SciVal: Advanced Skills

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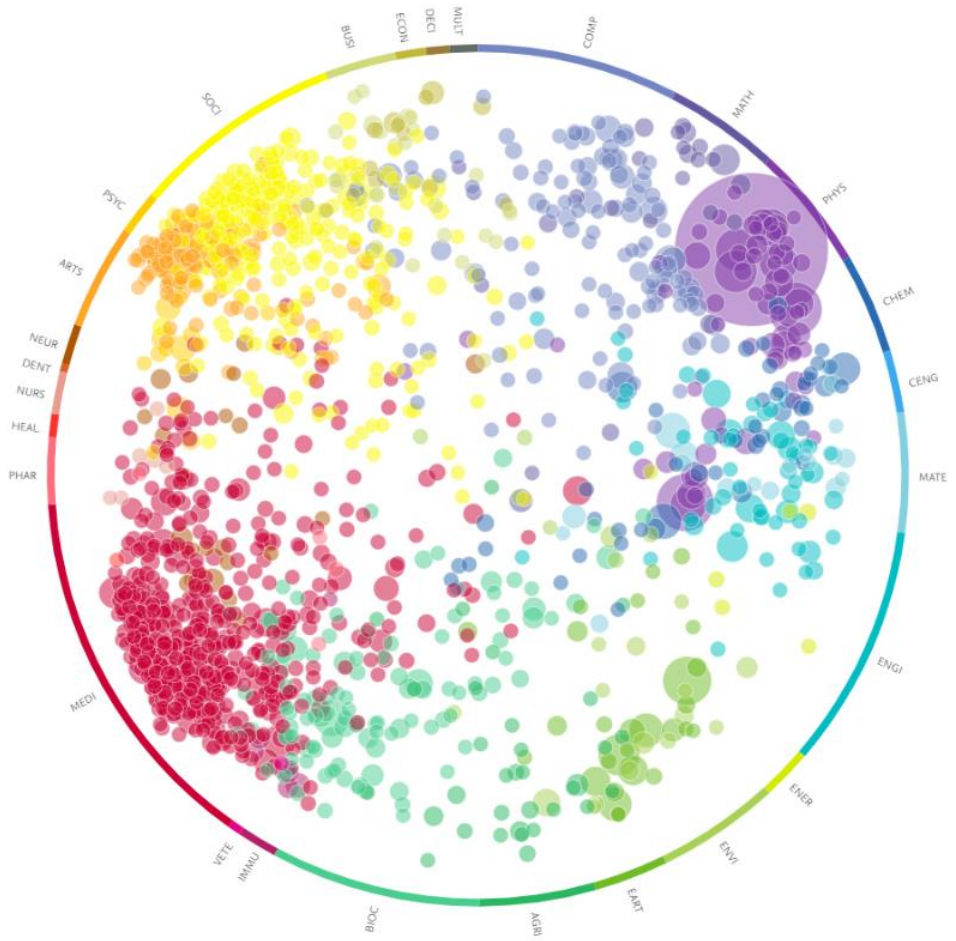
October 2019

Agenda

- SciVal Refresher
- Predictive analytics in SciVal
  - Topic Prominence description
- Practical applications of SciVal data and metrics
- Q & A



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Elsevier Research Intelligence Portfolio

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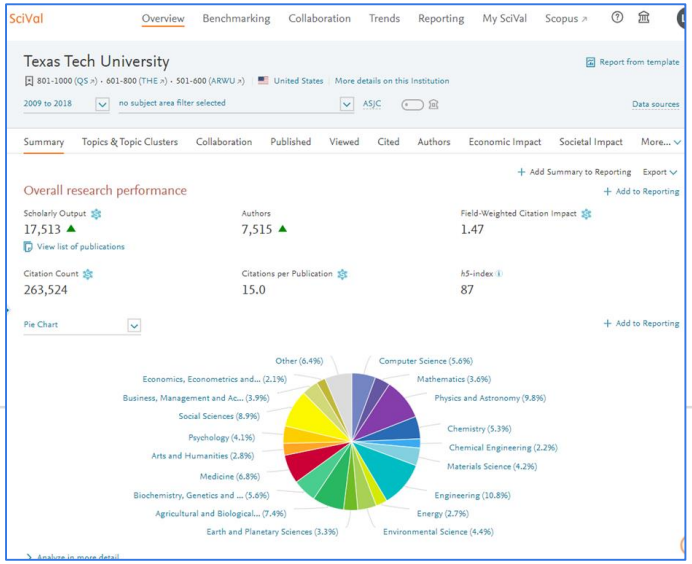
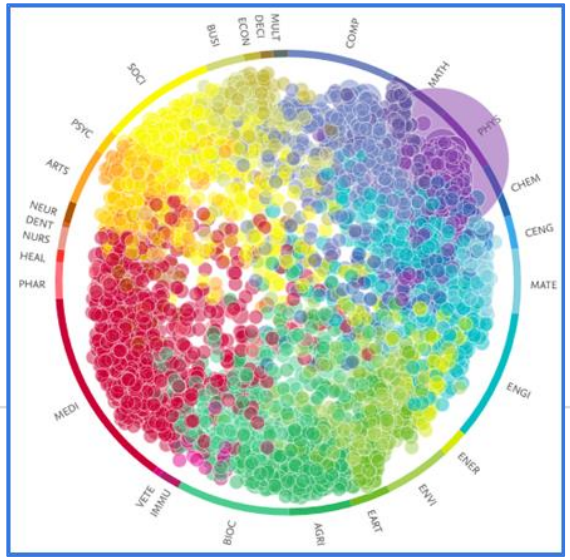
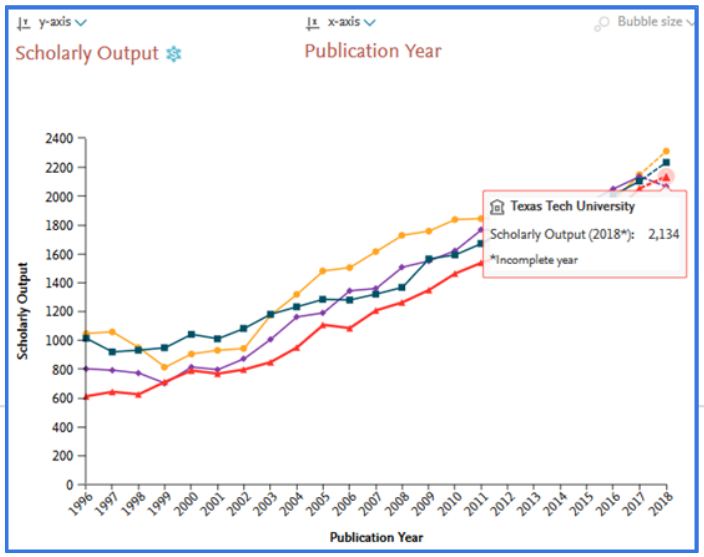
SciVal is an analytical tool that allows you to:

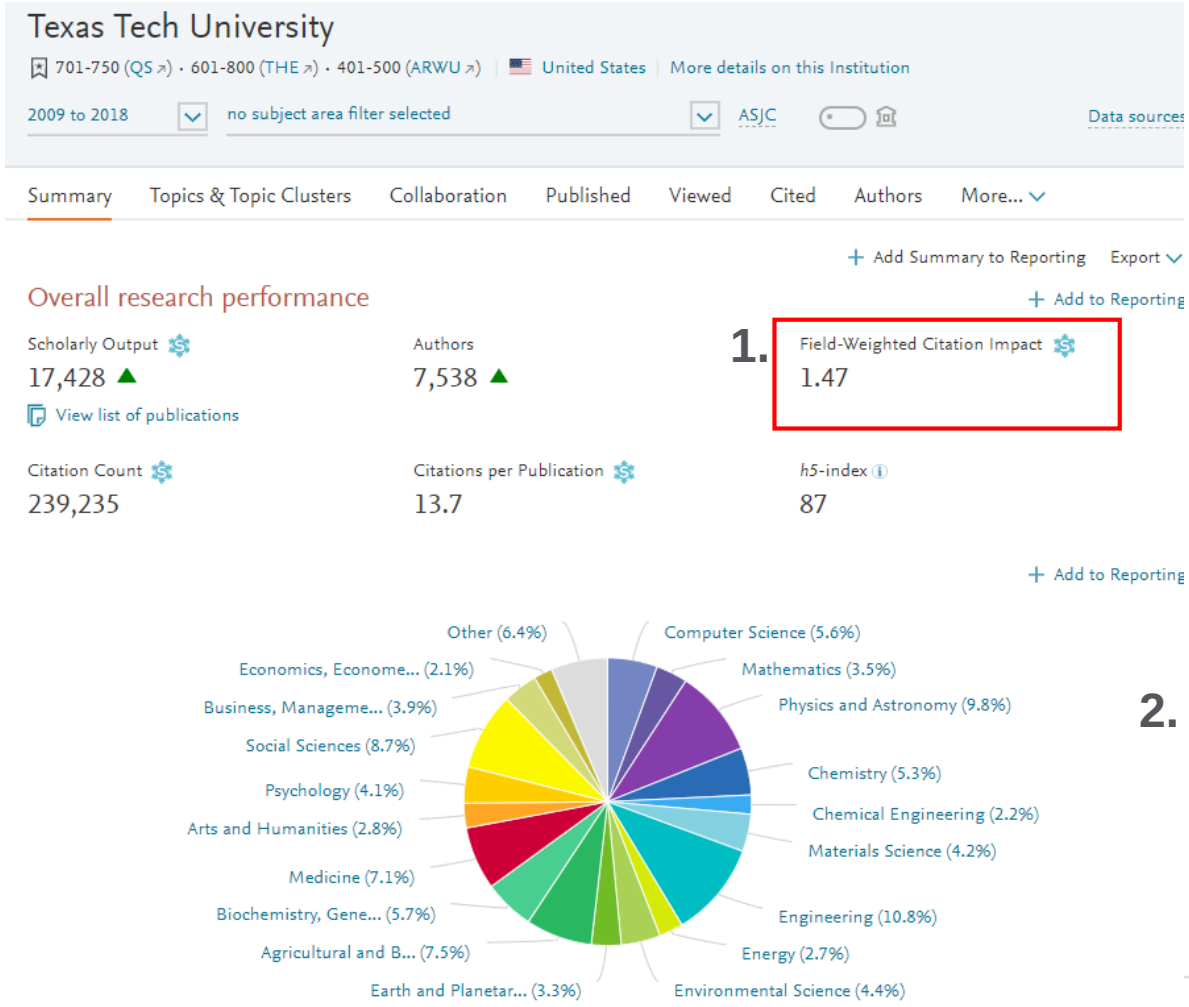
- Characterize research portfolio for any profiled Academic/Corporate/Government entity
- Benchmark performance against any set of peers
- Find top performers/rising stars in research fields
- Aid in research planning and analysis:
  - Pinpoint the research areas where your institution excels
  - Find out which areas your peers and competitors are active in
  - Identify research topics that are likely to be well funded



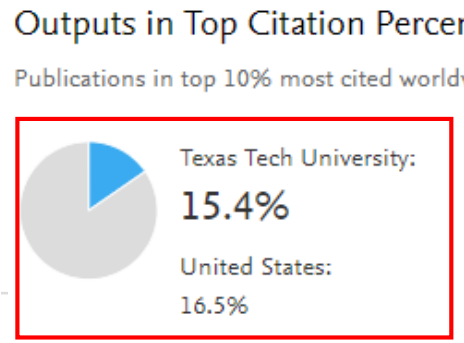


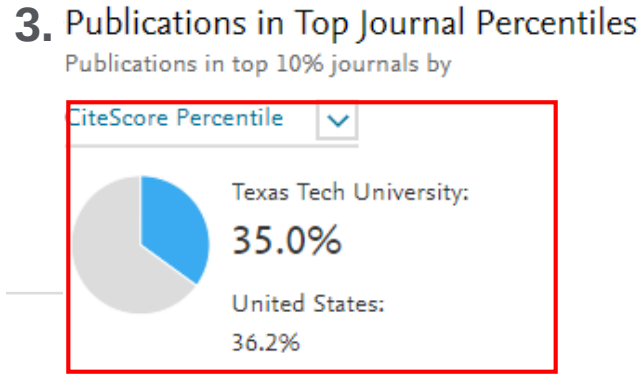


Metrics Highlights



1. Field Weighted Citation Impact (FWCI)
2. Outputs in top citation percentiles
3. Publications in Top Journals percentiles (SNIP and CiteScore)





Date range 2009 to 2018

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Topics of Prominence: Predictive Analytics

Use Topics of Prominence to:

* Tell the story of your research focus.
* Highlight areas of significant research contributions.
* Evaluate your position relative to others

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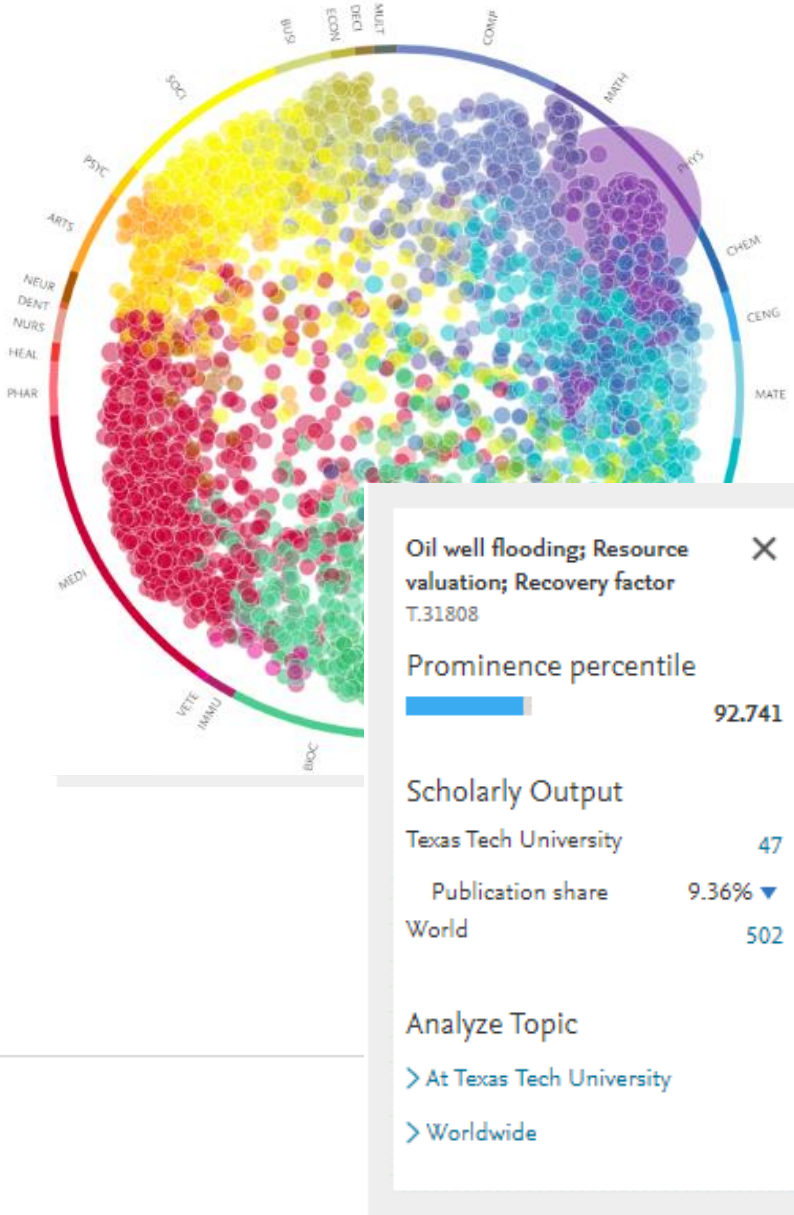
Introducing Topic Prominence

- Users needed a more granular way to group research topics:
- One of the most common categorization methods is based on the publication's journal subject areas
  - Scopus has 334 ASJC categories
- Other groupings have to be created by the user, which is very unstructured
  - e.g. Research Areas in SciVal
- But what if we could help the user find their topics of interest at a much more granular level?



A powerful tool to build a progressive and resilient research portfolio

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Topic Prominence in Science:

Moving beyond evaluation and benchmarking to research planning and analysis

…Help users

Identify pockets of **well funded research** in the **research portfolio**

Find the **top performers** and **rising stars** in those areas for recruitment, tenure and collaboration

Showcase that they or their institution is active in topics with high momentum

Identify which topics other researchers and universities are active in that have high momentum

…and uncover the impact

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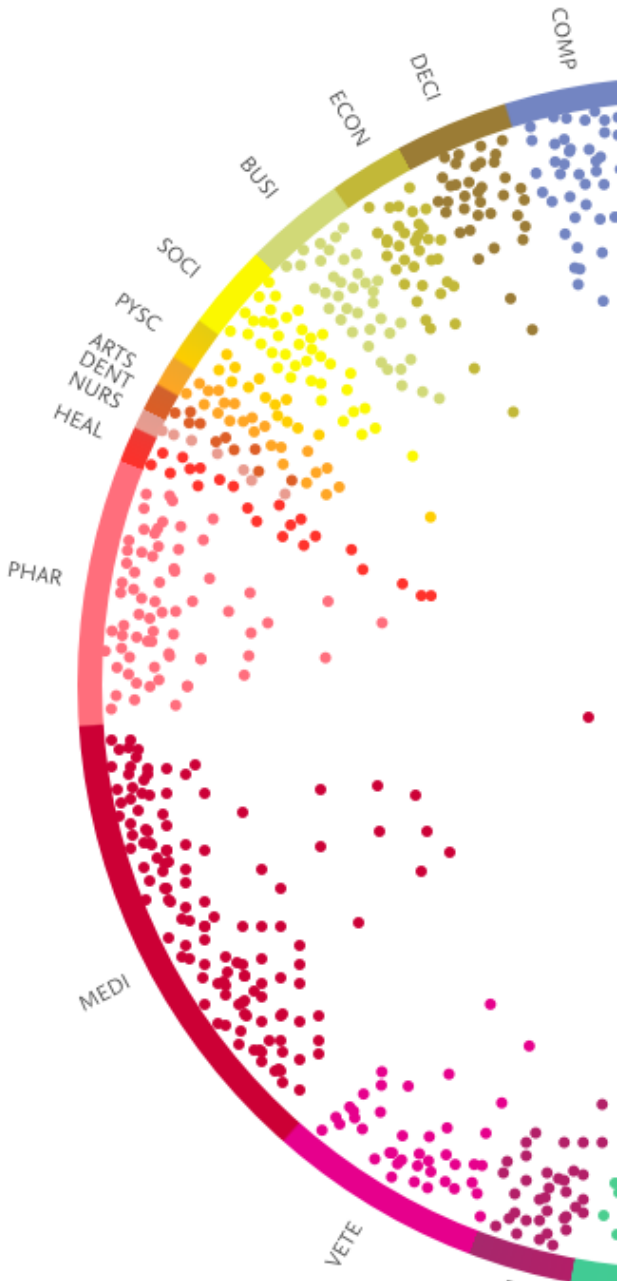
Solution – Topic Prominence

- We have identified **~96,000 global research topics by clustering all of Scopus** and ranked them by **Prominence.**
- **Prominence is a new indicator** that shows the **current momentum** of a topic by looking at **very recent citations**, **views** and **CiteScore** values.
- **Prominence = momentum** (not the same as importance!).
- **Prominence predicts funding** – helps researchers and research managers identify topics in which funding will increase.



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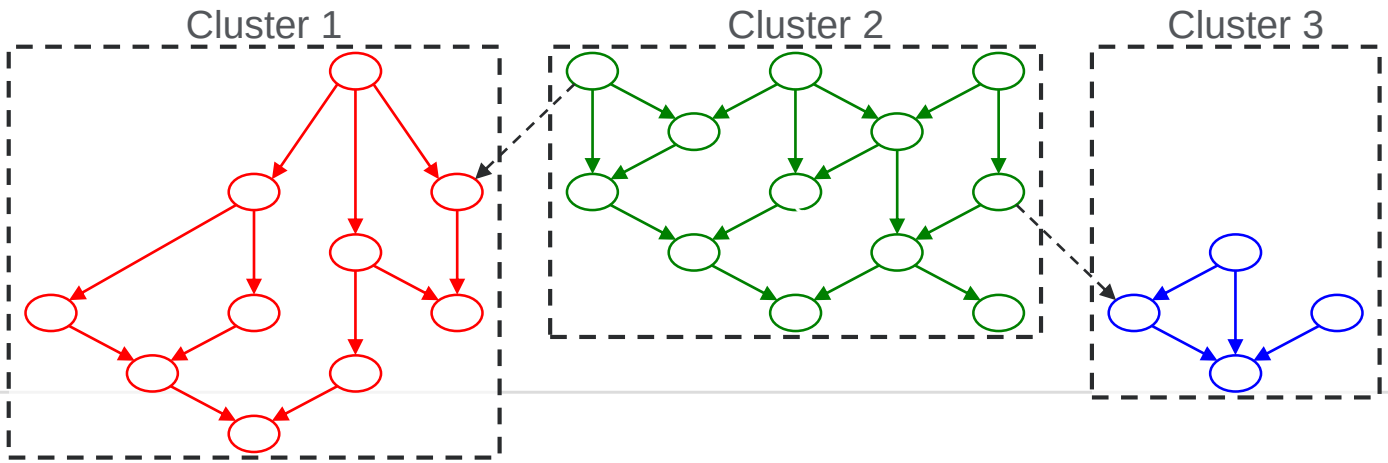
How are “Topics” identified

- All Scopus publications are clustered into topics using citation links
- ~46 million publications (1996-present) in ~96,000 topics
- Clustering is done using algorithms that
  - Divide the documents into groups
  - Have a resolution parameter where increasing the resolution increases the number of clusters and reduces cluster sizes
  - Maximize the links within clusters and minimize the links between clusters



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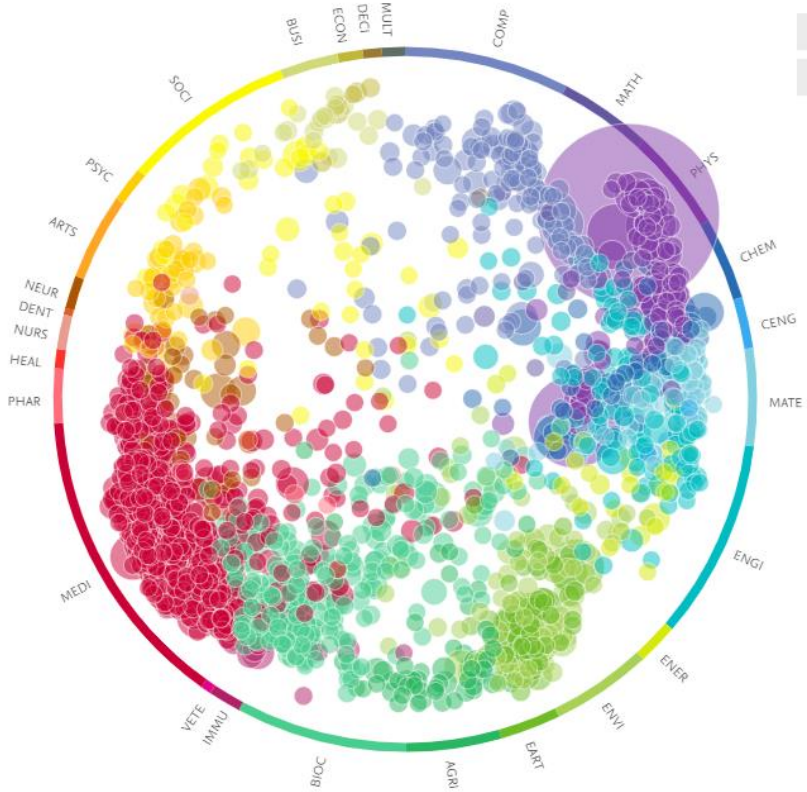
Prominence Indicator:

- Prominence combines 3 metrics to indicate the momentum of the topic
  - **Citation Count** in year n to papers published in n and n-1
  - Scopus **Views Count** in year n to papers published in n and n-1
  - Average **CiteScore** for year n

- Why call it “Prominence”
  - Prominence ≠ Importance (Topics can be important but not prominent)
  - Prominence ~ Visibility



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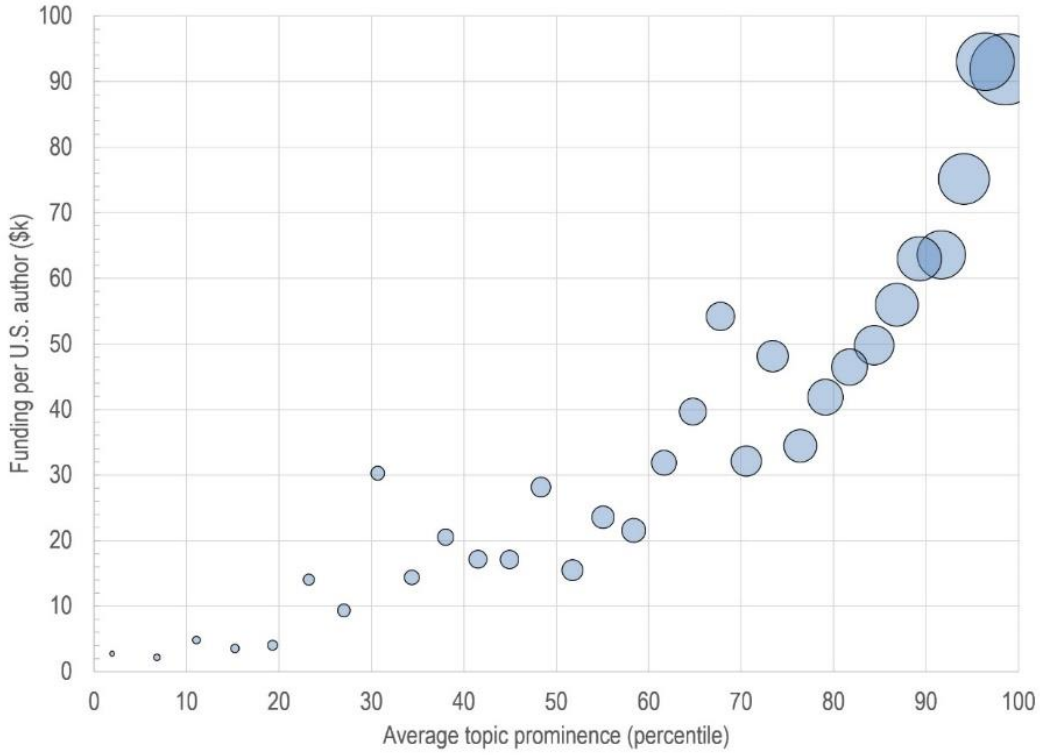
Prominence and funding

- Grant data (314K grants, $203 billion) from STAR METRICS database were assigned to topics using textual similarity
- Dependent variable = Funding per topic 2011-2013
- Prominence + Funding (2008-2010) together explain 66% of the variance



Klavans, R. and K.W. Boyack. (2017). Research portfolio analysis and topic prominence. *Journal of Informetrics*

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What is a Topic?

- **A cluster of documents with a common intellectual interest**
  - **Instantly recognizable by researchers**
- **Easy to interpret**
  - **Articles that cite each other are generally in the same topic**
- **Accurate** problem-level subdivisions of science
  - **We use the most accurate clustering methods available**
- Nearly **complete coverage**
  - **Papers from 1996-**

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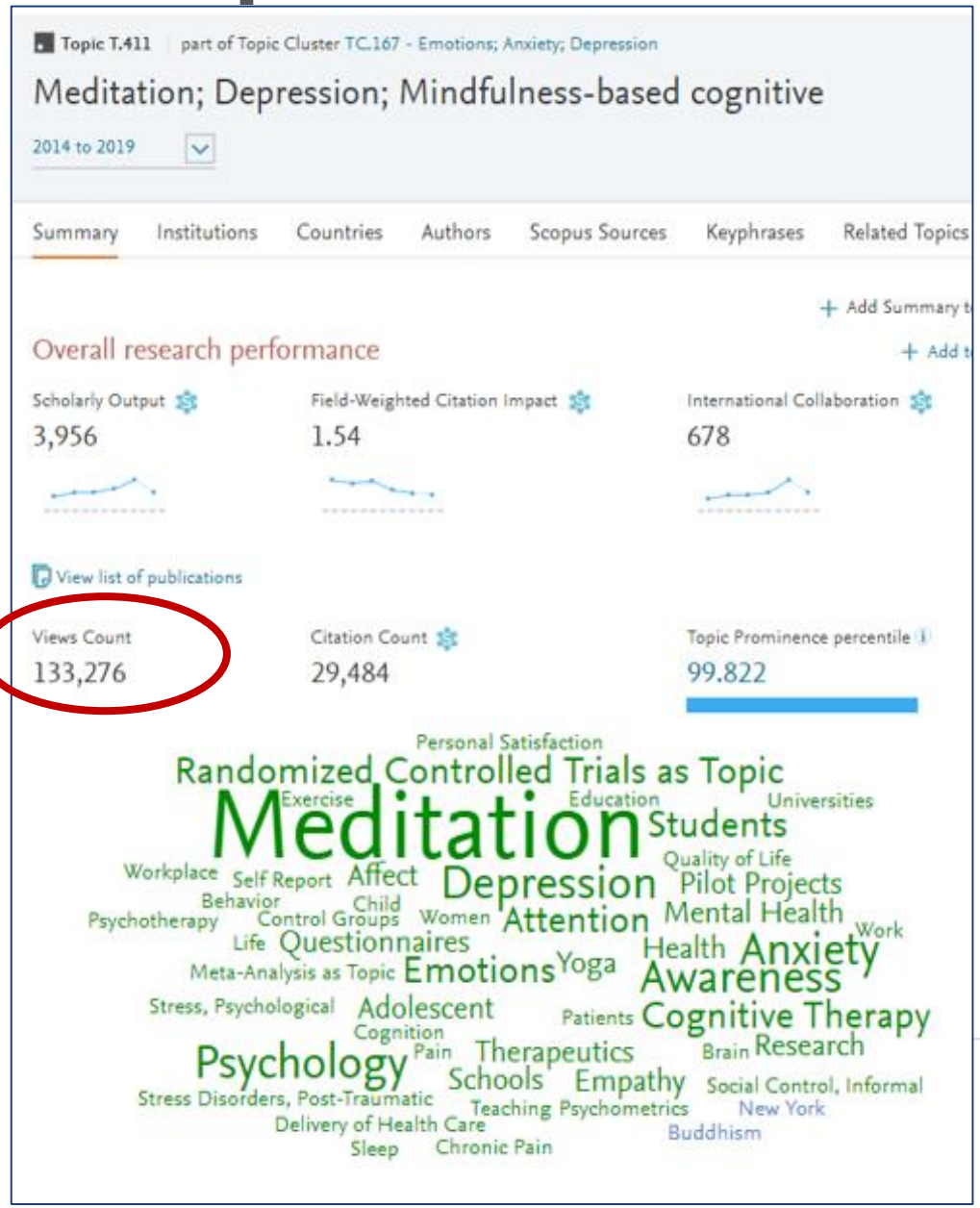
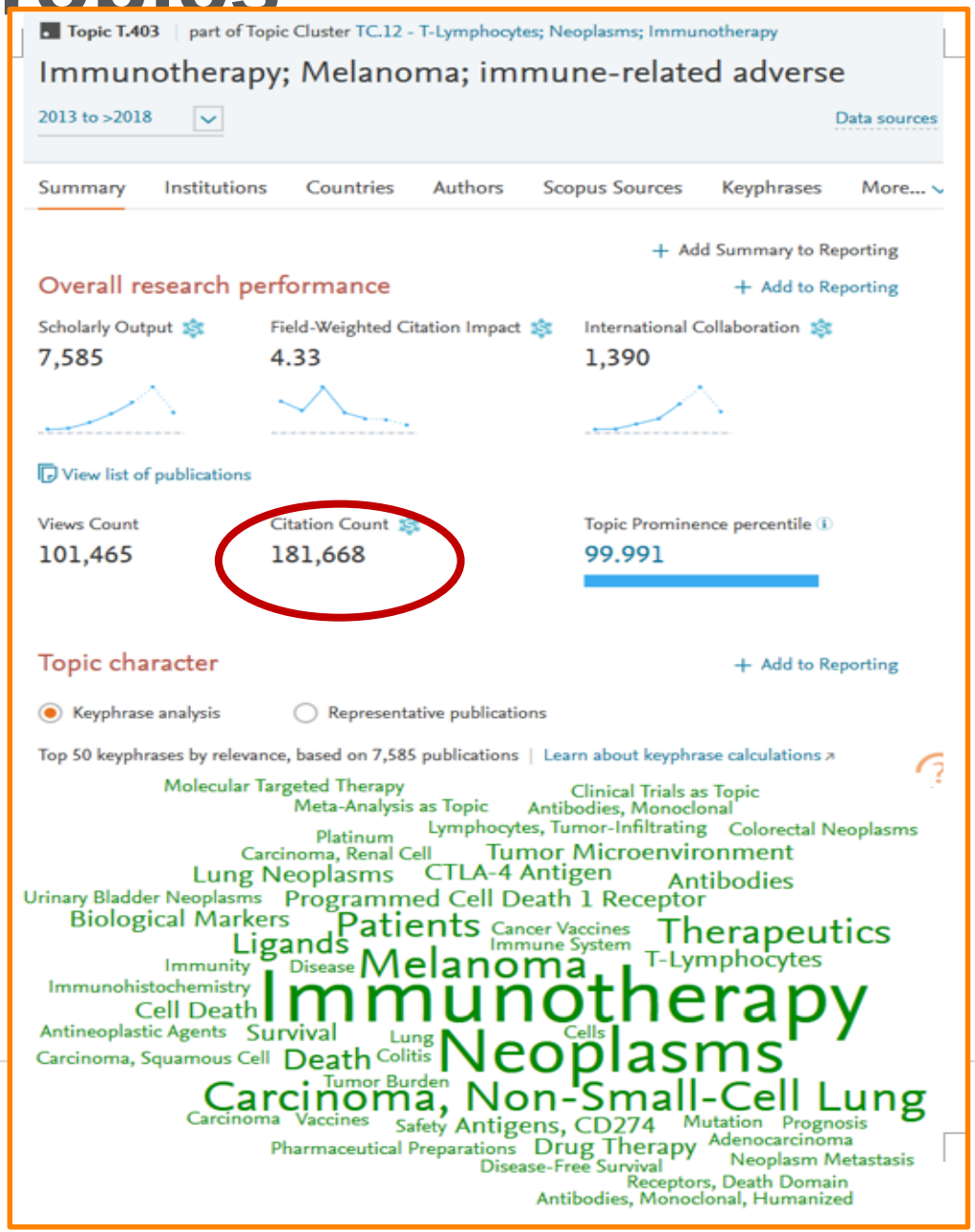
Examples of Prominent Topics





What can you do with Topics?

1. **Help your researchers and faculty identify funding opportunity areas**

2. **Assess which research areas to invest in:**

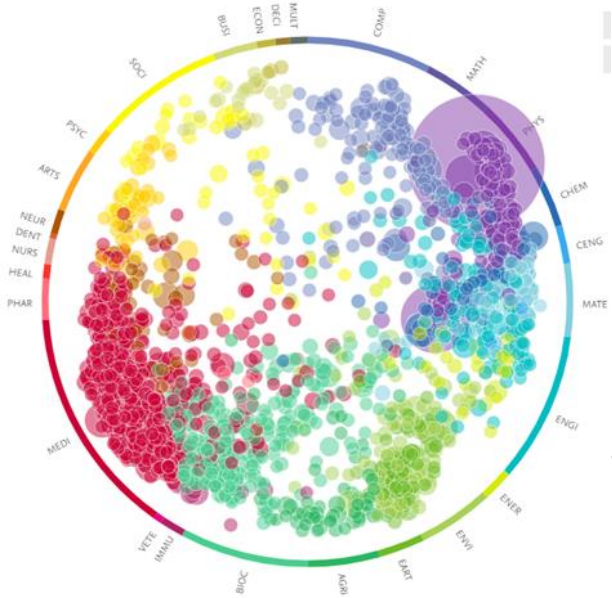
   Identify top researchers for **recruitment** or **collaboration**

   Find top institutions to partner with

   Retain your best researchers

3. **Help you showcase your achievements**

   To taxpayers and stakeholders
   To funding agencies
   To potential collaboration partners



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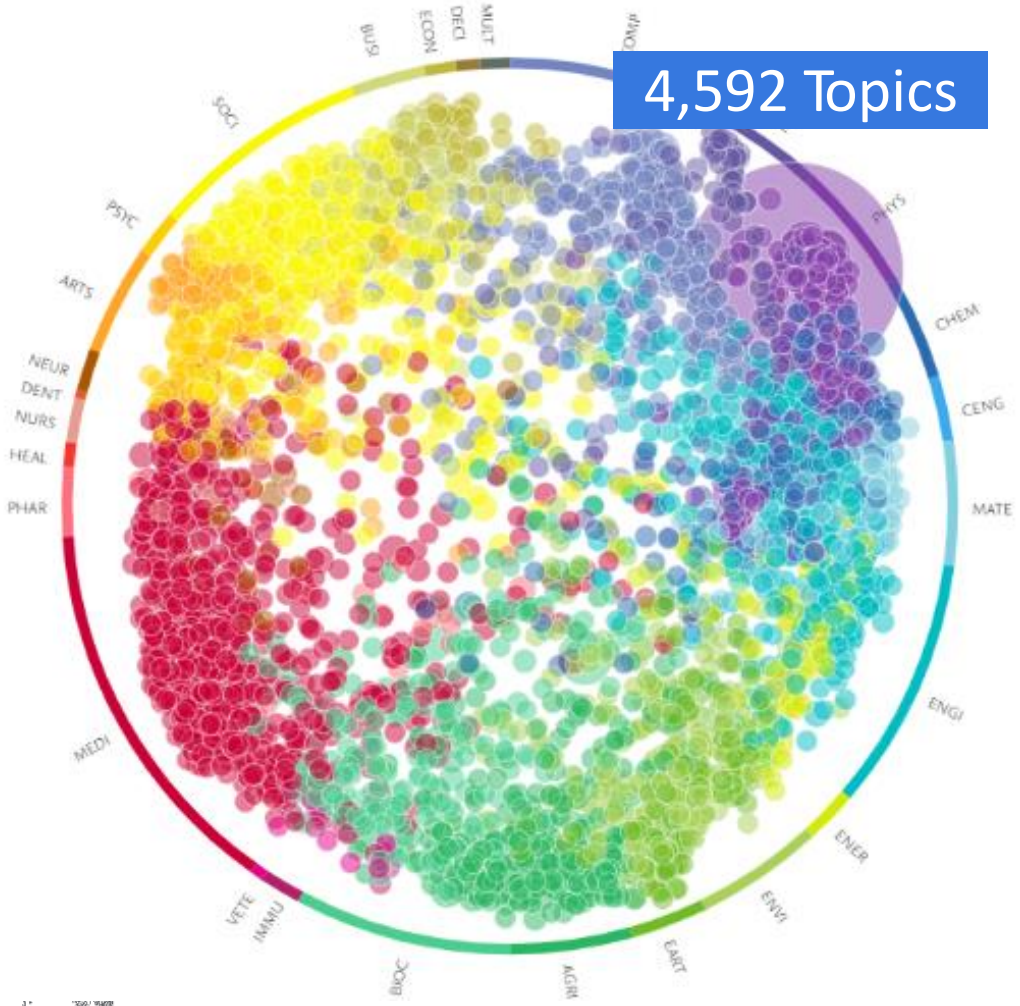
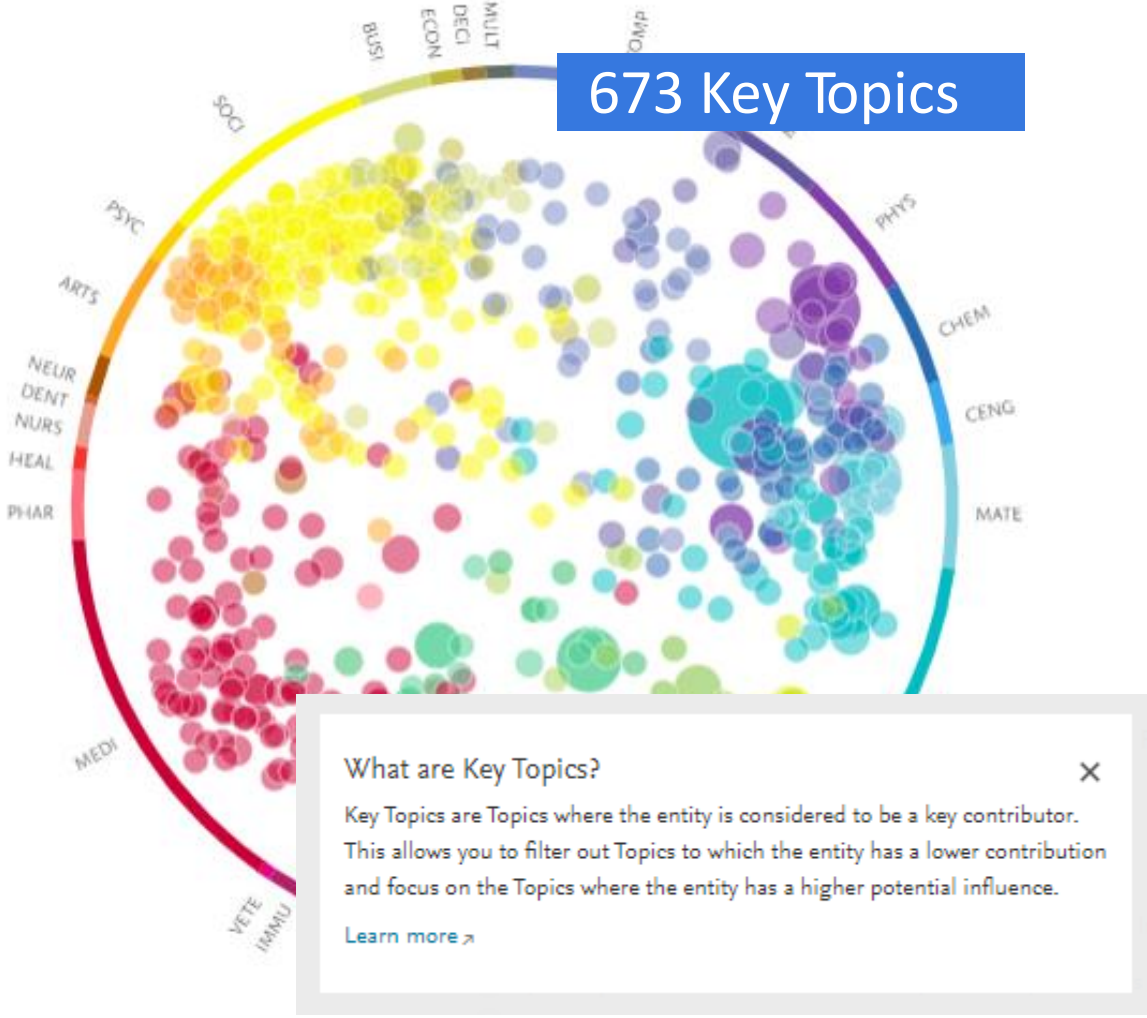
Key Topics





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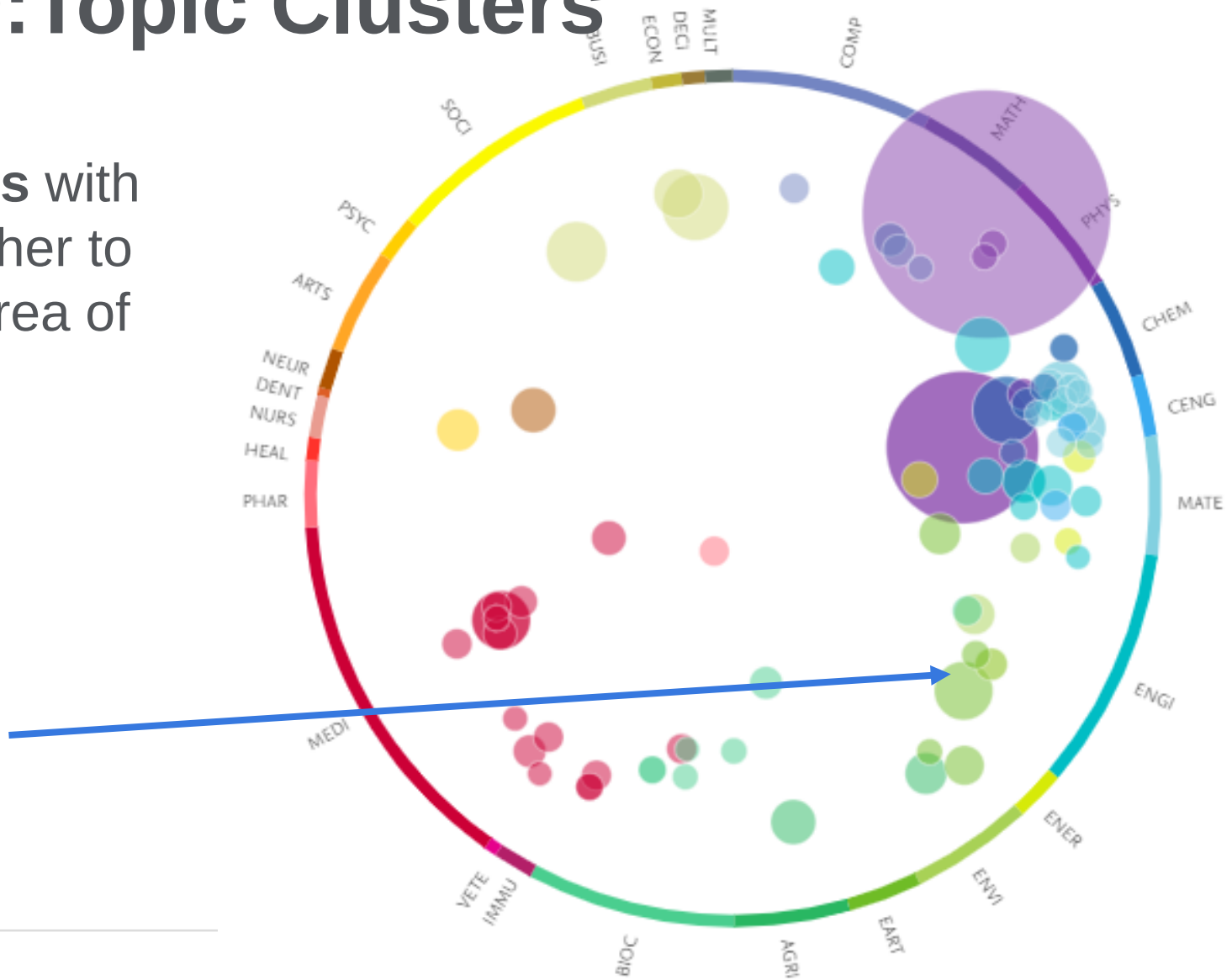
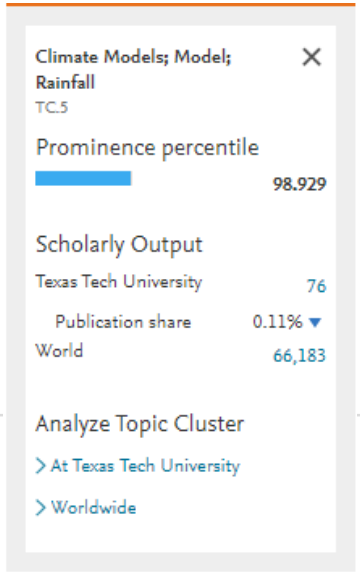
Introduced in 2019:Topic Clusters

Formed by aggregating **Topics** with similar research interest together to form a broader, higher-level area of research.

Top 5% Topic Clusters





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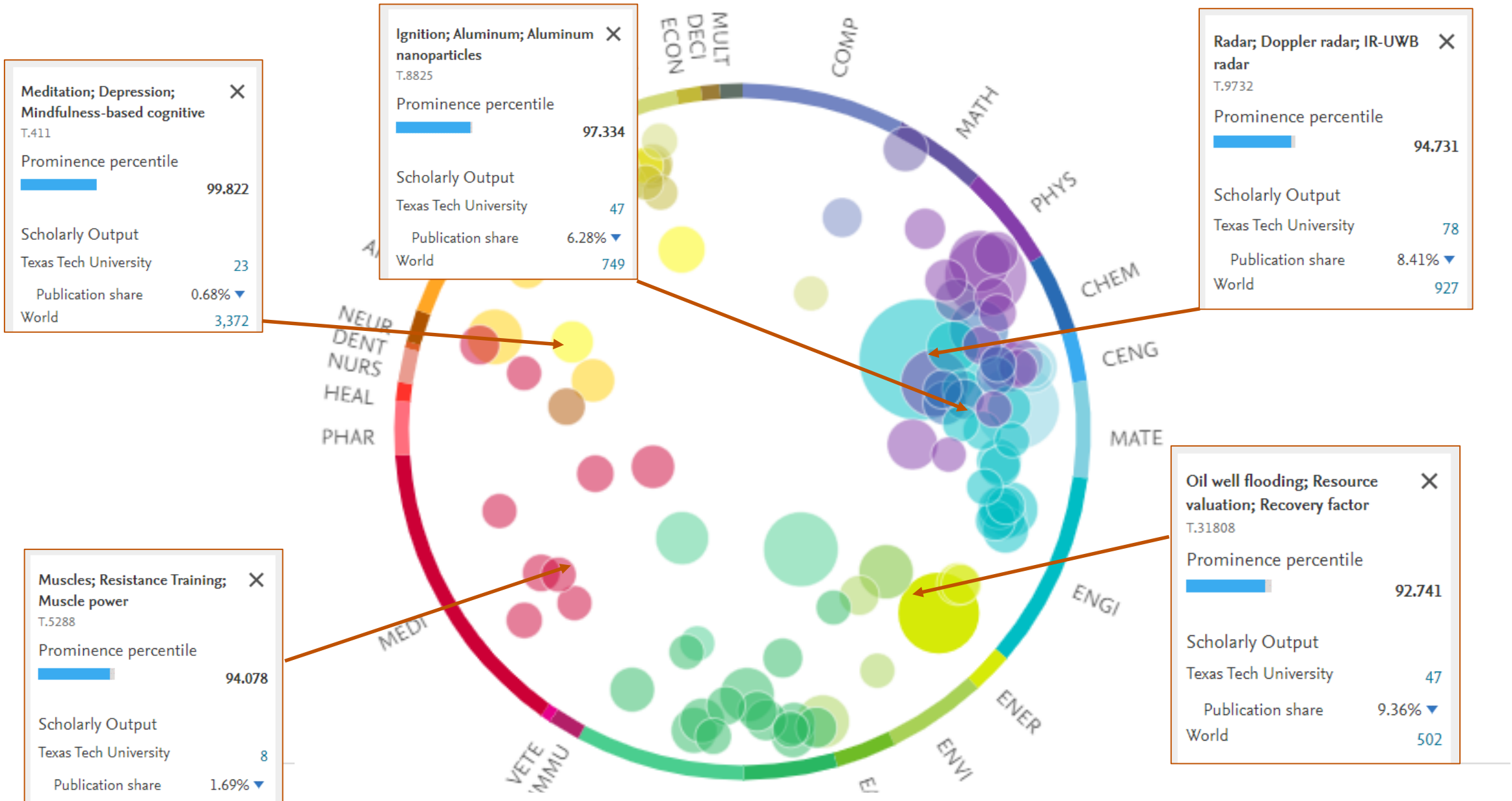

TTU Top 100 Key Research Topics

Topics in Scopus

- For docs from 1996-
- Each document belongs to one Topic
- Books and book chapters also have topics

Environmental Earth Sciences
Volume 71, Issue 6, 2014, Pages 2491-2501

Standardized precipitation evaporation index (SPEI)-based drought assessment in semi-arid south Texas (Article)

Hernandez, E.A., Uddameri, V.

Save all to author list

Department of Civil and Environmental Engineering, Texas Tech University, Box 41023, Lubbock, TX, 79409-1023, United States

Abstract

View references (29)

The coastal semi-arid region of south Texas is known for its erratic climate that fluctuates between long periods of drought and extremely wet hurricane-induced storms. The standard precipitation index (SPI) and the standard precipitation evaporation index (SPEI) were used in this study in conjunction with precipitation and temperature projections from two general circulation models (GCMs), namely, the National Center for Atmospheric Research (NCAR) Parallel Climate Model (PCM) and the UK Meteorological Office Hadley Centre model (HCM) for two emission scenarios-A1B (–720 ppm CO_2 stabilization) and B1 (–550 ppm CO_2 stabilization) at six major urban centers of south Texas spanning five climatic zones. Both the models predict a progressively increasing aridity of the region throughout the twenty-first century. The SPI exhibits greater variability in the available moisture during the first half of the twenty-first century while the SPEI depicts a downward trend caused by increasing temperature. However, droughts during the latter half of the twenty-first century are due to both increasing temperature and decreasing precipitation. These results suggest that droughts during the first half of the twenty-first century are likely caused by meteorological demands (temperature or potential evapotranspiration (PET) controlled), while those during the latter half are likely to be more critical as they curtail moisture supply to the region over large periods of time (precipitation and PET controlled). The drought effects are more pronounced for the A1B scenario than the B1 scenario and while spatial patterns are not always consistent, the effects are generally felt more strongly in the hinterlands than in coastal areas. The projected increased warming of the region, along with potential decreases in precipitation, points toward increased reliance on groundwater resources which are noted to be a buffer against droughts. However, there is a need for human adaptation to climate change, a greater commitment to groundwater conservation and development of large-scale regional aquifer storage and recovery (ASR) facilities that are capable of long-term storage in order to sustain groundwater availability. Groundwater resource managers and planners must confront the possibility of an increased potential for prolonged (multi-year) droughts and develop innovative strategies that effectively integrate water augmentation technologies and conservation-oriented policies to ensure the sustainability of aquifer resources well into the next century. © 2013 Springer-Verlag Berlin Heidelberg.

SciVal Topic Prominence

Topic: Drought | Stream flow | Evapotranspiration index

Prominence percentile: 99.361

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Identify institutional research strengths

Topics & Topic Clusters

+ Add to Reporting Export

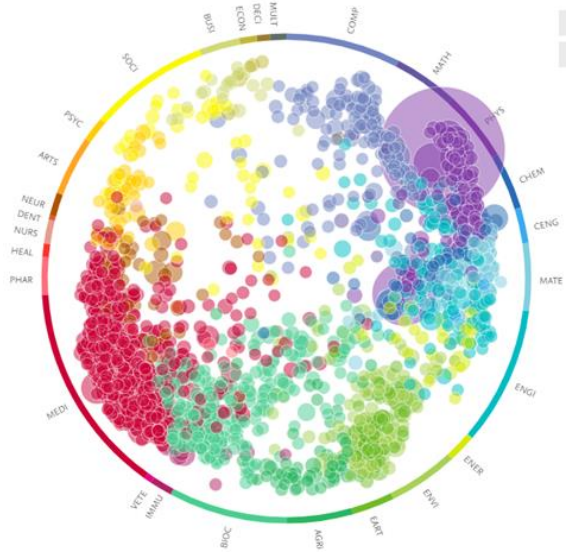
Between 2014 to 2018, researchers at Texas Tech University have contributed to:

- 1,096 Topic Clusters | Learn about Topics and Topic Clusters
- 4,592 Topics
  - only show the 673 Key Topics for this Institution

Table | Wheel

Top 5% of worldwide Topics by Prominence

Filter by keyphrase(s)



Topic	At this Institution: Scholarly Output	At this Institution: Publication Share	At this Institution: Field-Weighted Citation Impact	Worldwide: Prominence percentile
Ignition; Aluminum; Aluminum nanoparticles T.8825	47	6.28% ▼	0.85	97.334
Supersymmetry; Collisions; Squark pair T.23456	45	12.53% ▲	3.89	95.678
Polysaccharides; Glycosylation; Glycosylation sites T.1551	39	3.26% ▼	1.86	99.374
Gravitational waves; Neutron stars; Electromagnetic counterparts T.8569	33	2.87% ▲	28.88	99.896
Gravitational waves; LIGO (observatory); Stochastic gravitational-wave	28	10.49% ▲	4.77	96.749

Compare institutions' research strengths

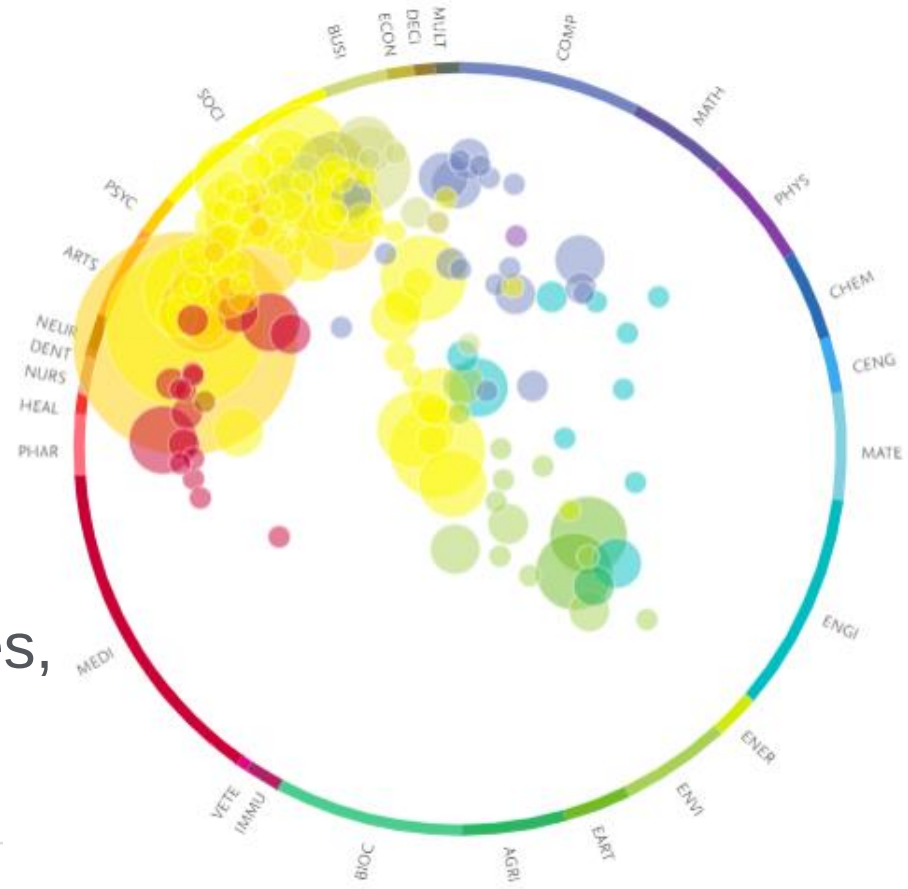
Top 100 Topics in this Institution group, by Scholarly Output

View the Scholarly Output by Institution group member, by Topic 0 1,208 Show navigator

Topic	Scholarly Output	Prominence Percentile	Texas State University	Texas Tech University	University of Houston	University of North Texas	of Texas at Arlington	University of Texas at Austin	University of Texas at Dallas	University of Texas at El Paso
Galaxies; Stars; Planets TC.1	2,387	99.264	4	284	10	27	49	1,208	44	5
Decay; Quarks; Neutrinos TC.6	2,281	98.394	0	496	443	0	607	876	661	16
Reservoirs (Water); Oil Well Flooding; Hydraulic TC.164	2,112	84.070	0	188	199	1	3	958	2	0
Graphene; Carbon Nanotubes; Nanotubes TC.22	1,913	99.866	18	69	105	97	46	508	290	65
T-Lymphocytes; Neoplasms; Immunotherapy TC.12	1,736	99.665	0	7	17	31	2	197	31	8
Secondary Batteries; Electric	1,593	100.000	23	43	121	47	69	627	111	14

What about Social Sciences & Humanities?

- Topics in SSH are just as valid as topics in STEM – this visualization shows UCIs key SS topics
- SSH topics are typically smaller and less prominent than STEM topics
- This is OK! Prominence ≠ Importance
- Comparisons of topics are best made within fields (e.g., Natural Sciences, Medical Sciences, SSH), rather than between fields



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With Topic Prominence we can …

…Help Researchers

- **Identify topics with high momentum** and most likely **high funding success rates.**
- **Showcase** that they are active in topics with high momentum.
- **Find the best potential co-authors** in those topics.
- **Identify emerging & related topics** with high momentum they should be aware of.

…Help Research managers

- Identify pockets of **well funded research** in the **research portfolio**.
- Find the **top performers** and **rising stars** in those areas for recruitment, tenure and collaboration.
- **Showcase** that they or their institution is active in topics with high momentum
- **Identify which topics other researchers and universities** are active in that have high momentum.

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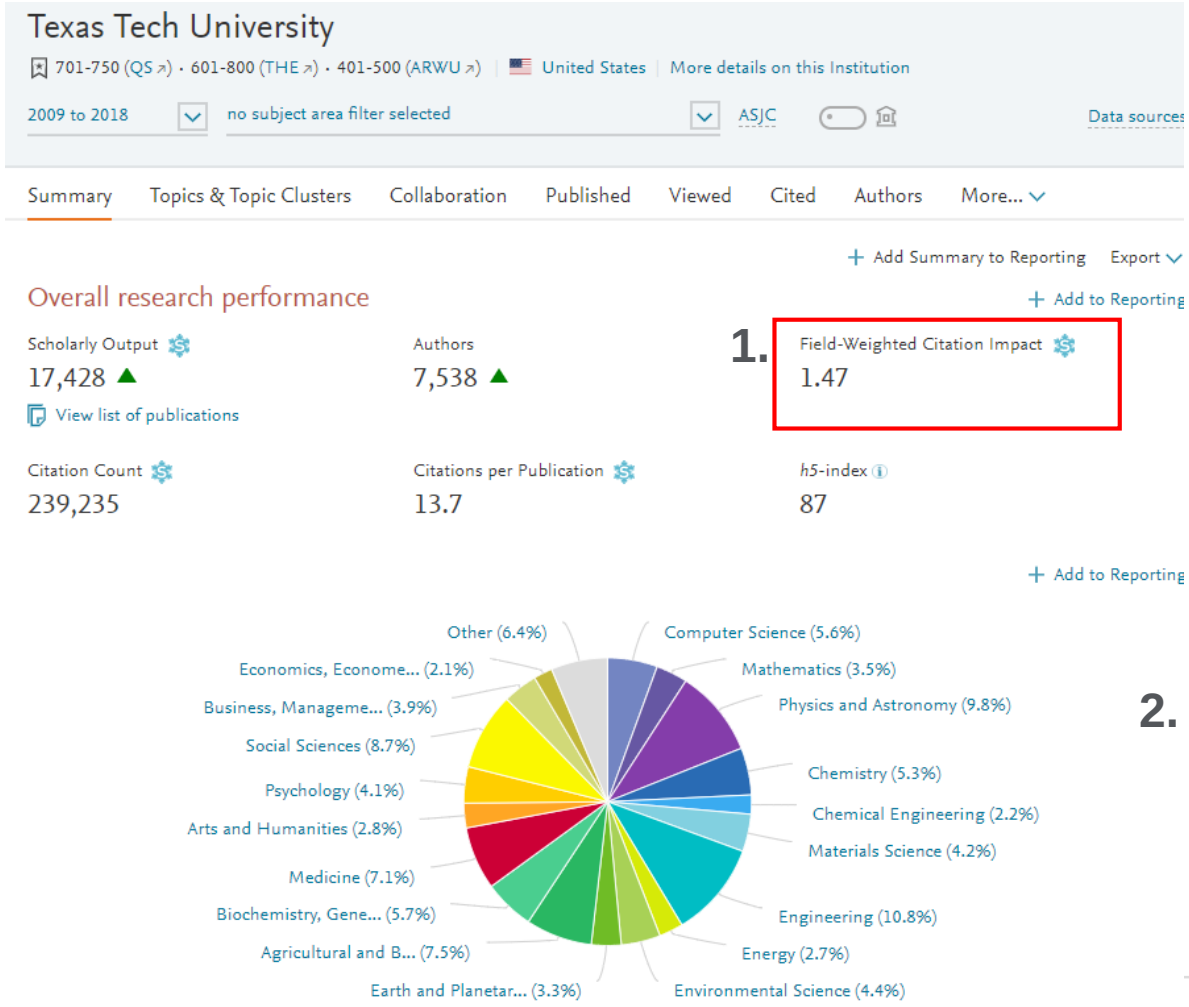
Questions?

Hands-on with SciVal

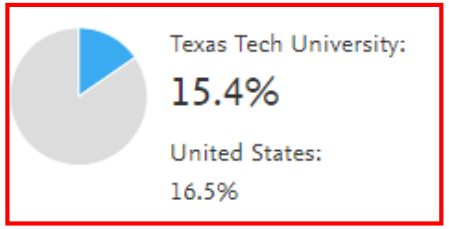
Some key metrics in SciVal Overview



1. Field Weighted Citation Impact (FWCI)
2. Outputs in top citation percentiles
3. Publications in Top Journals percentiles (SNIP and CiteScore)

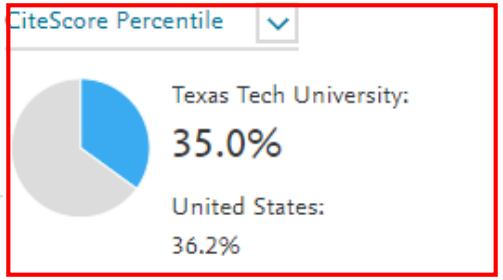
2. Outputs in Top Citation Percentiles

Publications in top 10% most cited worldwide



3. Publications in Top Journal Percentiles

Publications in top 10% journals by



Date range 2009 to 2018

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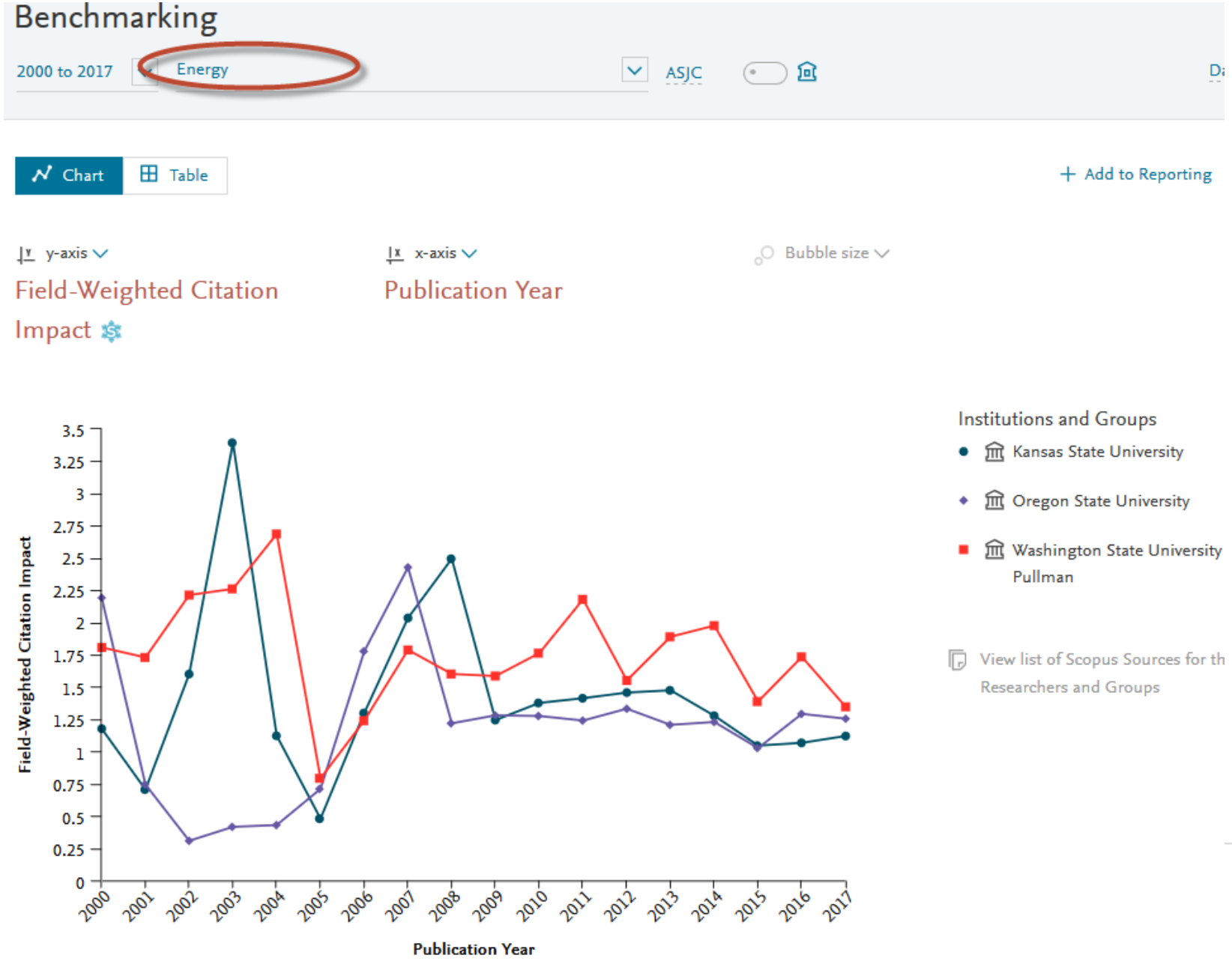
Benchmark – use filters for a nuanced perspective

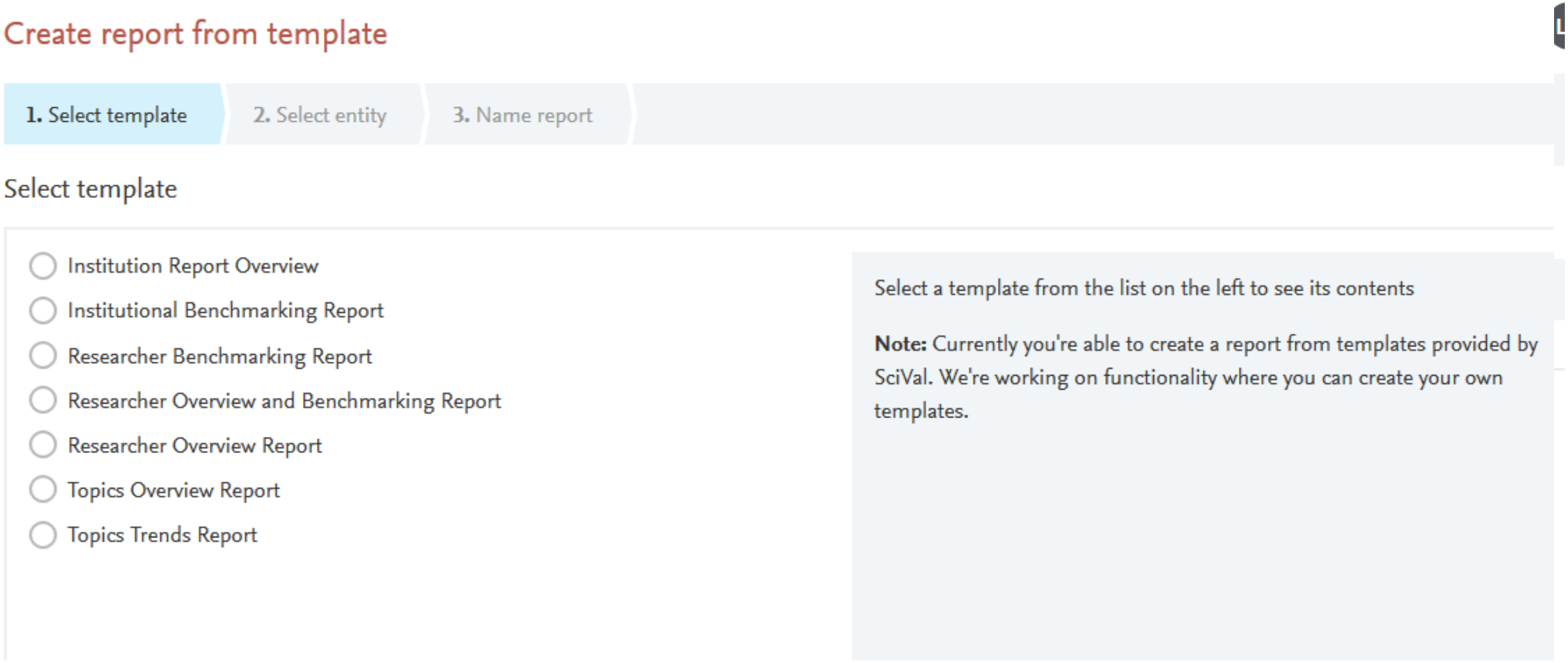


FWCI=Field-weighted citation impact

Takes into account – date of pub, field of pub and type of document

A Snowball standardized research impact metric

Create a Report from a template



Create report from template

1. Select template | 2. Select entity | 3. Name report

Select template

- (●) Institution Report Overview
- ( ) Institutional Benchmarking Report
- ( ) Researcher Benchmarking Report
- ( ) Researcher Overview and Benchmarking Report
- ( ) Researcher Overview Report
- ( ) Topics Overview Report
- ( ) Topics Trends Report

Institution Report Overview

Gives the key metrics for a summary of a single institution. Requires the Overview module.

Analyses:

- Overall research performance
- Publications by Subject Area
- Topics
- Topics
- Field-Weighted Citation Impact
- Collaboration
- Academic-Corporate Collaboration
- Top collaborating Institutions
- Output in Top Citation Percentiles (excl. self citations)
- Publications in Top Journal Percentiles by CiteScore Percentile

Note: once a report has been created from a template, you can change, remove and add analyses as you wish

Populate report >

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What is the most efficient way to create **or edit** a group of researchers?

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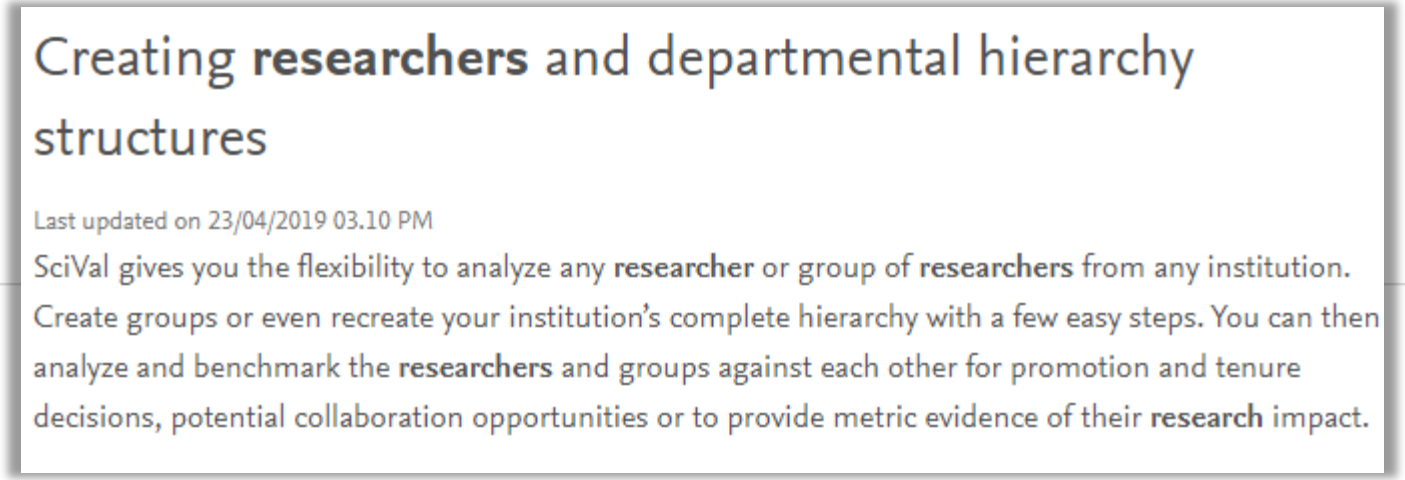
It depends….

- Does your organization also have Pure?
  - Coordinate with your Pure administrator to port all OR a selection of your departments or colleges to SciVal

- How many researchers and groups?
  - If a few, it may be more efficient to add one-by-one
  - If many, use a spreadsheet (templates available)
  - Lots of resources to support you!
  - SciVal Support Center



The source of truth for Researchers in SciVal: Scopus

Author details

< Return to search results 1 of 1 Print Emai

Mitchell, Mvron J.

View potential author matches

State University of New York Upstate Medical University, Syracuse, United States

Author ID: 7402871350

Other name formats: Mitchell, M. | Mitchell, Myron | Mitchell, Mvron J. | Mitchell, Myron J. | Mitchell, M. J. | Mitchell, Mylon J.

Subject area: Environmental Science | Agricultural and Biological Sciences | Earth and Planetary Sciences | Biochemistry, Genetics and Molecular Biology | Chemistry | Engineering | Social Sciences | Medicine

View all

Profile actions

Edit author profile

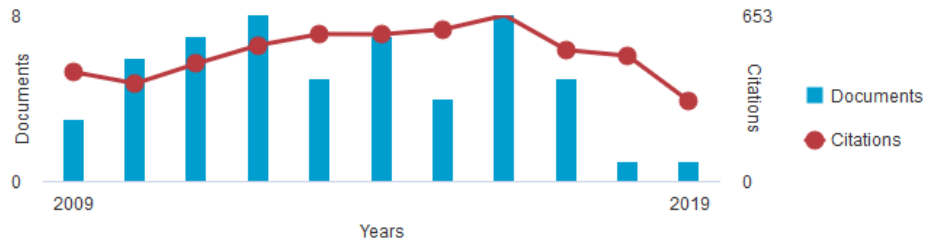
Connect to ORCiD

Alerts
Set citation alert
Set document alert

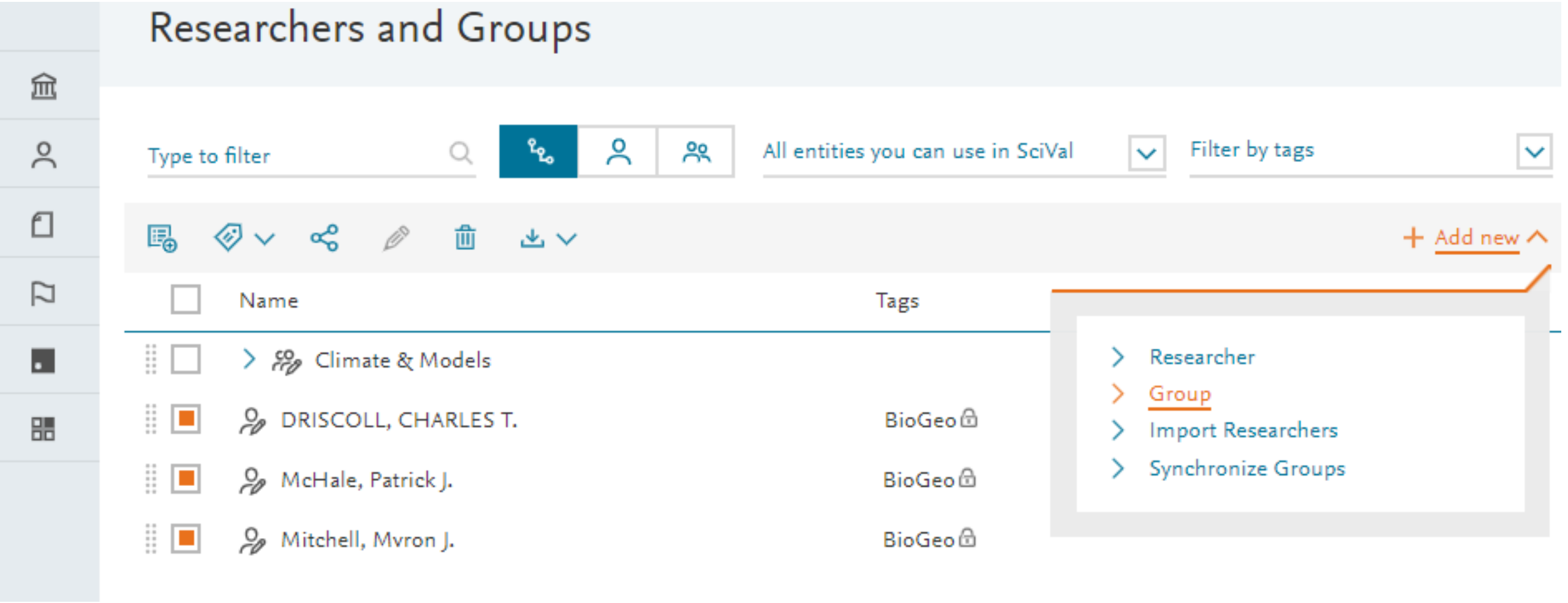
Export profile to SciVal

Documents by author	Total citations	*h*-index:
201 Analyze author output	8749 by 5859 documents View citation overview	48 View *h*-graph

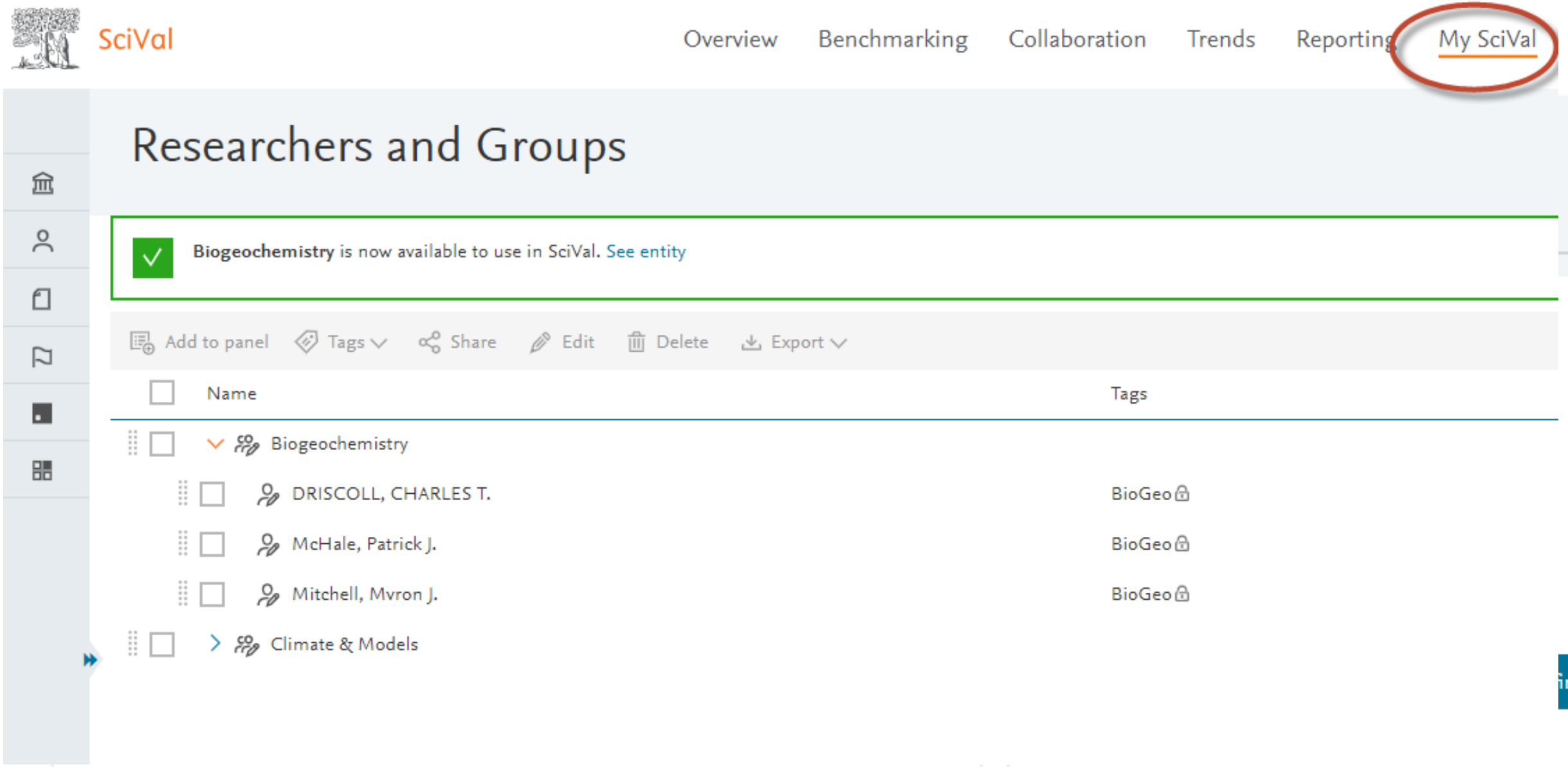
Document and citation trends:



Creating a small group of researchers



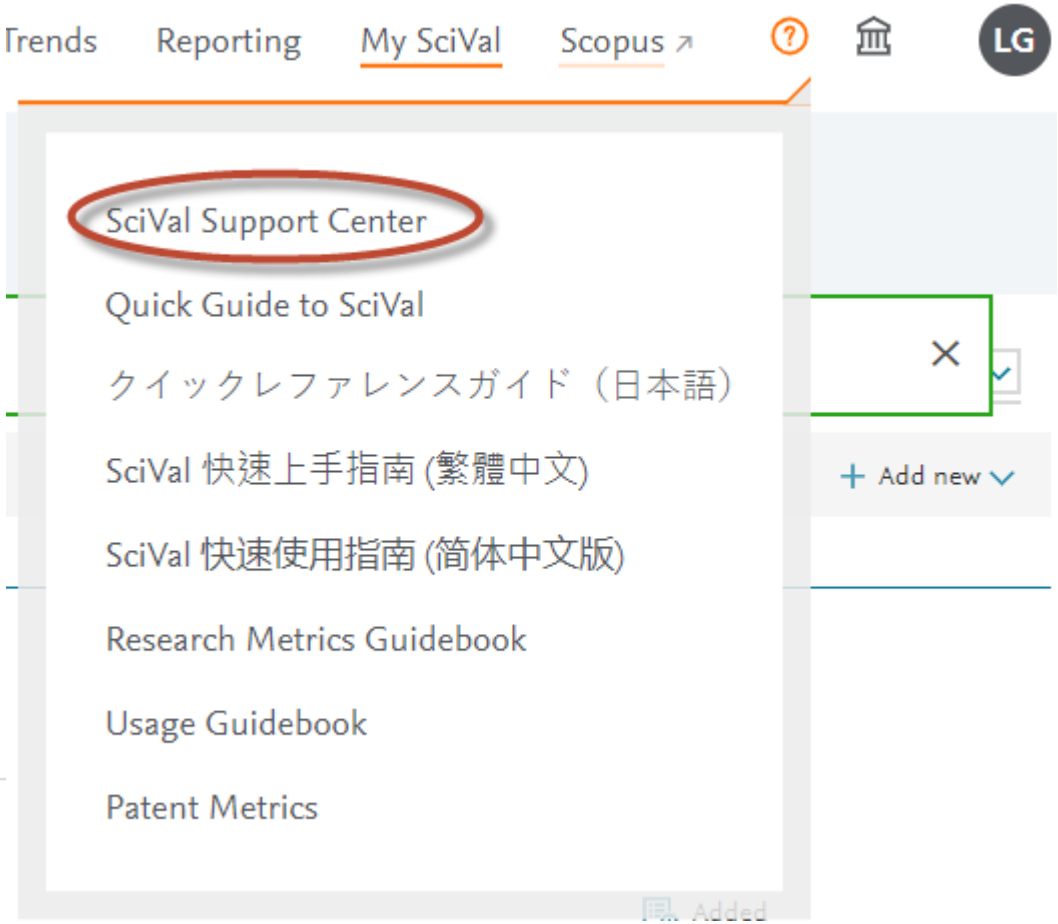
Creating a small group of researchers



More help

- **Importing Researchers & Creating your Hierarchies in SciVal;** recorded webinar: https://www.brighttalk.com/webcast/13819/343411

- SciVal in-product help



Creating researchers and departmental hierarchy structures

Last updated on 23/04/2019 03.10 PM

SciVal gives you the flexibility to analyze any researcher or group of researchers from any institution. Create groups or even recreate your institution's complete hierarchy with a few easy steps. You can then analyze and benchmark the researchers and groups against each other for promotion and tenure decisions, potential collaboration opportunities or to provide metric evidence of their research impact.

Below are FAQs for each step needed to create a hierarchy using the import functionality:

Thank you

Linda Galloway, Elsevier Research Intelligence Consultant

Hansa Magee, Arizona State University, Assistant Director, Knowledge Enterprise Analytics

Further reading

For further information regarding the methodology, how Prominence is calculated and assigned etc. please see the following papers:

- **Research Portfolio Analysis and Topic Prominence**
  Richard Klavans and Kevin Boyack

- **Identifying Emerging Topics in Science and Technology**
  Henry Small, Kevin W. Boyack and Richard Klavans

- **Which Type of Citation Analysis Generates the Most Accurate Taxonomy of Scientific and Technical Knowledge?**
  Richard Klavans and Kevin W. Boyack

- **A New Methodology for Constructing a Publication-Level Classification System of Science**
  Ludo Waltman and Nees Jan van Eck