



# **Measuring and Tracking Research Knowledge Integration (and Transfer)**


**Alan Porter**  
**TPAC, Georgia Tech**  
**alan.porter@isye.gatech.edu**  
**404-384-6295**  
**&**  
**Ismael Rafols**  
**SPRU, University of Sussex**  
**i.rafols@sussex.ac.uk**





# Research Aims: Measuring & Tracking Research Knowledge Integration & Transfer

*Premise that Interdisciplinary research ("**IDR**") is vital & warrants study to understand & nurture*

1. Advance conceptualization and analytical algorithms for IDR indicators
  2. Visually depict knowledge interchanges via multiple network representations (Maps)
  3. Apply to **Nano** – to study the intellectual & social research networks, their evolution
  4. For better tools to gauge such research endeavors
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# Research Activities

- Web of Science **Subject Categories (“SCs”)** are a key base for our analyses
  - To characterize a set of papers (breadth of dissemination)
  - To assess the degree of **Integration** one or more papers reflect, based on the diversity of their cited SCs
  - To track research knowledge flow & impact (citing article SCs)
  - We also cluster into Macro-disciplines
- Updated our base matrix of Citing SCs X Cited SCs for 2007 [Rafols & Leydesdorff]
- Select analyses underway

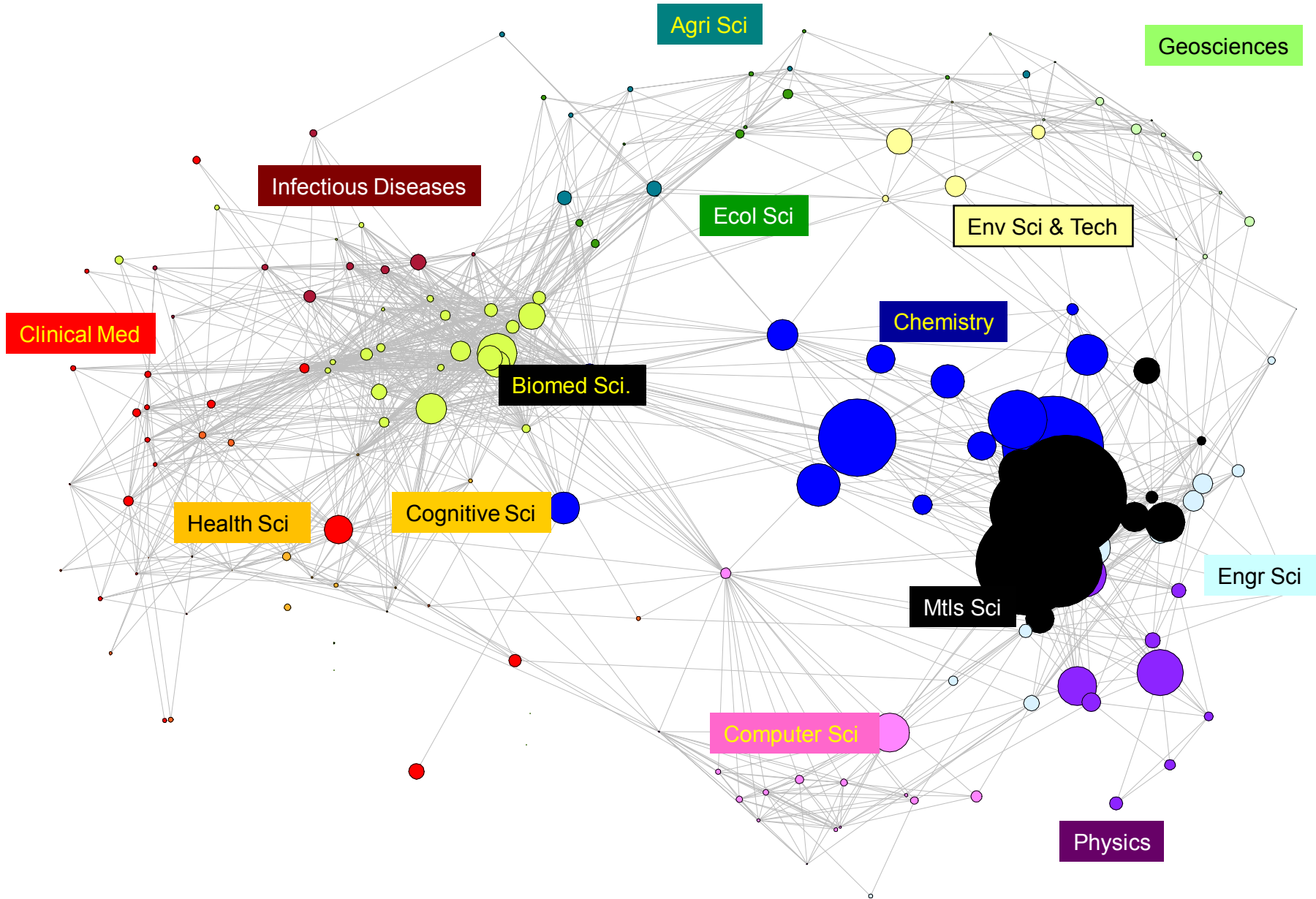
# Research Activities: ISSI Workshop

- International Conference on Scientometrics and Informetrics, Rio de Janeiro, July 14
- ***Tracking and evaluating interdisciplinary research: Metrics and Maps***
  - Conceptualizations and associated measures of interdisciplinarity
  - Varied approaches to visualize (map) the relative position of bodies of research
  - Assessment of the benefits and downsides of interdisciplinary research and the ensuing science policy implications.
- Short & long papers invited by April 17  
[www.sussex.ac.uk/units/spru/issi2009workshop](http://www.sussex.ac.uk/units/spru/issi2009workshop)

# Integration Score

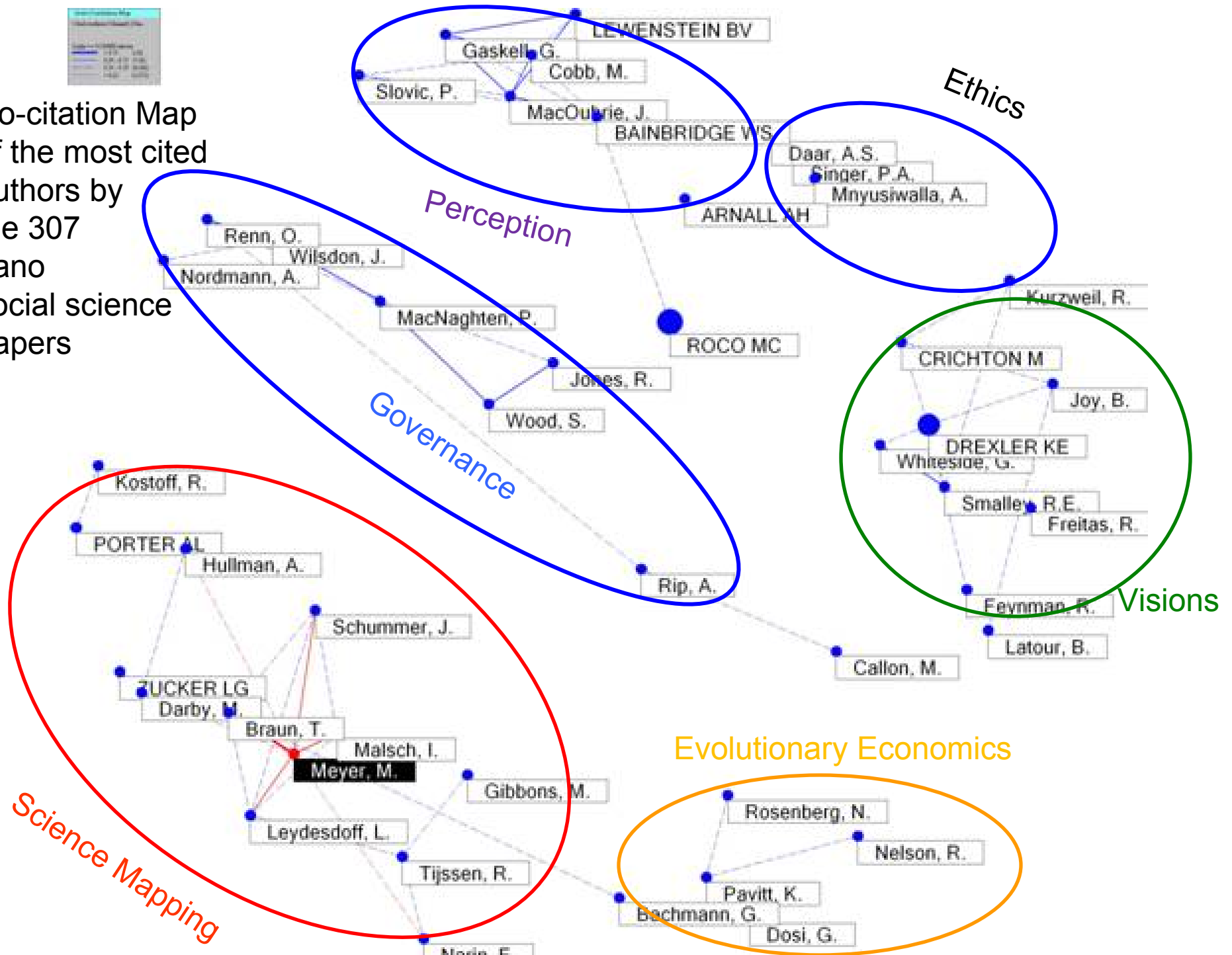
- Reflects the diversity of cited Subject Categories (SCs), taking into account their degree of association
- Ranges from:
  - 0 (stand alone research that cites work from a single SC) to
  - 1 (highly Integrative research drawing from multiple, ~unrelated SCs)
- 3 sets of nano-related articles from Web of Science, 2008 – I score averages 0.63
- 6 Benchmark 2005 samples (not just nano)
  - 5 average ~0.62
  - Math averages 0.29

# Nano (2008) over Base Map of Science





Co-citation Map  
of the most cited  
authors by  
the 307  
nano  
social science  
papers



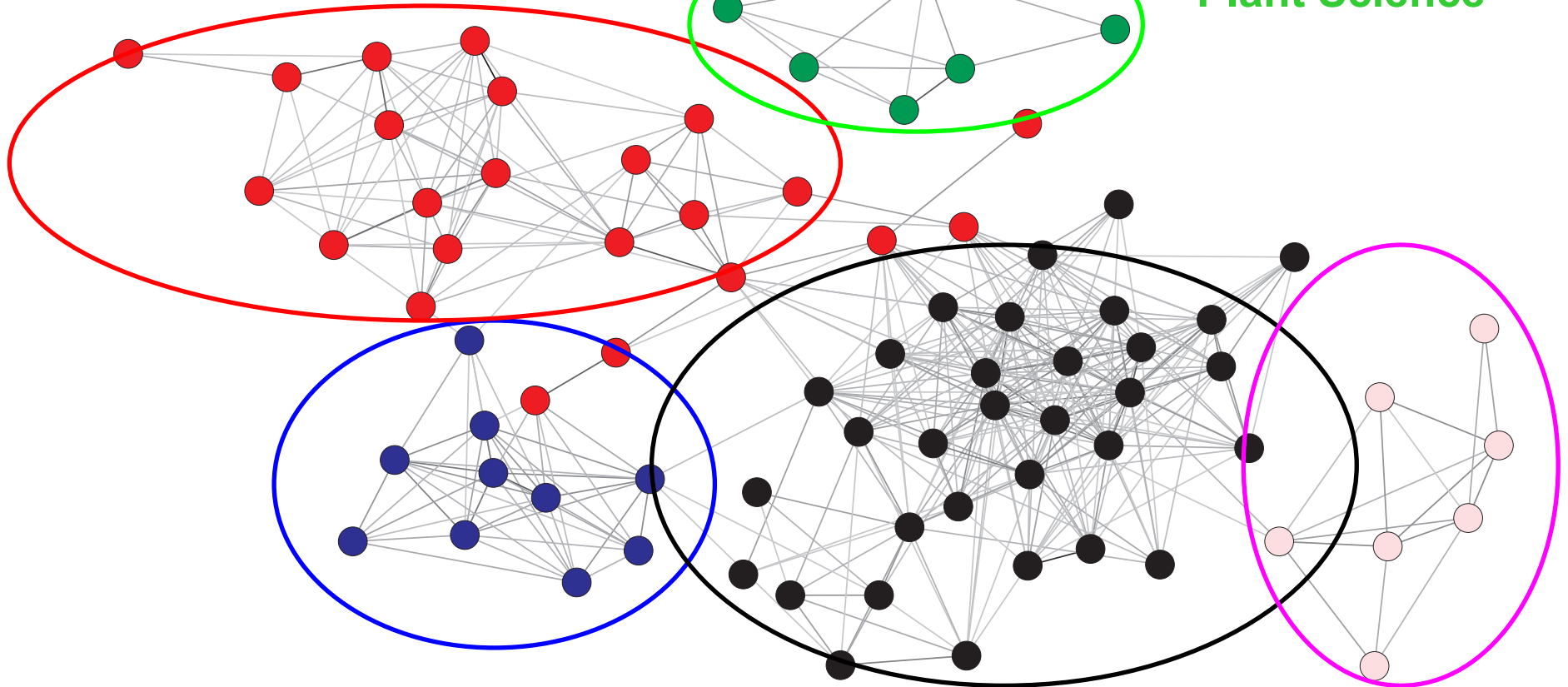
Science Mapping

**NETWORK COHERENCE  
2004-06**

Cilia related research

**Chemistry of kinesin**

**Plant Science**



**Cellular functions of kinesin**

**Mechano-chemistry**

**Material science  
applications (Nano)**

## Papers

- Porter, A.L., and Rafols, I., **Is Science Becoming more Interdisciplinary? Measuring and Mapping Six Research Fields over Time**, *Scientometrics*, to appear
- Porter, A.L., and Youtie, J., **How Interdisciplinary is Nanotechnology?**, *Journal of Nanoparticle Research*, in press
- Porter, A.L., and Youtie, J., **Locating Nanotechnology Among the Disciplines**, *Nature-Nanotechnology*, under submission.
- Rafols, I., and Leydesdorff, L. **Content-based and Algorithmic Classifications of Journals: Perspectives on the Dynamics of Scientific Communication and Indexer Effects**, *JASIST*, to appear.