“Modeling and Mapping Science”

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An ecology of knowledge

NanoBank, a digital library of:

- 580,710 articles written by 466,602 different authors published in 8,300 journals from 1970 to 2006
- Articles have been selected from *ISI Science Citation Index*, *Social Science Citation Index*, and *Arts & Humanities Citation Index* using two methods:
  - search for 379 predefined terms
  - probabilistic procedure for the automatic identification of additional terms

3 types of collaboration modes

- Nanoscience collaboration distribution
  - The log-normal "hook"
  - The power law tail
  - The anomalous peak
Collaboration between nano subfields

Fraction of collaborators belonging to some subfield

Level of internal collaboration

Internal collaboration, normalized for the size of a subfield

Normalized fraction of collaborators from some subfield...
Cognitive structure of LIS

- Data
  - 16 LIS journals
  - 20 years
  - 10000 articles
  - 8000 unique title words
    - Remove common and non-specific
  - Top 100 words
    - Covers 90% of articles
Five major areas of LIS as obtained by second-order clustering using Jaccard index and their topics.

Heatmap of 100 most frequent terms and LIS journals.
Dendrogram of LIS journals based on article title terms similarity index