Title
Scholarship in the Networked World: Big Data, Little Data, noData

Author
Borgman, Christine L.

Publication Date
2013-06-06

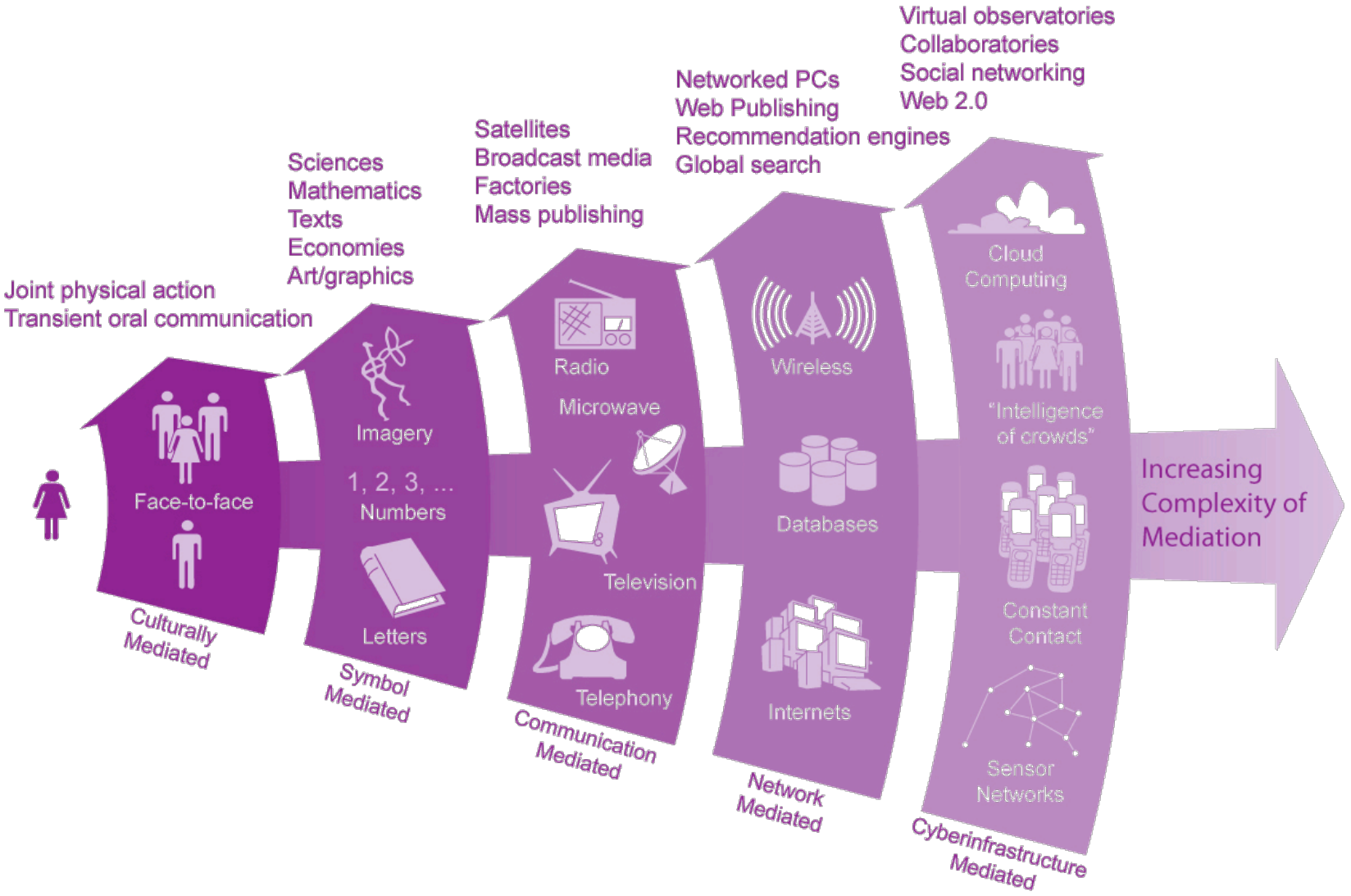
Scholarship in the Networked World: Big Data, Little Data, No Data

Christine L. Borgman
Oliver Smithies Visiting Fellow and Lecturer, Balliol College, Oxford
Visiting Fellow, Oxford Internet Institute
Visiting Fellow, Oxford eResearch Centre

Professor and Presidential Chair in Information Studies
University of California, Los Angeles

Oliver Smithies Lecture, Balliol College, Oxford, 6 June 2013

Technological advances in mediated communication



Borgman, C. L., Abelson, H., Dirks, L., Johnson, R., Koedinger, K. R., Linn, M. C., … Szalay, A. (2008). *Fostering Learning in the Networked World: The Cyberlearning Opportunity and Challenge.* National Science Foundation. http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08204

Image: Jillian Wallis and Roy Pea


12 September 2008 | $10
Science
AAAS

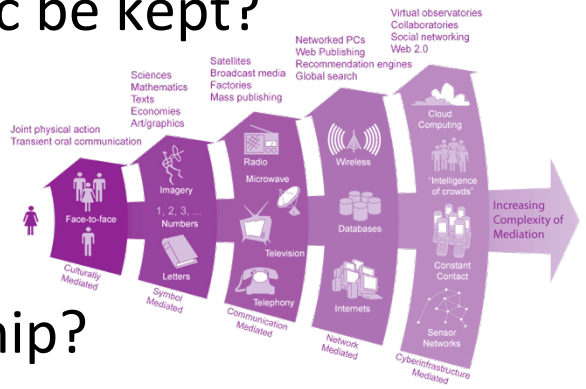

11 February 2011 | $10
Science
scientific
information
climate
science
research
new
analysis
visualization
researchers
access
many
human
challenges
brain
sharing
model
need
tools
health
community
example
knowledge
methods
data
AAAS

Data sharing imperatives

- Research Councils of the UK
  - Open access publishing requirements
  - Provisions for access to data
- Wellcome Trust
  - Open access publishing
  - Data sharing requirements
- National Science Foundation
  - Data sharing requirements
  - Data management plans
- U.S. Federal policy-2013
  - Open access to publications
  - Open access to data

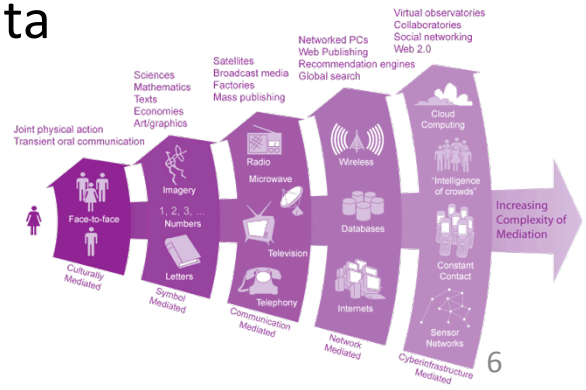
Scholarship in the Networked World: Problem statement

- Scholarship is conducted in the open
- What are the opportunities? the challenges?
- How to value scholarly records from tweets to theses?
- Which records are worthy of scholarly credit? of curation?
- How should publications, data, software, etc be kept?
  - By whom?
  - For how long?
  - For what uses?
- What shall be the record of digital scholarship?
- How do these concerns vary by academic field?



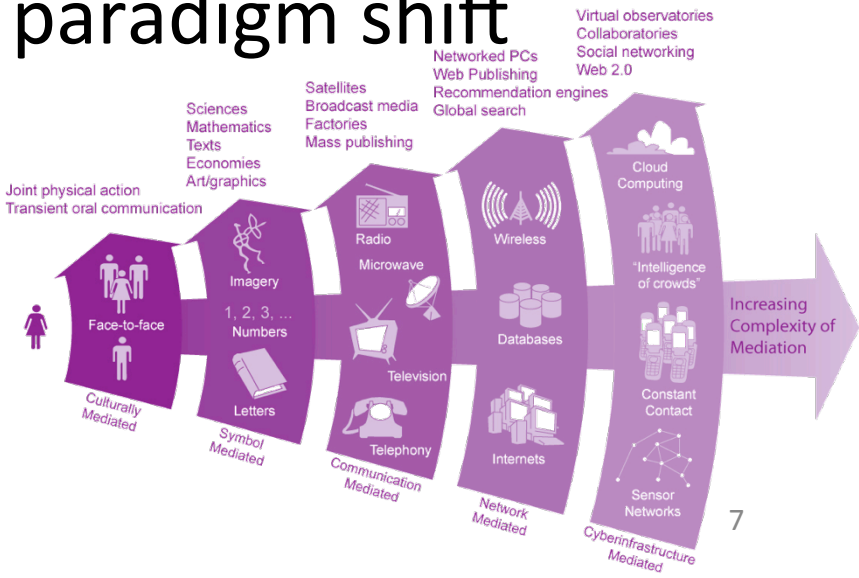
Big Data, Little Data, No Data: Scholarship in the Networked World

- Section I: Data and Scholarship
  - Ch 1: Big Scholarship, Little Scholarship
  - Ch 2: Data-Intensive Scholarship
  - Ch 3: What are Data?
- Section II: The Diversity of Data: Case Studies
  - Ch 4: Science: Astronomy, Sensor-networked science
  - Ch 5: Social Science: Surveys/Social Networks; Qualitative studies
  - Ch 6: Humanities: Digital collections; Buddhist studies
- Section III Data Policy and Practice
  - Ch 7: Sharing, Reusing, and Repurposing Data
  - Ch 8: Credit and Attribution
  - Ch 9: Scholarship and Policy
  - Ch 10: Into the Future

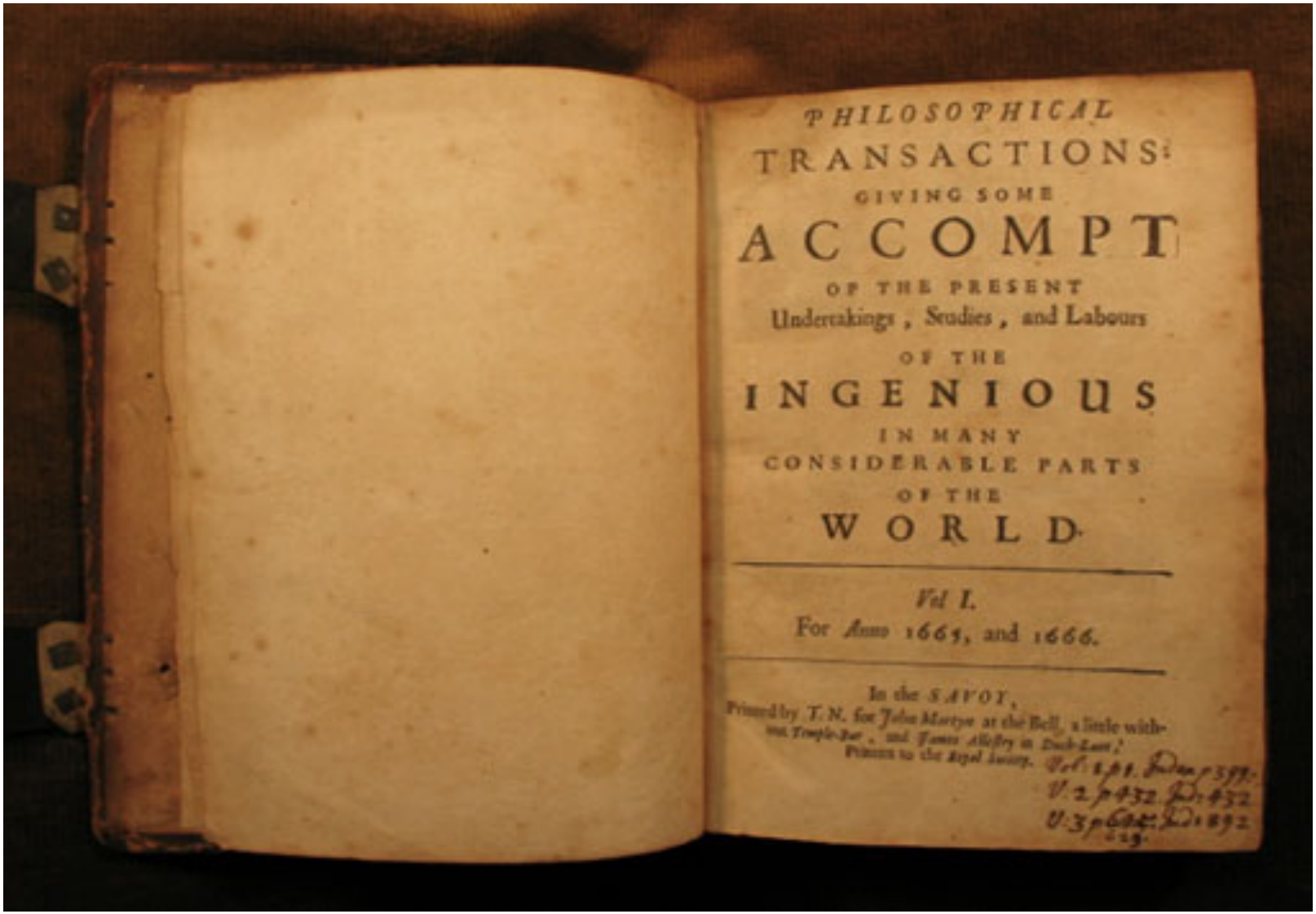


Theories and themes

1. Open scholarship is the norm
2. Formal and informal scholarly communication are converging
3. Data practices are local
4. Open access to data is a paradigm shift

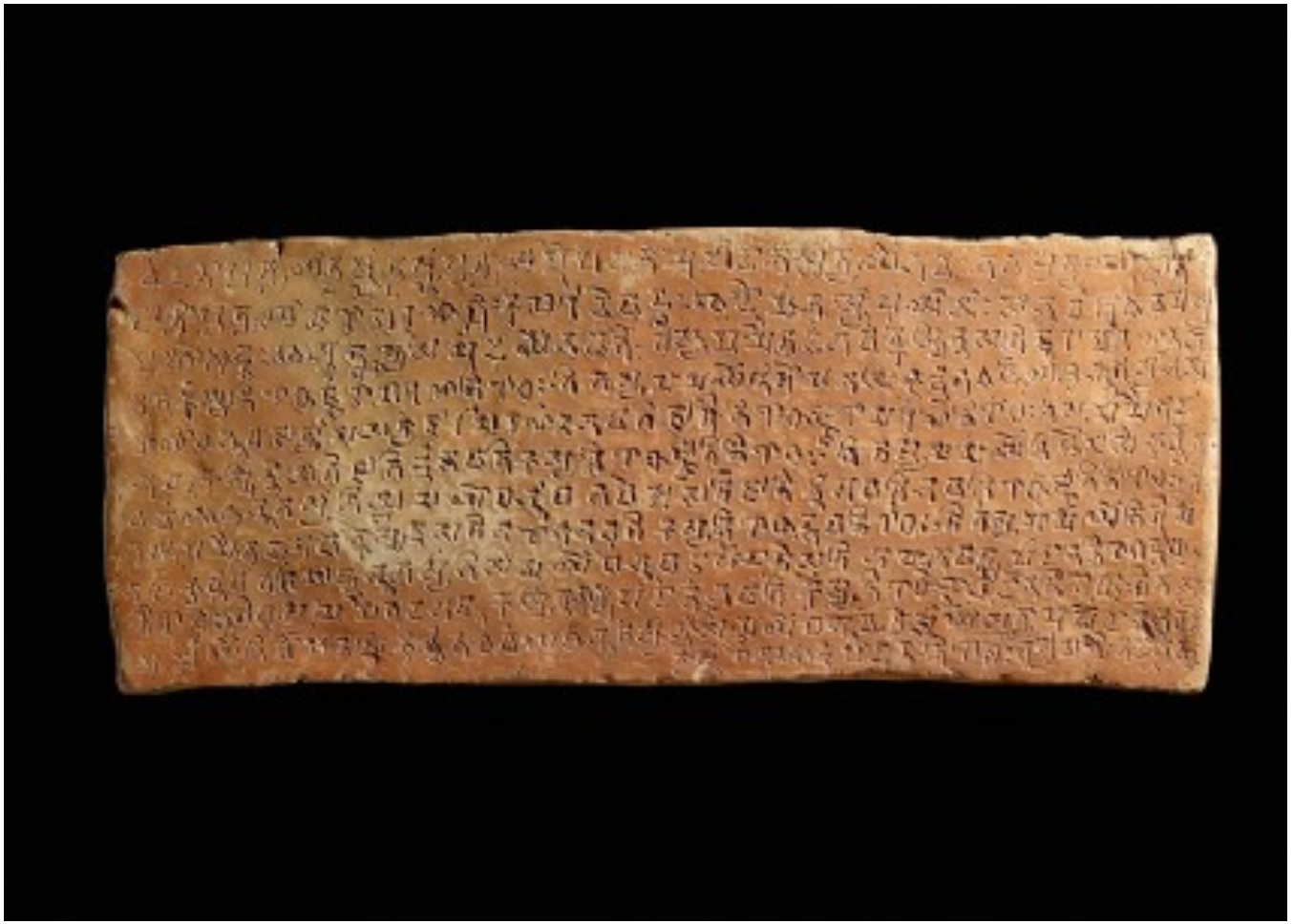


1. Open scholarship is the norm



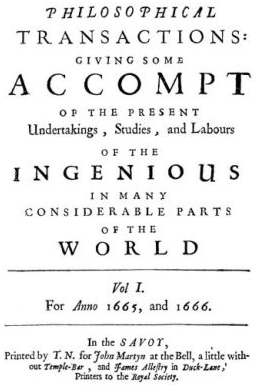
http://www.ansp.org/~/media/Images/ans/explore/online-exhibits/stories/philosophical-transactions-v1_510.ashx

1. Open scholarship is the norm



Brick inscribed with the Sutra on Dependent Origination *Gorakhpur district, late 5th century - early 6th century AD. Ashmolean Museum*

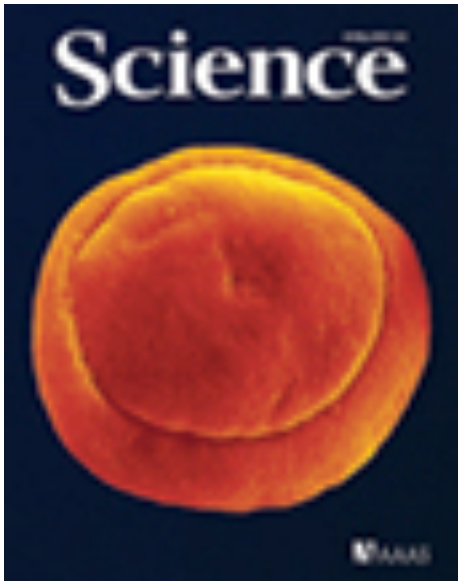
1. Open scholarship is the norm

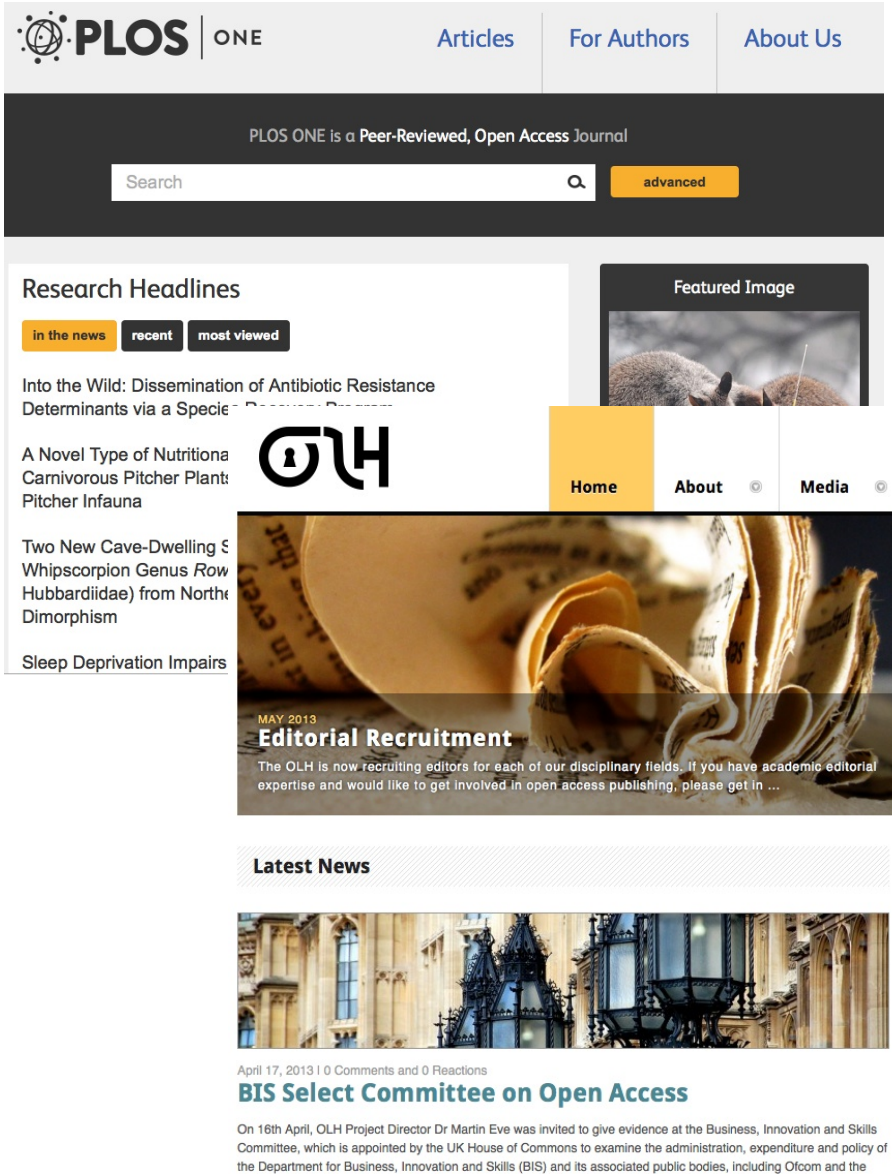


PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD

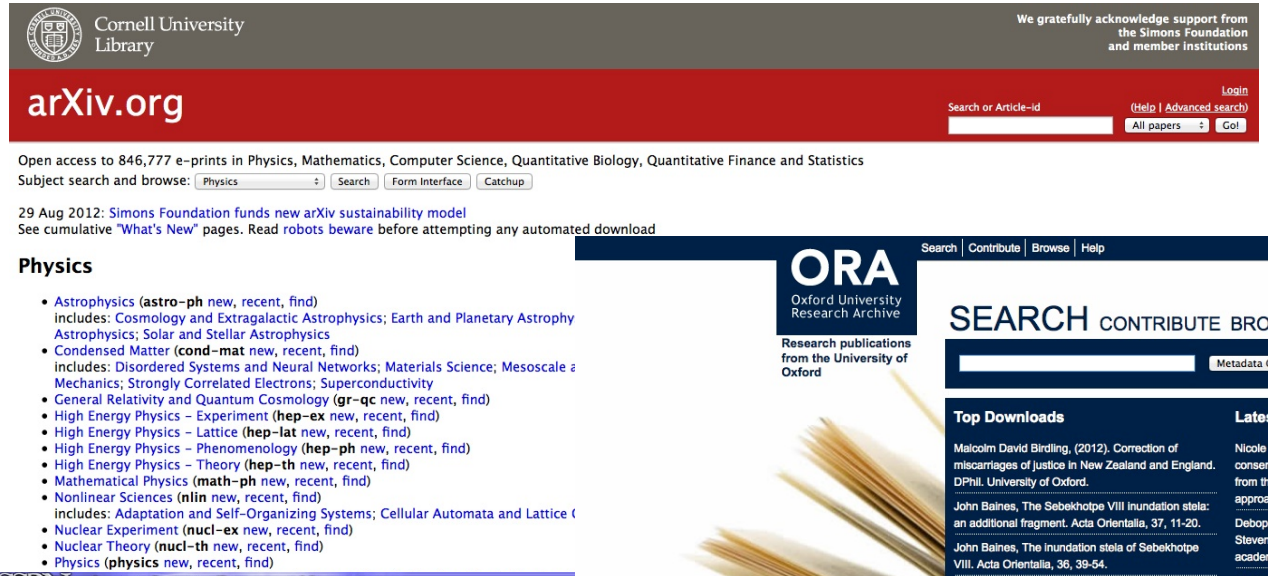
Vol I.
For Anno 1665, and 1666.

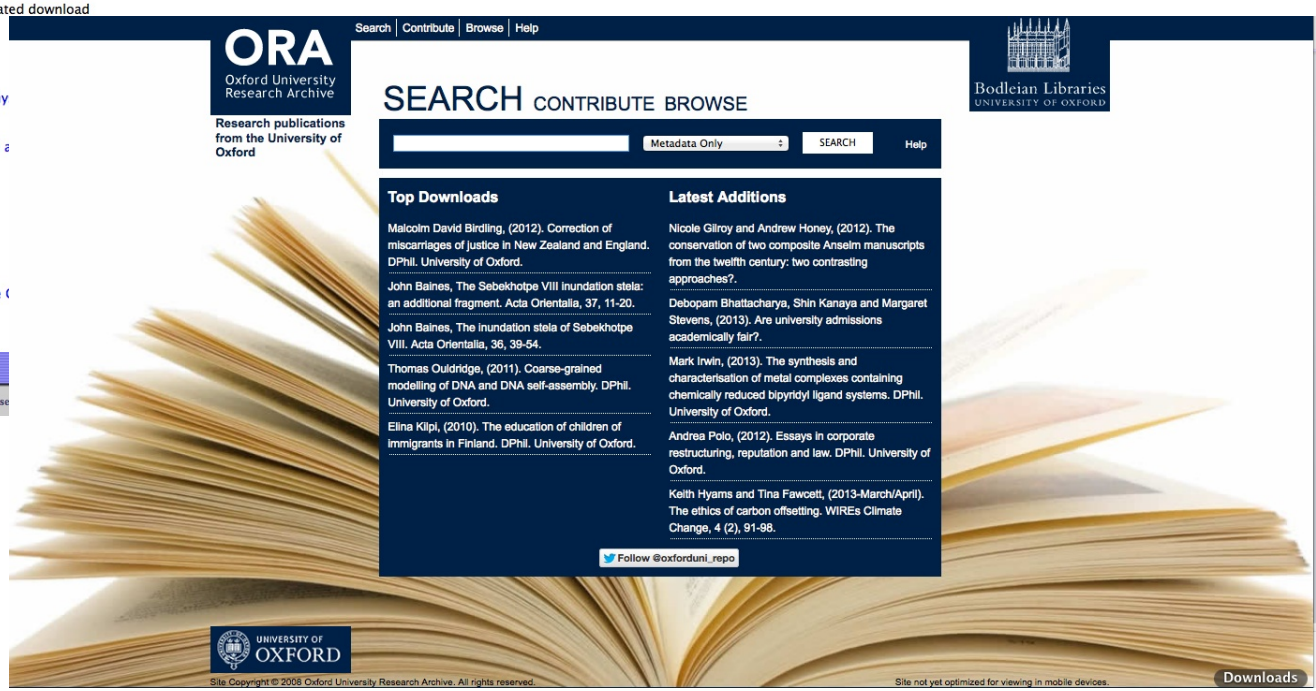
In the SAVOY,
Printed by T. N. for John Martyn at the Bell, a little without Temple-Bar, and James Allestry in Duck-Lane,
Printers to the Royal Society.





1. Open scholarship is the norm





Open scholarship is the norm

The Open Biological and Biomedical Ontologies

Ontologies | Resources | Participate | About

The OBO Foundry is a collaborative experiment involving developers of science-based ontologies who are establishing a set of principles for ontology development with the goal of creating a suite of orthogonal interoperable reference ontologies in the biomedical domain. The groups developing ontologies who have expressed an interest in this goal are listed below, followed by other relevant efforts in this domain.

In addition to a listing of OBO ontologies, this site also provides a statement of the OBO Foundry principles, discussion fora, technical infrastructure, and other services to facilitate ontology development. We welcome feedback and encourage participation.

Click any column header to sort the table by that column. The 🐾s link to the term request trackers for the listed ontologies.

OBO Foundry ontologies

Title	Domain	Prefix	File	Last changed
Biological process	biological process	GO	go.obo	
Cellular component	anatomy	GO	go.obo	
Chemical entities of biological interest	biochemistry	CHEBI	chebi.obo	
Molecular function	biological function	GO	go.obo	
Phenotypic quality	phenotype	PATO	quality.obo	
PRotein Ontology (PRO)	proteins	PR	pro.obo	
Xenopus anatomy and development	anatomy	XAO	xenopus_anatomy_edit.obo	
Zebrafish anatomy and development	anatomy	ZFA	zebrafish_anatomy.obo	2013/04/12

OBO Foundry candidate ontologies and other ontologies of interest

Title	Domain	Prefix	File	Last changed
Adverse Event Reporting Ontology	health	AERO	aero.owl	
Amphibian gross anatomy	anatomy	AAO	AAO_v2_edit.obo	
Amphibian taxonomy	anatomy	ATO	amphibian_taxonomy.obo	
Anatomical Entity Ontology	anatomy	AEO	aeo.obo	2012/06/01
Ascomycete phenotype ontology	phenotype	APO	ascomycete_phenotype.obo	2013/05/02
Basic Formal Ontology	upper	BFO	1.1	
Bilateria anatomy	anatomy	BILA	bilateria_mrca.obo	
Biological imaging methods	experiments	FBbi	image.obo	2011/05/24
BRENDA tissue / enzyme source	anatomy	BTO	BrendaTissueOBO	
C. elegans development	anatomy	WBls	worm_development.obo	
C. elegans gross anatomy	anatomy	WBbt	WBbt.obo	

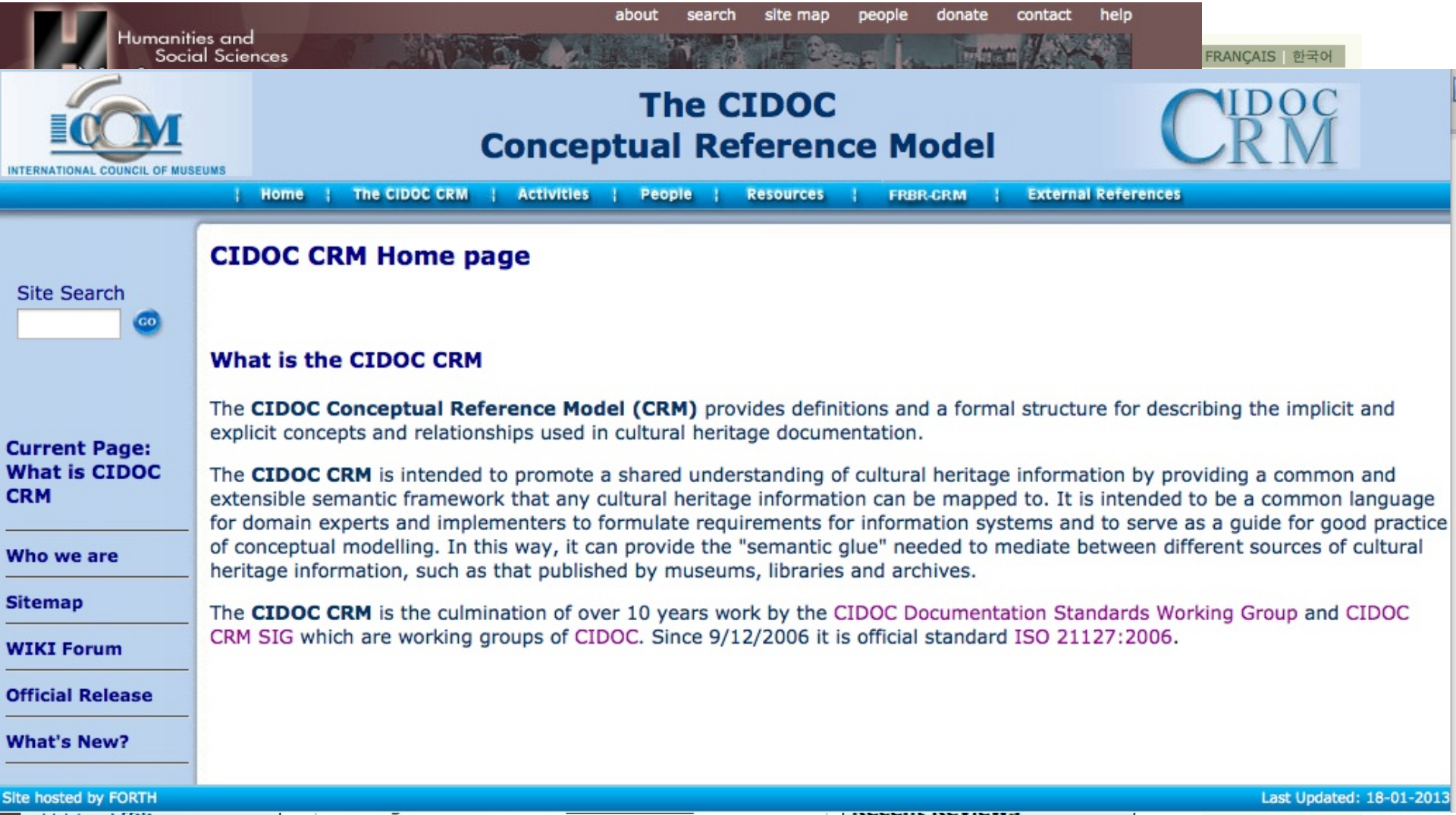
Quick Links

- Mappings between ontologies
- Download alternate formats
- About the OBO Foundry
- Current events
- How to join
- OBO Foundry paper in *Nature Biote*
  November 2007

Other Ontology Lists

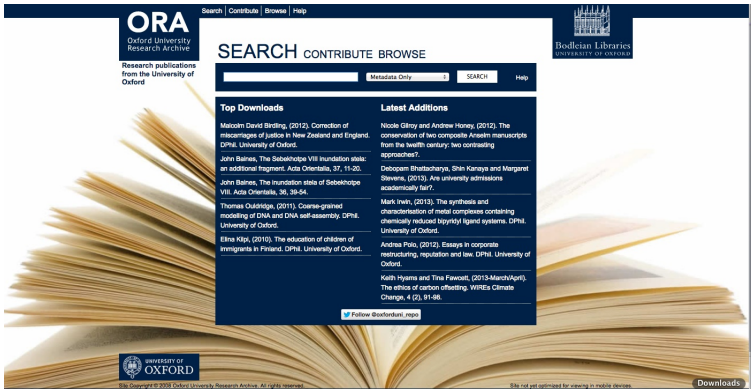
- BioPortal (NCBO's ontology repo
- Ontology Lookup Service (OLS)
  term lookup)

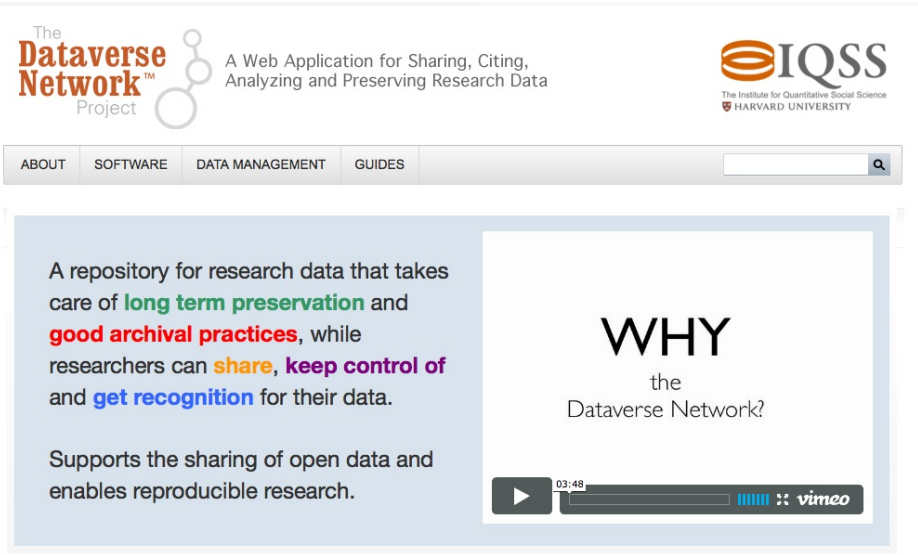
1. Open scholarship is the norm

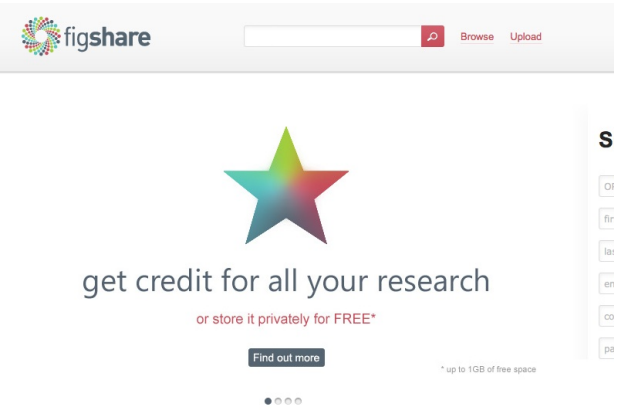


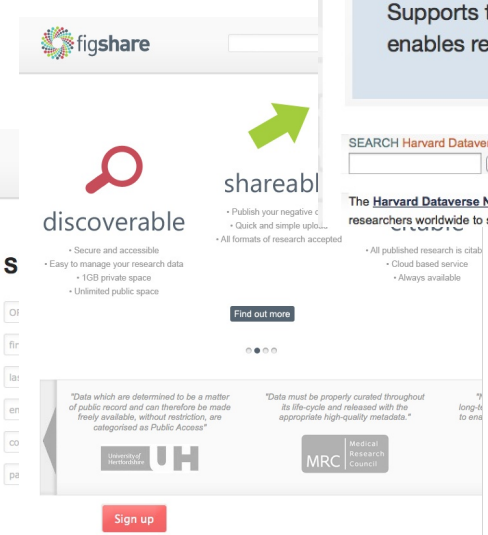
Disseminate data, figures, slides, images…

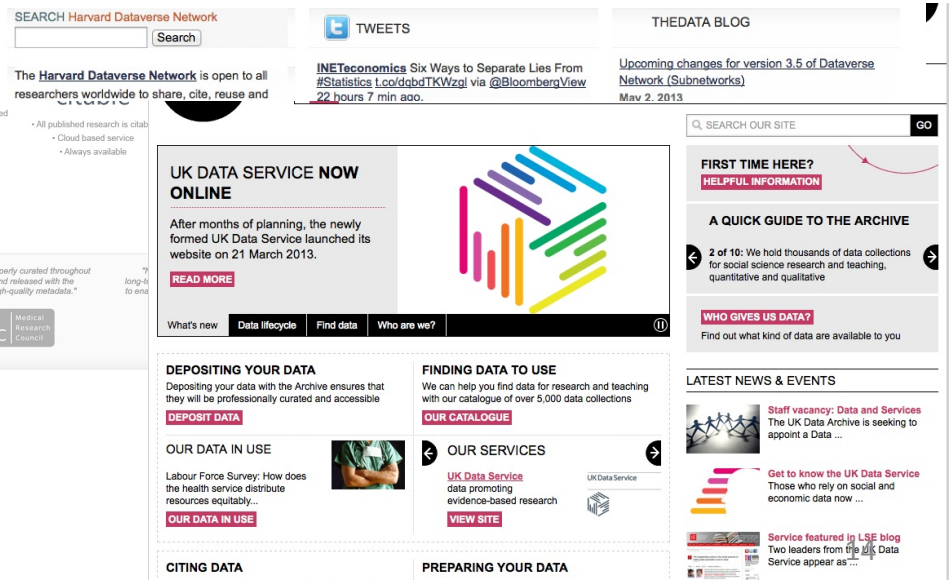
1. Open scholarship is the norm



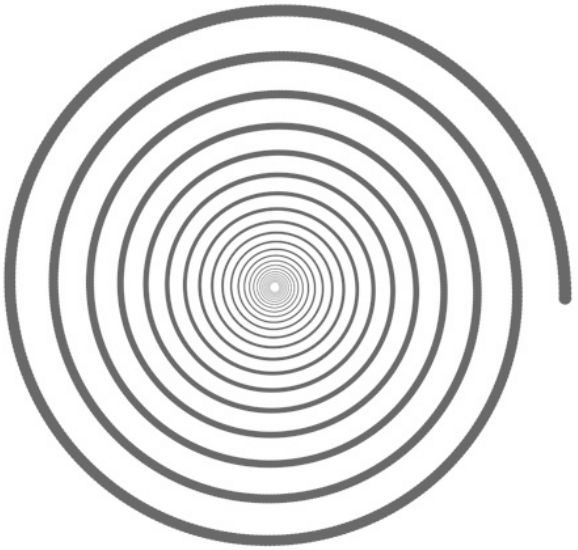






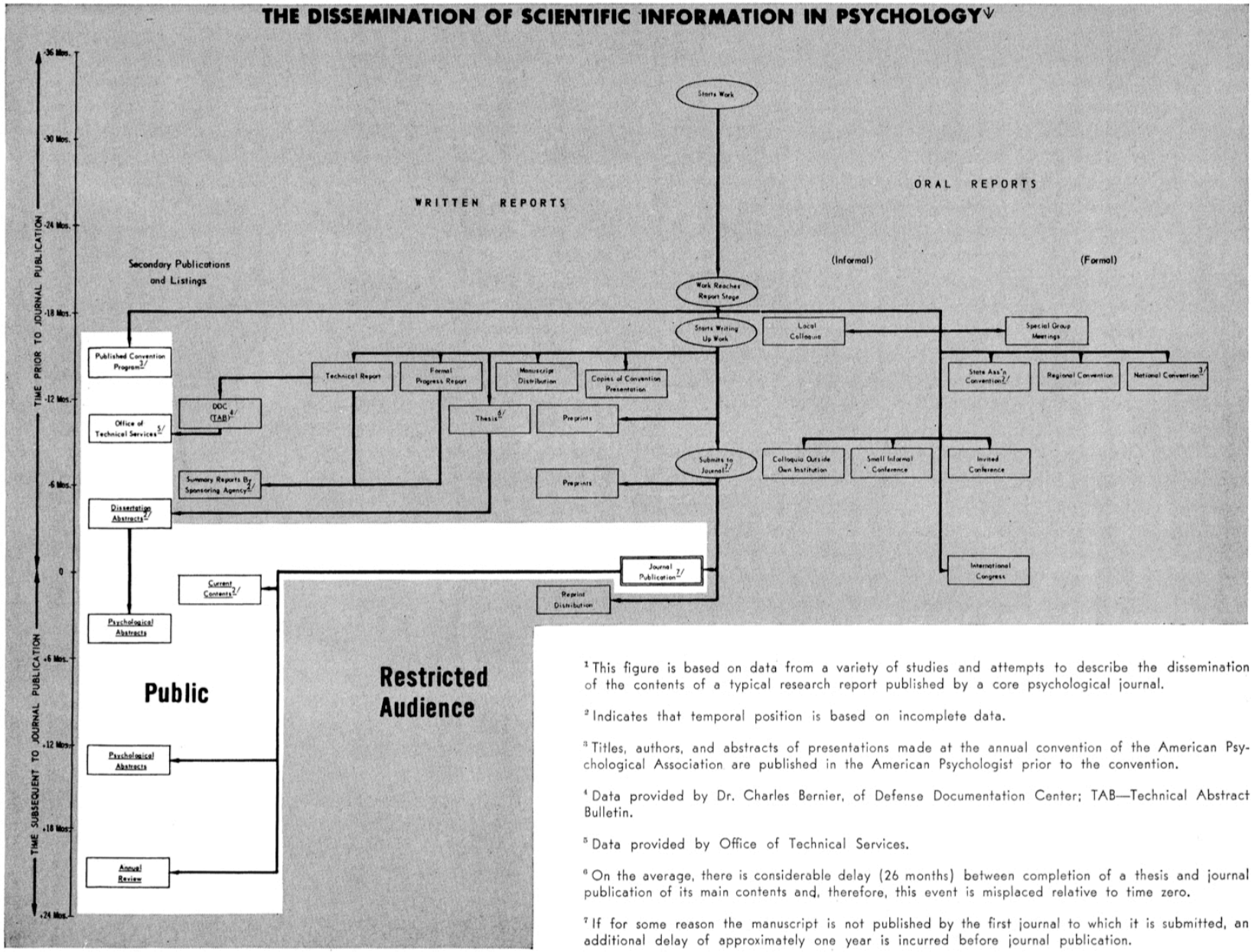


Release data, software, and methods



- Begets rigour
- Prevents fraud
- Speeds the pace of research
- Begets free riders
- Risks misuse and and misinterpretation
- Violates the confidentiality of human subjects
- Raises conflicts between policies of universities, funders, publishers, and research partners
- I don’t do data

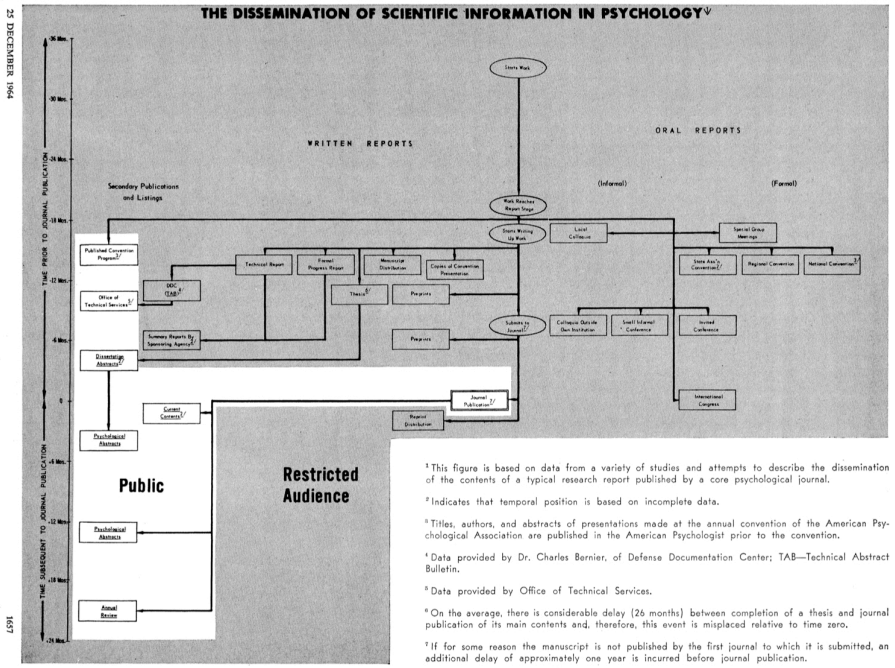
2. Formal and informal scholarly communication are converging



Garvey, W. D., & Griffith, B. C. (1964). Scientific information exchange in psychology. *Science*, *146*, 1655–1659. Figure redrawn by Jillian C. Wallis for Borgman, C. L. (2007). *Scholarship in the Digital Age: Information, Infrastructure, and the Internet*. Cambridge, MA: MIT Press.

Credit for formal scholarly communication

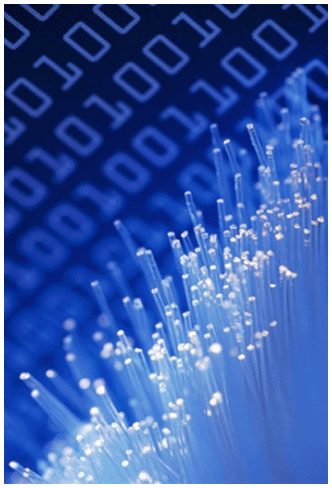
- Quality of content
- Citations to article
- Citations to journal
- Reviews of books
- Derived metrics
  - Impact factors
  - H-index



Garvey, W. D., & Griffith, B. C. (1964). Scientific information exchange in psychology. *Science*, *146*, 1655–1659. Figure redrawn by Jillian C. Wallis for Borgman, C. L. (2007). *Scholarship in the Digital Age: Information, Infrastructure, and the Internet*. Cambridge, MA: MIT Press.

2. Formal and informal scholarly communication are converging

```
<!-- Dismount 6.02-->
<Border Grid.Row="16" Grid.Column="22">
    <UniformGrid Rows="1" Columns="2">
        <Button Grid.Column="0" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_tucked]}" />
        <Button Grid.Column="1" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_tucked_180]}" />
    </UniformGrid>
</Border>
<Border Grid.Row="16" Grid.Column="23">
    <UniformGrid Rows="1" Columns="3">
        <Button Grid.Column="0" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_tucked_360]}" />
        <Button Grid.Column="1" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_stretched]}" />
        <Button Grid.Column="2" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_stretched_180]}" />
    </UniformGrid>
</Border>
<Border Grid.Row="16" Grid.Column="24">
    <UniformGrid Rows="1" Columns="2">
        <Button Grid.Column="0" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_piked_360]}" />
        <Button Grid.Column="1" DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_piked_540]}" />
    </UniformGrid>
</Border>
<Border Grid.Row="16" Grid.Column="25">
    <Button DataContext="{Binding Path=.ApparatusSymbolItems[dmt_salto_fw_stretched_720]}" />
</Border>
<Border Grid.Row="16" Grid.Column="26" />
<Border Grid.Row="16" Grid.Column="27">
    <Button DataContext="{Binding Path=.ApparatusSymbolItems[dmt_2_salto_fw_tucked]}" />
</Border>
<Border Grid.Row="16" Grid.Column="28" />
```



http://datalib.ed.ac.uk/GRAPHICS/blue_data.gif

http://3.bp.blogspot.com/-bJ29MM_7Nuk/UBzpOz2JXPI/AAAAAAAAAfA/vDpCD2dW0iE/s1600/GS_Code_Example.png

Pepe, A., Mayernik, M. S., Borgman, C. L. & Van de Sompel, H. (2010). From Artifacts to Aggregations: Modeling Scientific Life Cycles on the Semantic Web. Journal of the American Society for Information Science and Technology, 61(3): 567–582.

http://www.itadvicex.com/wp-content/uploads/2013/05/blogs-5.jpg

2 y

NYU PRESS

BOOKS | PARTNERS | NEWS | for AUTHORS | CONTACT

Search by Title, Aut

media comm
open scholarship i

Search | Register | Log in

TIVITY

Planned Ol

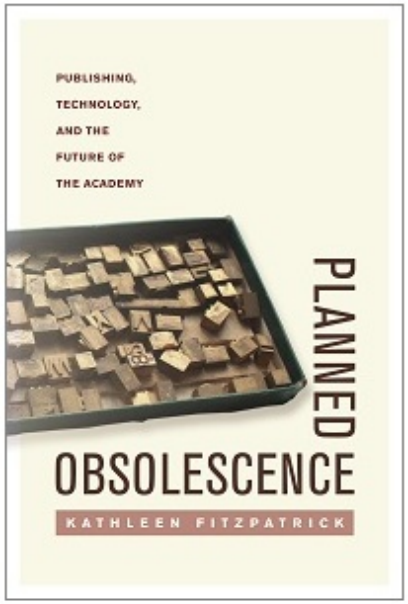
¶1 *Note: Planned Ob*
paperback and Ki
Barnes & Noble.

¶2 *"It's not the nine*
changed with a

¶3 There's a delicious
physical object — t
yet a book, though
change the world,
reside.

¶4 And it's attemptin
that this text argue
insisting that peer
and more effective
what it preaches, a

¶5 I'll be relying on th
all goes according
sending the manu



Search Inside the Book
powered by Google

Planned Obsolescence

Publishing, Technology, and the Future of the Academy

Kathleen Fitzpatrick

256 pages
16 illustrations
November, 2011
ISBN: 9780814727874

Introduction
Table of Contents

$79.00 Cloth
also available in **Paper, eBook**
click here for **exam copies**

BUY

SHARE

DESCRIPTION | AUTHOR | REVIEWS | AUDIO/VIDEO

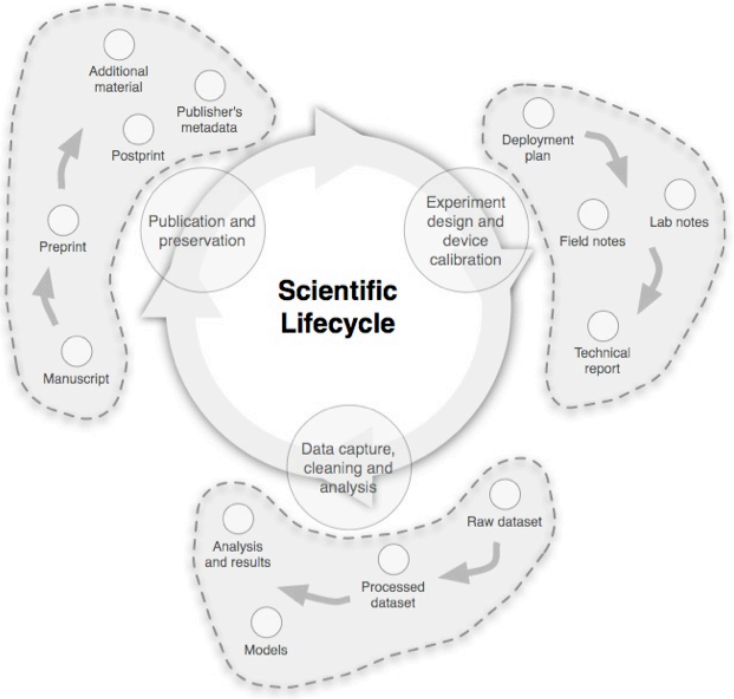
Subjects: Media Studies, Science & Technology, Cultural Studies

Choice's Outstanding Academic Title list for 2013

Academic institutions are facing a crisis in scholarly publishing at multiple levels: presses are stressed as

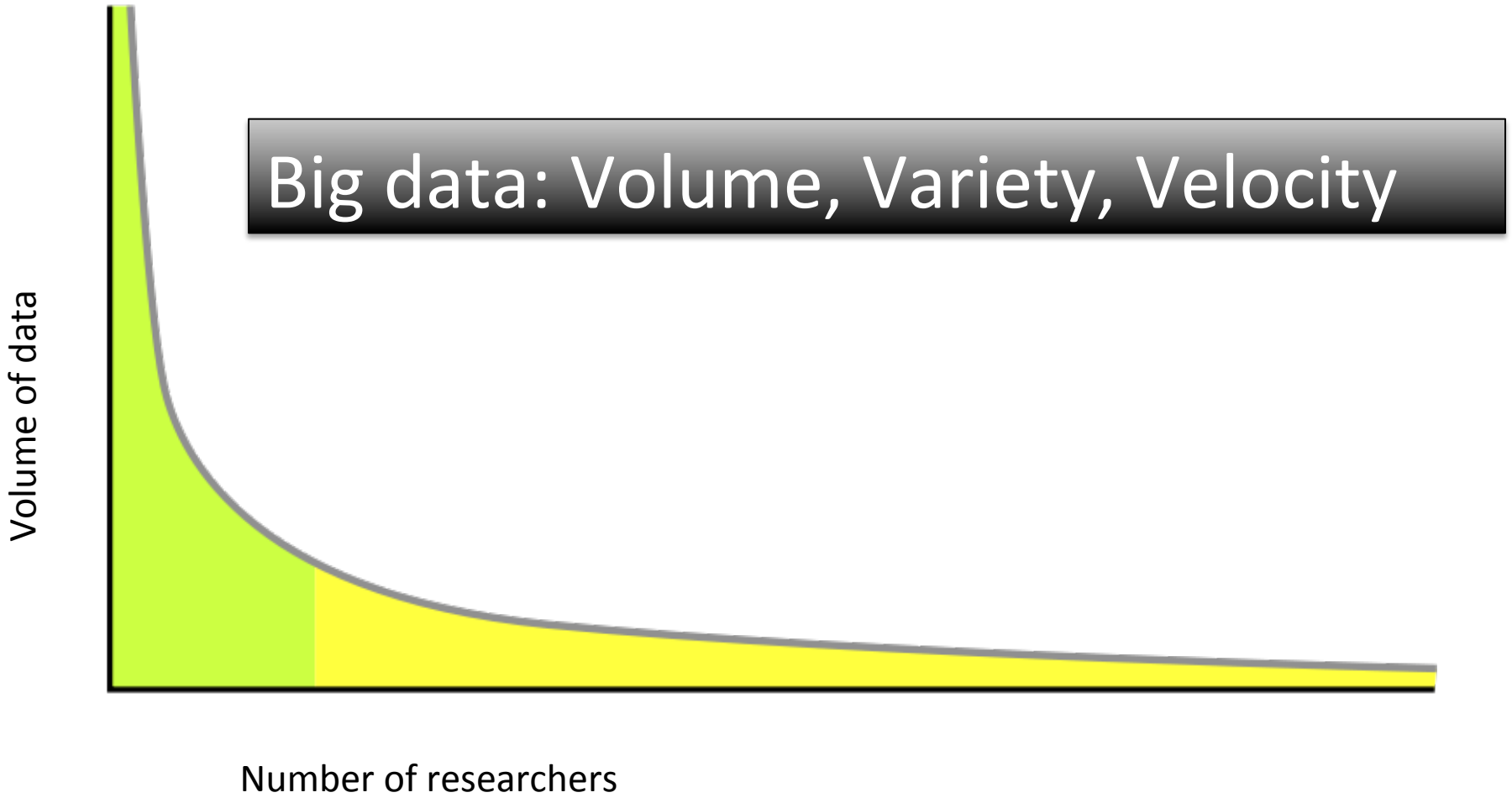
Credit for informal scholarly communication

- Altmetrics
  - Downloads of articles, preprints, books…
  - Tweets and retweets about person, pubs, etc.
  - Grants received
  - Blog posts
  - Citations to data
  - Citations to software
  - Experimental designs
  - Talks
  - Slides
  - Figures
  - Tables
  - ….



Pepe, A., Mayernik, M. S., Borgman, C. L. & Van de Sompel, H. (2010). From Artifacts to Aggregations: Modeling Scientific Life Cycles on the Semantic Web. Journal of the American Society for Information Science and Technology, 61(3): 567–582.

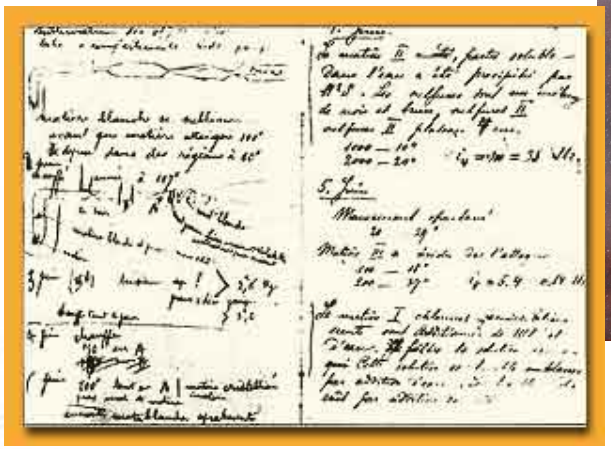
3. Data practices are local



Slide: The Institute for Empowering Long Tail Research

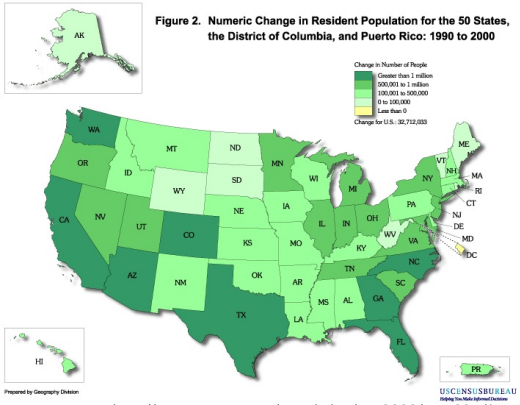
3. Data practices are local

hudsonalpha.org

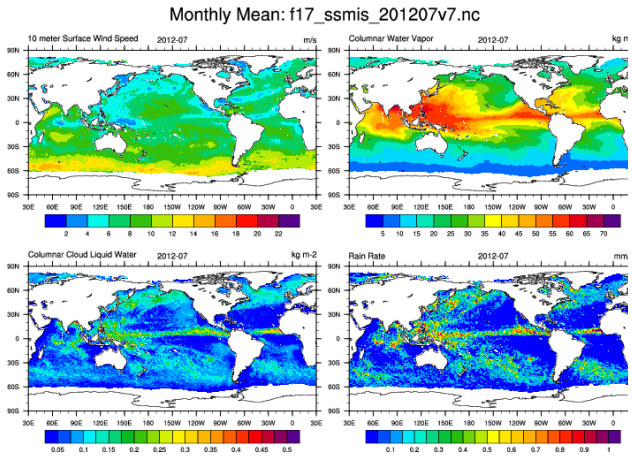


Marie Curie's notebook aip.org

NASA Astronomy Picture of the Day



http://www.census.gov/population/cen2000/map02.gif



ncl.ucar.edu

Date:1/2.07.75 Place:Sakaltutan
Zafor
He will grow old in his present house; new house is for sons - 5 sons. Not sure they want to live in village. He will only build another if they want him to. eS came from Germany and did the plastering. He arranged the carpentry in Kayseri. Çok para gitti. {much money went} Has a tractor.

Date:July1980 Place:Sakaltutan
Zafor:
Household now Zafor and wife; Nazif Unal and wife and youngest son, still a boy. They run two dolmuß; one with a driver from Süleymanli. Goes in and out once a day. He gets 8,000 a month. Zafor then said, keskin de©il. { not sharp - i.e.? not profitable} I said he did very well on 8,000 TL with only two journeys a day. Nazif Unal has "bought" a Durak {dolmuß stop} from Belediye and works all day in Kayseri.

http://onlineqda.hud.ac.uk/Intro_QDA/Examples_of_Qualitative_Data.php

3. Data practices are local

Industrial methods

Artisanal methods

3. Data practices are local

LETTERS

A role for self-gravity at multiple length scales in the process of star formation

Alyssa A. Goodman[1,2], Erik W. Rosolowsky[2,3], Michelle A. Borkin[1]†, Jonathan B. Foster[2], Michael Halle[1,4], Jens Kauffmann[1,2] & Jaime E. Pineda[2]

Self-gravity plays a decisive role in the final stages of star formation, where dense cores (size ~0.1 parsecs) inside molecular clouds collapse to form star-plus-disk systems[1]. But self-gravity's role at earlier times (and on larger length scales, such as ~1 parsec) is unclear; some molecular cloud simulations that do not include self-gravity suggest that 'turbulent fragmentation' alone is sufficient to create a mass distribution of dense cores that resembles, and sets, the stellar initial mass function[2]. Here we report a 'dendrogram' (hierarchical tree-diagram) analysis that reveals that self-gravity plays a significant role over the full range of possible scales traced by ^{13}CO observations in the L1448 molecular cloud, but not everywhere in the observed region. In particular, more than 90 per cent of the compact 'pre-stellar cores' traced by peaks of dust emission' are projected on the sky within one of the dendrogram's self-gravitating 'leaves'. As these peaks mark the locations of already-forming stars, or of those probably about to form, a self-gravitating cocoon seems a critical condition for their existence. Turbulent fragmentation simulations without self-gravity—even of unmagnetized isothermal material—can yield mass and velocity power spectra very similar to what is observed in clouds like L1448. But a dendrogram of such a simulation[4] shows that nearly all the gas in it (much more than in the observations) appears to be self-gravitating. A potentially significant role for gravity in 'non-self-gravitating' simulations suggests inconsistency in simulation assumptions and output, and that it is necessary to include self-gravity in any realistic simulation of the star-formation process on subparsec scales.

Spectral-line mapping shows whole molecular clouds (typically tens to hundreds of parsecs across, and surrounded by atomic gas) to be marginally self-gravitating[3]. When attempts are made to further break down clouds into pieces using 'segmentation' routines, some self-gravitating structures are always found on whatever scale is sampled[5–7]. But no observational study to date has successfully used one spectral-line data cube to study how the role of self-gravity varies as a function of scale and conditions, within an individual region.

Most past structure identification in molecular clouds has been explicitly non-hierarchical, which makes difficult the quantification of physical conditions on multiple scales using a single data set. Consider, for example, the often-used algorithm CLUMPFIND[7]. In three-dimensional (3D) spectral-line data cubes, CLUMPFIND operates as a watershed segmentation algorithm, identifying local maxima in the position–position–velocity (p–p–v) cube and assigning nearby emission to each local maximum. Figure 1 gives a two-dimensional (2D) view of L1448, our sample star-forming region, and Fig. 2 includes a CLUMPFIND decomposition of it based on ^{13}CO observations. As with any algorithm that does not offer hierchically nested or overlapping features as an option, significant emission found between prominent clumps is typically either appended to the nearest clump or turned into a small, usually 'pathological', feature needed to encompass all the emission being modelled. When applied to molecular-line

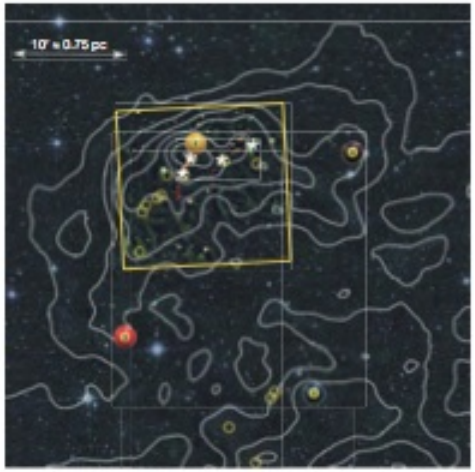


Figure 1 | Near-infrared image of the L1448 star-forming region with contours of molecular emission overlaid. The channels of the colour image correspond to the near-infrared bands J (blue), H (green) and K (red), and the contours of integrated intensity are from ^{13}CO(1–0) emission[8]. Integrated intensity is monotonically, but not quite linearly (see Supplementary Information), related to column density[14], and it gives a view of 'all' of the molecular gas along lines of sight, regardless of distance or velocity. The region within the yellow box immediately surrounding the protostars has been imaged more deeply in the near-infrared (using Calar Alto) than the remainder of the box (2MASS data only), revealing protostars as well as the scattered starlight known as 'Cloudshine'[11] and outflows (which appear orange in this colour scheme). The four billiard-ball labels indicate regions containing self-gravitating dense gas, as identified by the dendrogram analysis, and the leaves they identify are best shown in Fig. 2a. Asterisks show the locations of the four most prominent embedded young stars or compact stellar systems in the region (see Supplementary Table 1), and yellow circles show the millimetre-dust emission peaks identified as star-forming or 'pre-stellar' cores[1].

[1]Initiative in Innovative Computing at Harvard, Cambridge, Massachusetts 02138, USA. [2]Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts 02138, USA. [3]Department of Physics, University of British Columbia, Okanagan, Kelowna, British Columbia V1V 1V7, Canada. [4]Surgical Planning Laboratory and Department of Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts 02115, USA. †Present address: School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts 02138, USA.

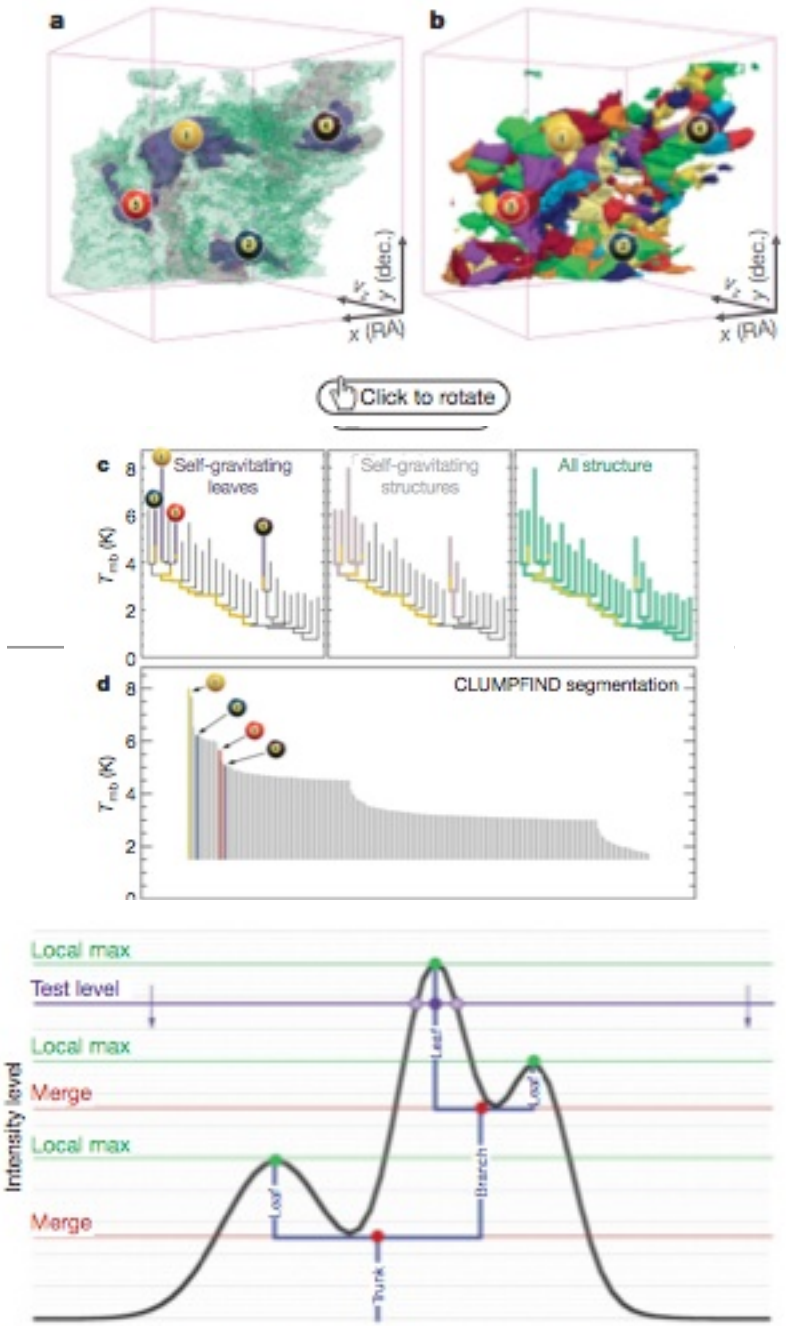
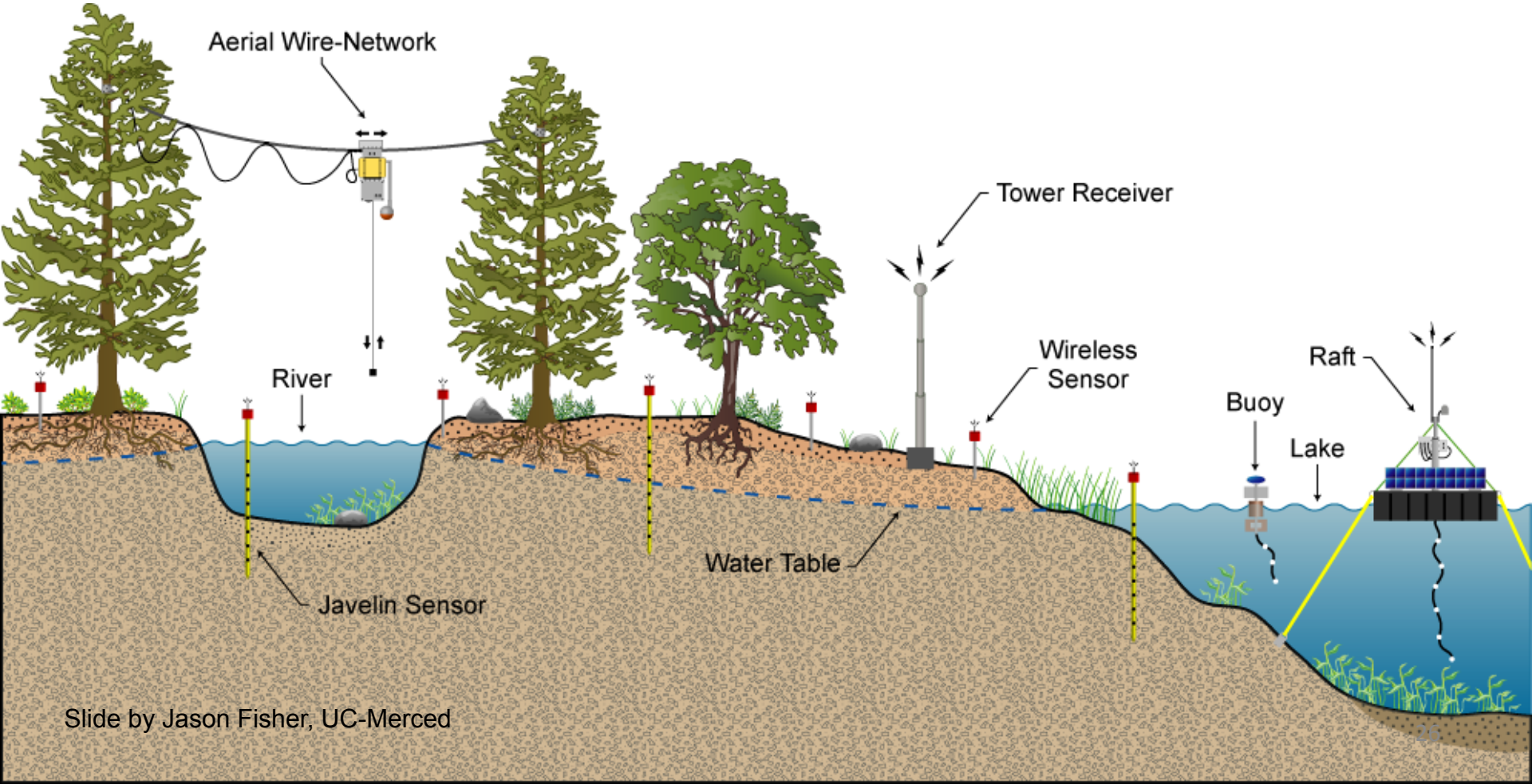


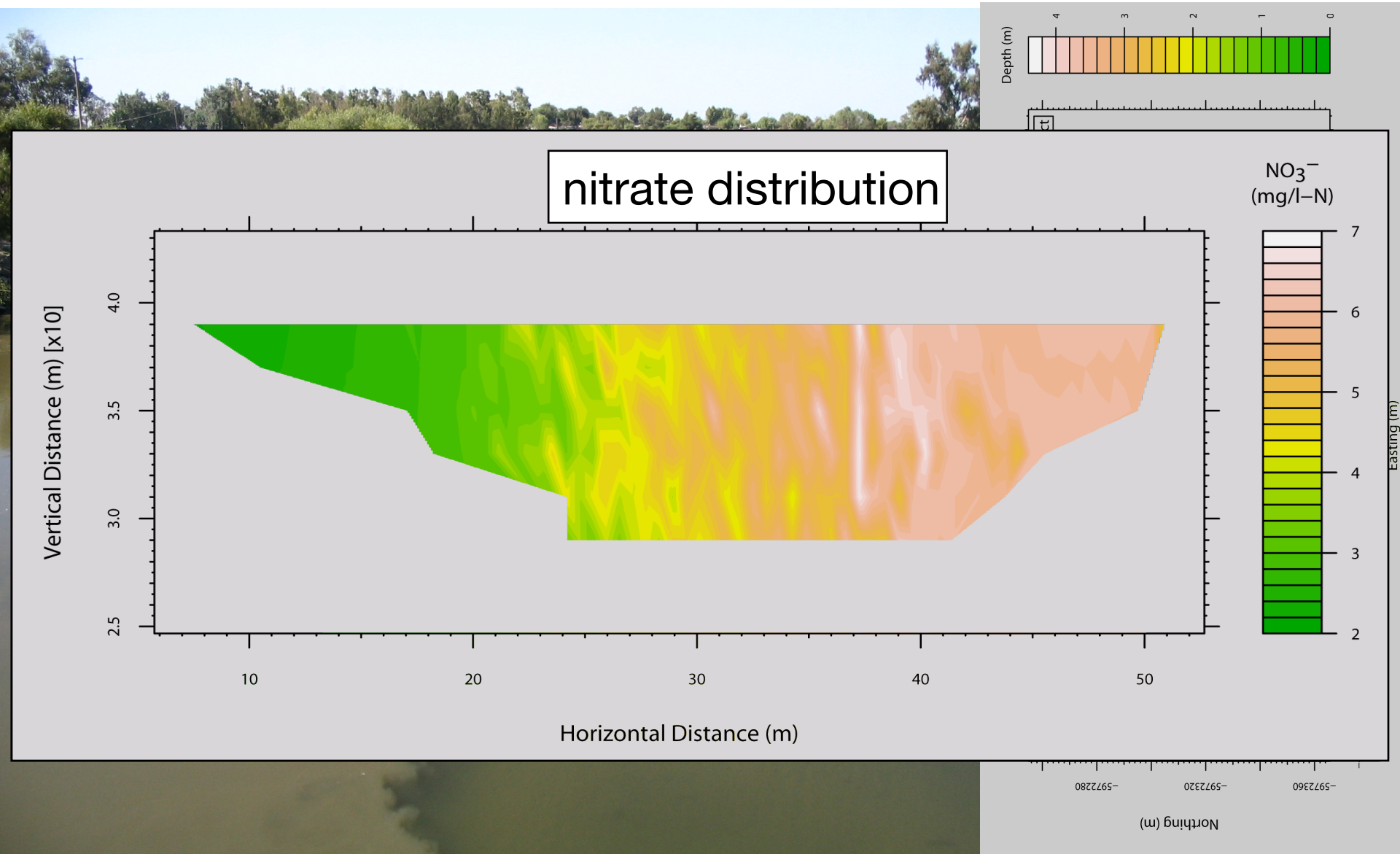
Figure 3 | Schematic illustration of the dendrogram process. Shown is the

3. Data practices are local



Slide by Jason Fisher, UC-Merced

3. Data practices are local



3. Data practices are local

56. Generally speaking, do you usua ... Independent, or what?

RESPONSE	PUN					COL: 240
			1994	1996	1998	ALL
Strong Democrat		27	423	400	370	6,046
Not very strong Democrat		21	644	577	597	8,756
Independent, close to Democrat		10	341	356	349	4,581
Independent (Neither, No response)		15	369	457	477	4,882
Independent, close to Republican		8	282	258	244	3,379
Not very strong Republican		19	519	500	484	6,265
Strong Republican		10	321	307	239	3,479
Other party, refused to say		7	44	43	63	530
Don't know		0	0	0	0	10
No answer		9	49	6	9	188

See Appendix D: Recodes, for origi ... Appendix N for changes across surveys. If planning to perfor ... GSS Methodological Report No. 56.

http://dss.princeton.edu/images/gss.gif

karmāntājīvā virahitākuśalakāyavāṅmanas-karmāntājīvāś[109] ca bhavanti sma

§ 1.66 (147c 28-148a 1) 一切衆生得平等心，展轉相瞻如父、如母、如兄、如弟、如姊、如妹，各各同心，等無偏邪，皆行慈心。

PG 4r 4-5 (Ś 18, 22-19, 1; PD 10, 1-2; PSL *kā* a 4-5): sarvasatvāś ca sarvasatveṣu samacittā abhūvan* yad uta[110] mātāpitṛbhrātṛbhaginīsamacittāḥ mitrajñātisahāyasamacittāḥ[111]

§ 1.67 (148a 1-2) 一切群萌悉修十善，清淨梵行，無有塵埃。

PD 10, 2-3 (PG 4r 5-6; Ś 19, 2-3; PSL *kā* a 5): daśakuśalakarmapathasevinaś ca bhavanti sma[112] / brahmacāriṇaḥ śucayo nirāmayagandhāḥ[113]

§ 1.68 (148a 2-4) 一切黎庶悉獲安隱，所得安隱猶如比丘得第三禪。于時衆生而致智慧，而悉具足善快調定，離於卑劣，逮得和雅。

PG 4r 6-8 (PD 10, 3-8; PSL *kā* a 5-6; Ś 19, 3-8): sarvasatvās tasmin samaye sarvasukhasamarpitā abhūvan* evaṃrūpeṇa sukhena samanvāgatās[114] tadyathā {s} tṛtīyadhyānasamāpannasya bhikṣoḥ sukhaṃ sarvasatvāś ca tasmin samaye evaṃrūpayā prajñayā samanvāgatā abhūvan* yad evaṃ jānaṃti sma[115] • sādhu dānaṃ sādhu damaḥ sādhu saṃyyamaḥ[116] sādhu satyaṃ • sādhv apramādaḥ sādhu maitrī sādhu karuṇā sādhv avihiṃsā prāṇibhūteṣu[117] •

[110] sarvasattvāś ... yad uta: not in PD & PSL.

[111] PG wrongly repeats verbatim this latter compound. PD 10, 2 and PSL have at this point a longer reading: mitrāmātyajñātisālohitasamacittā. Note that Ś has all the words construed as one compound.

[112] PG 4r 5-6 & Ś 19, 2: daśakuśalakarmapa(tha)samanvāgatā [Ś without daśa-] abhūvan.

[113] PG 4r 6, Ś 19, 3 and PSL *kā* a 5: nirāmagandhāḥ, which seems to be the correct reading; after this word, PG & Ś + sarvākuśalavitarkavigatāḥ.

[114] PD 10, 4 & PSL *kā* a 5: idṛśaṃ sukhaṃ pratilabhante sma.

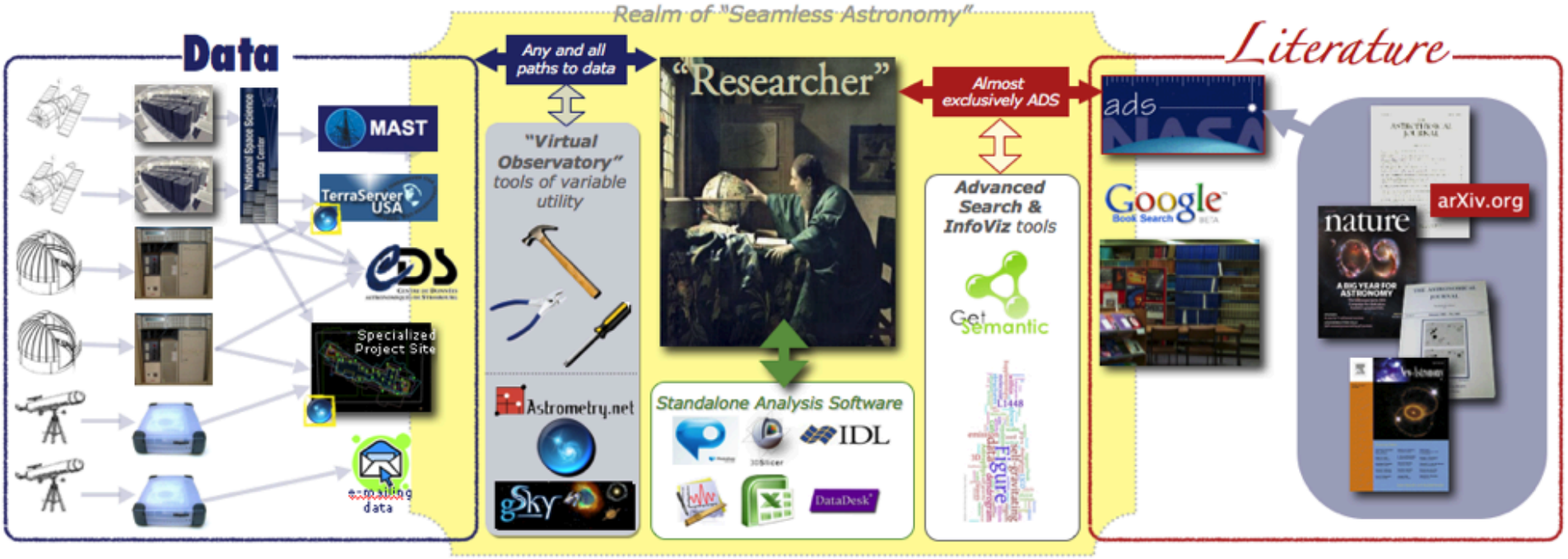
[115] yad ... sma: PD 10, 6 & PSL *kā* a 6: yad anyabuddhakṣetrasthā buddhā bhagavanta evam [PSL + udānam] udānayanti sma.

[116] Ś 19, 7: saṃyamaḥ.

[117] sādhu dānaṃ ... prāṇibhūteṣu: PD 10, 7-8 & PSL *kā* a 6: sādhu damaḥ [PSL + sādhu śamaḥ] sādhu saṃyamaḥ sādhu cīrṇo brahmacaryyāvāsaḥ sādhu prāṇibhūteṣv avihiṃseti.

Zacchetti, S. (2005). In Praise of the Light: A Critical Synoptic Edition with an Annotated Translation of Chapters 1-3 of Dharmaraksa's Guang zan jing, Being the Earliest Chinese Translation of the Larger Prajnaparamita. Tokyo, Japan: The International Research Institute for Advanced Buddhology, Soka University. Retrieved from http://iriab.soka.ac.jp/orc/Publications/BPPB/index_BPPB.html

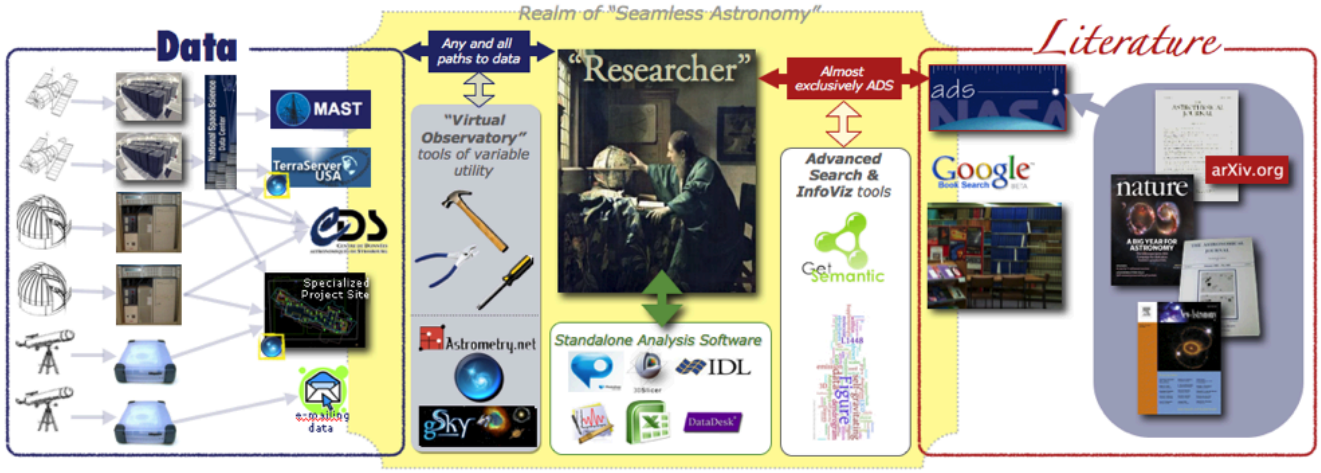
4. Open access to data is a paradigm shift



Slide: Alyssa Goodman, Harvard

4. Open access to data is a paradigm shift

- Goal of research project
  - Publication
  - Data reusable by others



Slide: Alyssa Goodman, Harvard

4. Open access to data is a paradigm shift

Industrial methods

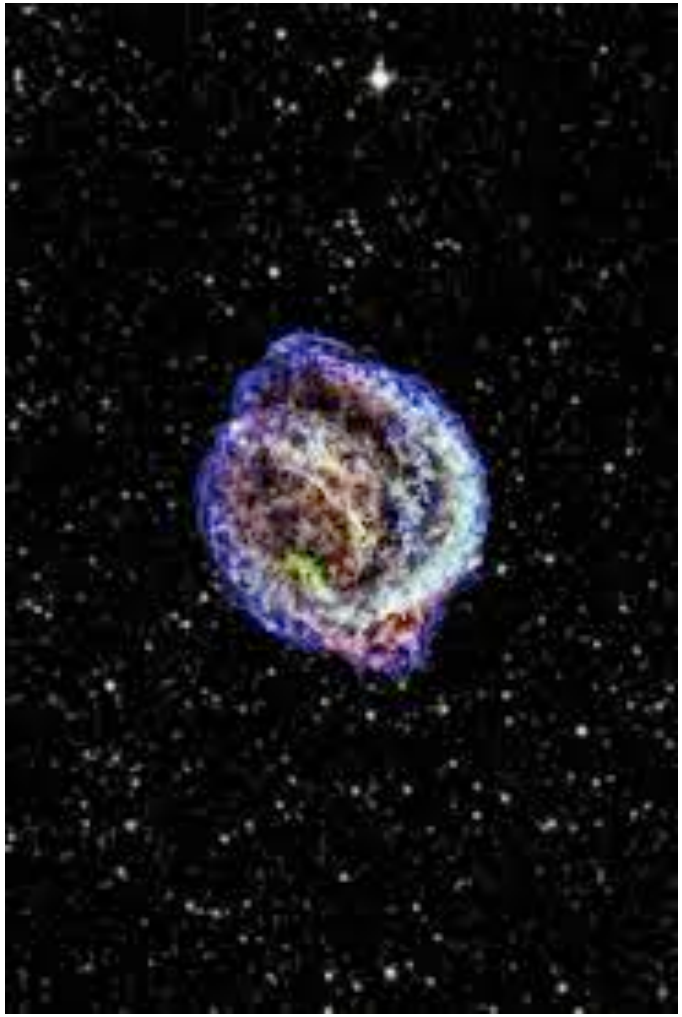
Artisanal methods

Replication

Interpretation

4. Open access to data is a paradigm shift

- Reuse by investigator
- Reuse by collaborators
- Reuse by colleagues
- Reuse by unaffiliated others
- Reuse at later times
  - Months
  - Years
  - Decades
  - Centuries



http://chandra.harvard.edu/photo/2013/kepler/kepler_525.jpg

Simple Rules for the Care and Feeding of Scientific Data*

1. Good science requires good data
2. Make your science inspectable by others
3. Conduct your science with provenance in mind
4. Do not reduce your data more than necessary
5. Make your data available
6. Make your workflows available
7. Publish all software, even small scripts
8. Foster a “data community” for your community
9. Describe how you want to be acknowledged
10. Attribute the sources of data that you use

*DRAFT: Radcliffe Seminar on Data Provenance, 9-10 May 2013, A. Goodman & X-L Meng

4. Open access to data is a paradigm shift

ahds arts and humanities data service

Select a subject area: Go

- Search Collections
- Creating Resources
- Depositing Resources
- News and Events
- About the AHDS
- Projects
- Search Site

Printer friendly version
Text version

AHDS Executive Address:
26 - 29 Drury Lane
3rd Floor
King's College London
LONDON, WC2B 5RL
Tel: 020 7848 1988
Fax: 020 7848 1989
Email the AHDS

Enabling Digital Resources for the Arts and Humanities

Latest News

From April 2008 the Arts and Humanities Data Service (AHDS) will no longer be funded to provide a national service. However, the JISC have very kindly provided funding for a further year to keep the website available, to maintain and update the AHDS cross-search catalogue, and for the Centres to continue to deliver AHDS collections. The catalogue will allow users to search across the collections of the AHDS partners, including new collections added after 31st March. To use the cross-search catalogue please use the link on the left hand side.

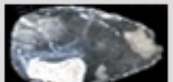
Despite the loss of central funding, the host institutions of the AHDS are committed to working separately and together to retain the expertise and skills of the staff of the AHDS, and to provide a revised set of services for the arts and humanities research community. For further details about the services on offer please click on the links on the right:

- Centre for e-Research at King's College London
- Archaeology Data Service
- Oxford Text Archive
- History Data Service
- Performing Arts Data Service
- Visual Arts Data Service

AHDS website content

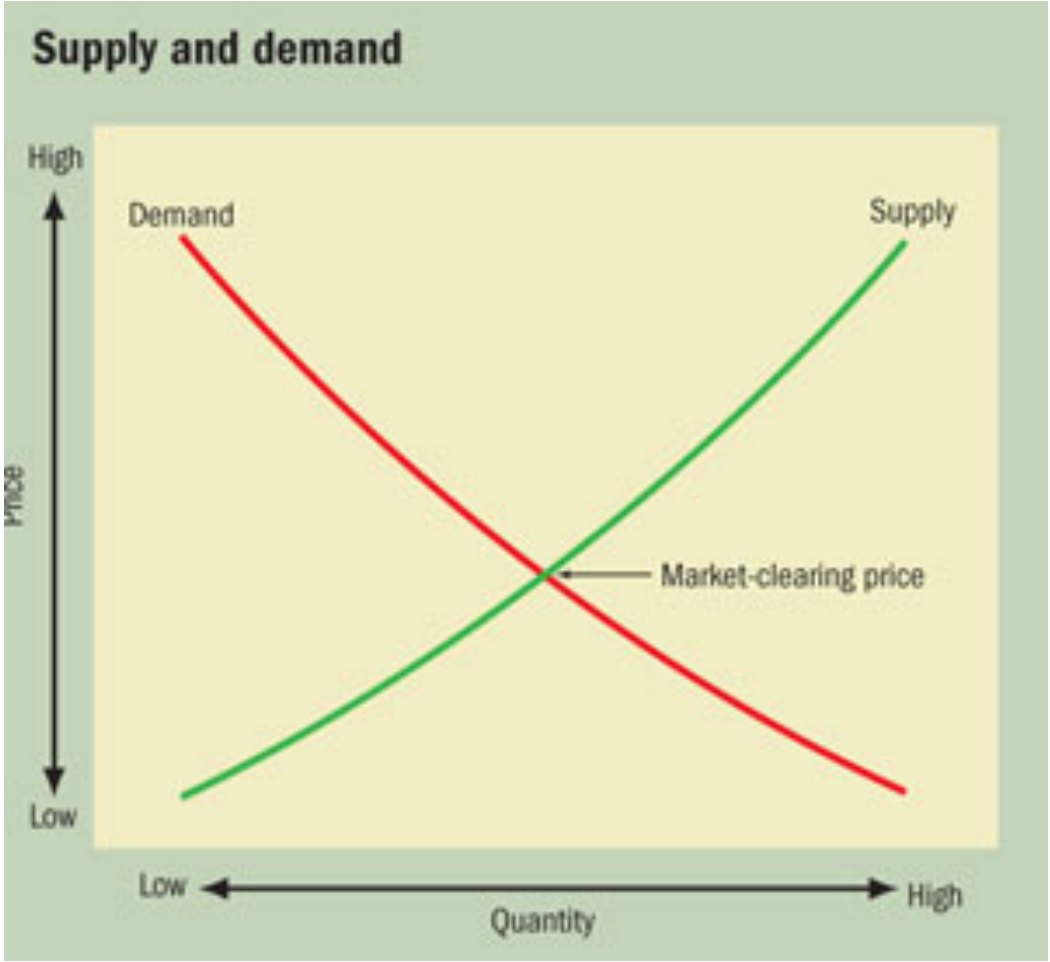
Executive

For Management, strategy, e-infrastructure developments and shared repository services.



For Archaeology resources and

Supply = continuity, trust

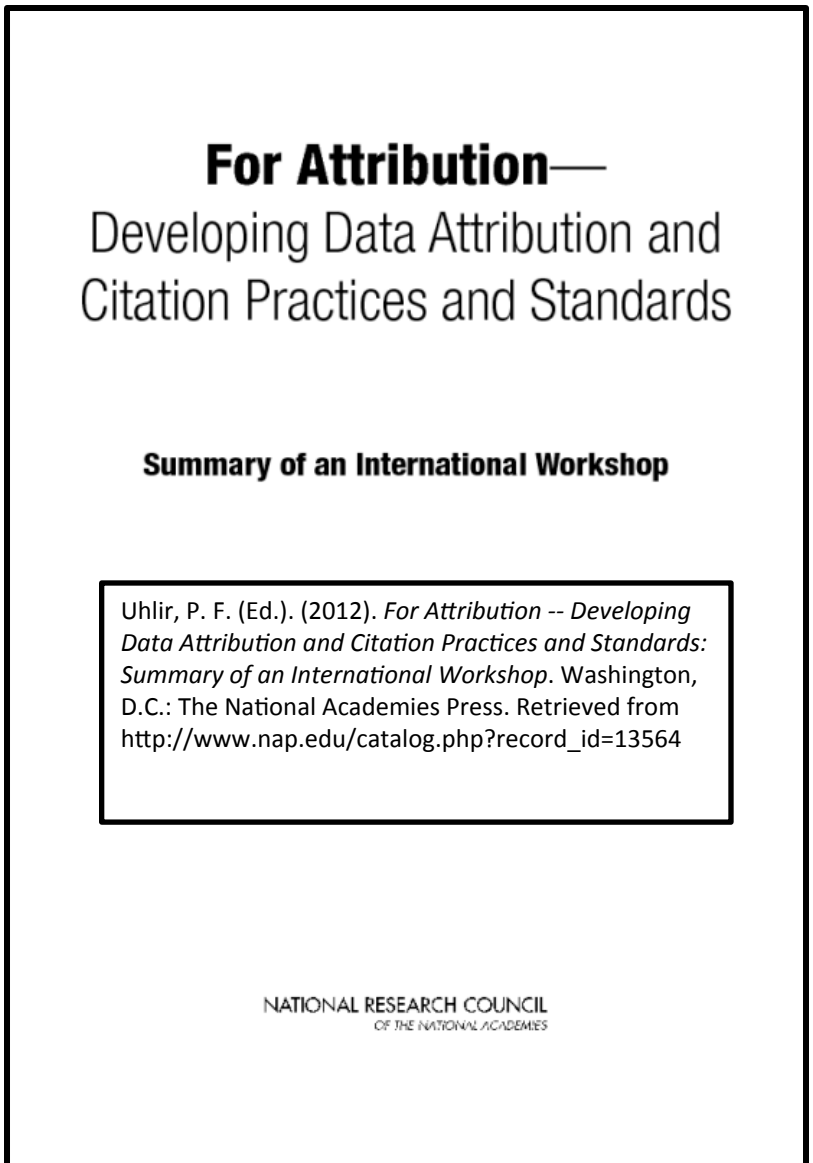


Demand = investment, risk

http://www.imf.org/external/pubs/ft/fandd/basics/images/suppdem_cht.jpg

Data reuse is difficult

- Identify
- Retrieve
- Open
- Read
- Interpret
- Evaluate
- Compute upon
- Replicate
- Combine
- Describe
- Annotate
- License/rights
- Provenance
- Trust
- Attribution…



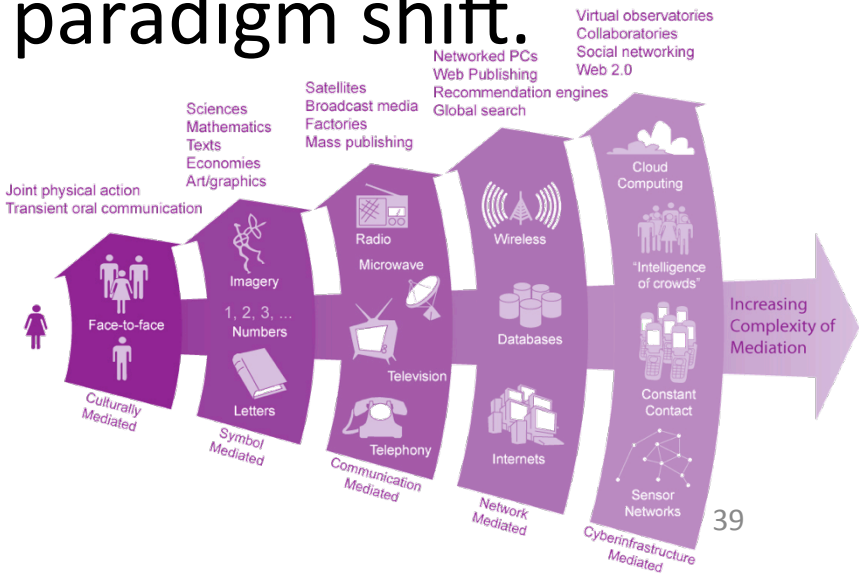
4. Open access to data is a paradigm shift

- Infrastructure investments
  - Data archives
  - Tools, services, support
  - Data curation workforce
  - Data management training
- Alignment of incentives
  - Data release
  - Data reuse
  - Publishing
  - Grants and funding
  - Credit and promotion

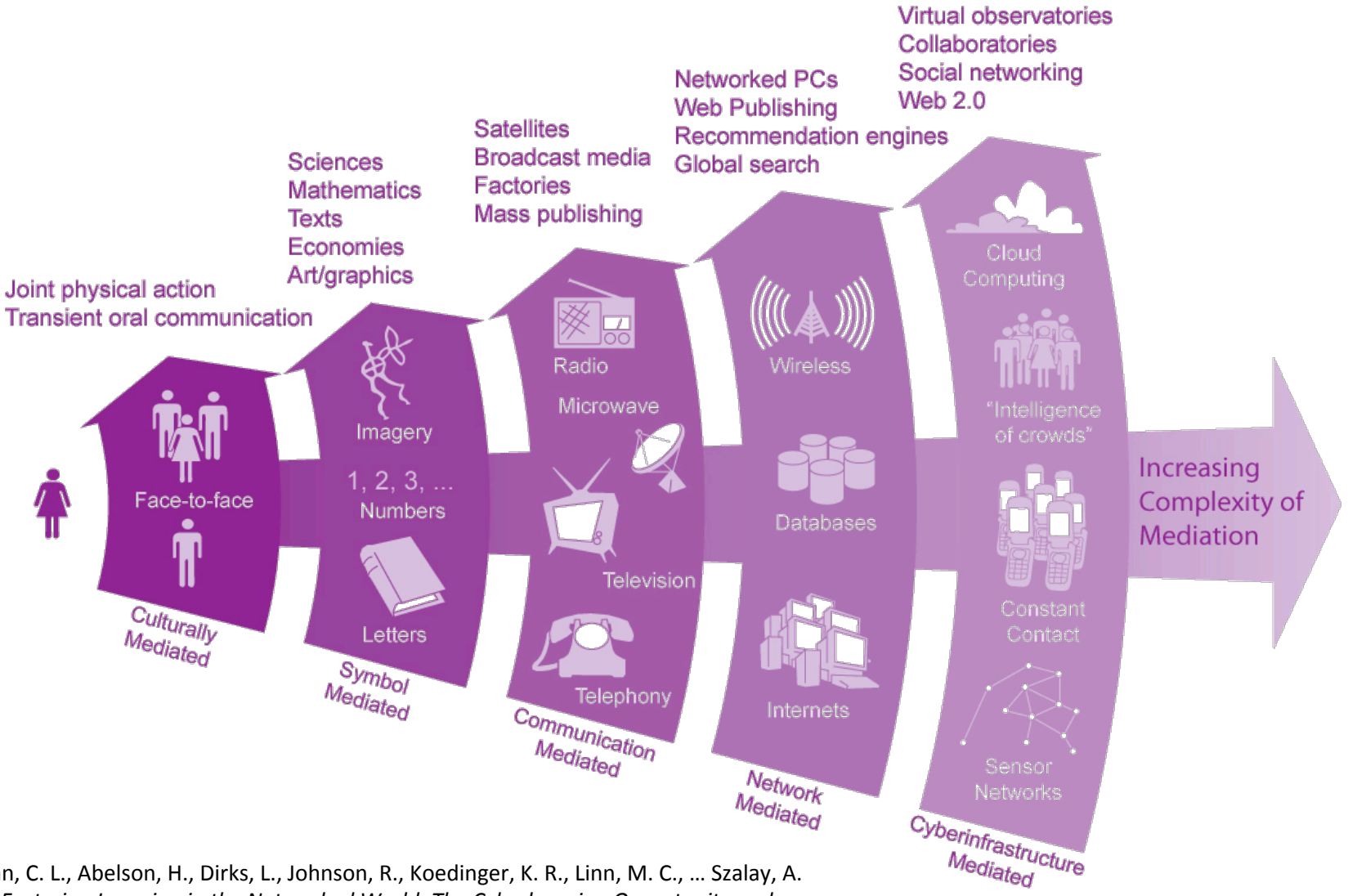
http://2.bp.blogspot.com/-fzIYX9zpcUU/T0kAuG83FGI/AAAAAAAAAKg/hgaotz3E_-A/s1600/infrastructure.jpg

Conclusions

1. Open scholarship is the norm.
2. Formal and informal scholarly communication are converging.
3. Data practices are local.
4. Open access to data is a paradigm shift.



Technological advances in mediated communication



Borgman, C. L., Abelson, H., Dirks, L., Johnson, R., Koedinger, K. R., Linn, M. C., … Szalay, A. (2008). *Fostering Learning in the Networked World: The Cyberlearning Opportunity and Challenge.* National Science Foundation. http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf08204

Image: Jillian Wallis and Roy Pea

Acknowledgements

- UCLA Data Practices team
  - Rebekah Cummings, Peter Darch, David Fearon, Ariel Hernandez, Matthew Mayernik, Alberto Pepe, Ashley Sands, Katie Shilton, Sharon Traweek, Jillian Wallis, Laura Wynholds
- Research funding
  - National Science Foundation
  - Alfred P. Sloan Foundation
  - Microsoft External Research
- University of Oxford
  - Balliol College
  - Oliver Smithies Fellowship
  - Oxford Internet Institute
  - Oxford eResearch Center
  - Bodleian Library