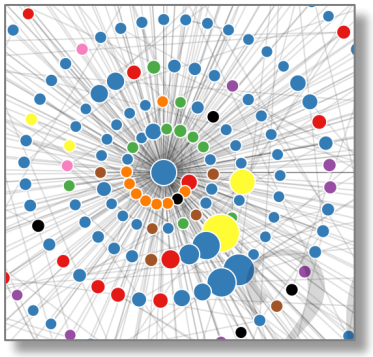
Science of Science



Systems View

Interchangeable components

Simple interactions

Regular or well-mixed structures

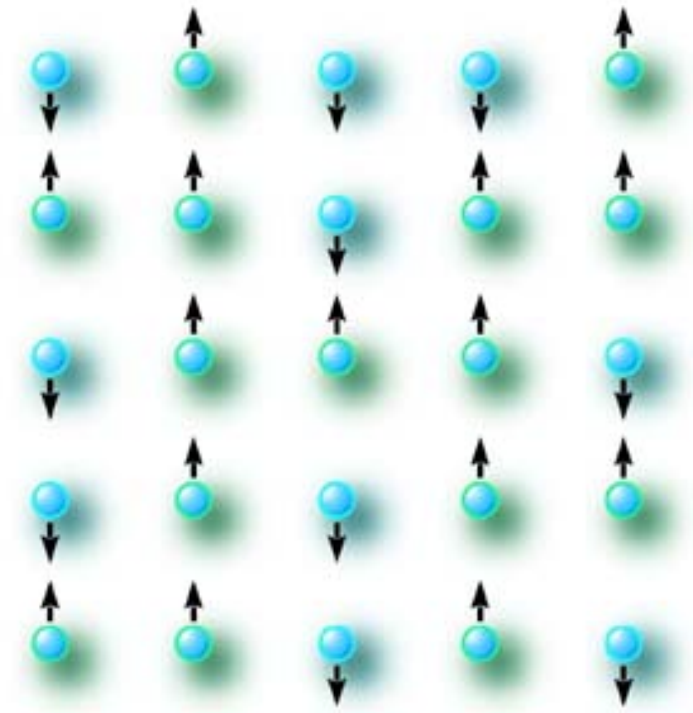


Image: Institute for Condensed Matter Physics
of the National Academy of Sciences of Ukraine

differentiated

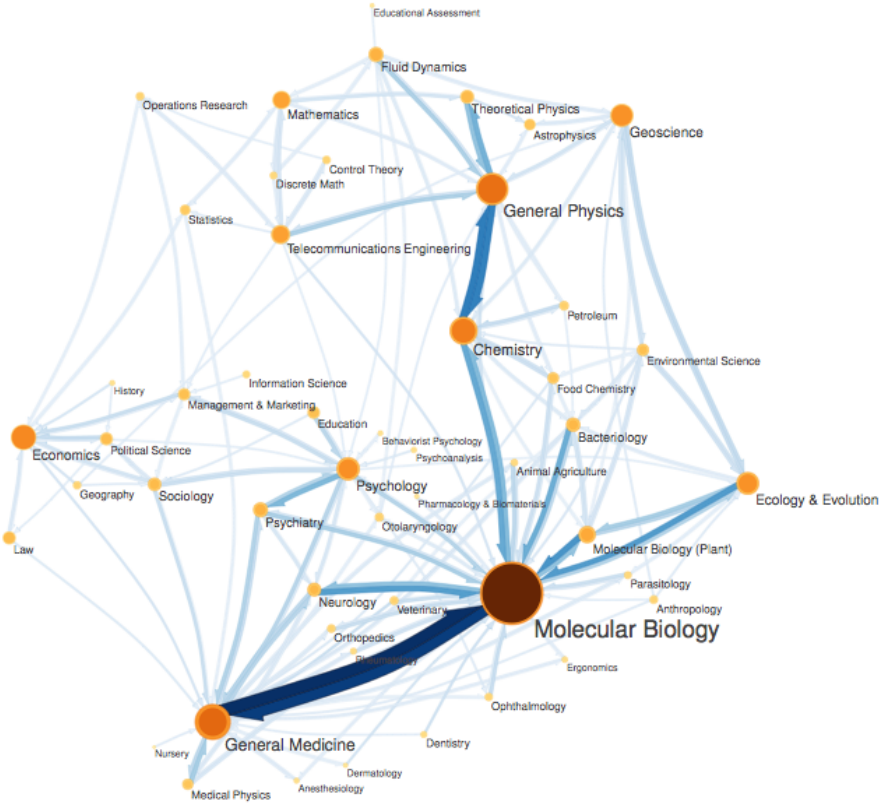
multipartite

integrated

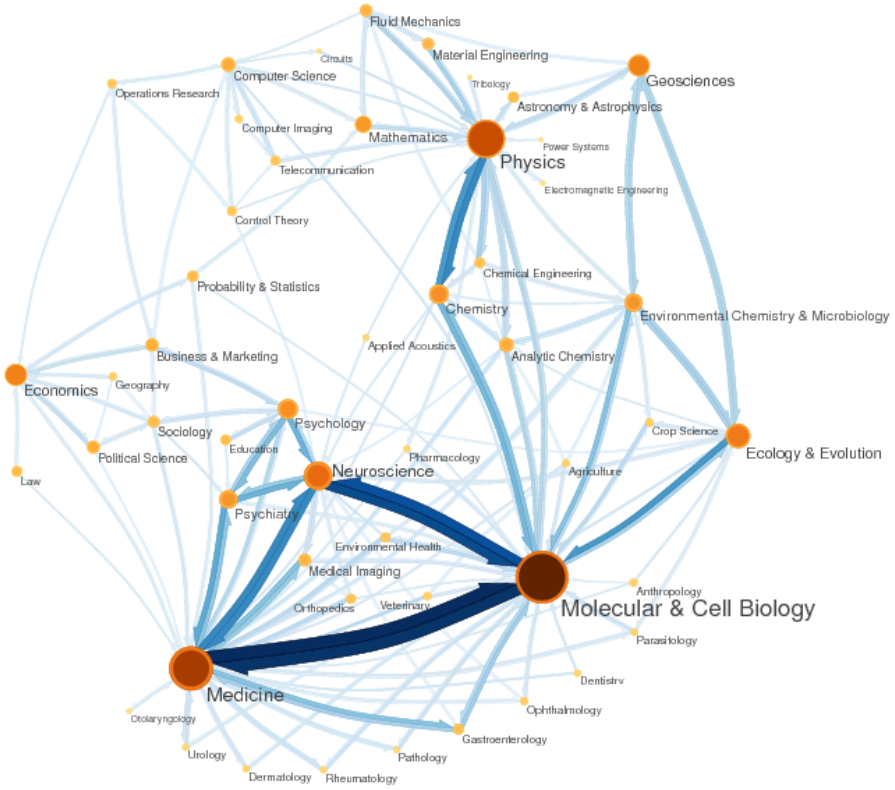
dynamic

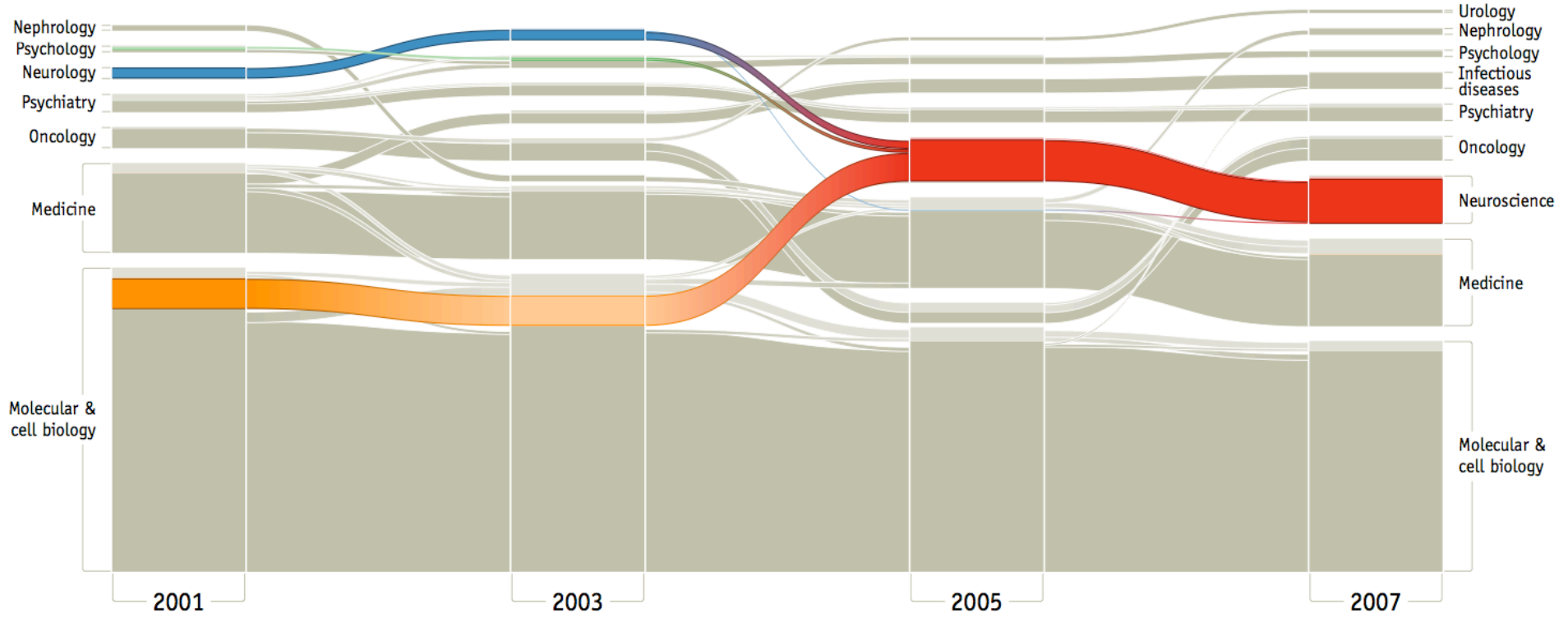
How do we *map* the evolution of scientific disciplines?

1995

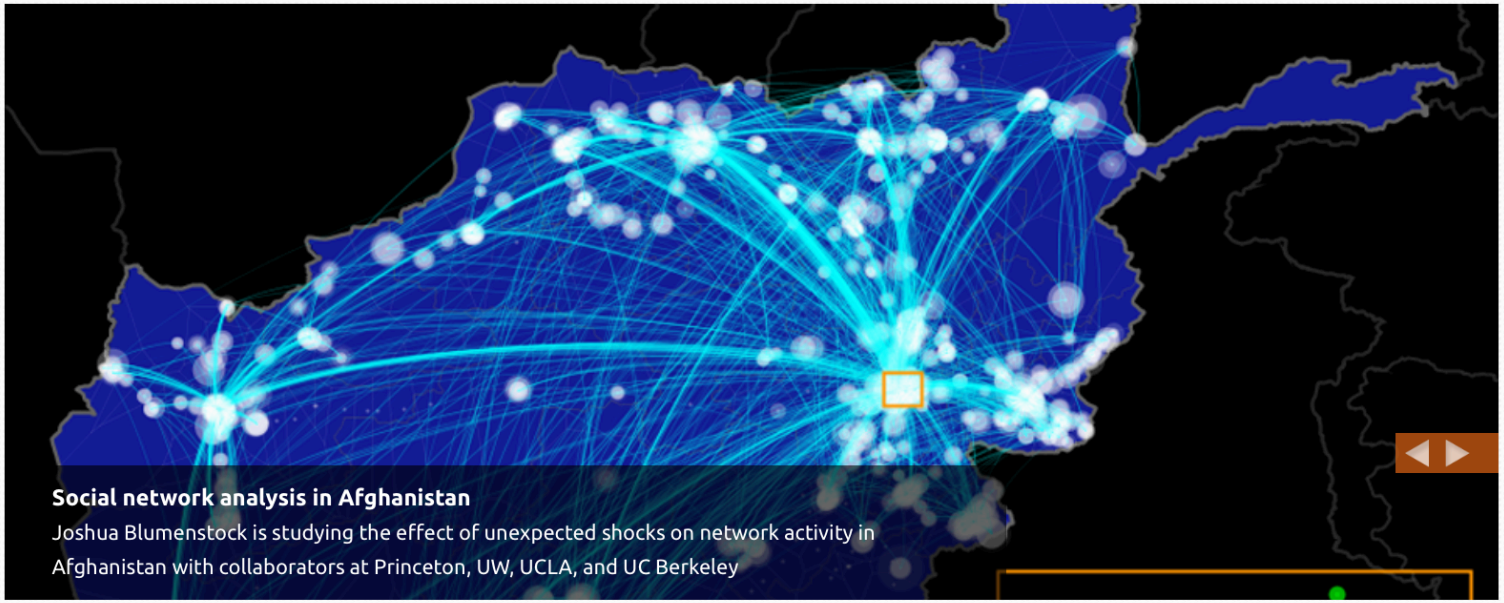

Educational Assessment
Fluid Dynamics
Operations Research
Mathematics
Theoretical Physics
Astrophysics
Geoscience
Control Theory
Discrete Math
Statistics
General Physics
Telecommunications Engineering
Petroleum
Chemistry
Environmental Science
Information Science
History
Management & Marketing
Food Chemistry
Education
Bacteriology
Economics
Political Science
Behaviorist Psychology
Psychoanalysis
Psychology
Animal Agriculture
Geography
Sociology
Pharmacology & Biomaterials
Ecology & Evolution
Psychiatry
Otolaryngology
Law
Molecular Biology (Plant)
Parasitology
Neurology
Veterinary
Anthropology
Molecular Biology
Orthopedics
Ergonomics
Ophthalmology
General Medicine
Nursery
Dentistry
Dermatology
Medical Physics
Anesthesiology

2004


Fluid Mechanics
Material Engineering
Circuits
Computer Science
Geosciences
Tribology
Operations Research
Astronomy & Astrophysics
Computer Imaging
Mathematics
Power Systems
Physics
Telecommunication
Electromagnetic Engineering
Control Theory
Chemical Engineering
Probability & Statistics
Chemistry
Environmental Chemistry & Microbiology
Applied Acoustics
Analytic Chemistry
Business & Marketing
Economics
Geography
Psychology
Crop Science
Sociology
Education
Ecology & Evolution
Political Science
Pharmacology
Neuroscience
Agriculture
Law
Psychiatry
Environmental Health
Medical Imaging
Anthropology
Orthopedics
Veterinary
Molecular & Cell Biology
Parasitology
Dentistry
Medicine
Ophthalmology
Otolaryngology
Gastroenterology
Urology
Pathology
Dermatology
Rheumatology



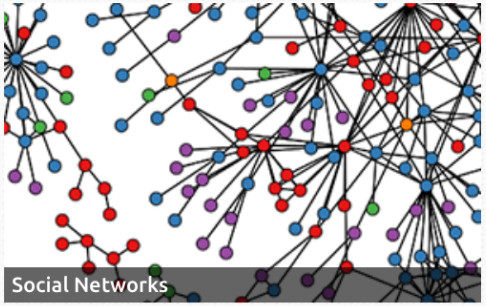
Rosvall & Bergstrom (2010) PLoS One

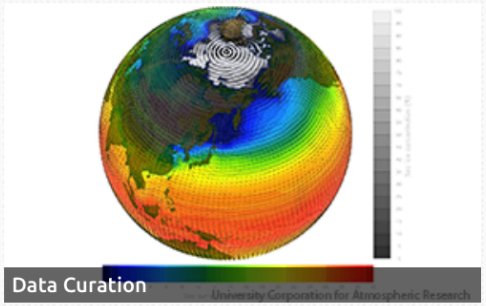


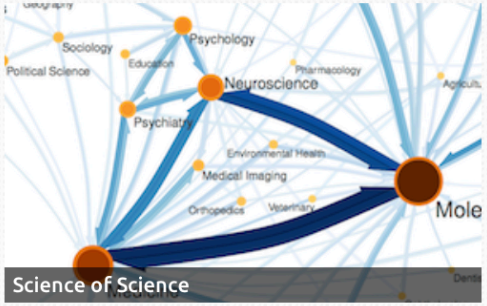
Social network analysis in Afghanistan

Joshua Blumenstock is studying the effect of unexpected shocks on network activity in Afghanistan with collaborators at Princeton, UW, UCLA, and UC Berkeley

Research Focus Areas







http://eigenfactor.org/projects/posts/citescore.php

EIGENFACTOR.org

Comparing Impact Factor and Scopus CiteScore

A real-time report of analysis by Carl T. Bergstrom and Jevin West.

December 8, 2016: This morning, Elsevier's Scopus released their ***CiteScore*** journal metric. This new metric is intended as an alternative to the popular Thomson-Reuters (now Clarivate Analytics) Impact Factor.

Some commenters have expressed concern, however, about a possible conflict of interest in the production this new metric. Elsevier not only owns the division (Scopus) that produces the CiteScore rankings, but also publishes a large fraction of the journals ranked therein. We consider it unlikely that Scopus is actively tampering with the citation counts or article counts in order to benefit Elsevier publications. But it does seem worth asking whether the particular choice of metric benefits Elsevier's publishing interests.

Over the next few days, we will be presenting a preliminary analysis here.

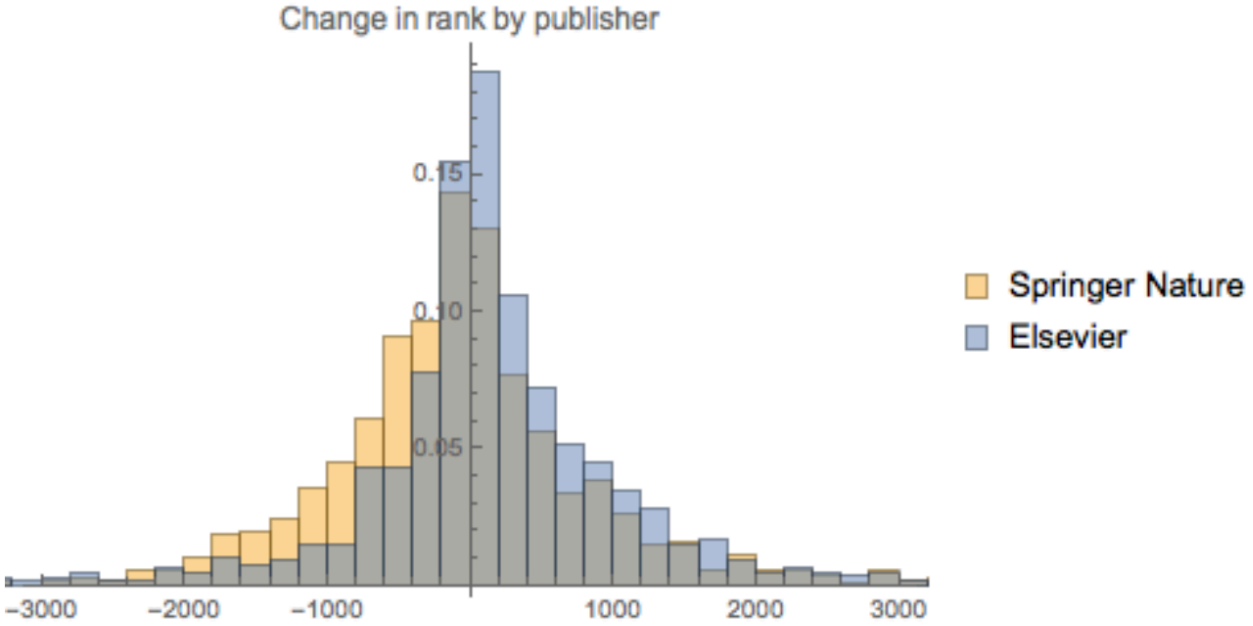
Effect on Nature Publishing Group

The scatterplot below shows the 60 highest-scoring journals (listed in both Scopus and the JCR) according to CiteScore ranking. On the horizontal axis is Impact Factor; on the vertical axis is CiteScore. (We've omitted *Ca-A Cancer Journal for Clinicians* from our analysis, as this is a massive outlier on both scales).

Looking at these data, one of the first things that leapt out at us is that there is a remarkable difference between the CiteScores that *Nature*-branded journals receive and the CiteScores that other journals with similar Impact Factors receive. The *Nature* journals are receiving much lower CiteScore values than we would expect given their Impact Factor scores. In other words, the Nature Publishing Group journals are taking a huge hit by this new metric.

Vilhena, Daril A., et al. "Finding cultural holes: how structure and culture diverge in networks of scholarly communication." *Sociological Science* 1 (2014): 221-238.

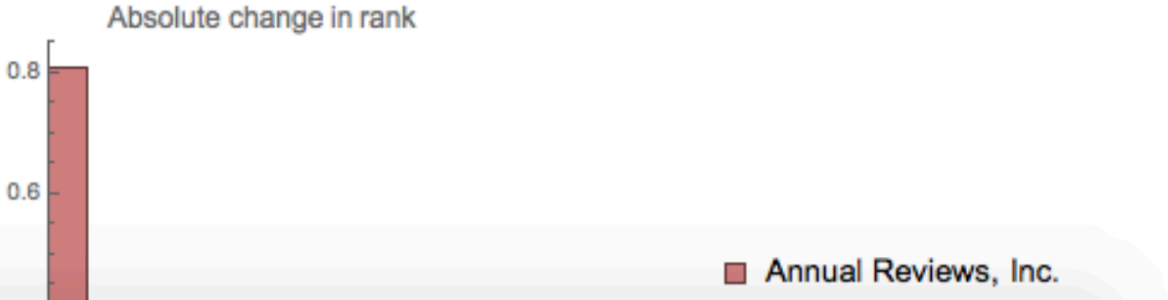
Of course, looking at means alones isn't nearly as informative as looking at the entire distribution. Comparing Elsevier journals to Springer Nature journals (even excluding the *Nature*-branded ones), we see that a majority of Elsevier journals impove their rank as we move from Impact Factor to CiteScore, whereas a majority of the Spinger Nature journals slip in rank.

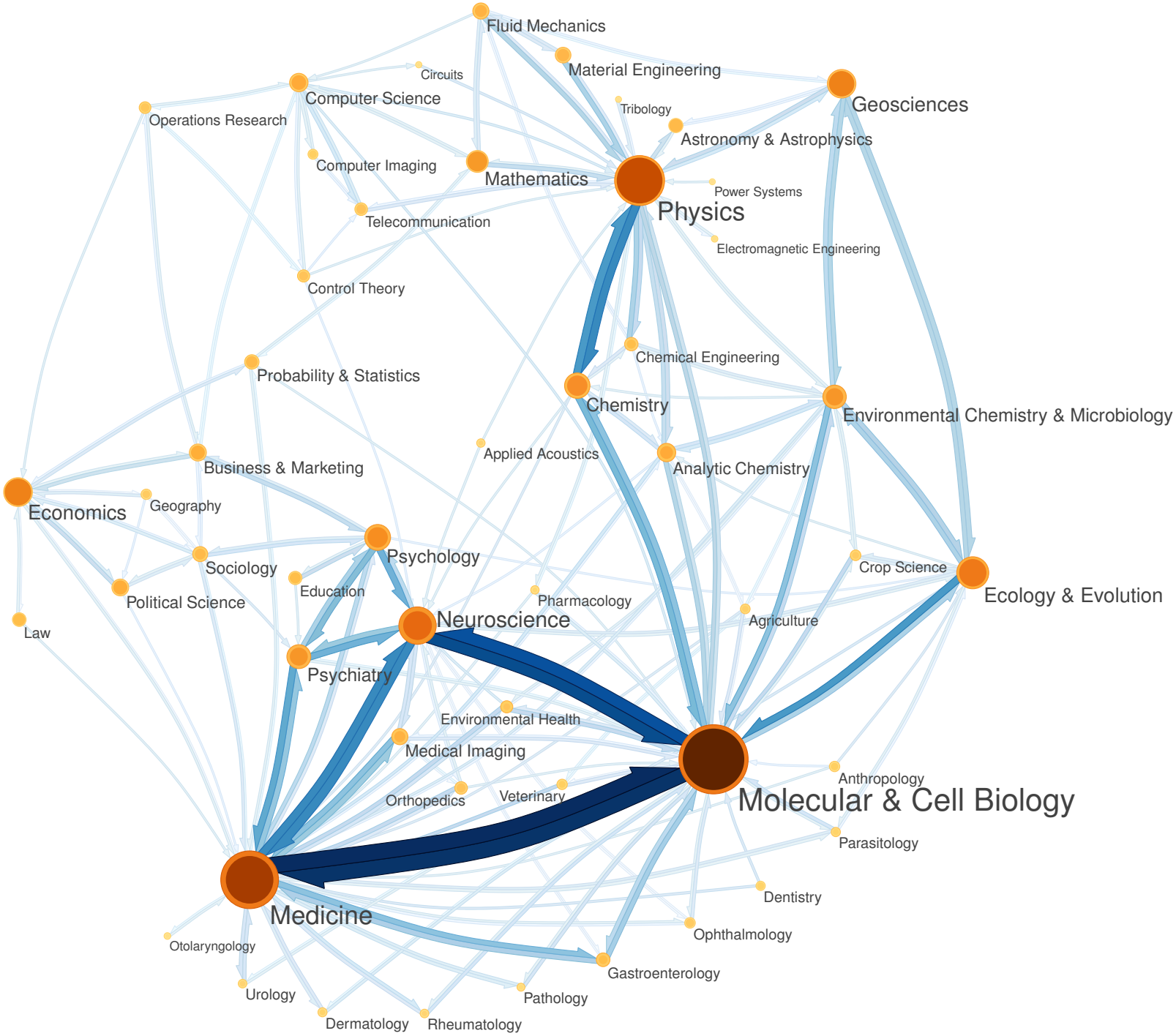


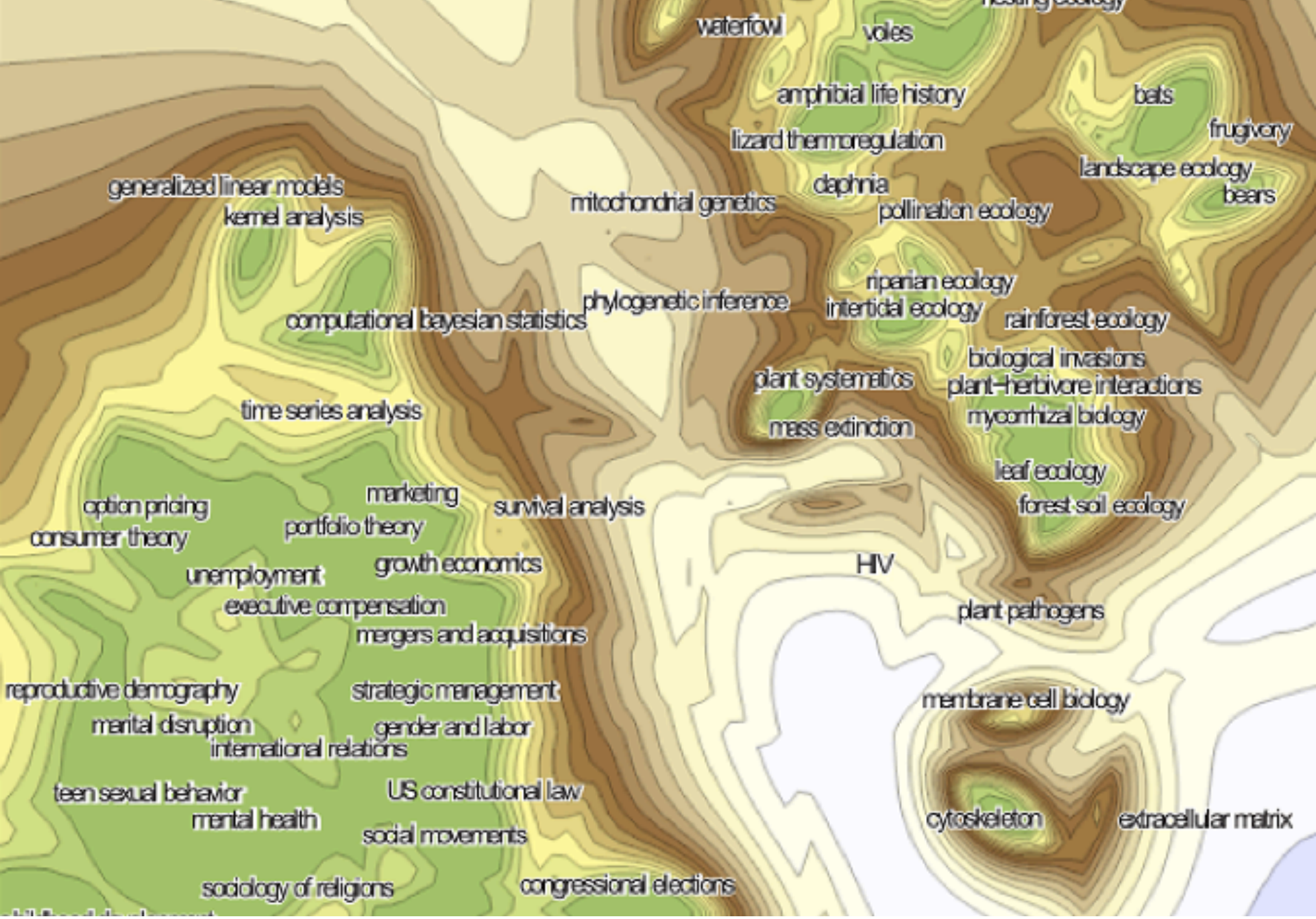
Looking at absolute changes in rank is probably a bit misleading, however. Viewed this way, a journal that moves from 9050th place to 9000th place has a bigger change in rank than a journal that moves from 59th place to 10th place. But the latter seems to be a much bigger and more important increase.

We see this is striking fashion when we compare the Emerald journals with the Annual Reviews Inc. journals. No Emerald journals in our data set are ranked in the top 1000 journals by Impact Factor, and most are ranked in below 5000th place. By contrast, more than half of the Annual Reports journals are ranked among the top 200 journals by Impact Factor.

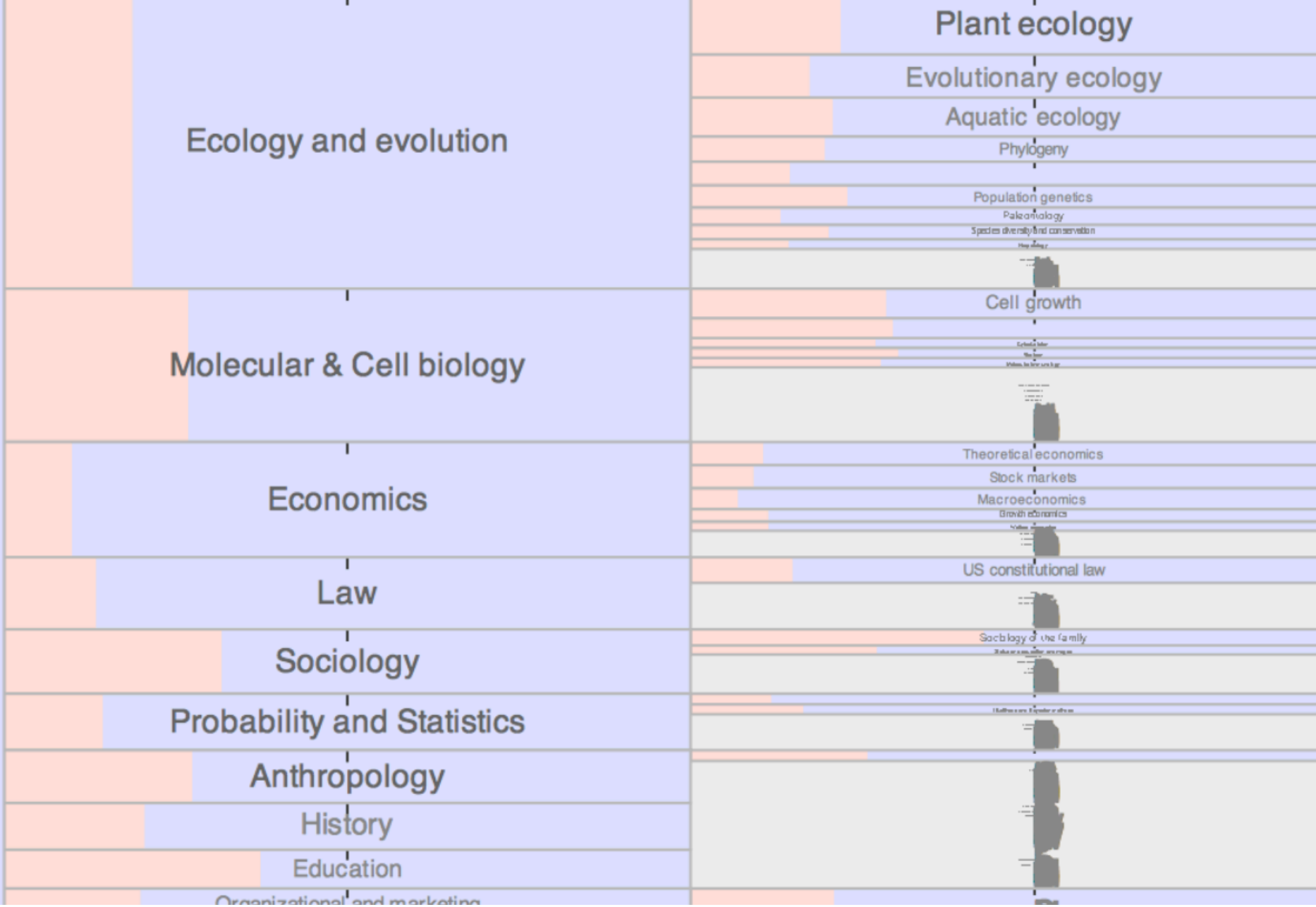
Both publishers benefit from switching to CiteScore, but if we consider absolute changes in rank, Emerald benefits far more.



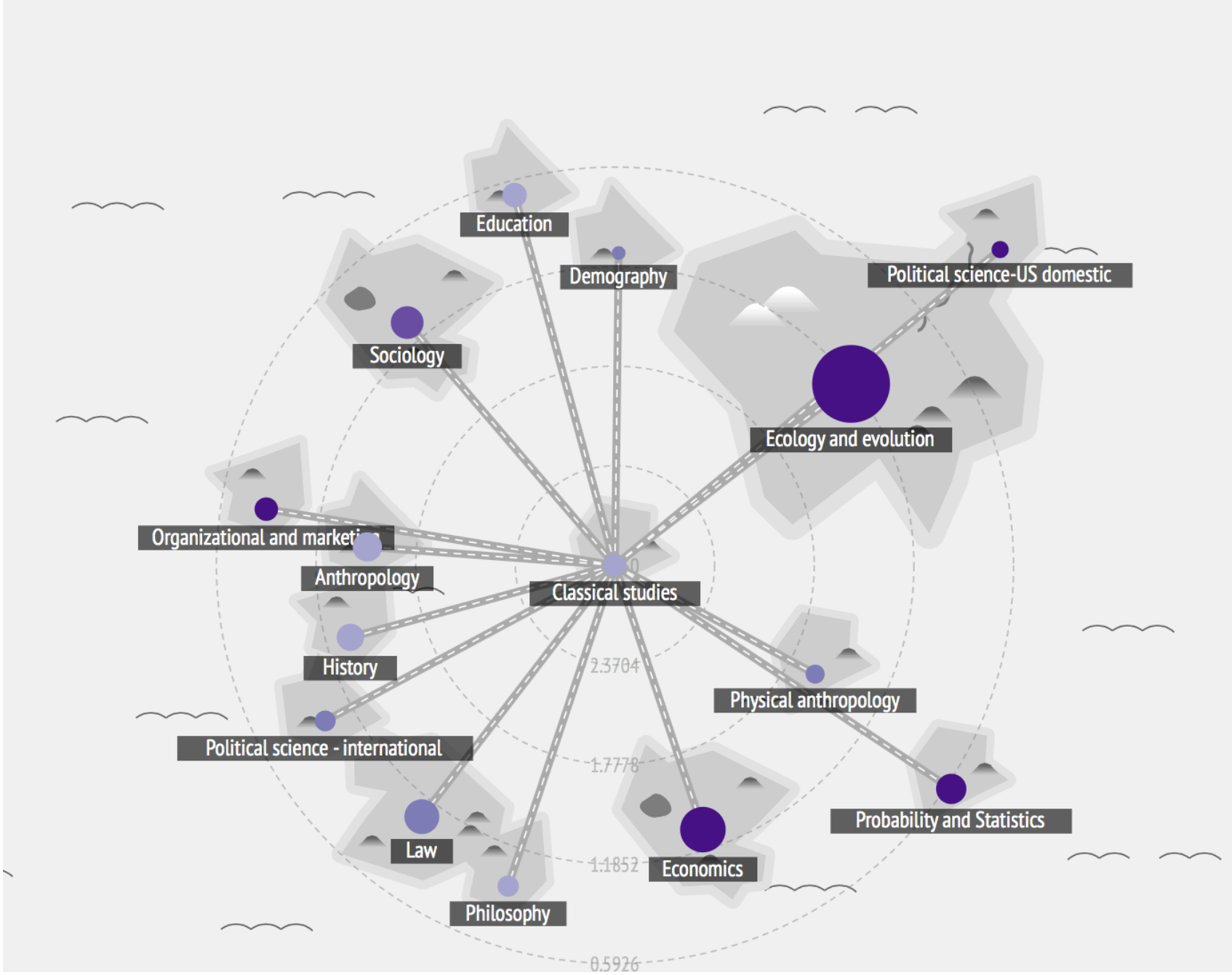

Fluid Mechanics
Material Engineering
Circuits
Computer Science
Geosciences
Operations Research
Tribology
Astronomy & Astrophysics
Computer Imaging
Mathematics
Power Systems
Physics
Telecommunication
Electromagnetic Engineering
Control Theory
Chemical Engineering
Probability & Statistics
Chemistry
Environmental Chemistry & Microbiology
Applied Acoustics
Business & Marketing
Analytic Chemistry
Economics
Geography
Psychology
Crop Science
Sociology
Education
Political Science
Pharmacology
Ecology & Evolution
Law
Neuroscience
Agriculture
Psychiatry
Environmental Health
Medical Imaging
Anthropology
Orthopedics
Veterinary
Molecular & Cell Biology
Parasitology
Dentistry
Medicine
Ophthalmology
Otolaryngology
Gastroenterology
Urology
Pathology
Dermatology
Rheumatology



Vilhena, Daril A., et al. "Finding cultural holes: how structure and culture diverge in networks of scholarly communication." *Sociological Science* 1 (2014): 221-238.



West, Jevin D., et al. "The role of gender in scholarly authorship." *PloS one* 8.7 (2013): e66212.



Hiniker et al. (2016) Toward the Operationalization of Visual Metaphor. [in review]

Visualizing Scholarly Influence Over Time

Influence of Pew Scholars

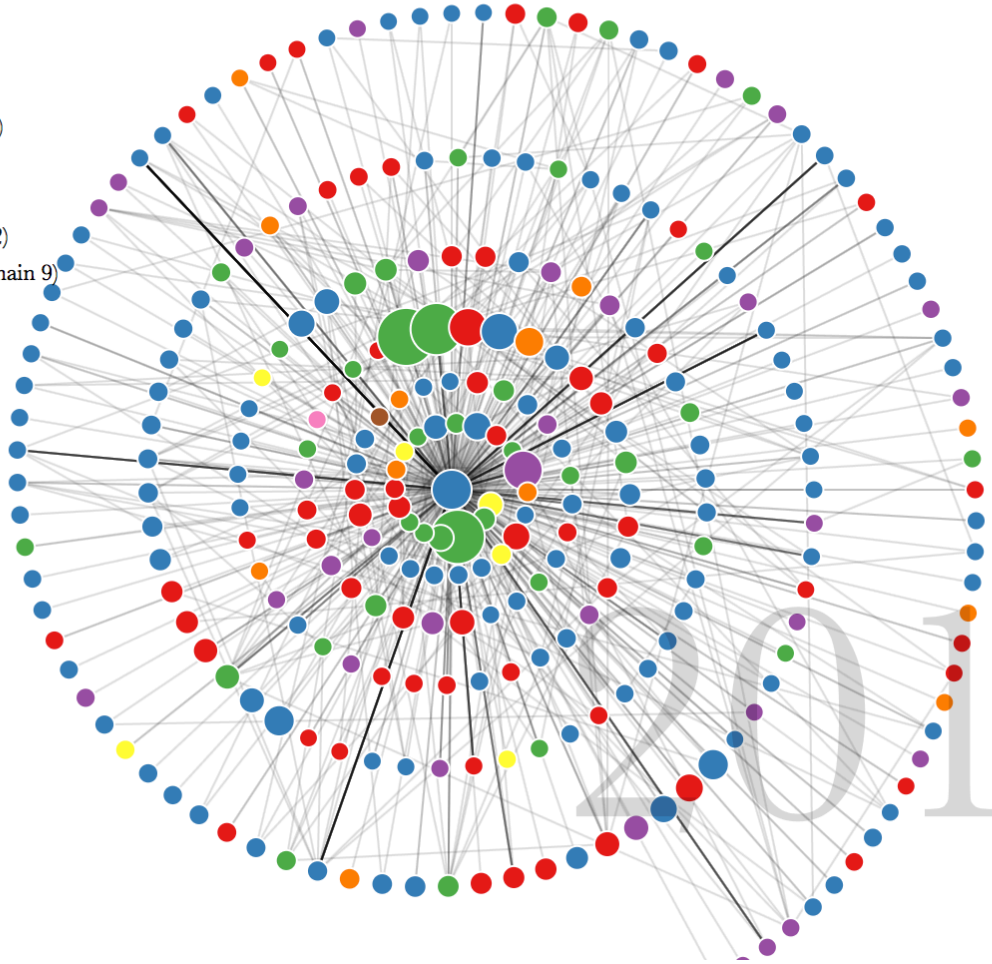
Mark W. Grinstaff

Learn More

- Papers in category "Chemistry" (domain 5)
- Papers in category "Medicine" (domain 6)
- Papers in category "Biology" (domain 4)
- Papers in category "Material Science" (domain 12)
- Papers in category "Engineering" (domain 8)
- Papers in category "Physics" (domain 19)
- Papers in category "Computer Science" (domain 2)
- Papers in category "Environmental Sciences" (domain 9)

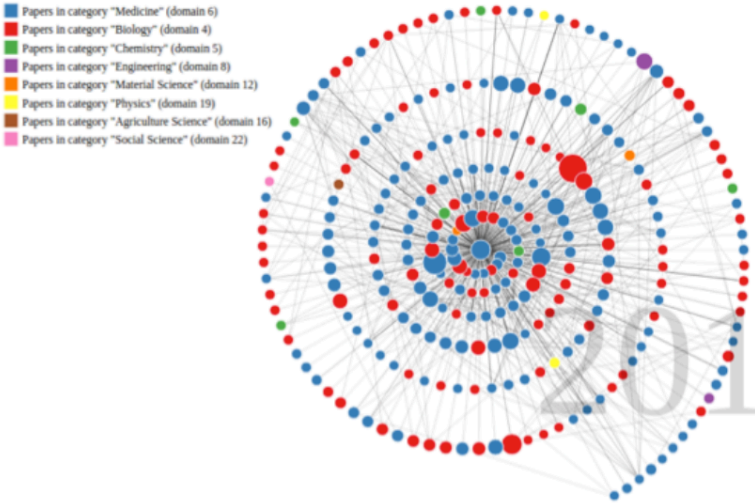
Mark W.
Grinstaff

Pew Scholar
1999



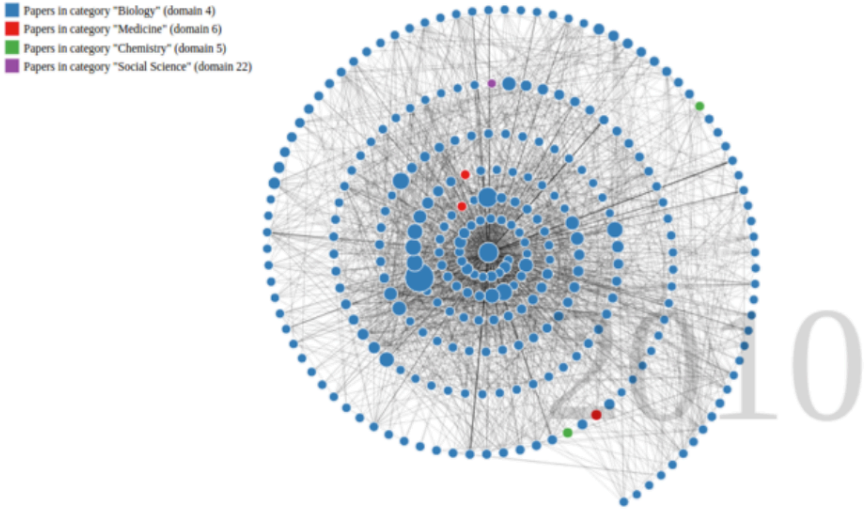
Portenoy, Jason, Jessica Hullman, and Jevin D. West. "Leveraging Citation Networks to Visualize Scholarly Influence Over Time." *arXiv preprint arXiv:1611.07135* (2016)

Comparing Authors



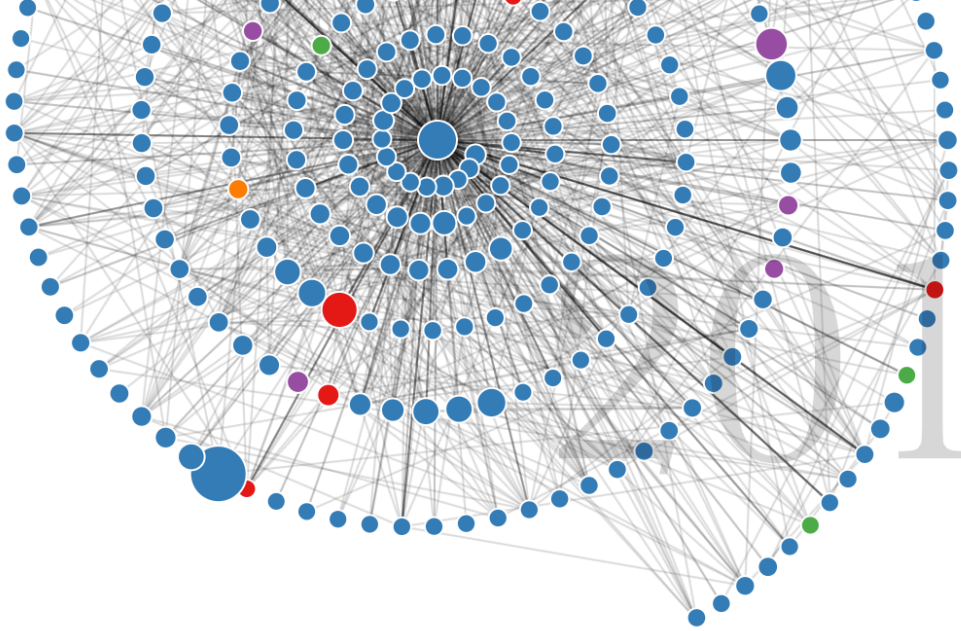
A more sparse network indicates fewer citations between papers shown in the network. This could be a result of the central scholar having impact across a wider set of academic communities.

A denser network means that the papers that cite the central author also tend to cite each other.

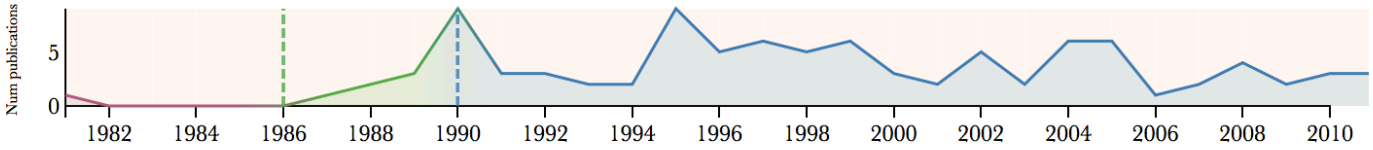


Philip A.
Hieter

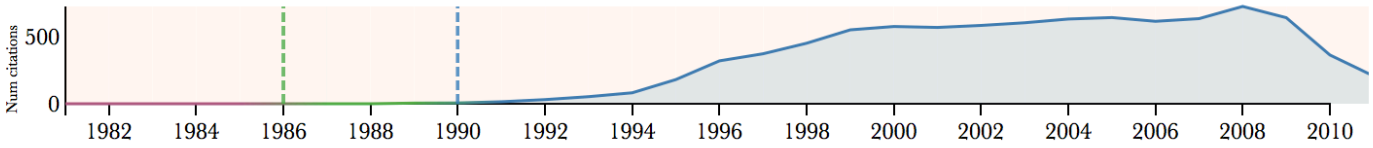
Pew Scholar
1986



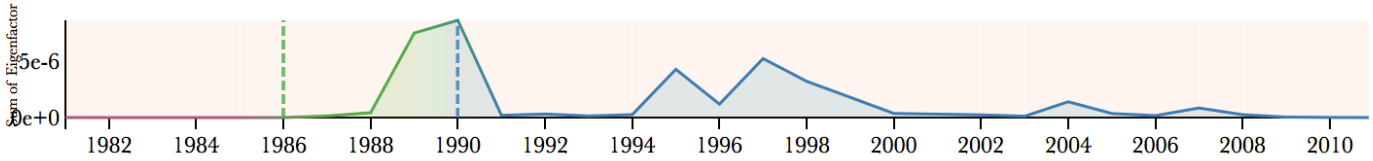
Number of publications



Number of citations received



Sum of eigenfactor for this author's publications by year



Acknowledgements

Jason Portenoy, Information School, University of Washington

Cecilia Aragon, HCDE, University of Washington

Martin Rosvall, Department of Physics, Umea University

Carl Bergstrom, Department of Biology, University of Washington