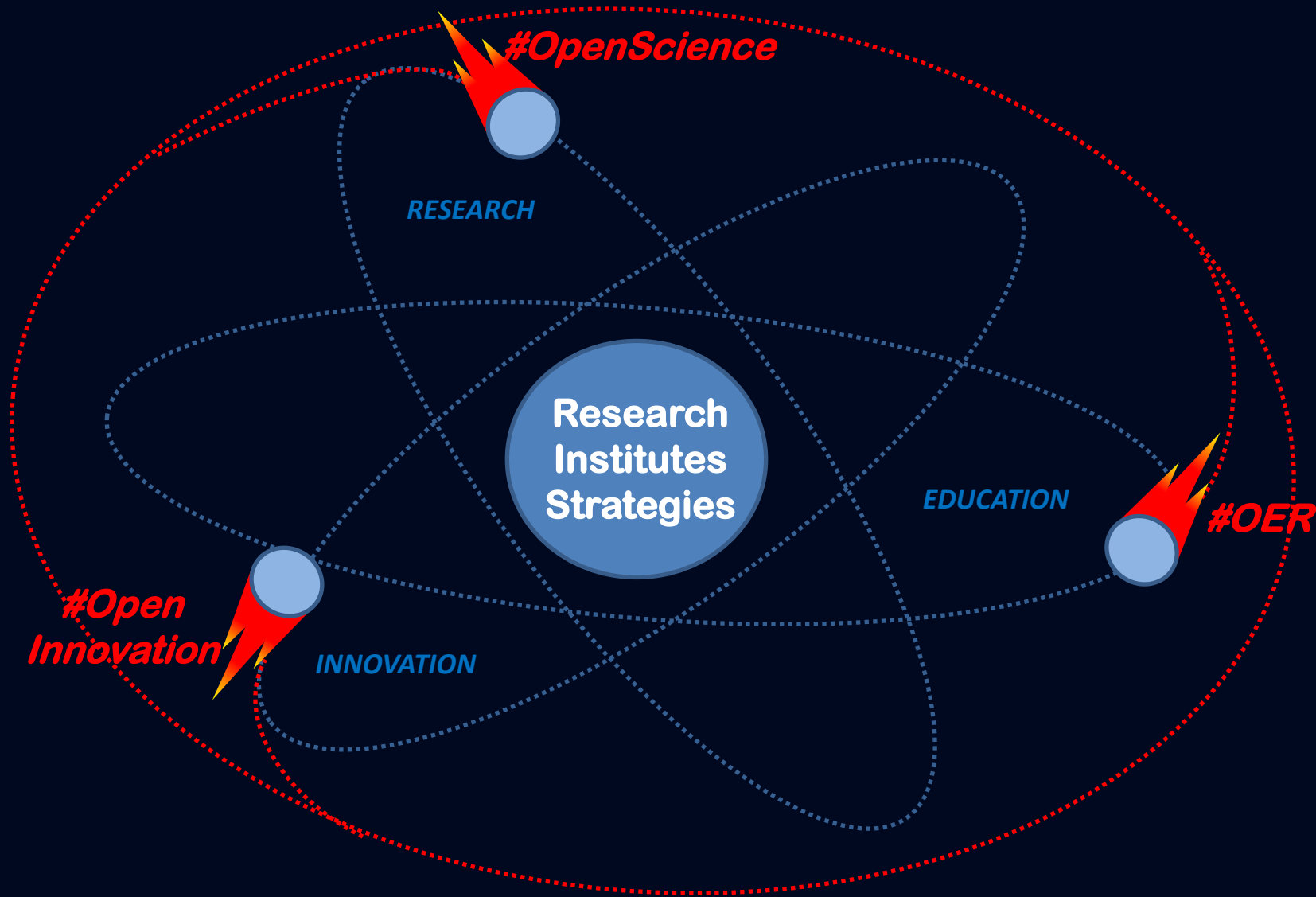
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Uploaded by [Le Gall](#) on 30 August 2012.

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3 *Greater funding success*

How are institutions evaluated?

65%

Quality Research Outputs: articles, books or other research outputs.

20%

Impact: in the form of case studies which demonstrate a distinctive social, economic or cultural impact outside academia.

15%

Research Environment: the quality of the environment within which the research is conducted.

Source: UK HEFCE, www.hefce.ac.uk/

**“60% of UCL-published
research was easily
accessible”**

2002

*Source: Paul Ayres, Senior Manager
University College London,
Library & Information Services (pers. comm.)*

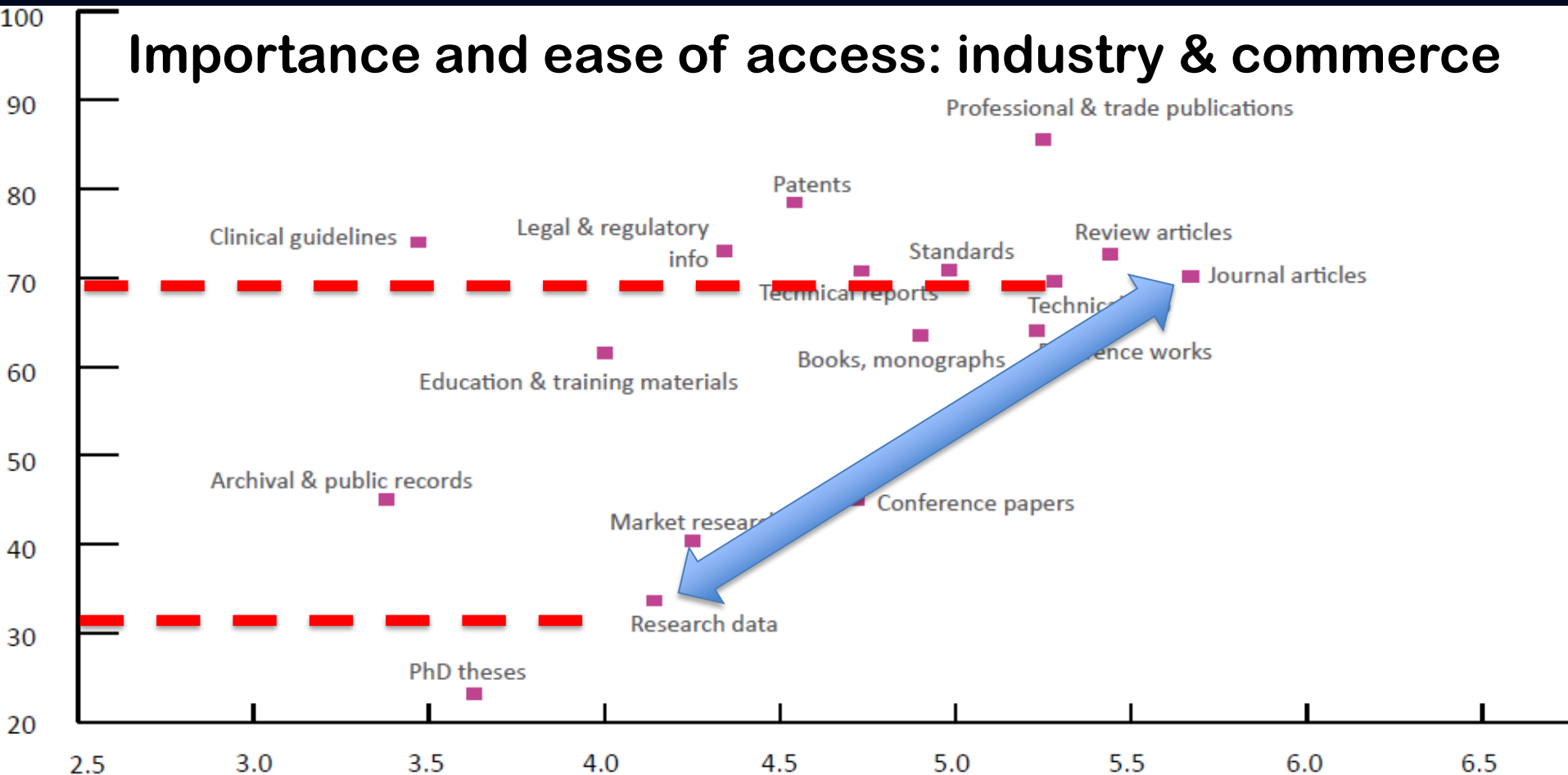
2011

**“around 50% of scientific papers
published in 2011 now
available for free”**

*Source: Proportion of Open Access
Peer-Reviewed Papers in 2004-2011,
Science Metrix Aug 2013, EC Commissioned Study
http://europa.eu/rapid/press-release_IP-13-786_en.htm*

... and the rest ?

Is there any evidence that Open Science leads to economic benefits?



Mean ratings (x axis), where 7='extremely important' and % of users for whom access is 'fairly easy' or 'very easy' (y axis) (n=699)

Is there any evidence that Open Science leads to economic benefits?



19% of the processes developed would have been delayed or abandoned without access to research



a 2.2 years delay would cost around EUR 5 million per firm in lost sales



Source: Houghton, J., Swan, A. & Brown, S. Access to research and technical information in Denmark. (2011) <http://eprints.soton.ac.uk/272603>

Complying with Horizon 2020 while getting funded ?

1. Excellence:

Objectives

Relevance to WorkProgram

Concept & Approach

Ambition

min 3/5 POINTS

2. Impact:

Expected impact to WorkProgram

Maximise Impact (Open Access & Open Data)

min 3/5 POINTS

3. Implementation:

Workplan & Management

Consortium & Resources

min 3/5 POINTS

Complying with Horizon 2020 while getting funded ?

2. IMPACT (min 3/5 points):

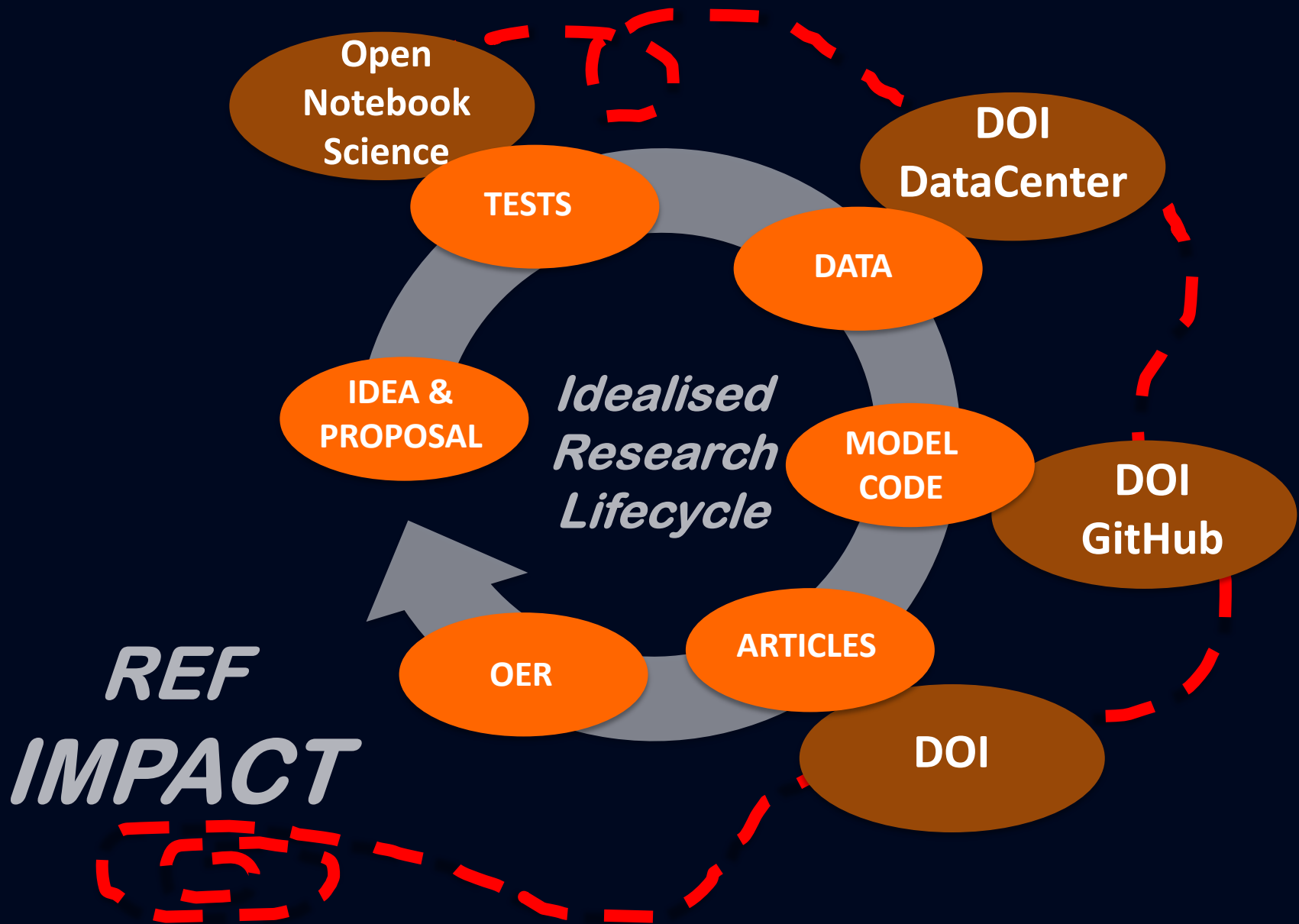
2.1 Expected impact to WorkProgram

- expected impacts set out in the work programme*
- delivering innovations to the **markets***
- **socially** important impacts*

2.2 Maximise Impact (Open Access & Open Data)

- plan for **results dissemination** and exploitation*
- **research data management** for verification & re-use*
- **knowledge strategy management** & Open Access*

... for public and societal engagement!



“Research Cycle” adapted from Tenopir C, Allard S, Douglass K, Aydinoglu AU, et al. (2011)

doi:10.1371/journal.pone.0021101 <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0021101>

Thank you

for the invitation & your attention!

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