



Bibliometrics

Limitations and Possibilities

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Definition

The application of statistical methods to the study of bibliographic data.

Literature Review



Search for
relevant literature



Evaluate
sources



Identify themes,
debates and gaps



Outline
the structure



Write your
literature review


Bibliometric Search


Literature


Focus on Relevance


| Sources | Authors | Documents |
|----------------|---------------|------------|
| Most relevant | Most relevant | Most cited |
| Dynamics | Papers/Year | References |
| H-Index | H-Index | Words |
| Bradford's Law | Countries | |
| | Lotka's Law | |


Facets/Metadata


Open Access 


Year 


Author name 


Subject area 


Document type 


Source title 


Publication stage 


Keyword 

Affiliation 

Funding sponsor 

Country/territory 

Source type 

Language 

Limit to

Exclude

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Bibliometric Search

6,521 document results

TITLE-ABS-KEY ("origins of life")


 [Edit](#)  [Save](#)  [Set alert](#)


Search within results...





Refine results


[Limit to](#) [Exclude](#)


Open Access 

☐ All Open Access (2,337) 


☐ Gold (764) 


☐ Hybrid Gold (342) 

☐ Bronze (576) 

☐ Green (1,885) 


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Year 

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Document title

Authors

Year

Source

Cited by

| | | | | | |
|----------------------------|---|---|------|---|---|
| <input type="checkbox"/> 1 | Incorporation and localisation of alkanes in a protomembrane model by neutron diffraction | Misuraca, L., LoRizzo, J., Oger, P., Peters, J., Demé, B. | 2023 | Biochimica et Biophysica Acta - Biomembranes 1865(3),184119 | 0 |
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| | | | | | |
|----------------------------|---|--------------|------|---|---|
| <input type="checkbox"/> 2 | Rethinking nucleic acids from their origins to their applications | Benner, S.A. | 2023 | Philosophical Transactions of the Royal Society B: Biological Sciences 378(1871),20220027 | 1 |
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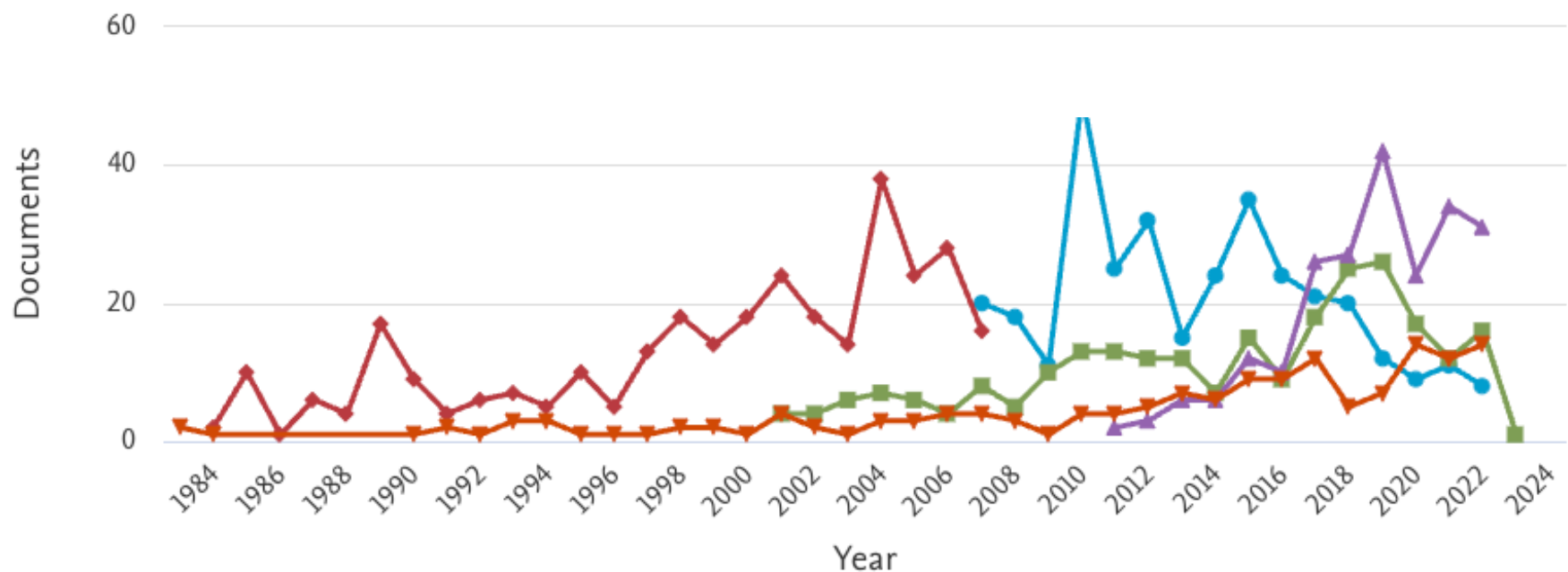
[Related documents](#)

Analyze Search Results

Documents per year by source

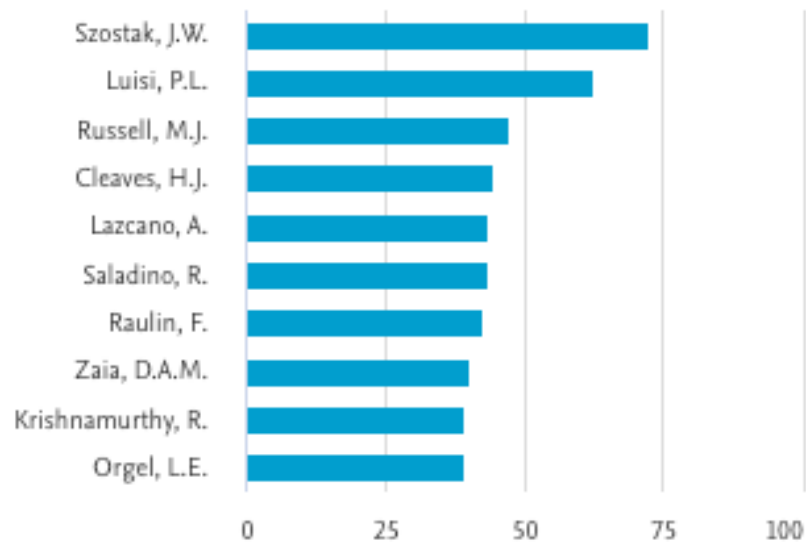
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[Compare sources and view CiteScore, SJR, and SNIP data](#)

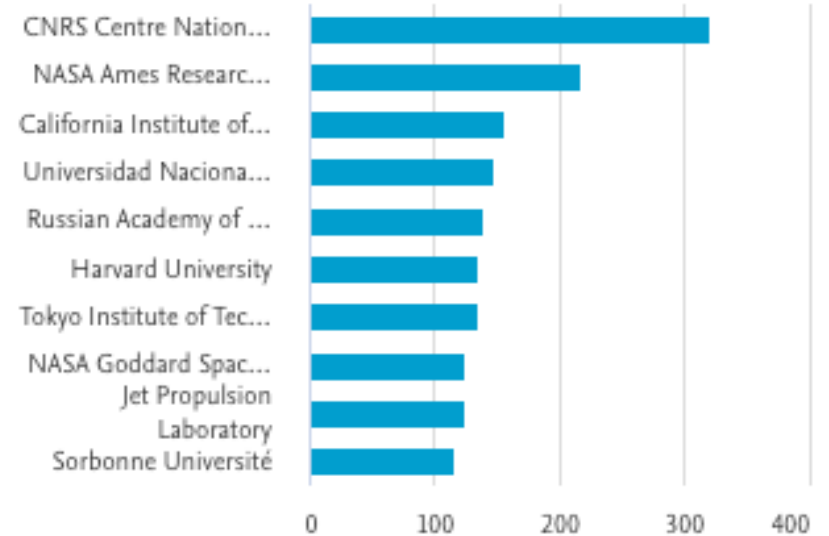


Analyze Search Results

Documents by author



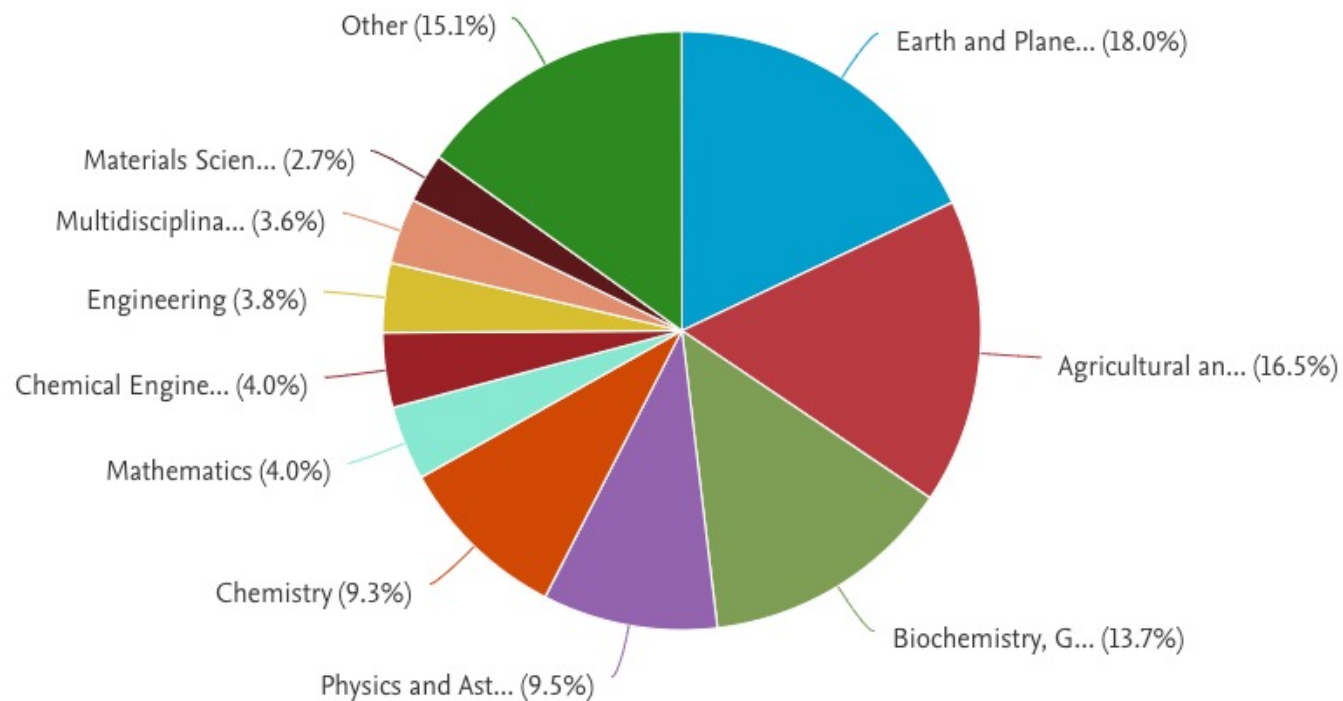
Documents by affiliation






Analyze Search Results

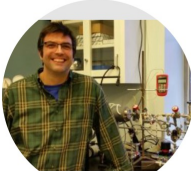
Still a paper-to-paper analysis

Documents by subject area




Google Scholar





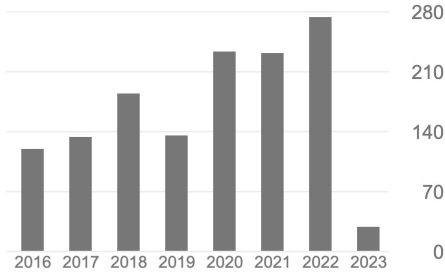
Morgan F. Schaller
[Rensselaer Polytechnic Institute](#), Associate Professor
Verified email at rpi.edu
[Earth System History](#)



| TITLE | CITED BY | YEAR |
|---|----------|------|
| Atmospheric pCO₂ perturbations associated with the Central Atlantic magmatic province MF Schaller, JD Wright, DV Kent Science 331 (6023), 1404-1409 | 224 | 2011 |
| River basins as groundwater exporters and importers: Implications for water cycle and climate modeling MF Schaller, Y Fan Journal of Geophysical Research: Atmospheres 114 (D4) | 164 | 2009 |
| Rapid emplacement of the Central Atlantic Magmatic Province as a net sink for CO₂ MF Schaller, JD Wright, DV Kent, PE Olsen Earth and Planetary Science Letters 323, 27-39 | 129 | 2012 |
| Drilling and sampling a natural CO₂ reservoir: Implications for fluid flow and CO₂-fluid-rock reactions during CO₂ migration through the overburden | 115 | 2014 |

Cited by[VIEW ALL](#)

| | All | Since 2018 |
|-----------|------|------------|
| Citations | 1597 | 1094 |
| h-index | 19 | 17 |
| i10-index | 23 | 23 |

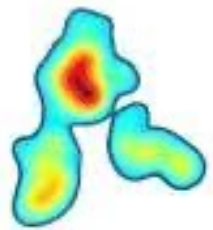


| Public access | VIEW ALL |
|---------------|--------------------------|
| 2 articles | 24 articles |
| not available | available |

Based on funding mandates

Bibliometric Tools

MetaKnowledge in Python
Bibliometrix in R



VOSviewer

Citation analysis is **the examination of the frequency, patterns, and graphs of citations in articles and books**. It uses citations in scholarly works to establish links to other works or other researchers.

CiteSpace



Tools

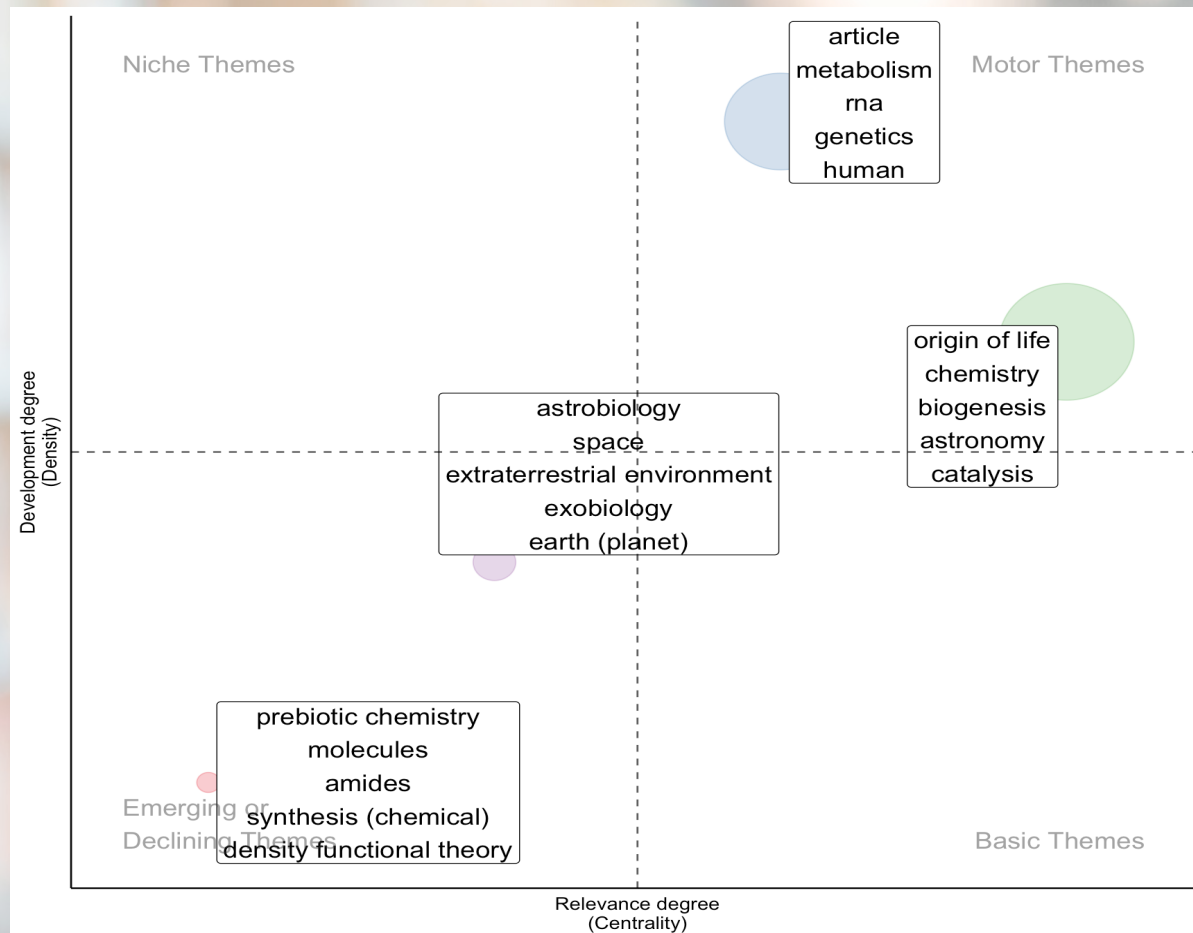
Bibliometric Tools

R's Bibliometrix

Still a paper-to-paper analysis

Highly developed and isolated (ltd. Importance)

Weakly developed and marginal



Well developed and important structures

General Topics transverse different research areas

Bibliometric Search

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Bibliometric Search

Literature

Focus on Relevance

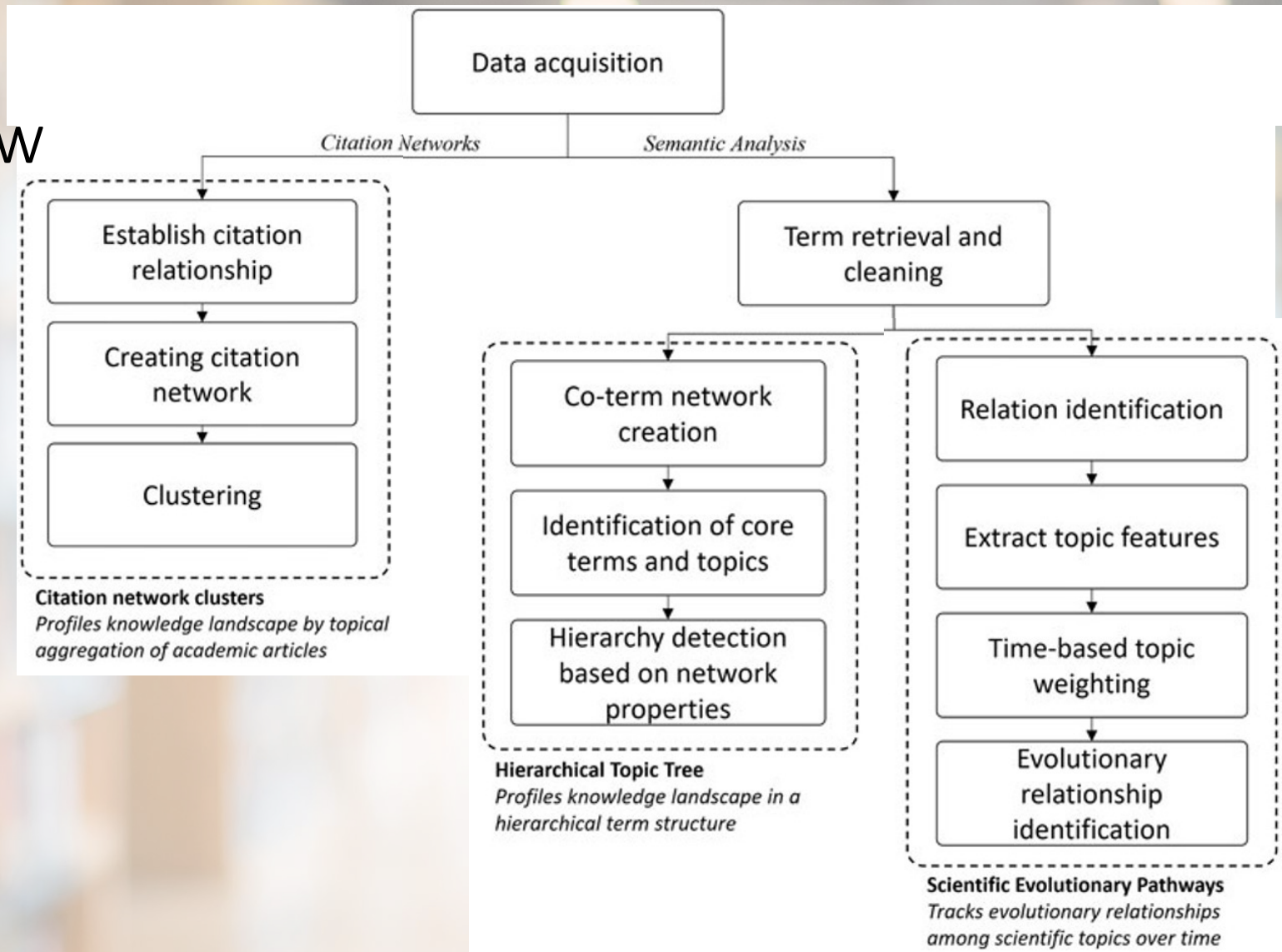
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Mapping the Science

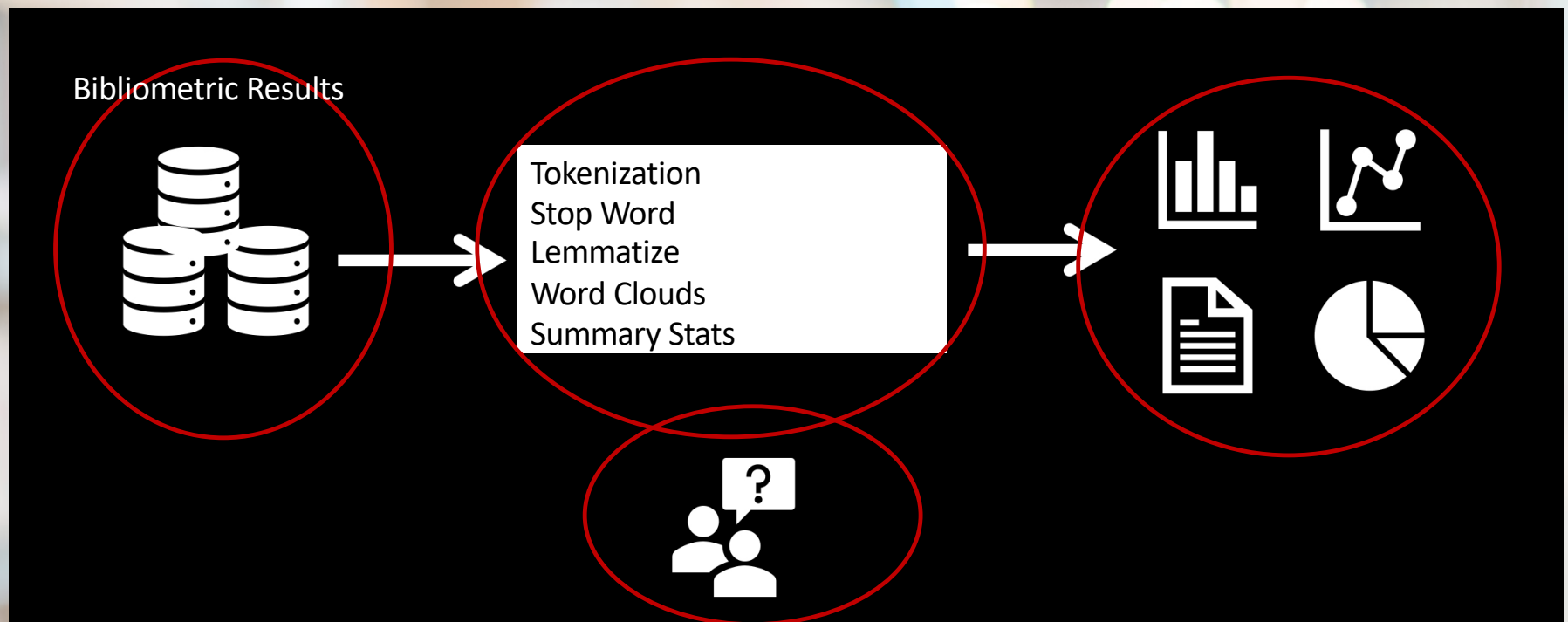
| Sources | Authors | Documents |
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| Structures in Lit | Biblio Technique | Unit | Statistical Technique |
|-------------------|-------------------------|-----------------|-----------------------|
| Concepts | Co-words | Keywords | Network Analysis |
| | | Author Keywords | PCA, MDS, MCA |
| | | Title | Theme Mapping |
| | | Abstract | Theme Evolution |
| | | Full Text | Topic Modeling |
| Knowledge | Co-citation Citation | References | Network Analysis |
| | | Authors | Historiographs |
| | | Journals | |
| Social | Collaboration | Authors | Collaboration Network |
| | | Institution | |
| | | Journal | |

Workflow



Natural Language Processing (NLP)



NLP -> Feature Engineering



Shallow Parsing

Part-of-Speech Tagging



Named Entity Recognition

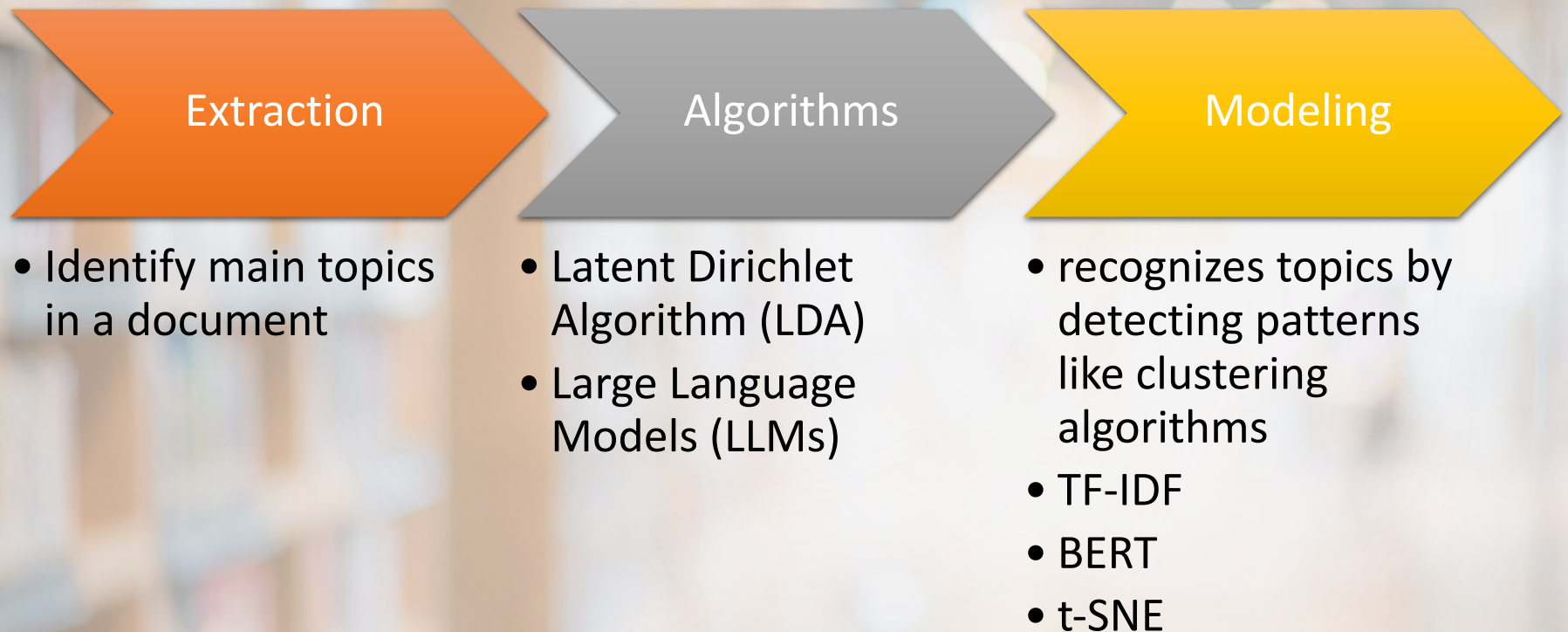
identifying authors, journal names, affiliations, publication dates, and other key information



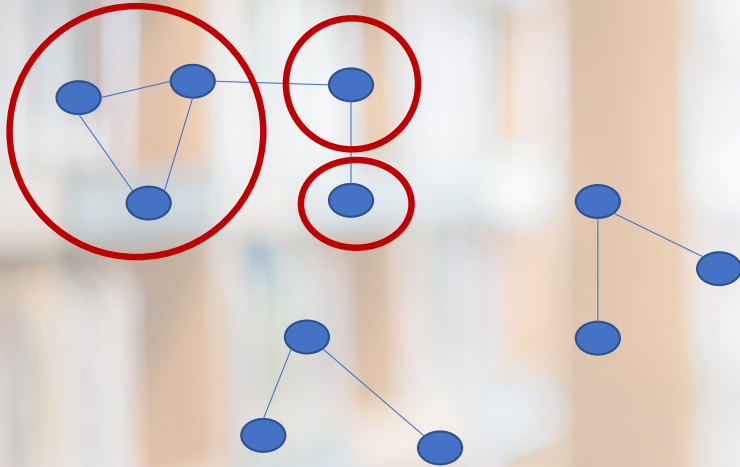
Word Sense Disambiguation

ability to determine the meaning of a word by its context

NLP -> Topic Extraction and Modeling



Network Science



Focuses on the study of patterns of connection in a wide range of physical and social phenomena

- Bibliometrics uses some form, fit for their own purpose.

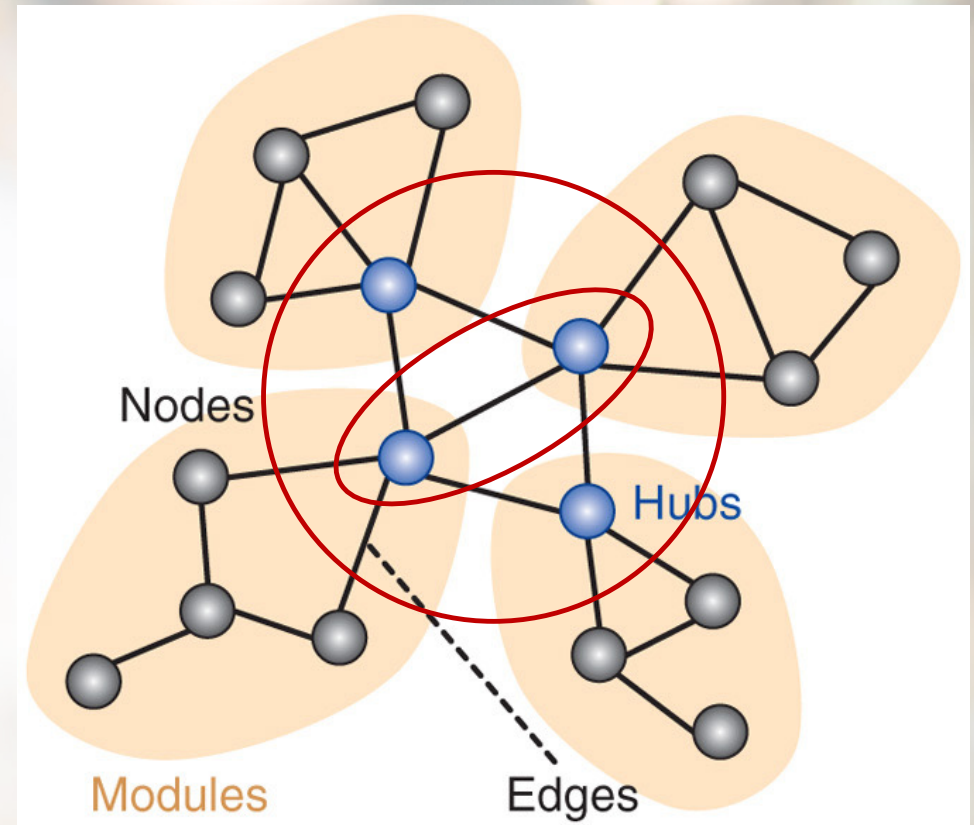
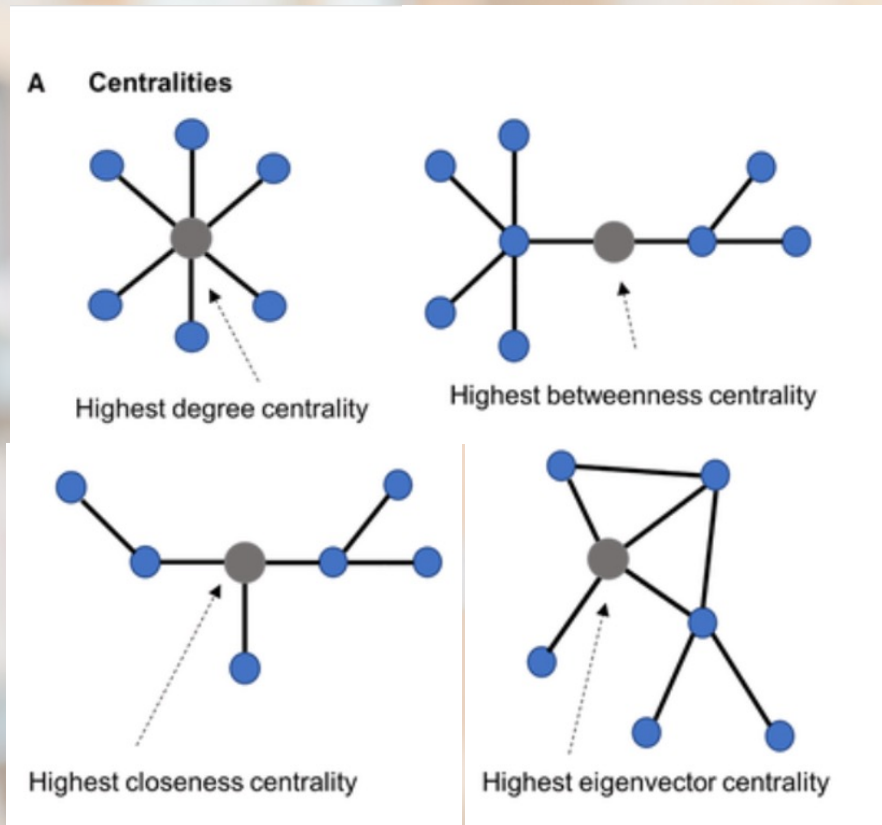
Descriptive Statistics to describe network structure.

- Degree distribution
- Size
- Density

Network Characteristics

- Components
- Centrality
- Communities

Network Characteristics



Discussion

- What metadata fields would enhance the researcher's experience with bibliometrics?
- What are some ways you can imagine improving the literature review process?
- What games might you play with the metadata to gain access to the information you need?
- Semantic shifts
- Emerging Research
- Topics



Thank you