2PM

7PM in London (GMT), 4AM in Tokyo (GMT+9)

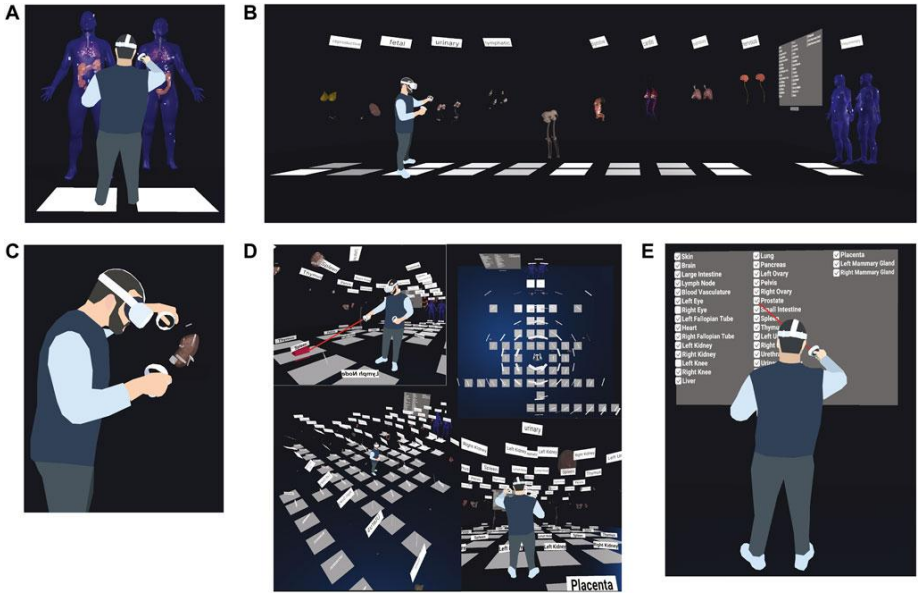
Publishers

Moderator: Andreas Bueckle, *Indiana University*

Presenters:

- Rita Strack, *Nature*
- Andrea Scharnhorst, *Royal Netherlands Academy of Arts and Sciences*

HRA Organ Gallery in VR



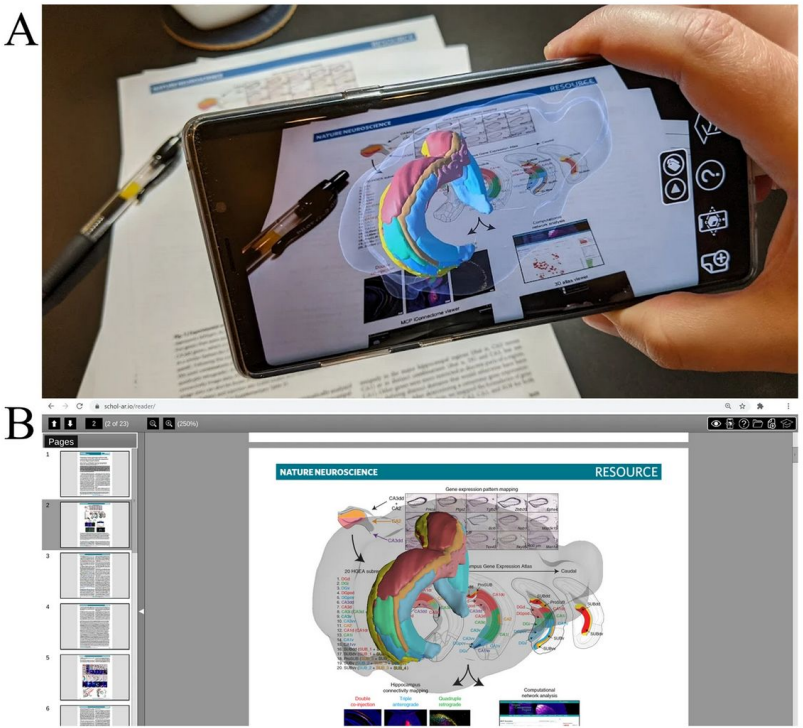
- VR and AR applications are best shown in person
- Videos work worse but better than stills
- Screenshots lack interactivity, spatial understanding, and temporality
- Screenshots can be edited more easily but only capture a slice of the functionality at once

Source:
https://doi.org/10.3389/fbinf.2023.1162723

Existing Work

Fig. 1

From: Integrating Data Directly into Publications with Augmented Reality and Web-Based Technologies – Schol-AR



An example of augmented data[46] directly layered on a publication and viewed through (**A**) an augmented reality mobile application and (**B**) a web-based PDF viewer. This figure is itself augmented and can be viewed through either option (See Results).

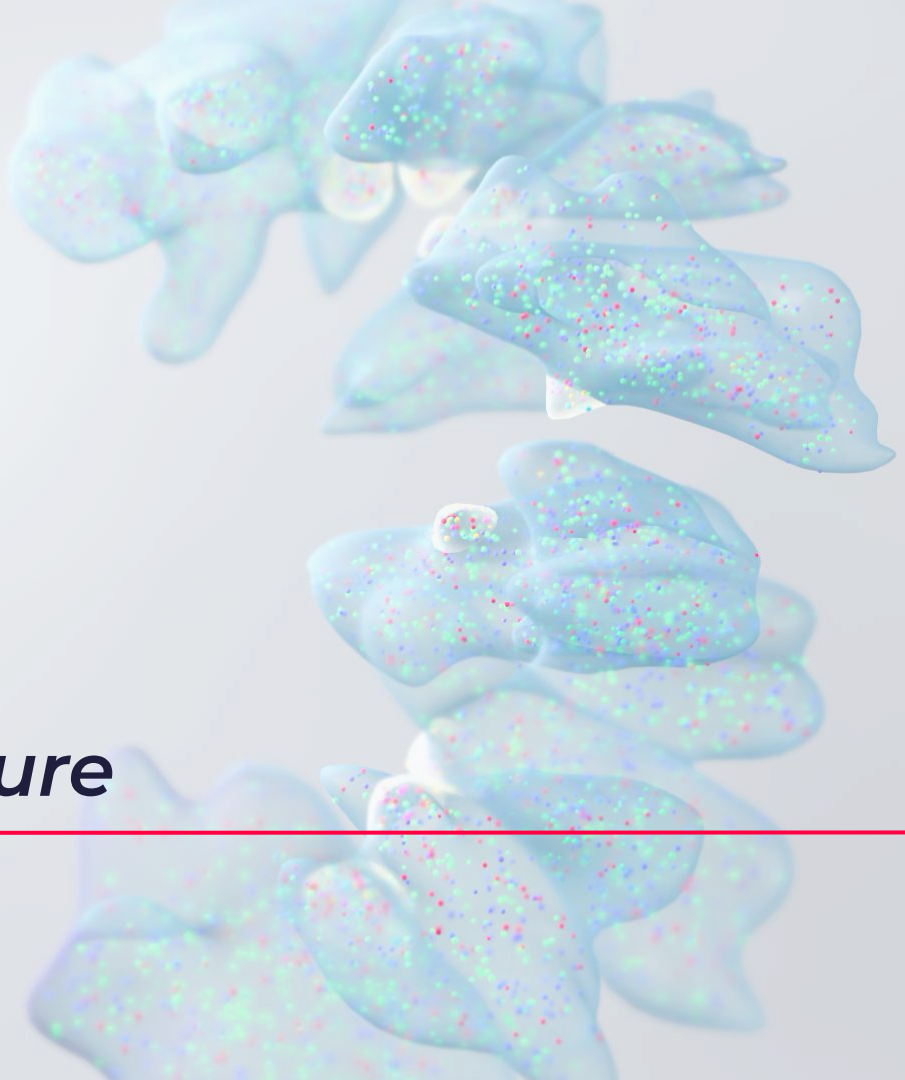
Schol-AR (https://www.schol-ar.io/) allows embedding digital content in papers (https://www.nature.com/articles/s41597-022-01426-y)

- Mobile app
- Web-based PDF viewer

Existing Work

Animated Figures in AAS Journal Articles: https://journals.aas.org/news/animated-figures-in-aas-journal-articles/

- **Cospaces Edu**: A paid web-based VR creation tool
- **ENTiTi Creator**: A free web-based VR creation tool
- **InstaVR**: A paid web-based VR creation tool
- **Thinglink Education**: A free basic web-based VR creation tool
- **Vizor VR**: A paid web-based VR creation tool
- **PLAY'A VR**: A VR video player with a built-in web browser for immersive VR experiences



Rita Strack, *Nature*

Part of
SPRINGER NATURE

What is a multiscale human?

Publishers

Rita Strack, Ph.D.
Senior Editor, *Nature Methods* (rita.strack@us.nature.com)

December 13, 2024

nature portfolio

Outline

1. Nature Portfolio *and Nature Methods*
2. Spatial biology at the journal
3. Publishing challenges and opportunities

Nature Portfolio

Widest importance and implications.

Significance should be obvious to any scientist working in any field of research.

Most relevant advances in a field.

Significance should be apparent to anyone in that discipline.

Highly significant advances that influence a field.

Broad appeal isn't a prerequisite for publication… but great science is.

Important insights into focused areas of research.

New open access options reporting high-quality findings.

Technically sound, quality science.

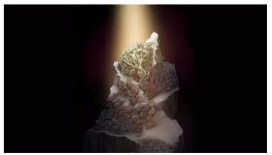
Significance is less important than sound science.

nature portfolio

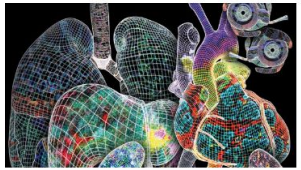
- Launched in 2004, team of seven editors with diverse research expertise
- High visibility forum for publishing important new methods
- Focused on methods for basic research
- Serve developer communities but our readership is biologists
- Emphasis on conceptual advances with immediate practical utility
- Novel biological insights not required for publication

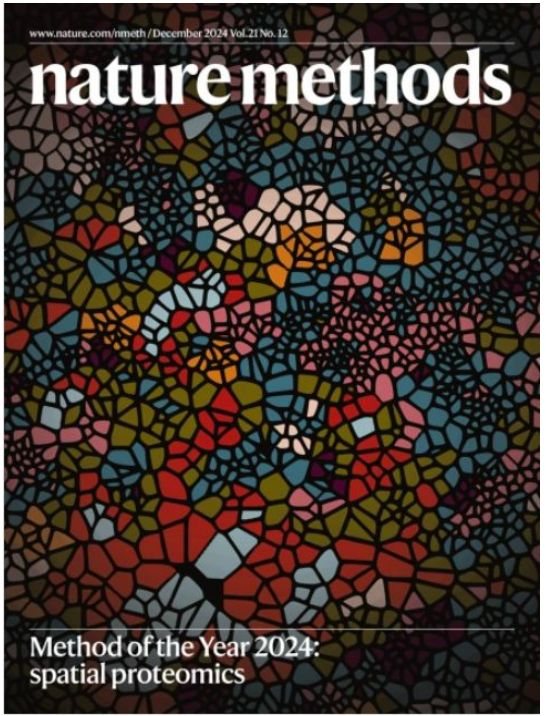
Spatial Biology

- Long-standing interest in single-cell and spatial omics technologies
- Part of cross-journal collections associated with HTAN, HuBMAP, and HCA
- Chose Spatially Resolved Transcriptomics as Method of the Year in 2020
- Had a Focus issue on highly multiplexed tissue imaging in 2022



the Year 2024





nature › collection

Collection | 30 October 2024

The Human Tumor Atlas Network (HTAN): exploring tumor evolution in time and space

Studying the evolution of cancer malignancy in space and time provides clues that are crucial for understanding how tumors develop, how they evade the immune system, and how they resist therapy and recur. Since 2018, the Human Tumor Atlas Network (HTAN), a US National Cancer Institute (NCI)-funded Cancer Moonshot℠ initiative, has been compiling 3D atlases that integrate cellular, molecular and histological features of diverse tumors across the span of cancer evolution.

nature › collection

Collection | 19 July 2023

Human BioMolecular Atlas Program

Inaugurated in 2018, the Human BioMolecular Atlas Program (HuBMAP) endeavours to construct comprehensive spatial maps that feature a range of biomolecules such as RNA, proteins, and metabolites in human organs at single-cell resolution. This collection features the research, datasets, methods and tools generated by this project, accompanied by a Perspective, a News and Views, and links to other resources.

How can the scientific community publish an **evolving** human atlas that has new data elements, higher coverage and accuracy, and new use cases every six months?

(1) Conventional – Publish versions of the atlas that have grown or changed sufficiently to justify an e.g. 2.0 version.

Pros: Can easily reflect changes in authorship and give new researchers credit

Publications can reflect productivity

Researchers have a clear record of what changes occurred with each version

Cons: Small, but important changes may not justify a new paper

Writing up can be onerous

May be difficult to get the attention of “high profile” journals

(2) “Living” publications – papers that can be regularly updated to reflect changes in large projects.

Pros: Readers can immediately get the most up-to-date information

All citations would go to a “single” paper

Cons: A new idea

Constant updates could be onerous

Versioning/doi tracking could be a challenge

How do you best assess **multiscale** research that covers very different domains of expertise, e.g., molecular biology, single-cell biology, and pathology?

What we think about when we read a new submission

- Topic: scope, audience
- Novelty and significance
- Practical value and generality
- Validation
- Application
- Not necessarily: technical correctness

- Does it enable new biological discovery?

How do you best assess **multiscale** research that covers very different domains of expertise, e.g., molecular biology, single-cell biology, and pathology?

Have papers become unreviewable?

- Too much expertise needed to evaluate a full study
- Difficult to do careful review of papers with 6 main text display items, 10 extended data items, and 40 supplementary items

We try to use reviewers that have the relevant technical expertise to assess the data quality and whether it supports the main claims. We (editors) synthesize advice from diverse experts to make decisions. We also use our own shared expertise and experience reviewing related papers.

Many researchers are thinking across scales these days, so getting useful expert feedback is doable.

How can we publish **3D data, VR user interfaces** in papers?

Conventional: Supplementary movies

Newer: Some journals can embed videos into the html versions of papers
Figshare

Brief Communication | Published: 12 October 2020

*v*LUME: 3D virtual reality for single-molecule localization microscopy

Alexander Spark, Alexandre Kitching, Daniel Esteban-Ferrer, Anoushka Handa, Alexander R. Carr, Lisa-Maria Needham, Aleks Ponjavic, Ana Mafalda Santos, James McColl, Christophe Leterrier, Simon J. Davis, Ricardo Henriques & Steven F. Lee ✉

Nature Methods **17**, 1097–1099 (2020) | Cite this article

Brief Communication | Published: 21 September 2020

Genuage: visualize and analyze multidimensional single-molecule point cloud data in virtual reality

Thomas Blanc, Mohamed El Beheiry, Clément Caporal, Jean-Baptiste Masson ✉ & Bassam Hajj ✉

Nature Methods **17**, 1100–1102 (2020) | Cite this article

Article | Open access | Published: 04 September 2024

Collaborative augmented reconstruction of 3D neuron morphology in mouse and human brains

Lingli Zhang, Lei Huang, Zexin Yuan, Yuning Hang, Ying Zeng, Kaixiang Li, Lijun Wang, Haoyu Zeng, Xin Chen, Hairuo Zhang, Jiaqi Xi, Danni Chen, Ziqin Gao, Longxin Le, Jie Chen, Wen Ye, Lijuan Liu, Yimin Wang ✉ & Hanchuan Peng ✉

Nature Methods **21**, 1936–1946 (2024) | Cite this article

HuBMAP, HCA and other paper packages have been successful in interlinking relevant papers. Could there be "**packages of paper packages**" as the human atlas effort grows beyond 20 consortia?

I think so, coordination is key. Timing the review and publication of many dozens of papers is challenging, so scale is a key consideration.

What would publishers/editors like to publish, but nobody is submitting it?

We see it all! The methods space moves rapidly, and most pursuable avenues that are conceptually straighrforward are quickly pursued.

Progress tends to be (1) Cool new method, looks awesome, does good on demos. (2) Lots of people try it with varying success, learn pros and cons. (3) Method(s) mature, and in crowded toolscapes, winners emerge. (4) Standards arise.

Data deluge. I strongly support a system of federated repositories for bioimaging data with free or low-cost data storage and FAIR sharing.

It would be great if subdisciplines within microscopy would have mutually agreed upon standards for data sharing. What is raw data? Can compressed data be stored and shared? If so, what is the optimal compression. What about file formats and metadata?

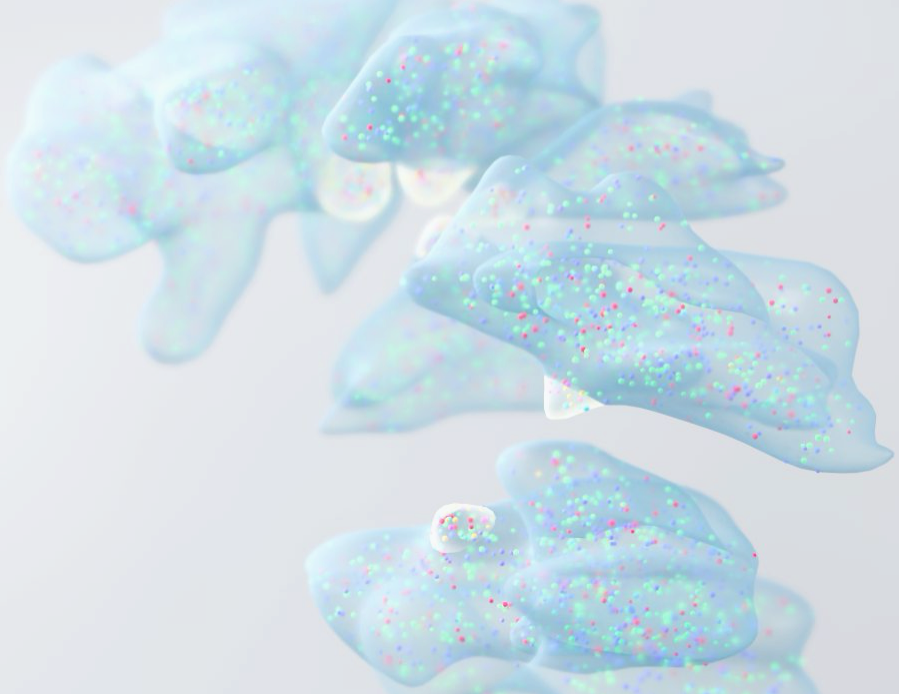
Is the highly multiplexed imaging field and groups like HuBMAP and HTAN and source of guidance on these issues?

Thanks to the organizers!

Follow up with me **rita.strack@us.nature.com**

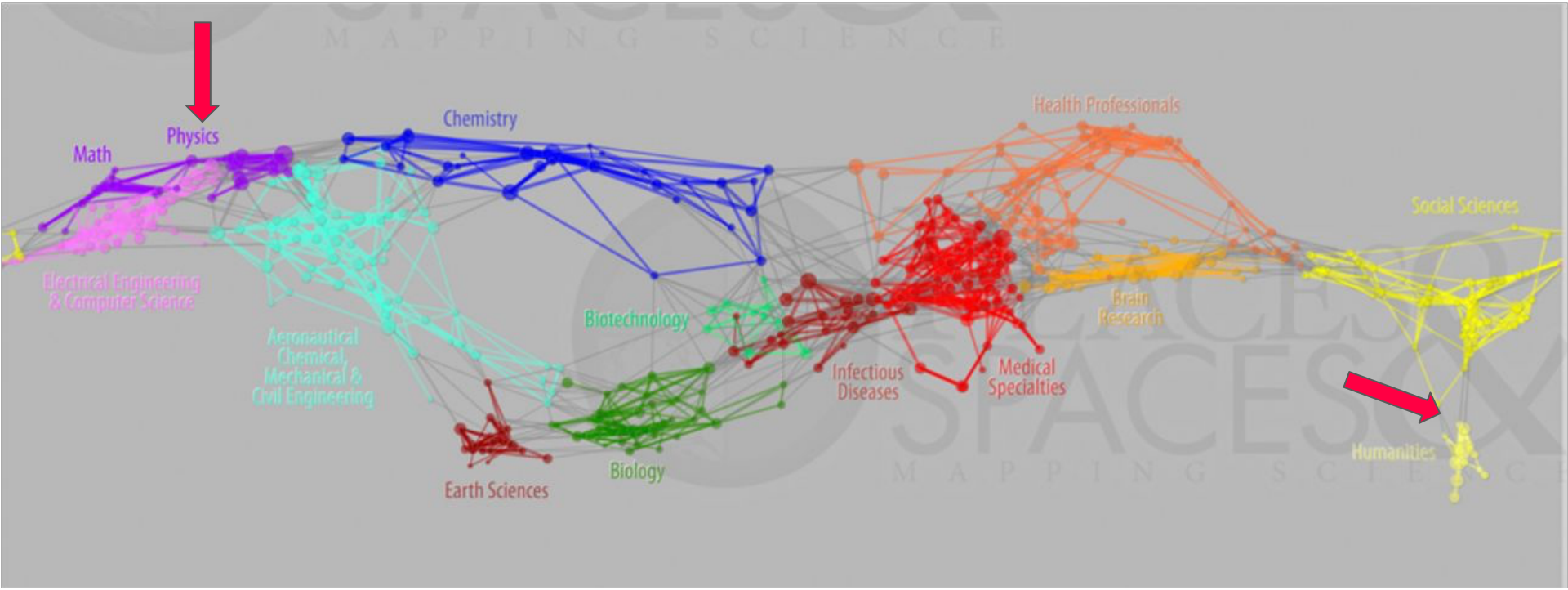
Twitter/X **@rita_strack**

Bsky @ritastrack.bsky.social



Andrea Scharnhorst, *Royal Netherlands Academy of Arts and Sciences - Data Archiving and Networked Services*

Academic background



Klavans, Richard and Kevin W. Boyack. 2007. *Maps of Science: Forecasting Large Trends in Science*. Courtesy of Richard Klavans, SciTech Strategies, Inc. In “3rd Iteration (2007): The Power of Forecasts,” *Places & Spaces: Mapping Science*, edited by Katy Börner and Julie M. Davis. http://scimaps.org.

Editing Special Issues (journals) and Book collections

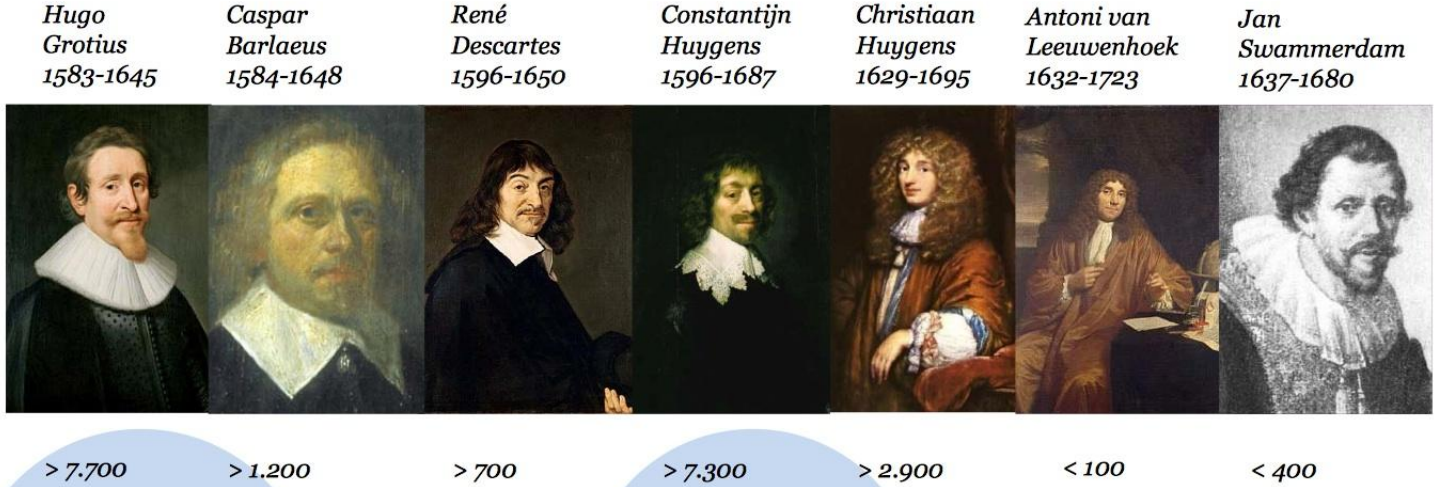
They are part of *Formal Scientific Communication*.

Ideas emerge in the brain of **one** person! But they can only fly and influence mankind when **shared** (orally or written or...).

It started with *Letters* during Enlightenment -> Republic of Letters

Circulation of Knowledge and Learned Practices

in the 17th century Dutch Republic. A web-based Humanities' Collaboratory of Correspondences



Picture from [CKCC project] Mijnhardt Utrecht University, Van den Heuvel, KNAW and many others

From Letters to Journals ....

Letters bundled in journals -> https://en.wikipedia.org/wiki/Academic_journal

"*Journal des sçavans*. The journal's first issue was published on 5 January 1665. It was aimed at people of letters, and had four main objectives:[5]

1. review newly published major European books,
2. publish the obituaries of famous people,
3. report on discoveries in arts and science, and
4. report on the proceedings and censures of both secular and ecclesiastical courts, as well as those of universities both in France and outside."

What is a journal - in science dynamics?

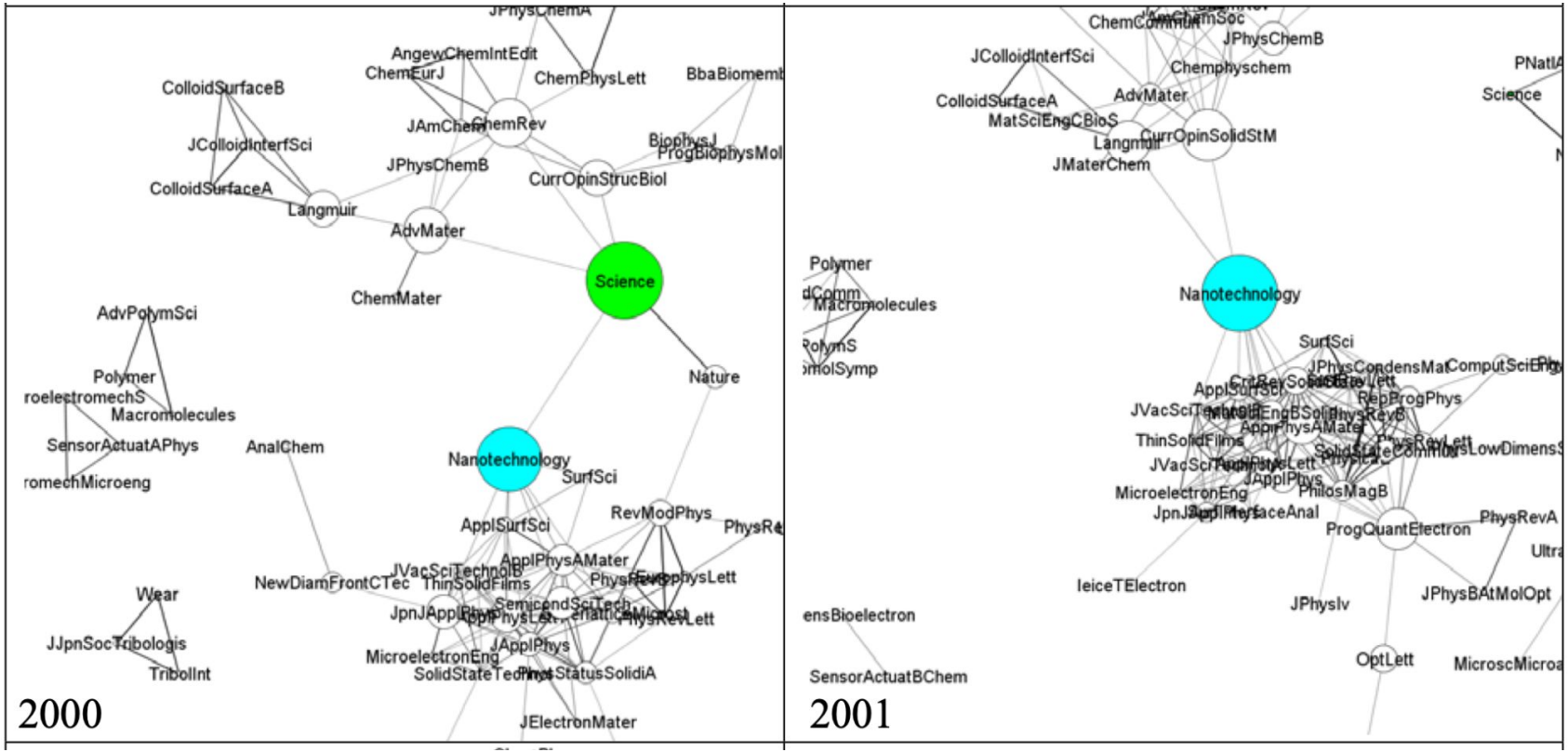
The sciences (all, academia) have grown and differentiated into disciplines (Mathematics, Physics, Biology, Engineering, Social Sciences, Humanities...), and subdisciplines and fields and *specialities*.

Science of science has investigated these structures, and found in the 1950's that specialties (or special fields) are *invisible colleges* of about 100-200 persons which know each other (from formal scientific communication and sometimes personally) and work on one research topic/question.

Traditionally, journals represents those cognitive structures (disciplines, fields, subfields or even specialties).

With new ideas new journals emerge.

Networks of journals - Loet Leydesdorff



L. Leydesdorff: Journals, entry in David H. Guston, *Encyclopedia of Nanoscience and Society*. London: Sage, 2010, https://www.leydesdorff.net/nano10/

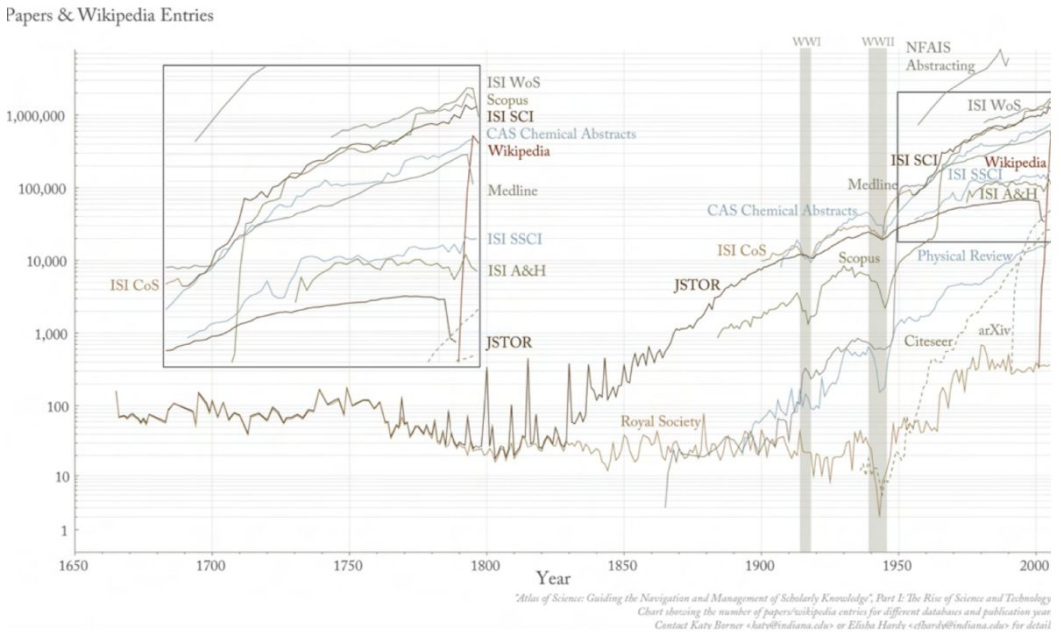
Journal, special issues and book collections

- Journals represent a field; an Editor-in-chief together with the Editorial Board acts as Guardian of the field: What belongs to it? What is new and worth to be published? How should the knowledge be shared?
- Who decides what is right or wrong? - Norms are set by groups of people
- Peer review is at the heart of the self-organised nature of the sciences
- For authors: it is proof to belong to a *scientific community*, prestige, career steps depend on publications (and citations)

From Small World to information explosion

Earthquakes on science world

Growth of the science system

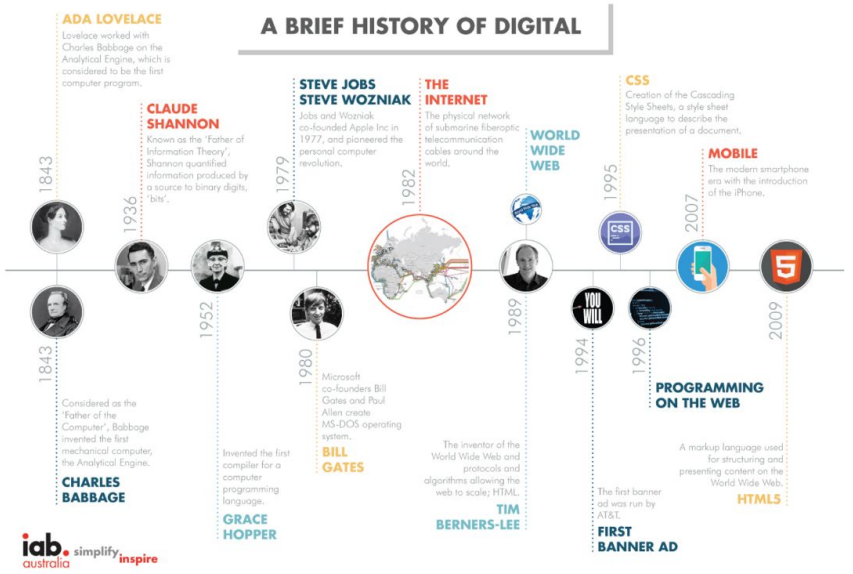


Katy Börner: Atlas of Science, 2010

From Small World to information explosion

Earthquakes in world of science

Print, Computer, Internet



Print (1440)

Computer

Internet/WWW

Source: https://web.archive.org/web/20190716132221/https://www.iabaustralia.com.au/iab-blog/blog-articles/entry/a-brief-history-of-digital-it-s-always-good-to-reflect

Herbert vdS: Webarchive your resources!

Information is a web - we are humans not spiders and need “spaces” to navigate

- Journals are still around, new journals appear
- Special issues serve as ‘topic containers’ - same is true for book collections
- Making a special issue (or a book collections) is a way to create and manage a scientific community (even if it is a temporary one)
- Special issues can also represent findings from (external funded) *projects*

Workflow towards a special issue or book collection

- Define the main idea/topic/purpose including the audience
- Find co-editors ! [it is a lot of work]
- Find authors (open or closed call for contributions)
- Think about the style/lengths/types of contributions which fit your purpose.
- Form the loose bunch of authors into a group:
    - Easier if they work together in a project
    - Workshop (series) also useful
- Planning and a timeline which also allows intellectual interactions (mutual reading, reviewing, ...)

Examples *Shamelessly from own publication list*

K. Börner, A. Scharnhorst (Eds.) (2009) *Science of Science: Conceptualizations and Models of Science*. Special issue. *Journal of Informetrics*3(3)
New subfield

Scharnhorst, Andrea, Katy Börner, and Peter Besselaar (Eds.). (2012). *Models of Science Dynamics*. Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-23068-4.
Workshop series, new subfield, book collection

Gläser, J, Glänzel, W & Scharnhorst, A (2017). *Same data – different results? Towards a comparative approach to the identification of thematic structures in science* Special issue. *Scientometrics*, vol. 111, no. 2.
Workshop series, working on shared dataset

Smiraglia, R., A. Scharnhorst (Eds.) (2021) *Linking Knowledge*. *Linked Open Data for Knowledge Organization and Visualization*. Baden-Baden, Ergon-Nomos, doi: 10.5771/9783956506611 (zenodo editor version OA: https://zenodo.org/record/6513663#.YqMf8y8RphA)
Project, bridge between communities

Chambers, S., Palkó, G., Morselli, F., Ferguson, K., & Scharnhorst, A. (Eds) (2023). Book of Abstracts, DARIAH Annual Event 2023: Cultural Heritage Data as Humanities Research Data?. DARIAH Annual Event 2023 - Cultural Heritage Data as Humanities Research Data? (DARIAH AE 2023), Budapest, Hungary. Zenodo. https://doi.org/10.5281/zenodo.8340671
Proceedings, abstract based, activities of a network

Thanks to the organisers for creating this panel!

More information

Visit our website **www.dans.knaw.nl**

And follow us online

Mastodon @DANS_knaw_nwo

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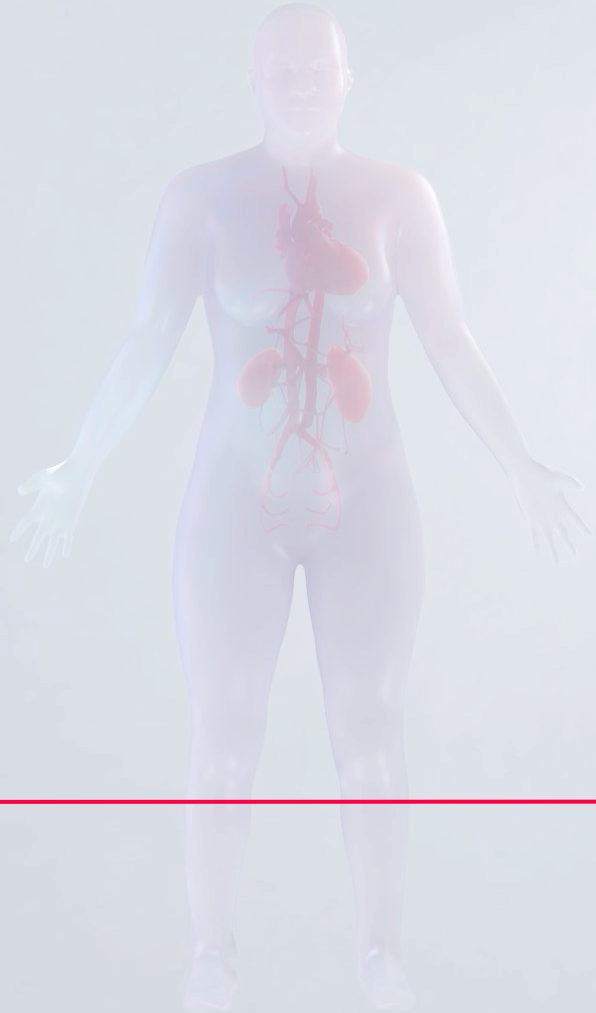
DANS is an institute of KNAW and NWO
Dutch national centre of expertise and repository for research data



Q&A

https://humanatlas.io/events/2024-24h

Q&A

- How can the scientific community publish an **evolving** human atlas that has new data elements, higher coverage and accuracy, and new use cases every six months?
- How do you best assess **multiscale** research that covers very different domains of expertise, e.g., molecular biology (proteins and genes), single-cell biology, and pathology?
- How can we publish **3D data, VR user interfaces** in papers?
- HuBMAP, HCA and other paper packages have been successful in interlinking relevant papers. Could there be "**packages of paper packages**" as the human atlas effort grows beyond 20 consortia?
- What would publishers/editors **like** to publish, but **nobody** is submitting it?
- How can we use **AI** to navigate through oceans of informations, and different orientation systems?
- How does **AI** alter the paper-publishing process, specifically around generative AI for text and (animated) images?
- How can you **coordinate and invite** submission at many scales? How an you **find agreement** on what scales there are?

Thank you