The Future Infrastructure for Open Science

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Contents
A time of plenty?

- ❑ Open Science rollout
- ❑ The constituents of Open Science
  - ❑ Open Access to Publications
  - ❑ Research Data Management
  - ❑ Open Science Cloud
- ❑ Next Steps for Open Science

Il Duomo, Milan: West Front

Contents
A time of plenty?

❑ Open Science rollout

❑ The constituents of Open
Science

   ❑ Open Access to
      Publications

   ❑ Research Data
      Management

   ❑ Open Science Cloud

❑ Next Steps for Open
Science

Il Duomo, Milan: West Front

3

Open Science – the Motivation

❑ <u>Validation</u> of the results of the EU's public consultation on *Science 2.0: Science in Transition* now published

❑ Science 2.0 now renamed 'Open Science'

❑ Trends in Open Science

  ❑ Significant increase in scientific production

  ❑ New ways of doing Science (data-intensive science)

  ❑ Increased number of actors and addressees of science

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4

Barriers to Open Science – for individual researchers
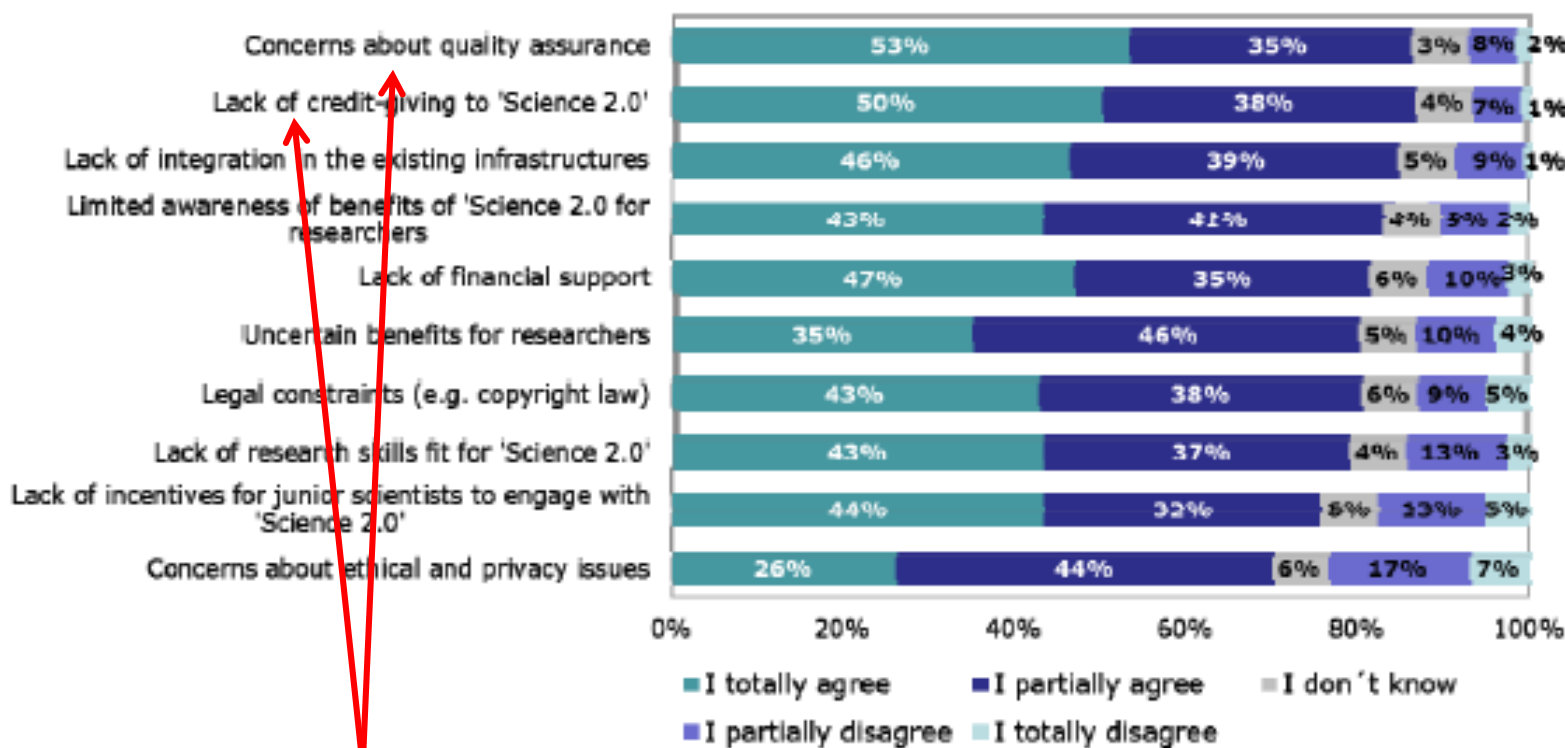
☐ **Academic issues and concerns around Career progression seen as the biggest barriers**

5

% Agreement for Policy actions (abbrev.)

Question/Issue	Need to Intervene Y	Need to Intervene N	Req'd Action Y	Req'd Action N	EU Action Y	EU Action N
Foster Open Science – raise awareness	52%	4%	48%	4%	19%	4%
Traditional Metrics do not capture Open Science	22%	7%	22%	7%	4%	7%
Develop research infrastructures	56%	4%	11%	4%	48%	4%
OA to publications and data	63%	11%	33%	26%	26%	11%

❑ **The most significant total in the Validation exercise**

❑ **Not much interest in any intervention**

6

Open Science – broad policy lines

❑ 5 broad policy action lines (from public consultation, validated by stakeholders incl. Member States and endorsed in Digital Single Market):

1. Fostering and creating incentives for open science

2. Removing barriers for open science

3. Mainstreaming and further promoting open access policies

4. Developing an open science cloud

5. Embedding open science in society to make science more responsive to societal and economic expectations

Open Science – top-level ambitions/1

❑ 4 top-level ambitions with regard to the use & management of research results and data:

1. Open Data: FAIR data sharing is the default for funding scientific research

2. Science cloud: All EU researchers are able to deposit, access and analyse European scientific data through the open science cloud, without leaving their desk

3. Altmetrics: The role of alternative metrics in replacing/complementing conventional indicators for research quality and impact (e.g. Journal Impact Factors and citation counts)

4. Changing business models for scientific publishing: All peer reviewed scientific publications are freely accessible
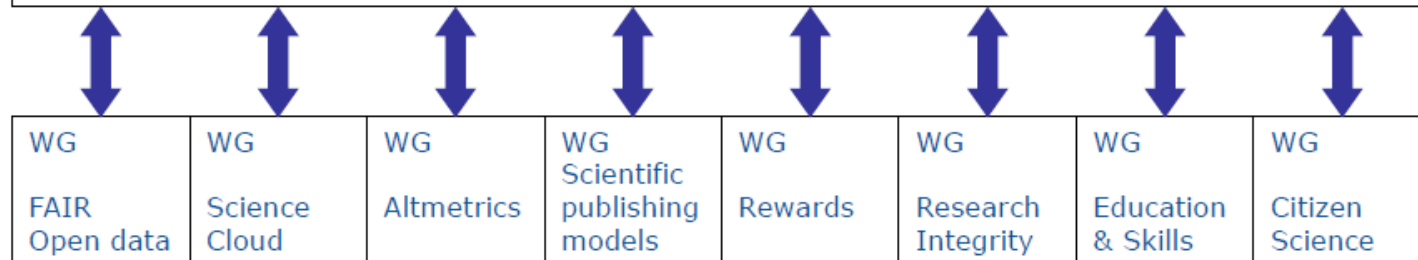
Open Science – top-level ambitions/2

❑ 4 top-level ambitions with regard to relations with research actors (researchers, institutions and funders):

1. Rewards: The European research career evaluation system fully acknowledges Open Science activities

2. Research Integrity: All publically funded research in the EU adheres to commonly agreed Open Science Standards of Research Integrity

3. Education and skills: All young scientists in Europe have the necessary skills and support to apply Open Science research routines and practices

4. Citizen Science: Citizen scientists significantly contribute and are recognised as valid knowledge producers of European science
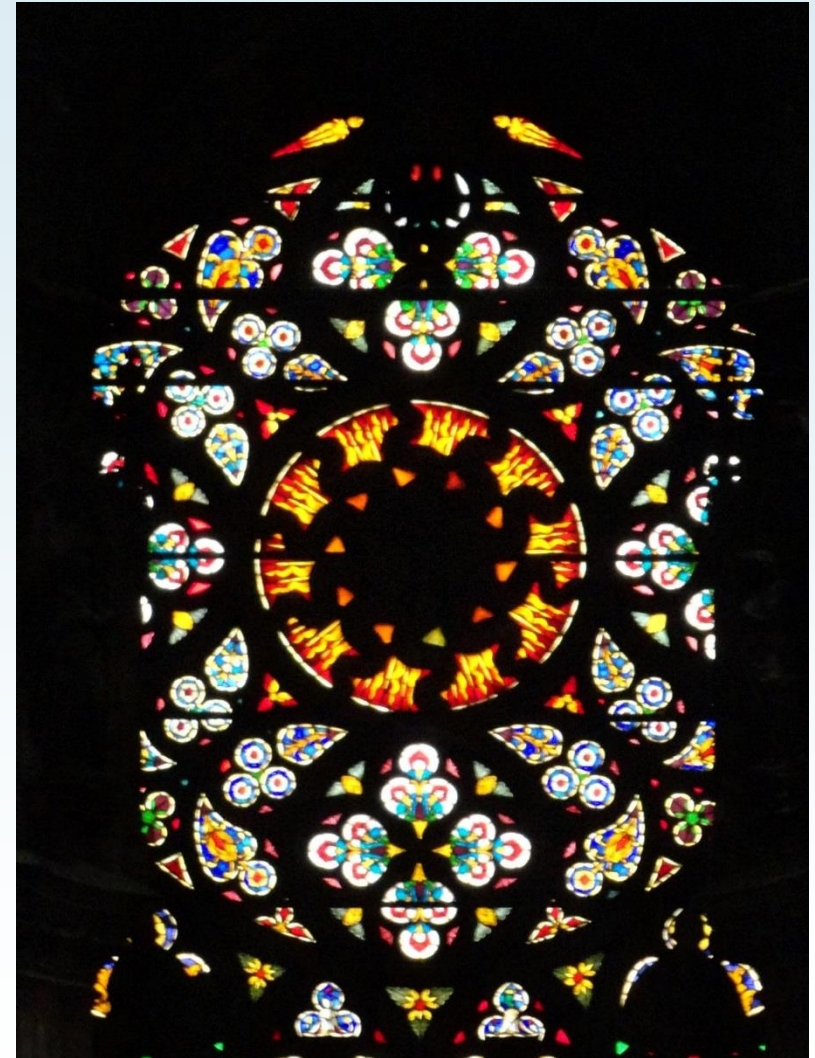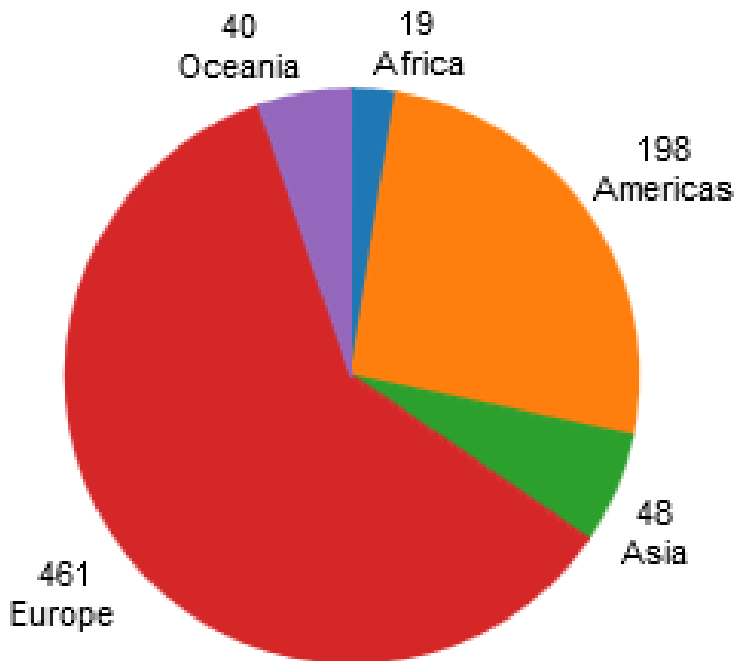
Contents
A time of plenty?

❑ Open Science rollout

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    ❑ Research Data Management

    ❑ Open Science Cloud

❑ Next Steps for Open Science

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Open Access a central tenet

❑ Open Access Policies
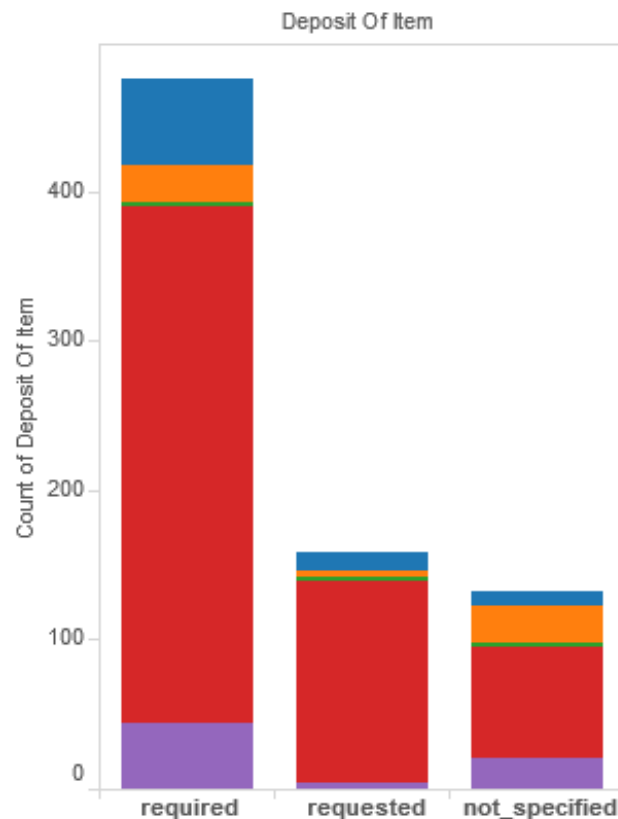

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Routes to Open Access

Open Access Policies using Green and Gold Criteria by Policymaker

13
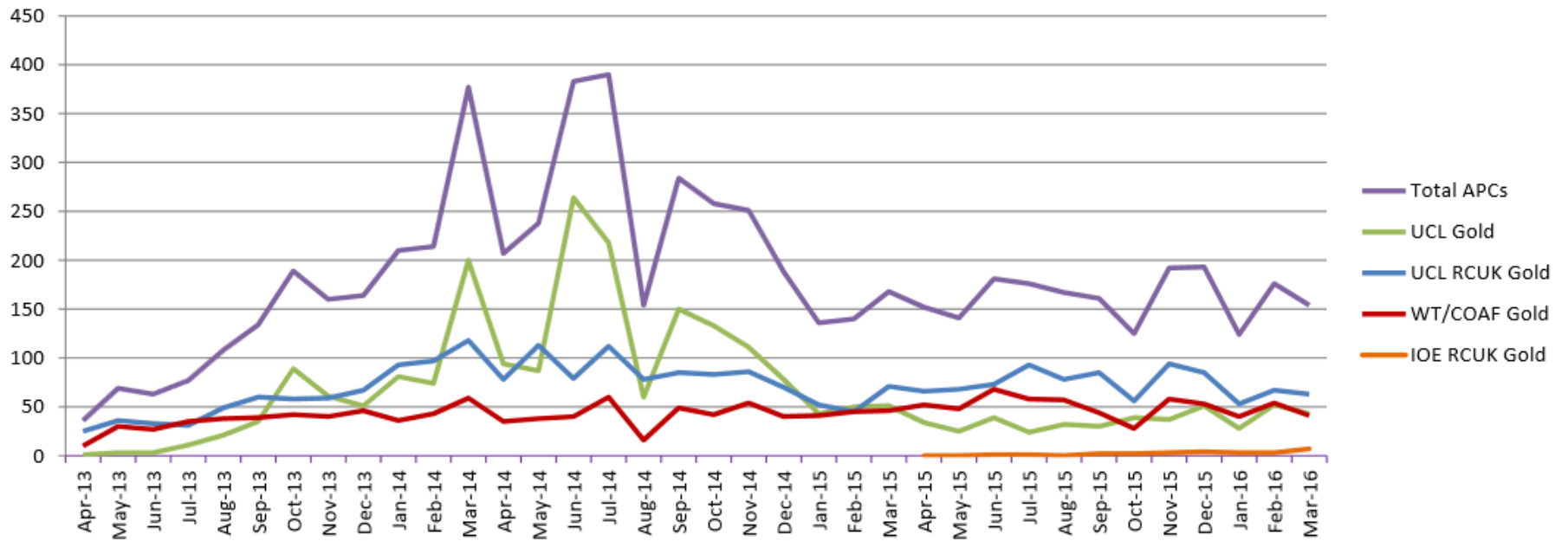
UCL Discovery downloads

Full-text downloads to 31 March 2016

- 2016 to date: 617,917 downloads
- Lifetime downloads (from Feb 08): 9,403,622

15

Most-downloaded outputs Q1 2016

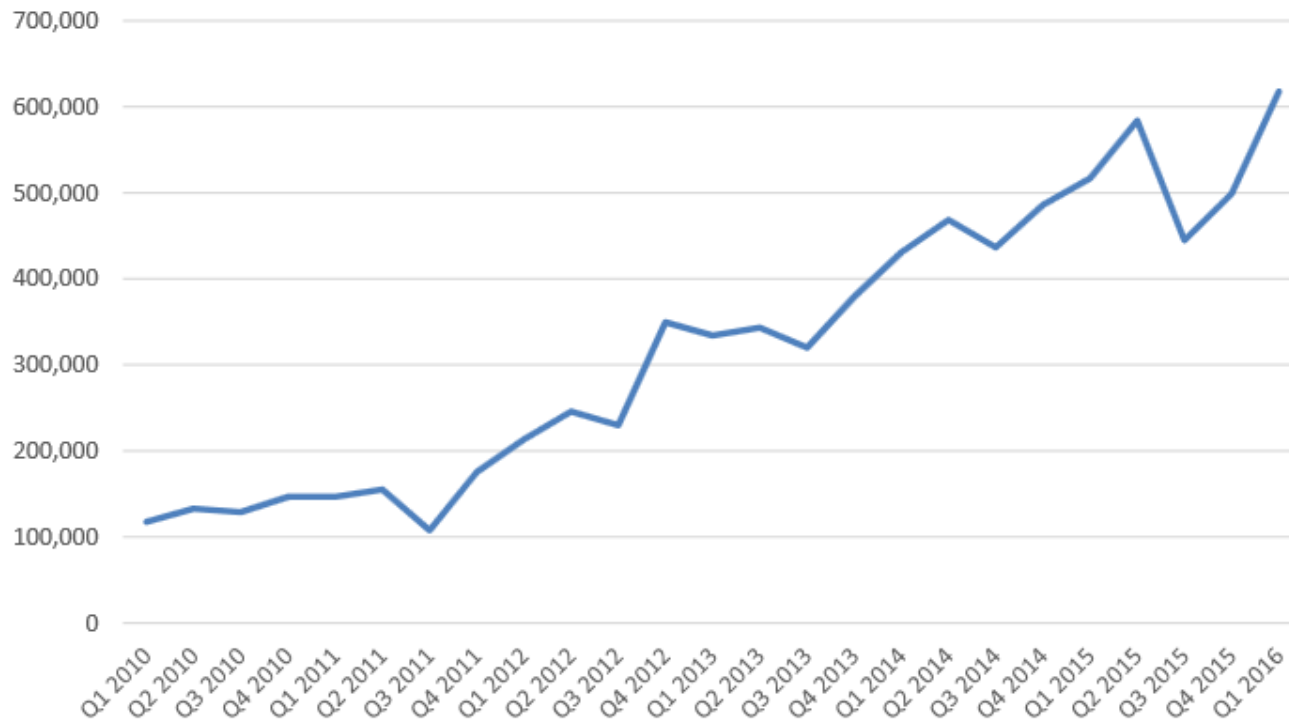|			
1.	How the World Changed Social Media	6,740	2016 UCL Press
2.	Marketing theories and concepts for the international construction industry: a study of their applicability at the global, national and corporate perspectives	3,161	1990 Bartlett thesis
3.	Machine learning for financial market prediction	2,107	2012 Comp Sci thesis
4.	Fatigue and fracture mechanics analysis of threaded connections	1,937	1992 Mech Eng thesis
5.	Social Media in an English Village	1,883	2016 UCL Press
6.	A study of the design of fluidized bed reactors for biomass gasification	1,878	1999 Chem Eng thesis
7.	Why are most buildings rectangular?	1,792	2006 Article
8.	Effective design, configuration, and use of digital CCTV	1,735	2009 Comp Sci thesis
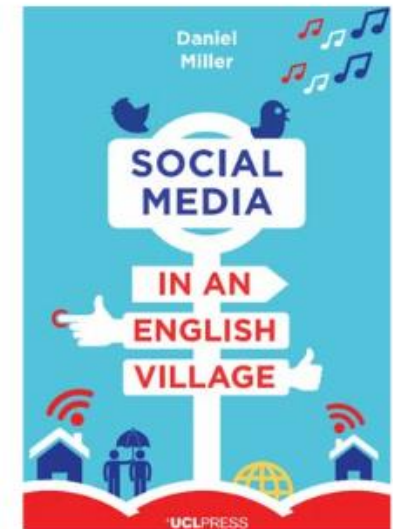
Contents
The pick of the bunch

❑ Research Data management

Council of the European Union

The transition towards an Open Science system
- Council conclusions (adopted on 27/05/2016)

http://data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf
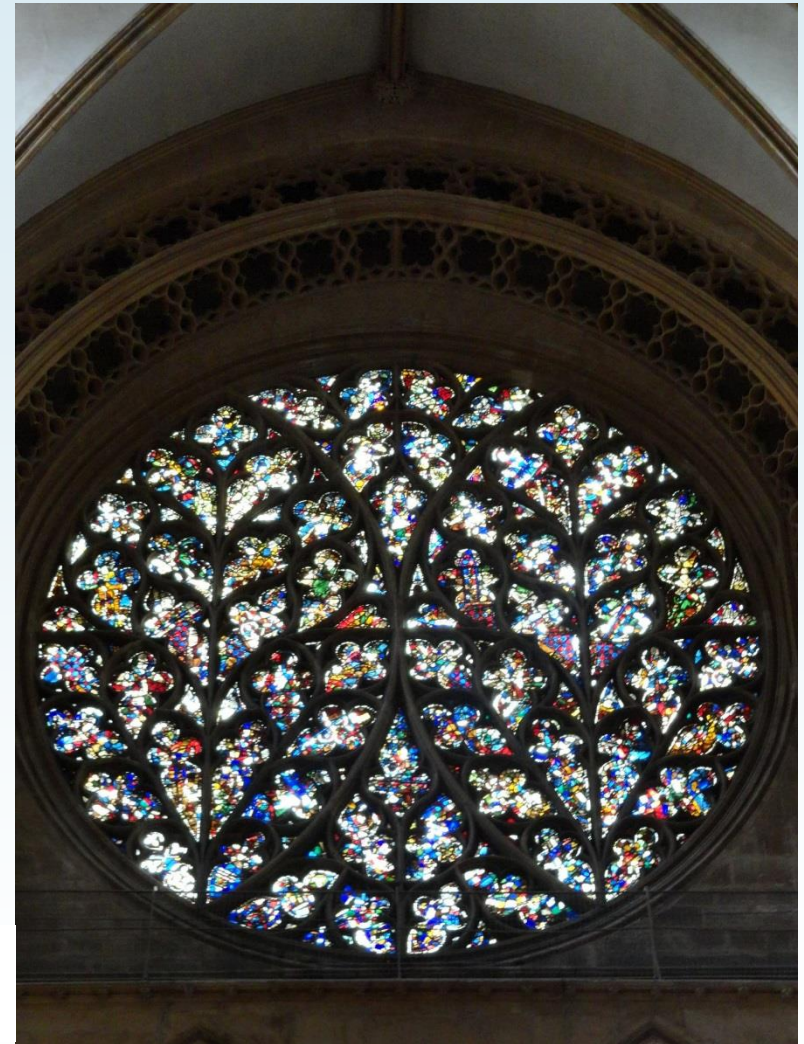
Lincoln Cathedral: The Bishop's Eye

Council's Statements on Research Data

(14) Encourages stakeholders to set optimal reuse of data as the starting point – 'as open as possible, as closed as necessary'

(15) Commission to promote data stewardship – including training activities and awareness raising; and calls for the implementation of Data Management Plans

(16) Data should be FAIR (Findable, Accessible, Inter-operable, Re-usable)

(17) Endorses the creation of a European Open Science Cloud

LERU Roadmap for Research Data

❑ Overseen by Research Data Working Group

Pablo Achard (University of Geneva)
Paul Ayris (UCL, University College London)
Serge Fdida (UPMC, Paris)
Stefan Gradmann (University of Leuven)
Wolfram Horstmann (University of Oxford)
Ignasi Labastida (University of Barcelona)
Liz Lyon (University of Bath)
Katrien Maes (LERU)
Susan Reilly (LIBER)
Anja Smit (University of Utrecht)
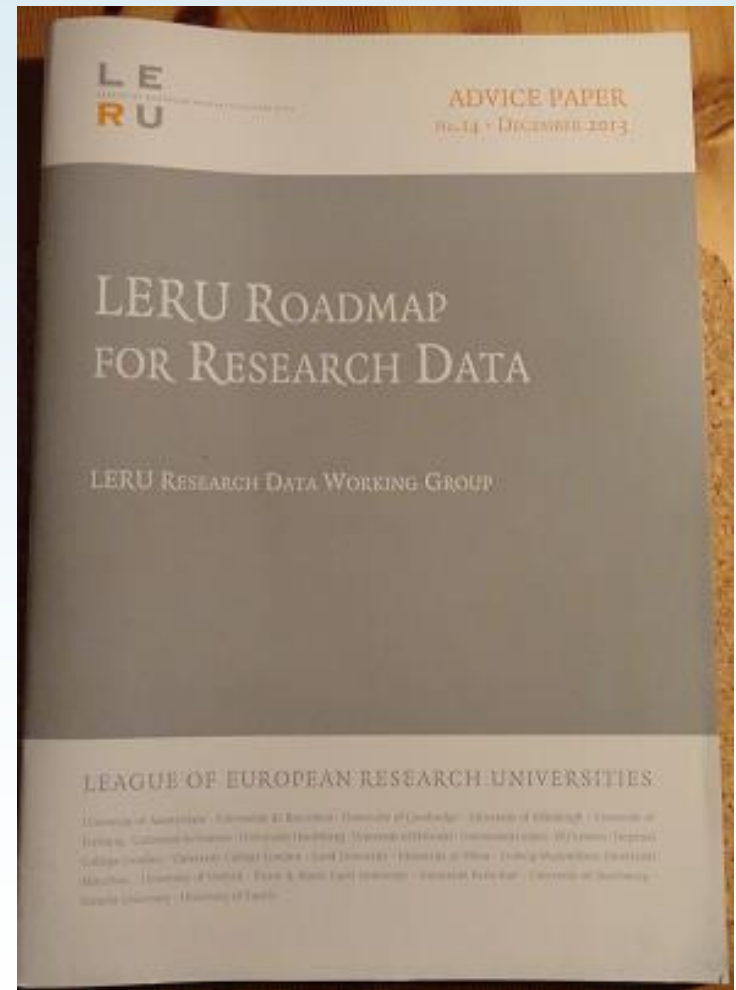
Policy and Leadership

- Identifies how policy development and leadership are undertaken

Advocacy

- Who undertakes advocacy and what is the message?

Selection, Collection, Curation, Description, Citation, Legal Issues

- Technical Issues around collection and curation

Research Data Infrastructure

- Where is it stored and by whom?

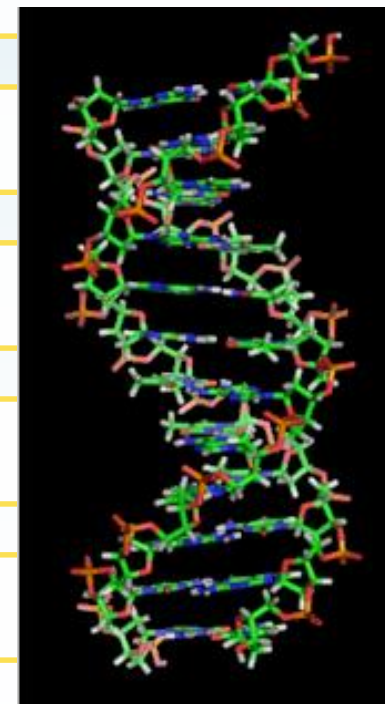## Costs

- How much does it cost?

Roles, Responsibilities, Skills

- What skills are required by which communities?

Recommendations to different stakeholder groups

- Who does what?

http://en.wikipedia.org/wiki/File:DNA_orbit_animated.gif

Key Messages

❑ Each LERU university needs a Research Data Management Strategy

❑ Researchers should have Research Data Management Plans

❑ LERU universities need to bring stakeholders together

❑ Benefits of 'open data' for sharing and re-use should be advocated and explored

A Box of Useful Knowledge
 (Brougham Papers, UCL Library Services)

Open Data

❑ Open Data allows research data to be shared and re-used
- ❑ Avoids costly duplication of research activity
- ❑ Provides greater transparency in research activity
- ❑ Potential to speed discovery of solutions to societal Grand Challenges, such as health care & environmental science
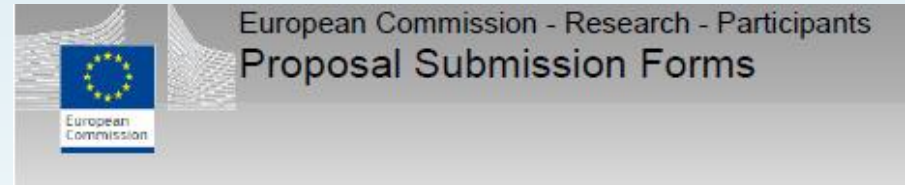
❑ Can all research data be open?

❑ Certain categories probably cannot
- ❑ National security
- ❑ Data protection
- ❑ Commercial Funder requirements

http://en.wikipedia.org/wiki/File:Open_Data_stickers.jpg

LEARN – LEaders Activating Research Networks

❑ Purpose is to develop the LERU Roadmap for Research Data to build a global co-ordinated global e-infrastructure

❑ Outputs

    ❑ Model Research Data Management policy

    ❑ Toolkit to support implementation

    ❑ Executive Briefing in five core languages so as to ensure wide outreach

European Commission - Research - Participants
Proposal Submission Forms

European Commission

Horizon 2020

Call: H2020-INFRASUPP-2014-2

Topic: INFRASUPP-7-2014

Type of action: CSA

Proposal number: 654139

Proposal acronym: LEARN

23

LEARN

- ❑ 5 partners
  - ❑ UCL (University College London) – lead partner
  - ❑ University of Barcelona
  - ❑ University of Vienna
  - ❑ LIBER
  - ❑ ECLAC – UN Commission for Latin America and the Caribbean
- ❑ Starts in June 2015; runs for 24 months
- ❑ €497,000 budget
  - ❑ 100% funded


Wilkins Building, UCL, 1826

LEARN Deliverables

❑ Model Research Data Management Policy

  ❑ Fed by a study of RDM policies and input from Workshop attenders

❑ Toolkit to support implementation

  ❑ Issues identified in Workshops and in literature

  ❑ Surveys and self assessment tools

❑ Executive Briefing (in several languages)

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25

European Open Science Cloud

❑ Working Group Report, at http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud

❑ Issues considered:

    ❑ Infrastructures

    ❑ Skills development

    ❑ Reward and Recognition

    ❑ Roles and responsibilities

    ❑ Governance & Standards

    ❑ Funding opportunities
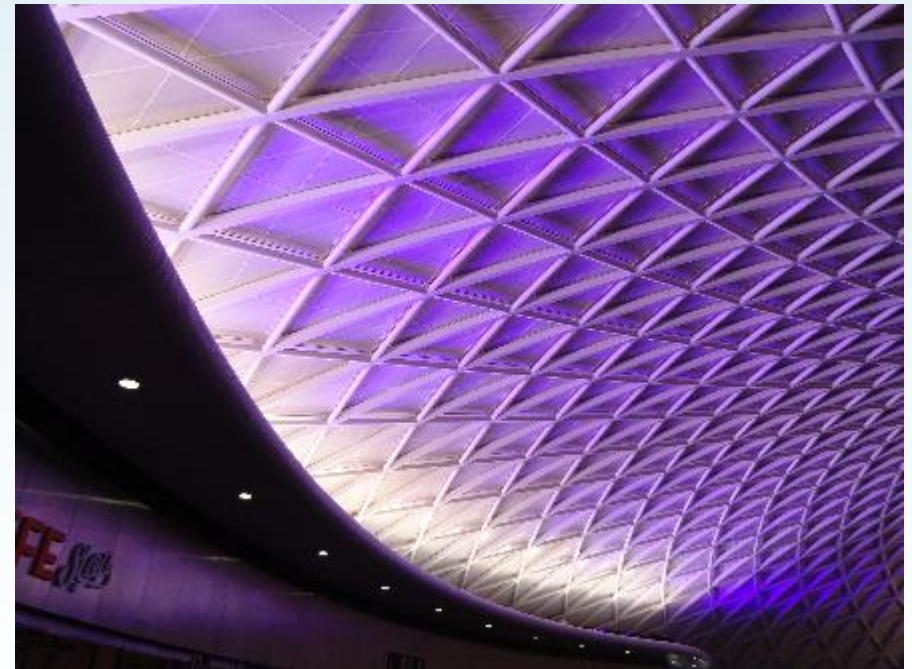
King's Cross Station, London

European Open Science Cloud will…

❑ Encourage Innovation

❑ Support transition to Open Science

❑ Enable re-use of resources and services across boundaries

❑ Be a Commons based on scientific data

❑ A federated environment for sharing and re-use

❑ Based on current provision

❑ Light touch governance

❑ Globally interoperable

❑ Include personal training and development
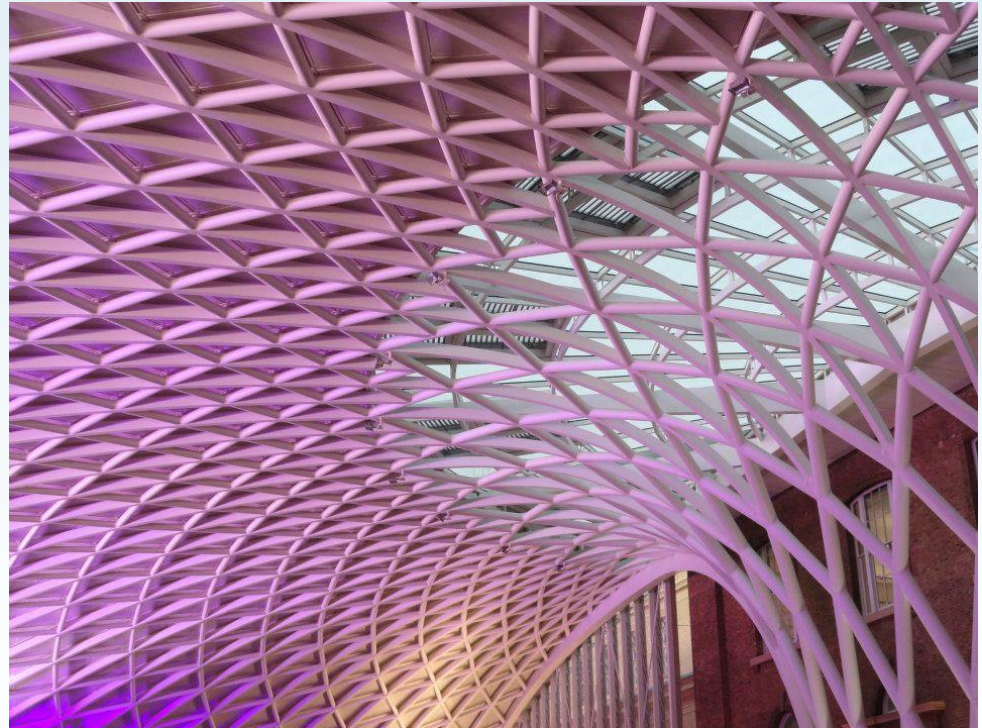
King's Cross Station, London

27

Contents
A time of plenty?

☐ Open Science rollout
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  ☐ Open Data
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Il Duomo, Milan: West Front

Conclusions

❑ RDM has many stakeholders

❑ Data-driven research changing the way research is undertaken

❑ LEARN will provide

    ❑ Model RDM policy

    ❑ Exemplar case studies

    ❑ Executive Briefings

❑ Need to embed change of research culture in universities

❑ Happy to hear questions