The scientists: what are THEY doing in this new digital communication world?

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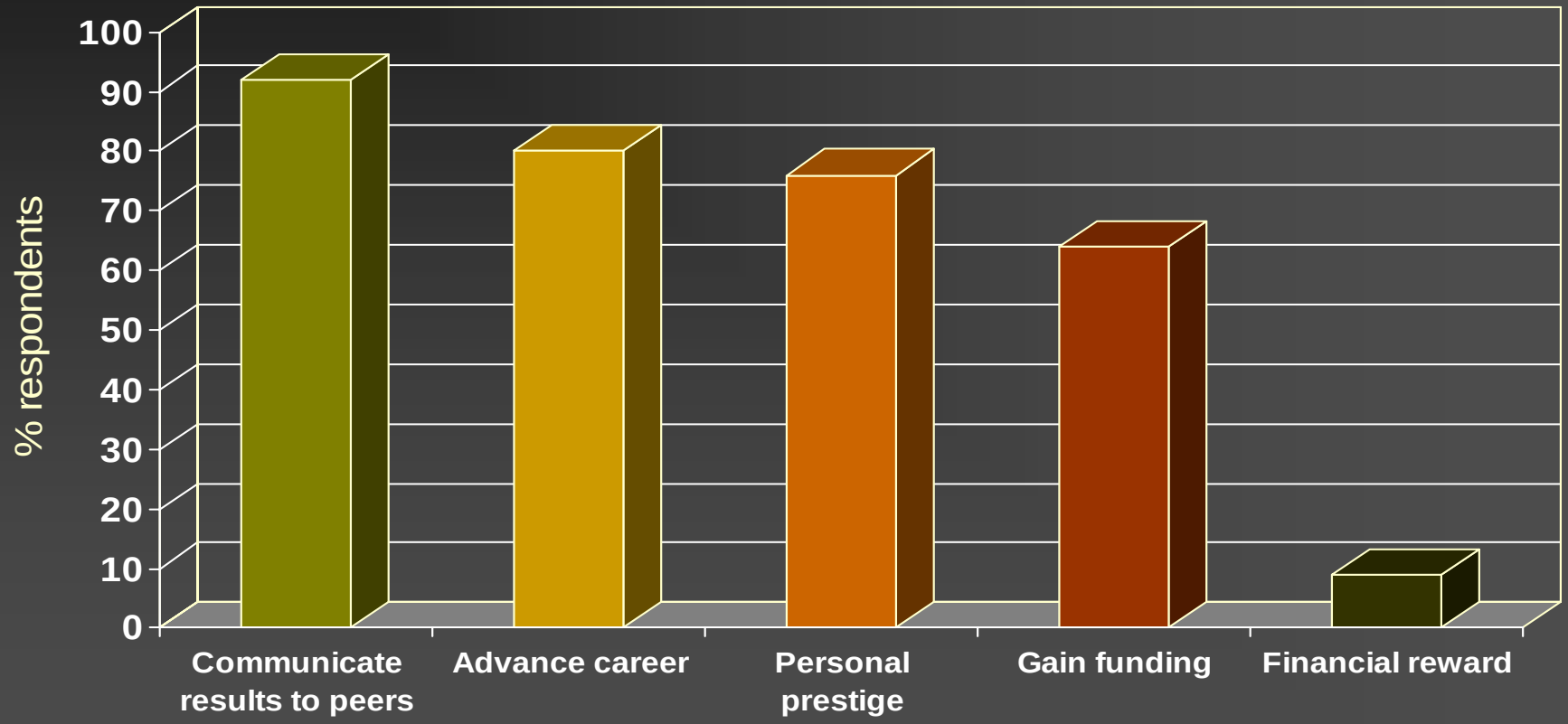
Key Perspectives Ltd
Truro, UK

Why researchers publish their work

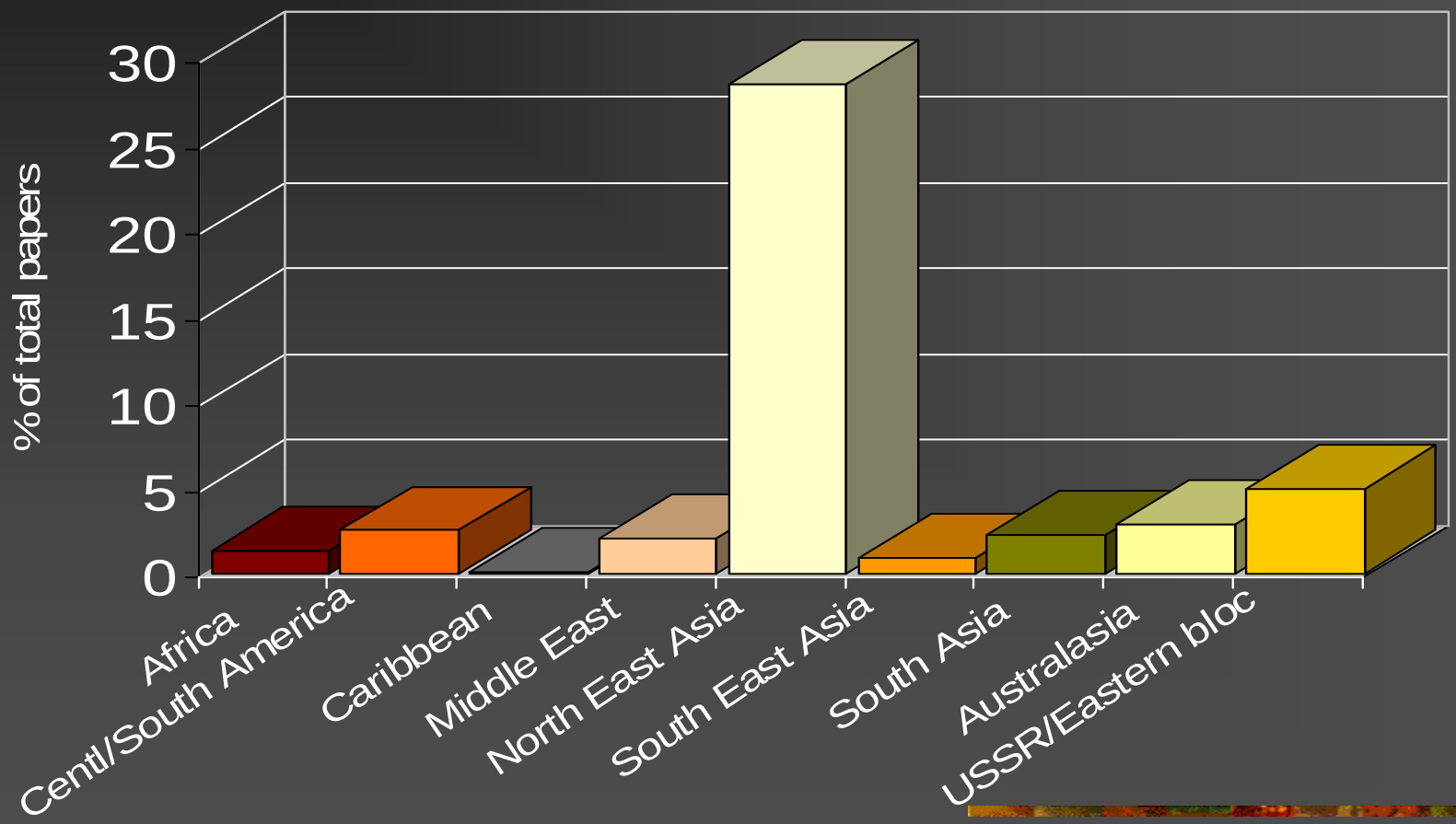


What are they doing (I): Publishing more papers (science)

- Total SCI database records:
  - 1983: 672,417
  - 1993: 754,305
  - 2003: 1,111,397

- Publications from North America and Western Europe account for:
  - 1983: 75% of total records
  - 1993: 70% of total records
  - 2003: 50% of total records

SCI articles 2003



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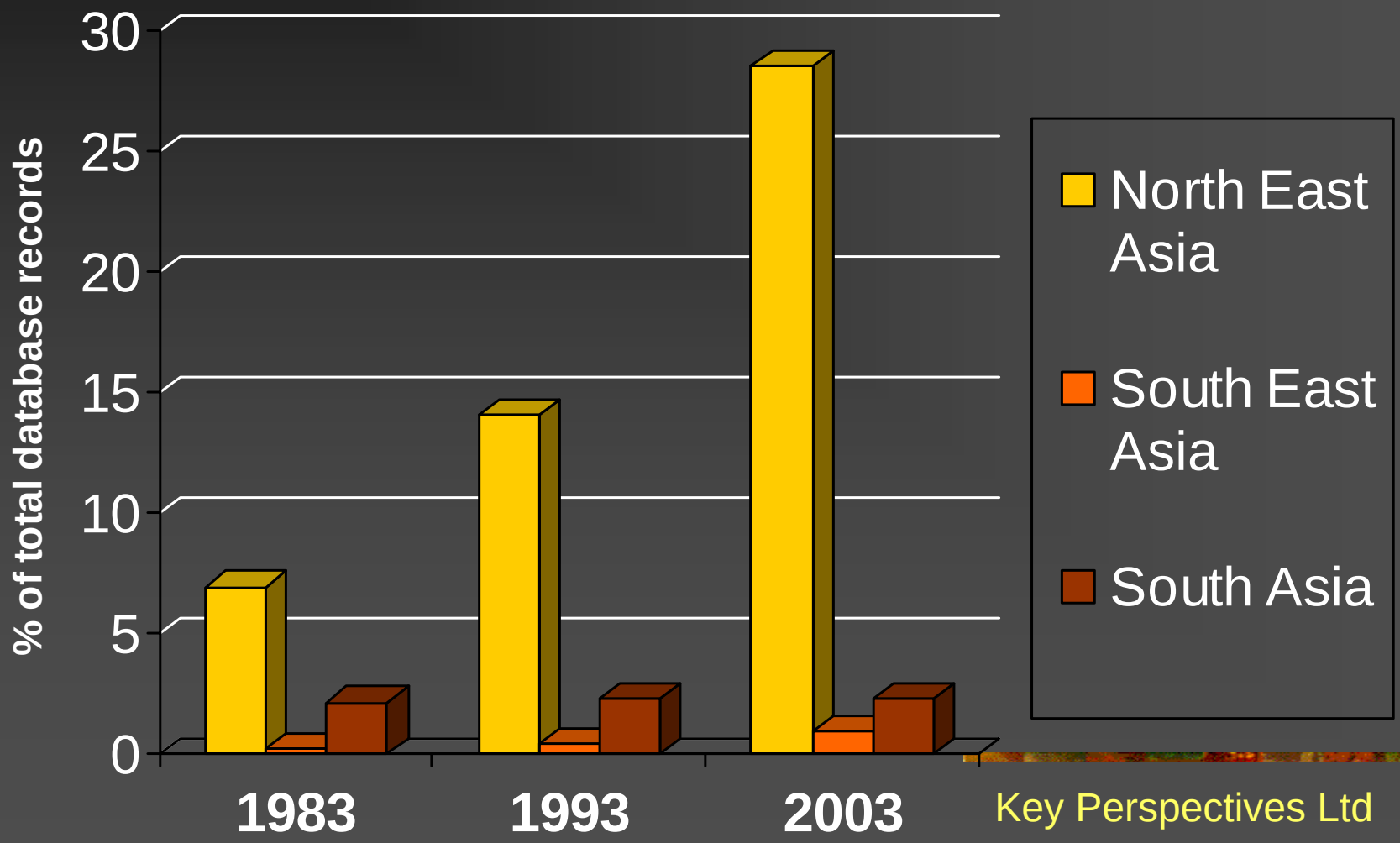
Asian science output



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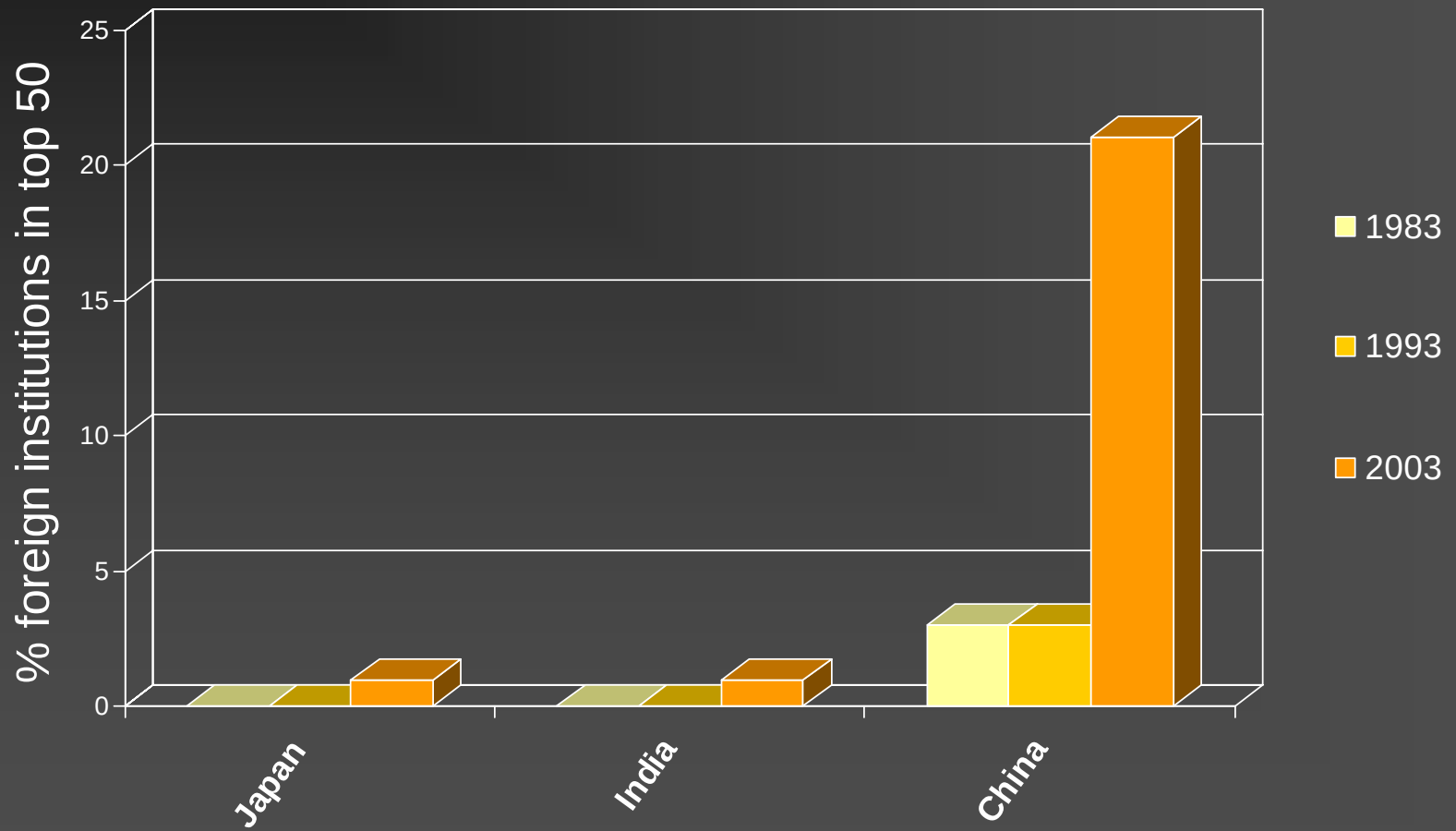
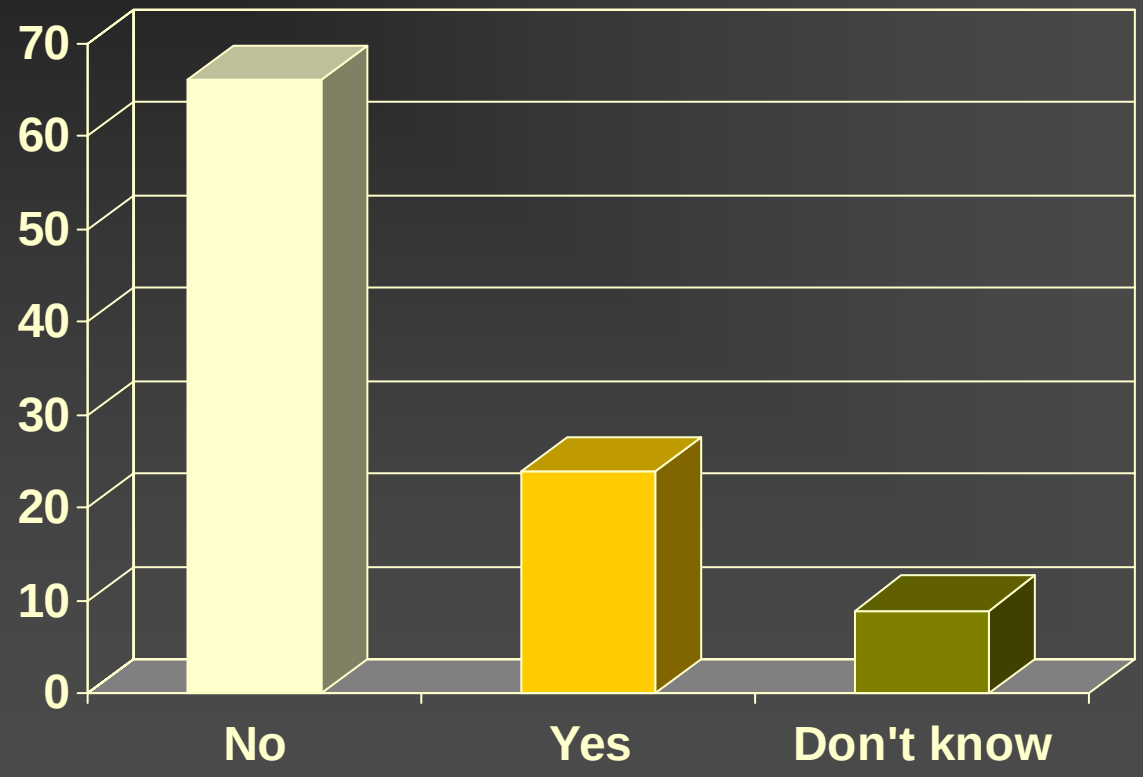
What are they doing (II): Collaborating internationally



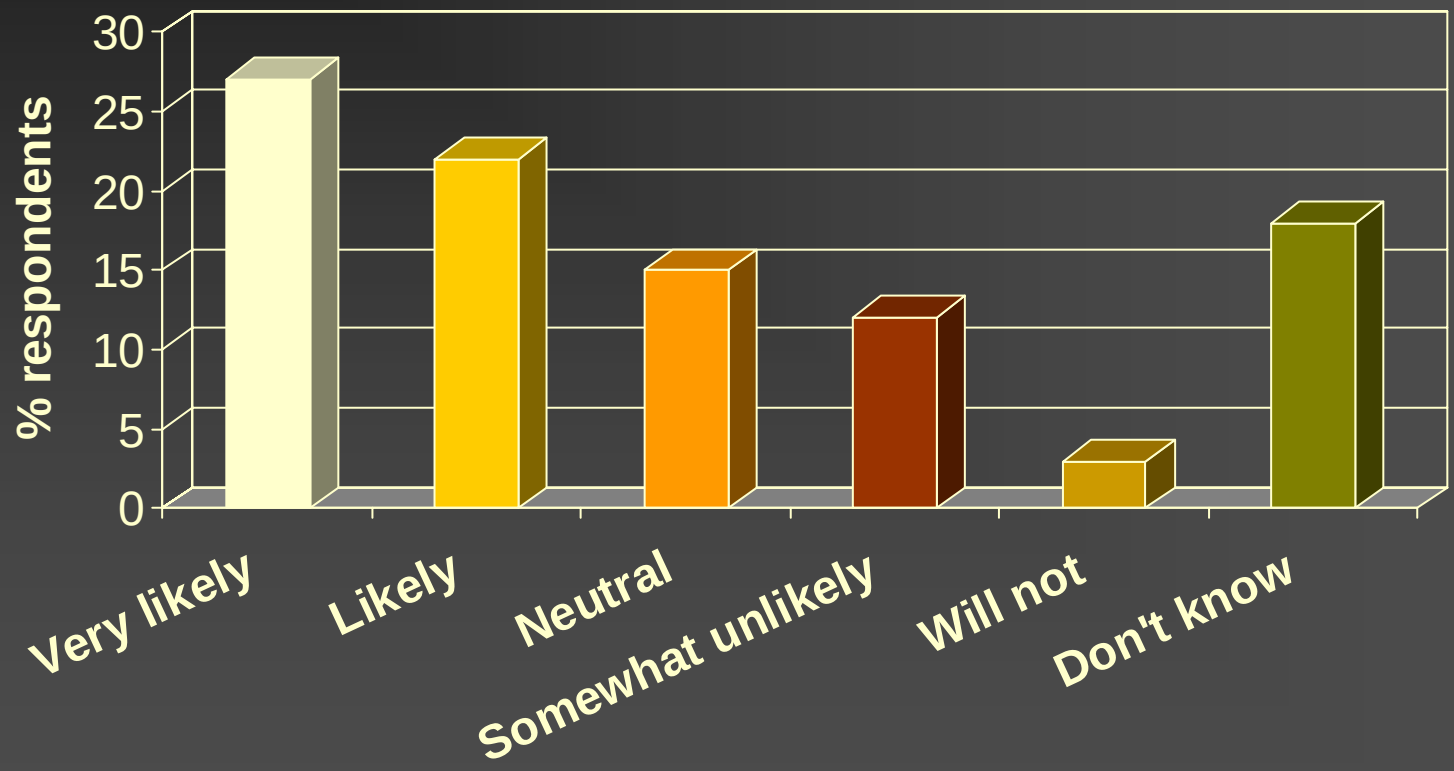
What are they doing (III): Publishing in OA journals



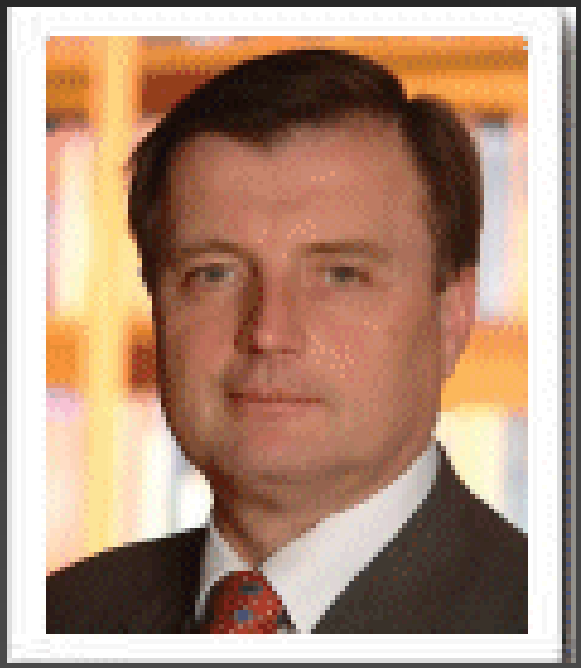
Gold-ish (‘hybrid’)journals and publishers

- NAS (*PNAS*)*:*
  - $1000
  - 16% take-up
- OUP (*Nucleic Acids Research*):
  - Partial OA through 04, fully gold in 05
- Blackwell: ‘Online Open’ trial
  - $2500 or £1250; free via Synergy

OA publishing intentions



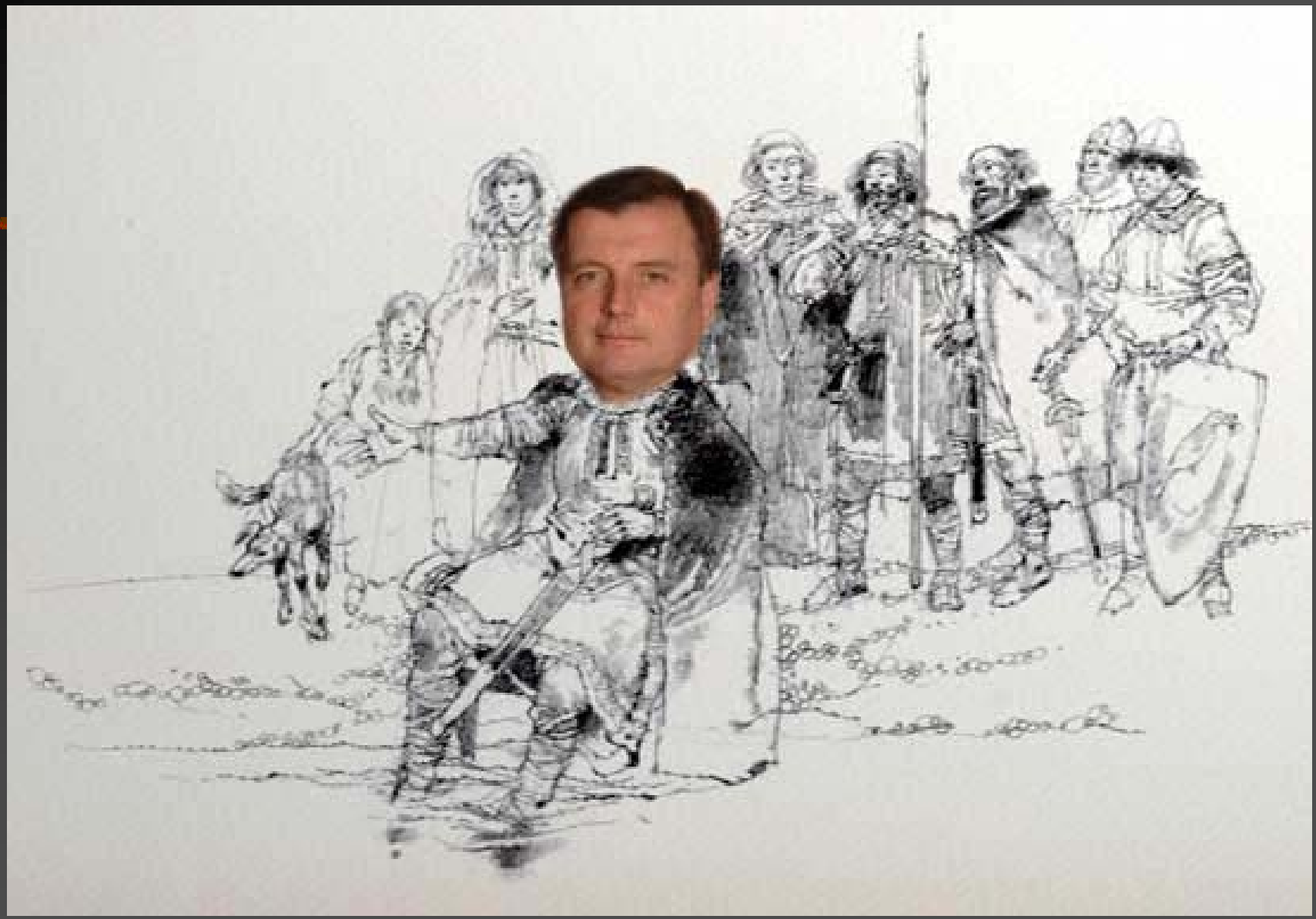
Derk Haank



Early 2004:

Joined Springer as CEO

Introduced ‘Open Choice’



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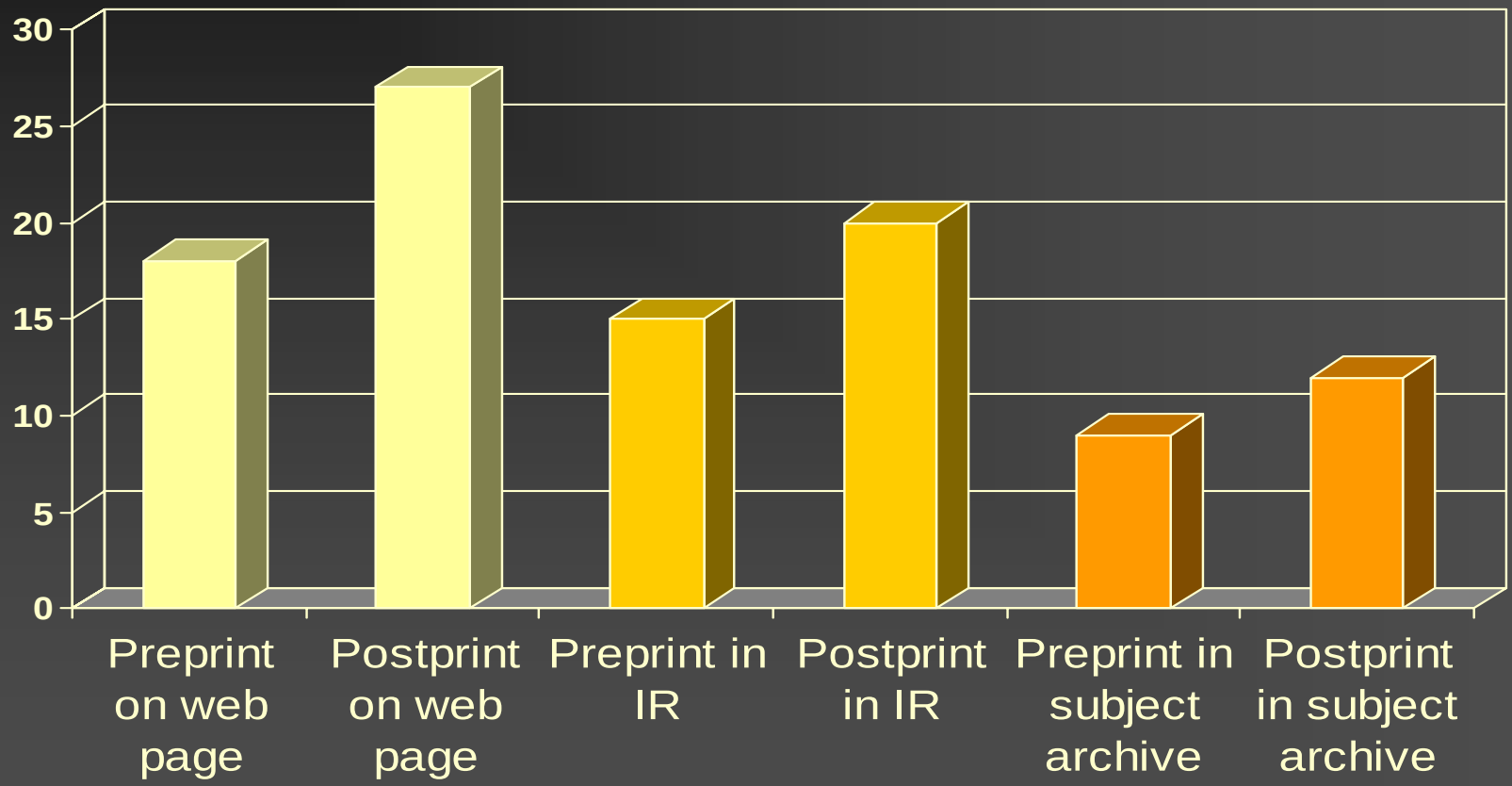
Derk’s new move

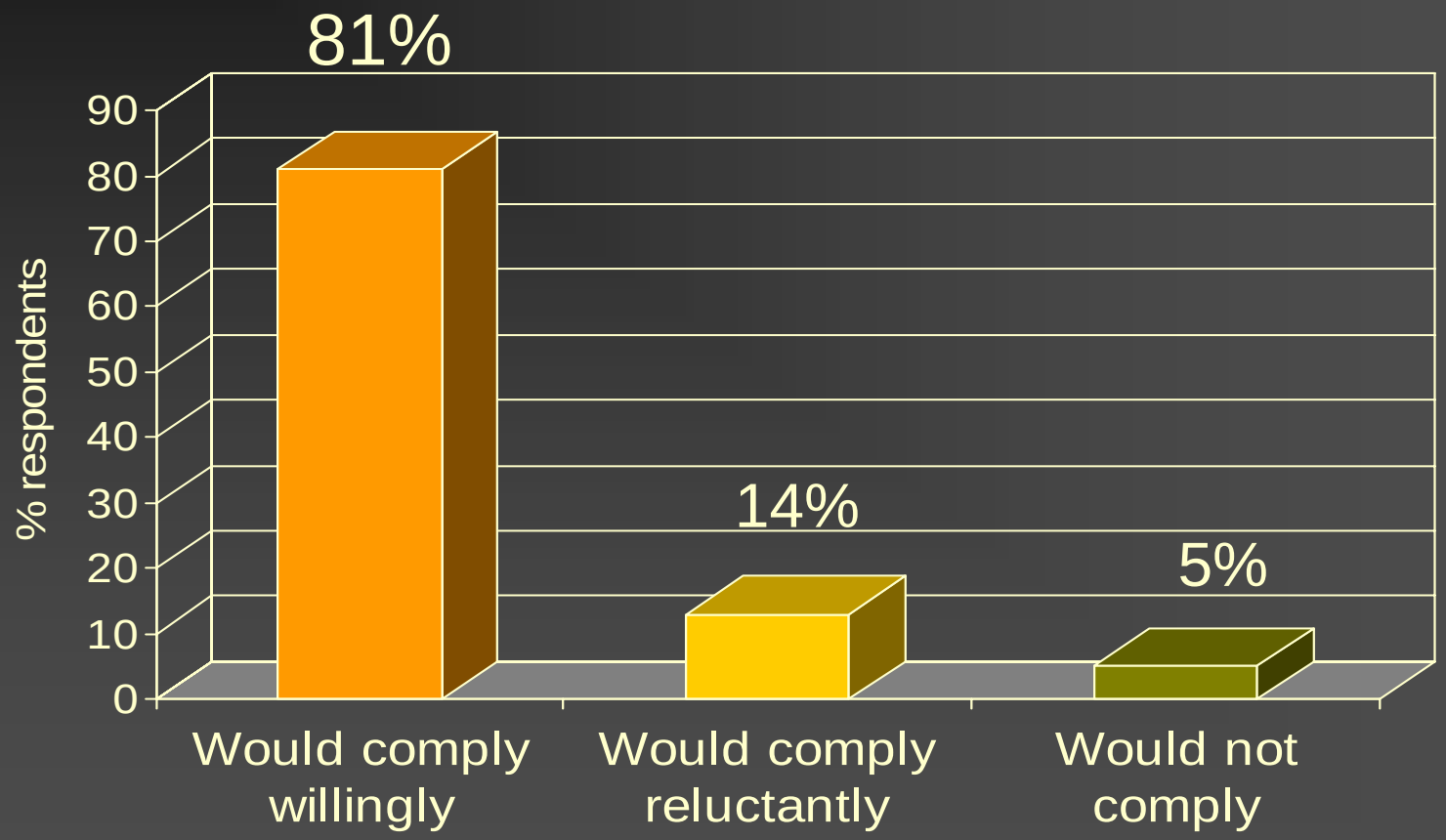
August 2005:

Appointed Jan Velterop as Director of Open Access

What are they doing (IV): Self-archiving



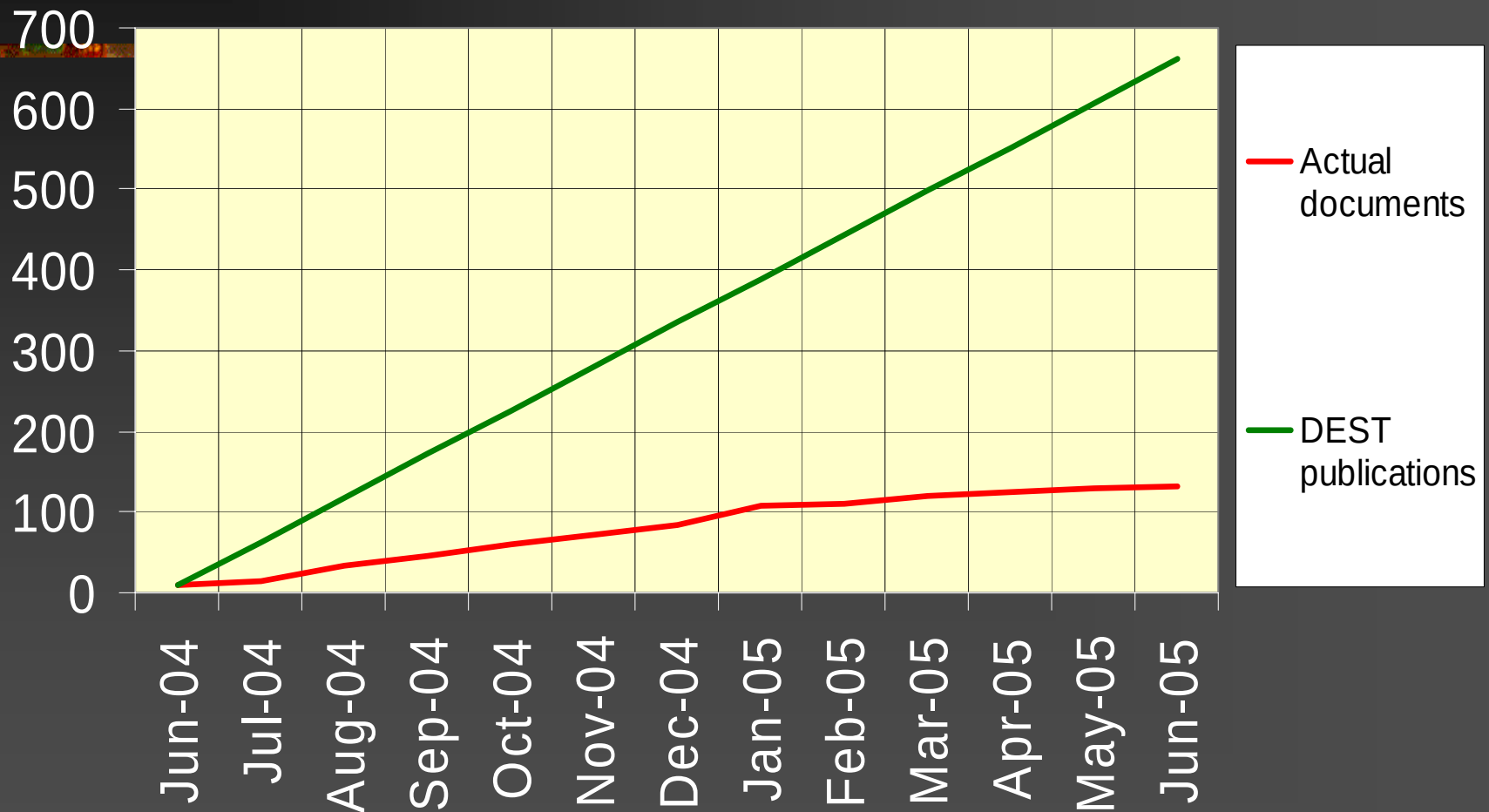
Author readiness to comply with a mandate



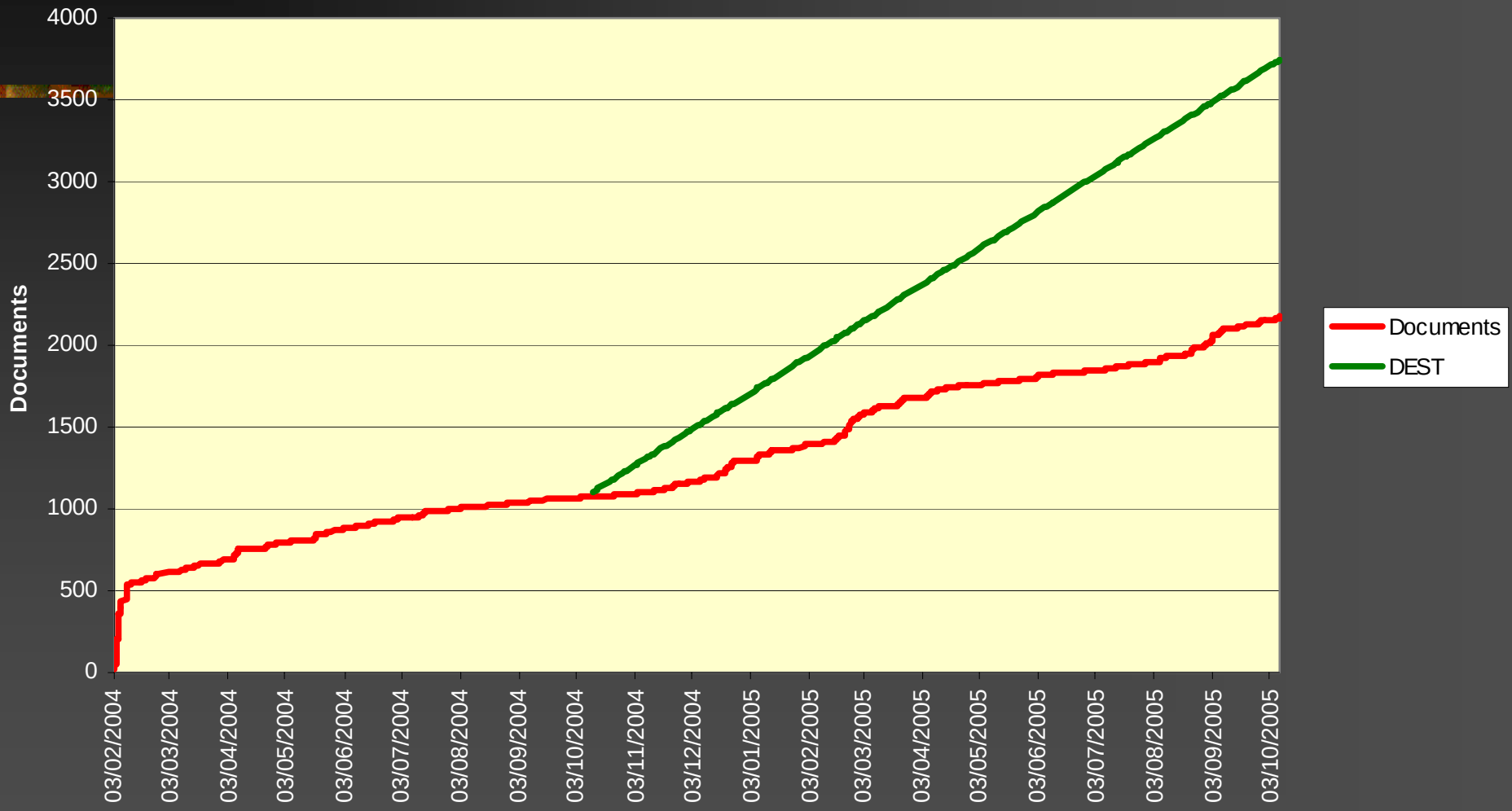
Mandates in place

- QUT
- CERN
- School of ECS, Southampton University
- University of Minho
- University of Zurich
- Compliance as expected

University of Tasmania



University of Queensland



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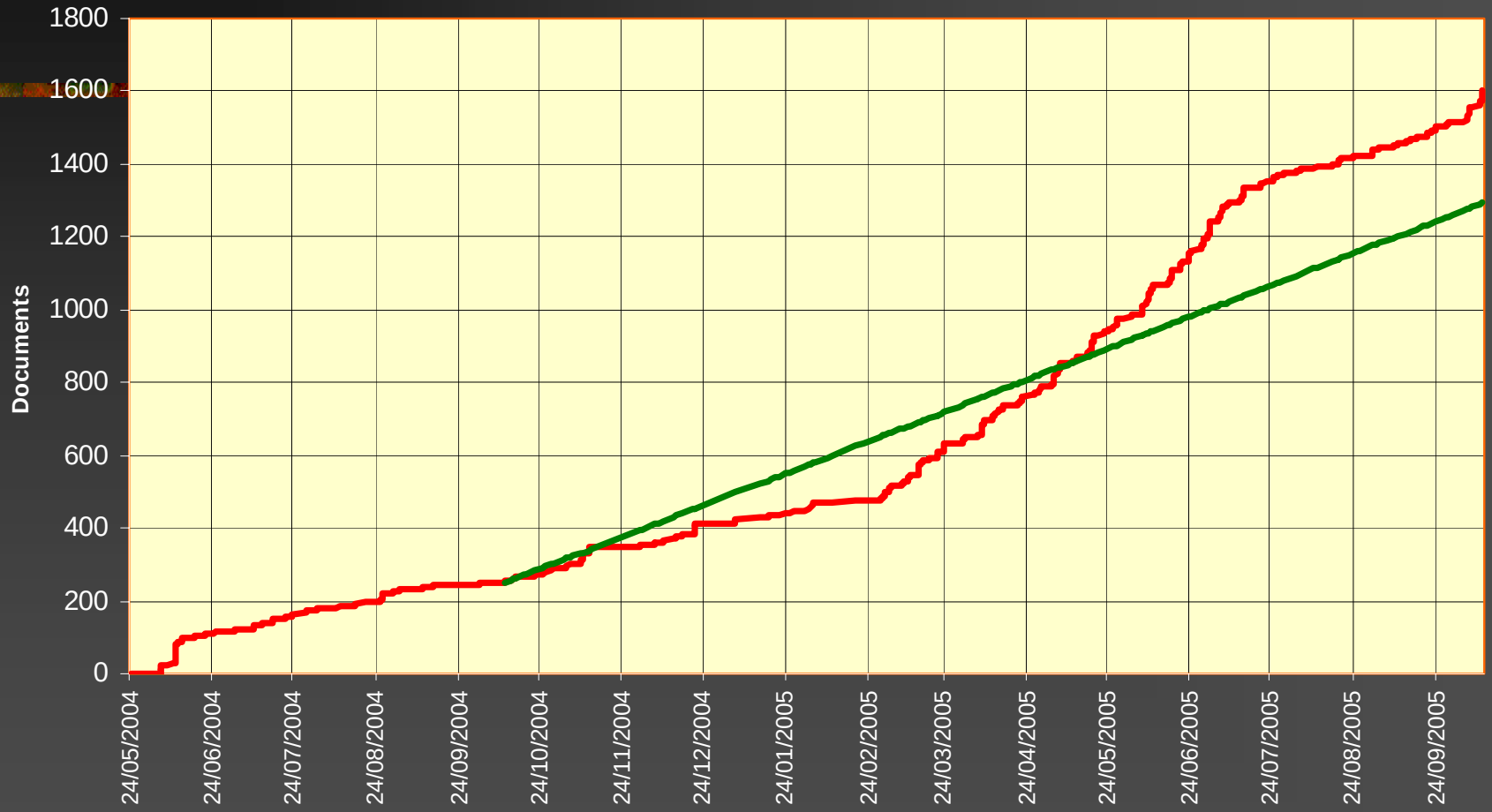


What are they doing (V): Obeying embargoes?

- Nature Physics Issue 1:
- 8 primary research papers
- 7 available on the web on the day of publication (1 not available except in jrnl)
- 4 had postprints in arXiv
- 2 had preprints in arXiv
- 2 had Nature's own PDF on author websites
- Citations: postprints -1,5,0,3 preprints 3,0
- (physics research/pub cycle is moving very fast)

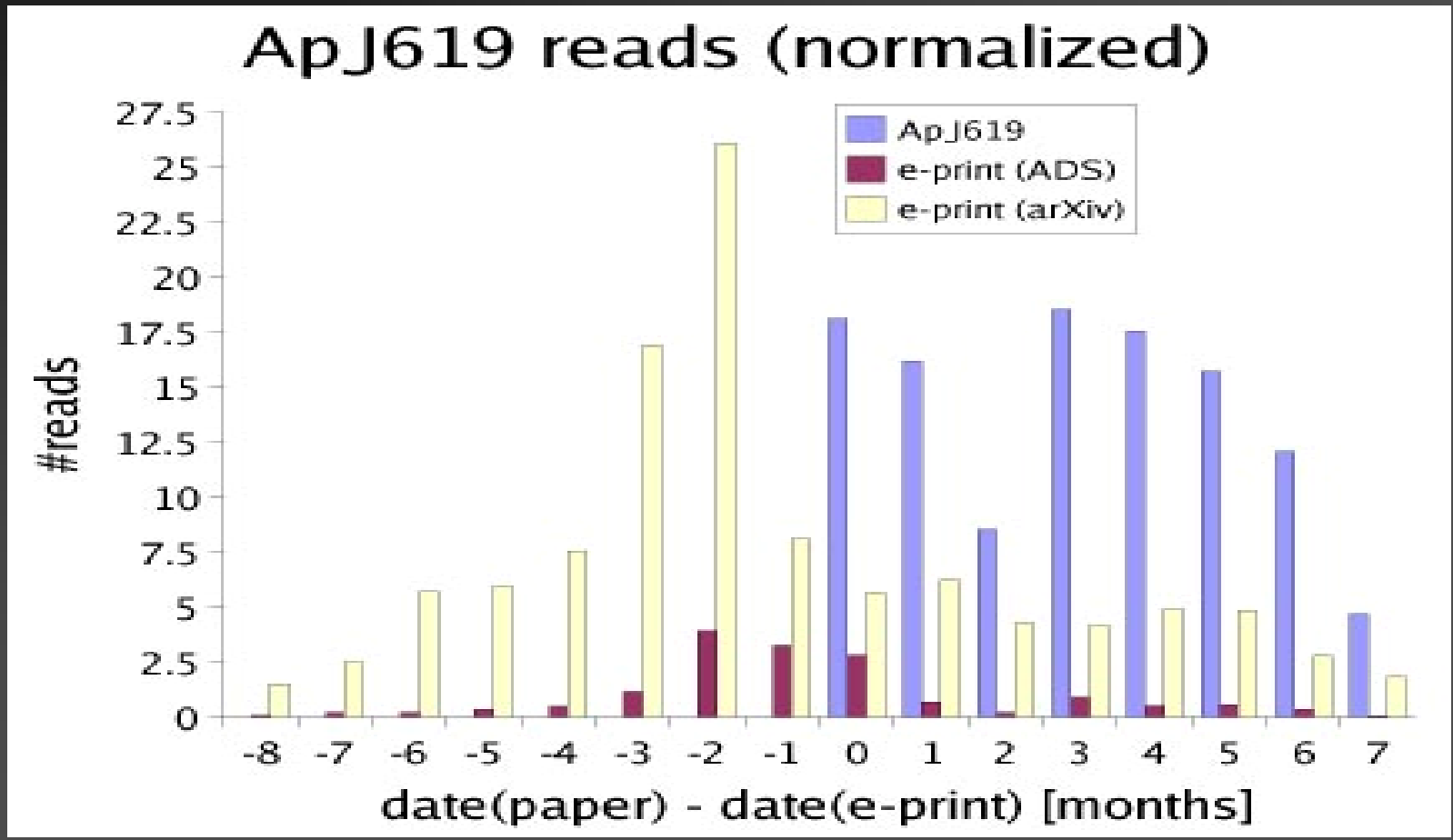
What are they doing VI: Studying publication usage: Physics (arXiv)

- 100% content available in some fields
- 52% has postprint status:
  - Total records: 336829
  - Journal reference: 173901
  - “Accepted”: 15772
  - “Submitted”: 14539

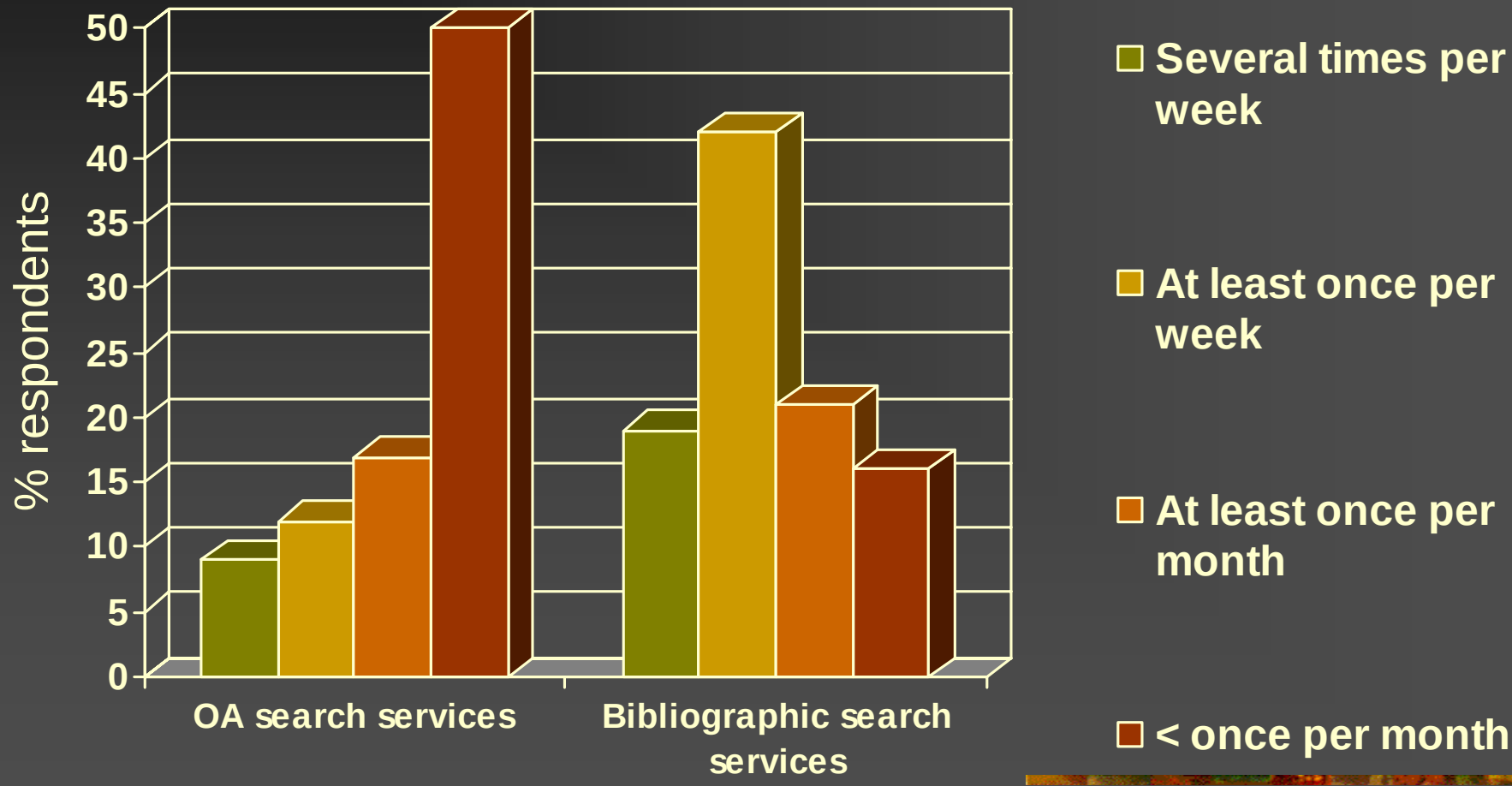
Effect of arXiv

- No loss of subscriptions (yet)
- Downloads are reduced (not clear by how much, or why)
- Michael Kurtz and Edwin Henneken (D-Lib magazine)

Astronomy (*Astrophysical Journal*)



What are they doing (VII): Navigating



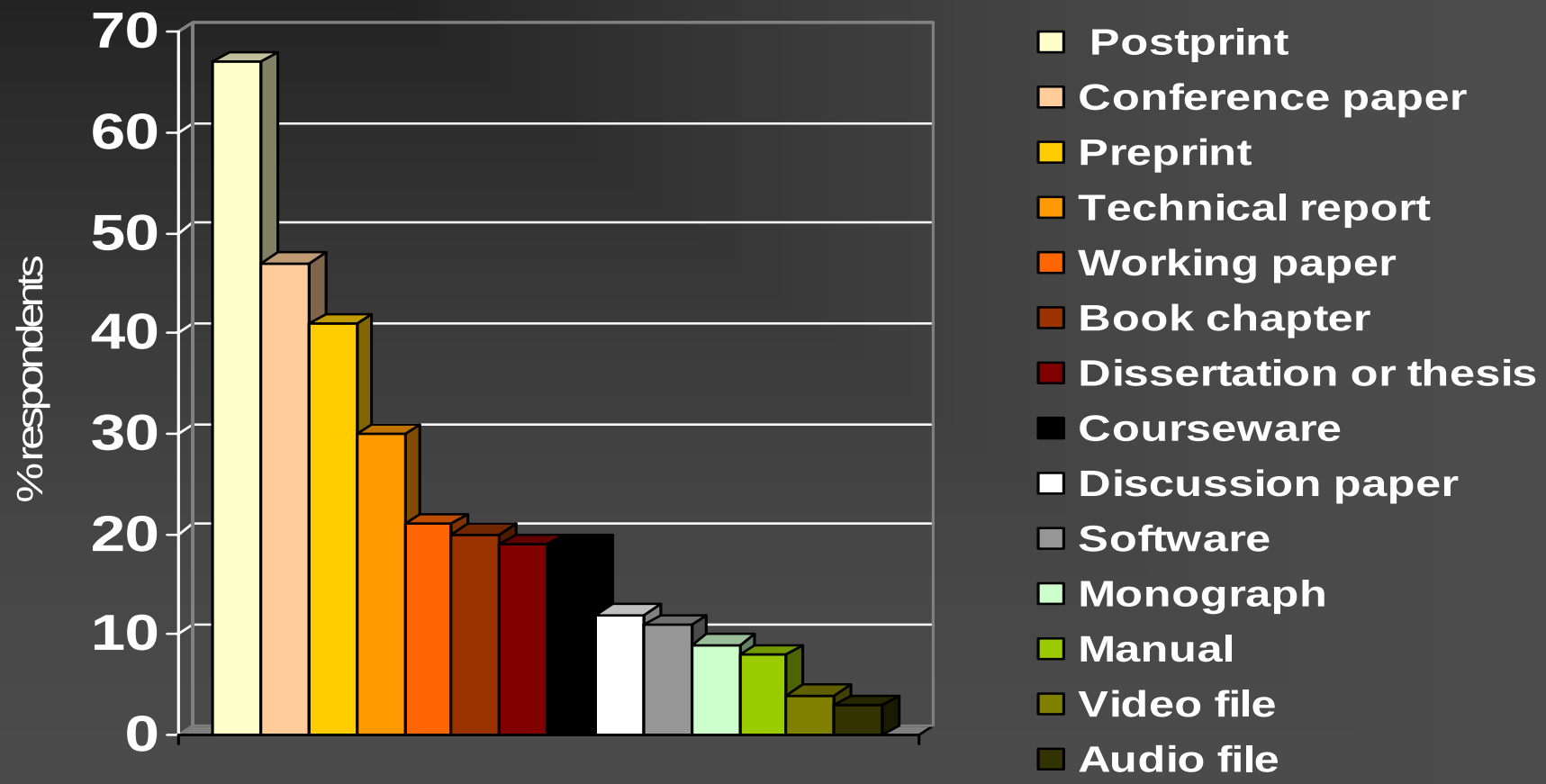
Overall proportion of people using these

- ‘Traditional’ bibliographic services: 98%
- OAI search services: 30%
- Google 72%

Indexing services (secondary publishers)

- Elsevier launched Scopus
  - Covers 14,000 titles
  - Includes 532 open access journals
  - Scirus links off Scopus site
- ISI announced Web Citation Index
  - Collaboration with NEC (CiteSeer)
  - Other collaborations on OA underway

What are they doing (VIII): Self-archiving other digital objects



Other developments in science

- Data sharing
- e-science
- Interdisciplinary research

What are they doing (IX): Data sharing

National Institutes of Health

‘Data should be made as widely and freely available as possible while safeguarding the privacy of participants, and protecting confidential and proprietary data’

Data sharing: NIH Cancer Biomedical Informatics Grid (caBIG) Project

- ‘Software, data, standards, infrastructure directly supported by caBIG resources must be open source and open access (i.e. licensed to the government with the government having no restrictions with regard to redistribution).’

Data sharing: NASA

- ‘NASA is committed to full and open sharing of ESE data from its funded and owned systems’
  - No embargo period
  - Access for the scientific community and the general public
- ‘NASA is committed to non-discriminatory access to data’

Data sharing: Global Change Research Program

Bromley Principles:

‘Full and open sharing of the full suite of global data sets for all global change researchers is a fundamental objective.’

Data sharing: OECD (Declaration on Access to Research Data from Public Funding)

The governments of 34 nations recognise:

- Optimum international exchange of data, information and knowledge contributes decisively to the advancement of scientific research and innovation
- Open access to, and unrestricted use of, data promotes scientific progress and facilitates the training of researchers
- Open access will maximise the value derived from public investments in data collection efforts
- Substantial benefits that science, the economy and society at large could be gained from the opportunities that expanded use of digital data resources
- The risk that undue restrictions on access to and use of research data from public funding could diminish the quality and efficiency of scientific research and innovation

Data sharing: UK funding bodies

- Research Councils
- Joint Data Standards Study
- Wellcome Trust

Data sharing: *Nature*

‘A condition of publication in *Nature* is that authors are required to make materials, data and associated protocols available to readers on request’

Data sharing: ICMJE (Intl Committee Medical Journal Editors)

- Open access registry of drug trials data
- Electronically searchable; public access
- The 11 journals involved will not publish the results of clinical trials unless research teams have pre-registered the trial and deposited the data

What are they doing (X): e-science

‘e-Science is about global collaboration in key areas of science, and the next generation of infrastructure that will enable it.’

John Taylor

Director General of Research Councils

Office of Science and Technology

And…

‘The large scale science that will increasingly be carried out through distributed global collaborations enabled by the Internet.’

RCUK’s e-Science Programme

e-science: ‘Atkins’ Report on Cyberinfrastructure (NSF)

‘Archives containing hundreds or thousands of terabytes of data will be affordable and necessary for archiving scientific and engineering information’.

e-science Infrastructure

- The Grid – software that enables flexible, secure, coordinated resource sharing among dynamic collections of individuals, institutions and resources
- Middleware - services that allow scientists to build – as a matter of routine – the infrastructure for their ‘Virtual Organisations’

Already in place

- Particle Physics
  - global sharing of data and computation
- Astronomy
  - ‘Virtual Observatory’ for multi-wavelength astrophysics
- Chemistry
  - remote control of equipment, data archives
- Environment
  - federated data centres

‘Atkins’ continued…

‘The primary access to the latest findings in a growing number of fields is through the Web, then through classic preprints and conferences, and lastly through refereed archival papers’.

What are they doing (XI): Interdisciplinary research: NSF

Program	$millions FY2005
Total funding	**3844**
Mathematical & physical sciences	1115
Computer Science & Engineering	618
Engineering	576
Multidisciplinary research	31

Interdisciplinary research: EPSRC (UK)

Programme	£millions
Engineering	234
Materials science	177
Physics	128
Mathematics	54
Life sciences interface	31

Interdisciplinary fields

- Biomimetics
- Systems biology
- Environmental science
- Chemical biology
- Genomics
- Healthcare technologies
- Green chemistry

What are they doing (XII): Citation and impact studies

- Lawrence 2001 (computer science)
- Kurtz 2004 (astronomy)
- Brody & Harnad 2004 (all disciplines)
- Antelman 2005 (philosophy, politics, electrical & electronic engineering, mathematics)
- Wren 2005 (biomedicine)

New scientometric measures

- ISI ‘times cited’
- Measures of correlation of downloads and citations
- New measures of impact and new ways of measuring linkages and trends in the research literature

Scholarly communication drivers

- Increasing diversity in location
- Increasing collaboration
- Increasing diversity of communication methods including informal ones
- Increasing interdisciplinary work, with concomitant demand for access to information across traditional boundaries
- Research cycle speed is increasing – ‘bigger, better and faster’ science is being done
- The semantic web is happening

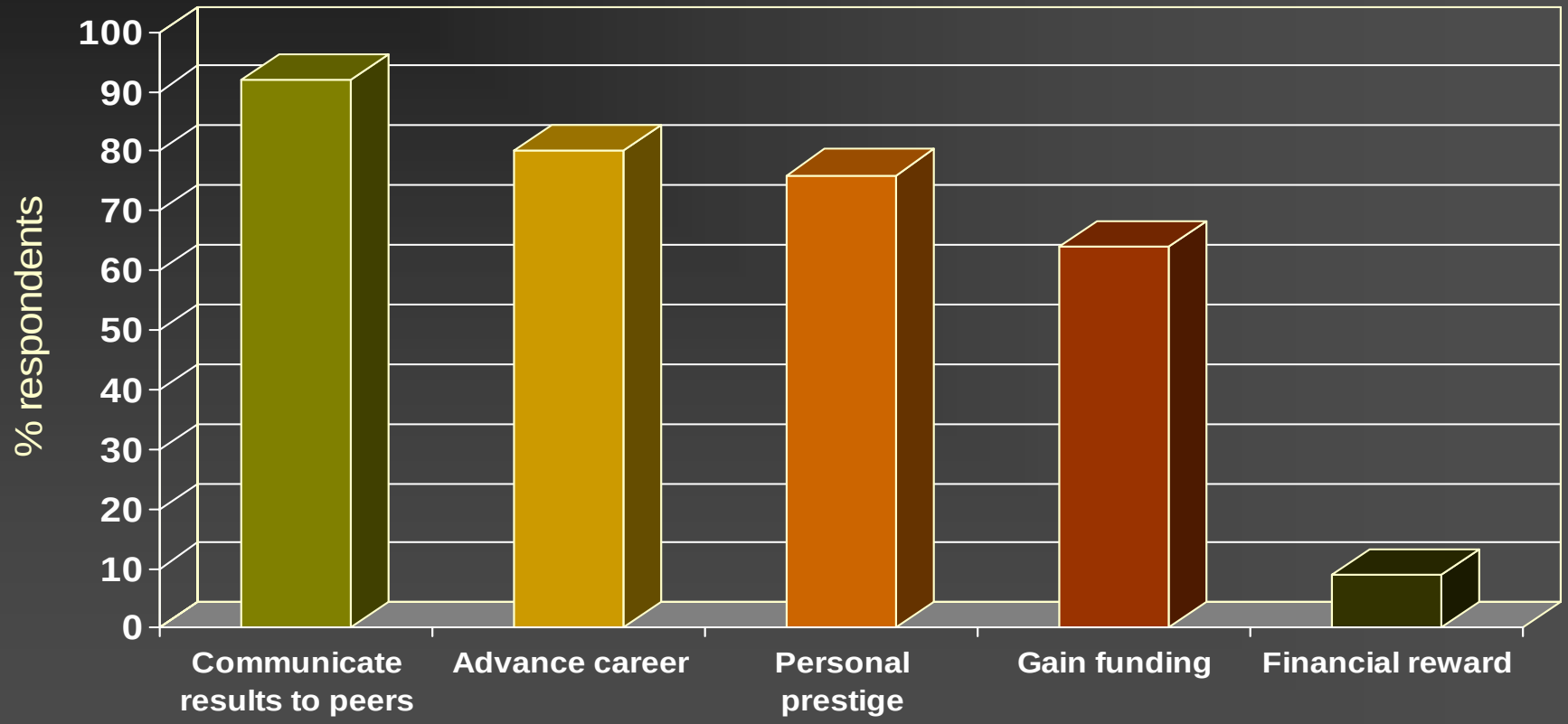
Impact on scientific publishing

- Increasing tendency for published papers to have an archival role rather than awareness of new findings
- Databases will be increasingly important
- Preprint/early postprint deposition coupled with new linking possibilities will change face of bibliometrics

The opportunities for science publishers

- Peer review (paid for)
- Indexing
- Database publishing
- New services with aggregated content
- Tertiary publishing

Why researchers publish their work



Thank you for listening

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