为高等教育寻找有意义的绩效分析与评估的方法

刘 煜

中国区总裁 首席代表

汤森路透

THOMSON REUTERS

AGENDA

- 引文分析应用于科研绩效分析与评估的理论基础和若干问题
- From Ranking to Benchmark

  — 构建科研绩效“仪表板”
- 华中科技大学学术论文及重点学科分析
- 汤森路透简介
- 讨论

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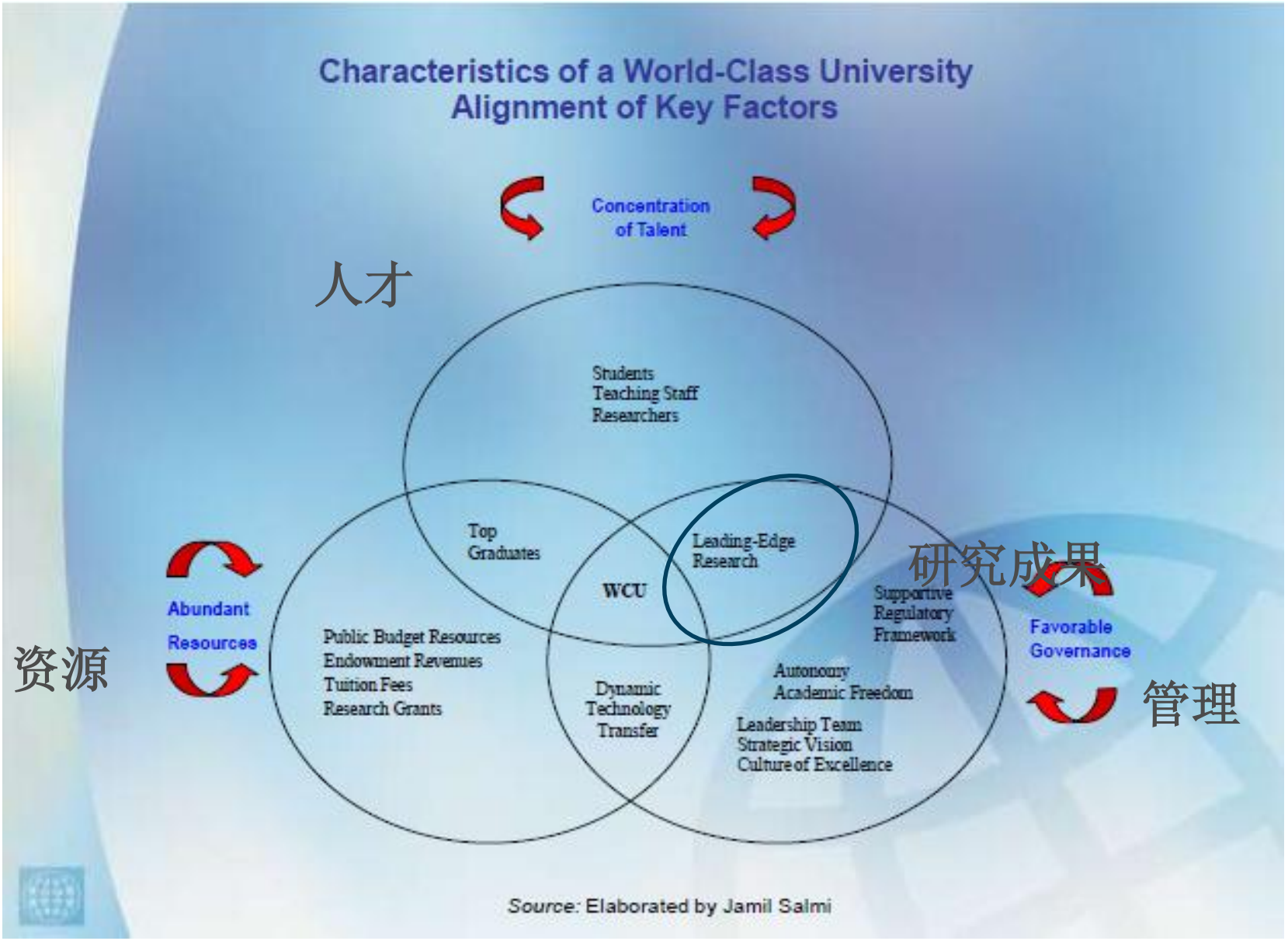
Finding Meaningful Performance Measures for Higher Education
为高等教育寻找有意义的绩效评估方法

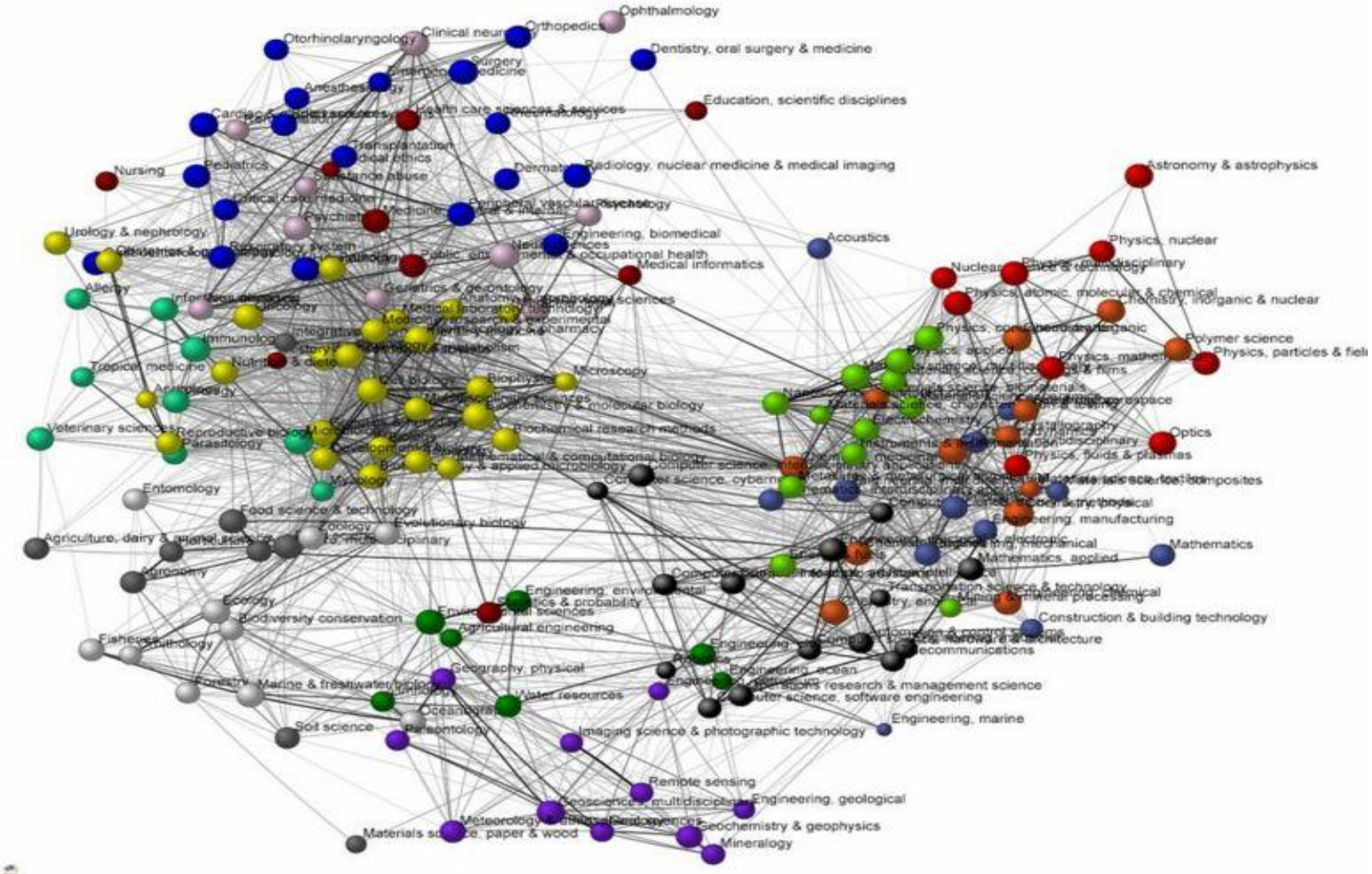
University administrators collect, analyze, and interpret institutional data on students, faculty, educational programs, research performance and support services to plan and make decisions in order to implement, wisely, policies based on their knowledge and understanding.


Characteristics of a World-Class University
Alignment of Key Factors
Concentration of Talent
人才
Students
Teaching Staff
Researchers
Top Graduates
WCU
Leading-Edge Research
研究成果
Abundant Resources
资源
Public Budget Resources
Endowment Revenues
Tuition Fees
Research Grants
Dynamic Technology Transfer
Supportive Regulatory Framework
Autonomy
Academic Freedom
Leadership Team
Strategic Vision
Culture of Excellence
Favorable Governance
管理
Source: Elaborated by Jamil Salmi

Surveys by Thomson Reuters of Administrators of Higher Education
汤森路透对高等教育机构管理部门的调查 2008

- Grant funding 41%
- Faculty salaries 36%
- Research spending 36%
- Rankings 23%
- Patents 18%
- Research output 18%
- Graduation rates 14%
- Private gifts 14%
- Enrollment growth 9%
- Faculty reputation 9%
- Standard definitions 45%
- Accessible data 41%
- Timely updates 32%
- Multiple measures 14%
- Data granularity 9%

Global Map of Science Using Thomson Reuters Field Categories
利用汤森路透学科分类描绘出的世界科学地图



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Research Evaluation: Qualitative vs. Quantitative Two (Complementary) Types of Peer Review

研究绩效评估：定性 vs. 定量 两种（互补）的同行评议方式

Peer Review: Qualitative

- Small-scale, ground-up view
- Absolute counts, size colors perceptions, judgments
- Affected by work done long ago

同行评议：定性

- 小范围内，自下而上的视角
- 绝对的、主观认知和判断
- 会受到较早以前研究成果的影响

Research Evaluation: Qualitative vs. Quantitative Two (Complementary) Types of Peer Review
研究绩效评估：定性 vs. 定量
两种（互补）的同行评议方式

Citation Analysis: Quantitative 引文分析：定量

- Global, top-down view
- Weighted and relative measures
- Can reveal more recent contributions

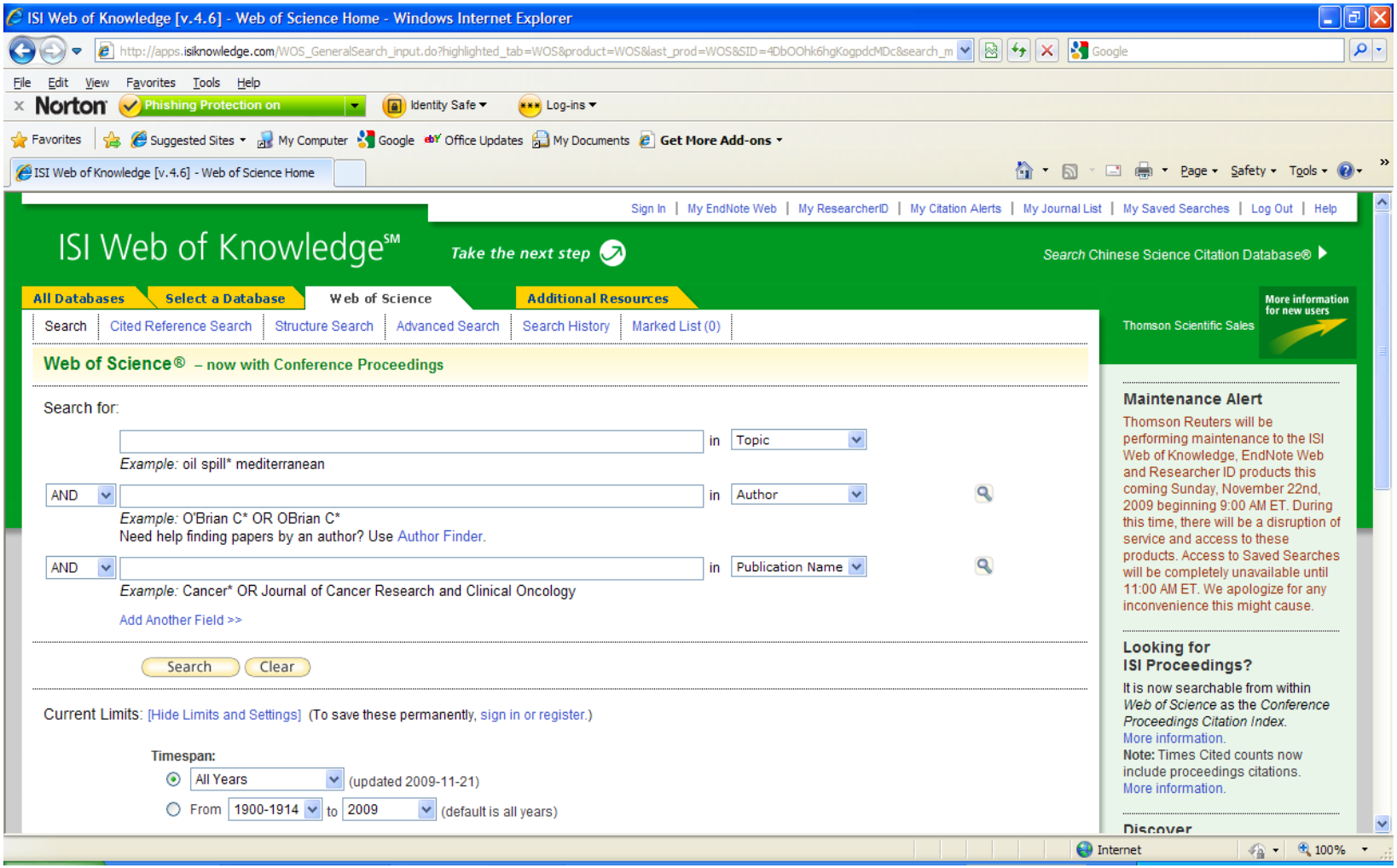
- 全球化，自上而下的视角
- 加权的、相对的度量方
- 能够揭示最新研究的贡献

“If You Can Measure…”
“如果你可以度量…”

"If you can measure that of which you speak, and can express it by a number, you know something of your subject; but if you cannot measure it, your knowledge is meager and unsatisfactory.”

— William Thomson, Lord Kelvin

Thomson Reuters: Web of Knowledge



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Web of Science

- Rigorous selection of internationally influential journals, continually reviewed
- 严格遵循50多年来一贯的选刊标准，遴选全球最具学术影响力的高质量期刊
- Comprehensive in respect to information on each research article – with citations links and counts
- 完整收录每一篇文章的全部信息，包括引文信息在内




Web of Science

- Unmatched time depth, 1900 to present: 44 million article records and 700 million citations
- 前所未有的回溯深度，包含1900年至今的共4400多万条文献和7亿多条参考文献
- Provides powerful retrieval and analytic capabilities
- 强大的检索和分析功能




The Institutes and Reports using Web of Science data for research performance evaluation
全球利用Web of Science数据进行科研绩效评估的机构与报告

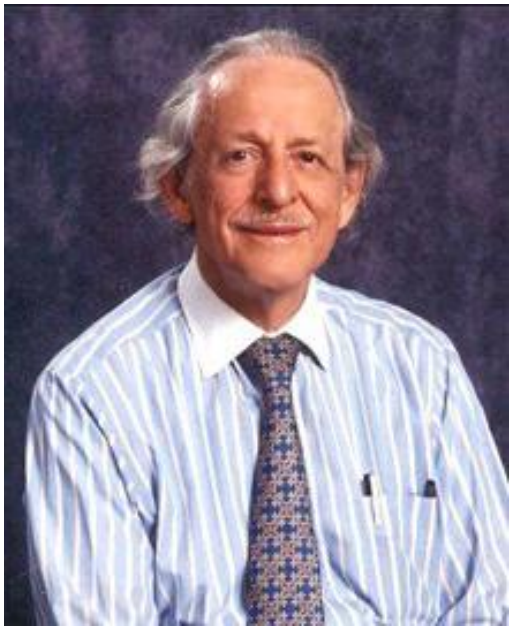
- US, NSF: biennial Science & Engineering Indicators report (1974 -)
- European Union, EC's DG XII (Research Directorate)
- UK, Office of Science & Technology; Higher Education Funding Council
- Canada, NSERC, FRSQ (Quebec), Alberta Research Council
- France, Min. de la Recherché, OST - Paris, CNRS
- Italy, CRUI (University Rectors) MURST (Ministry of Research, CNR
- Spain, CSIC (Spanish Science Agency), CIRIT (Catalonia)
- Japan, National Institute of Informatics, Ministry of Education, Ministry of Economy, Trade & Industry
- People's Republic of China, ISTIC, Chinese Academy of Sciences, Shanghai Jiao Tong University, Wuhan University
- Korea, Korea Research Foundation, Korea Advanced Inst. Of S&T
- Australia, Australian Academy of Science, gov't lab CSIRO
- New Zealand, S. Africa, Portugal, Ireland, Switzerland, Austria, Poland, Czech Republic, Singapore, Malaysia, Thailand, Sweden, Norway, Denmark, Finland, Mexico, Brazil, Chile, Argentina, Uruguay, Russia… and more!

Times Higher Education Chooses Thomson Reuters as Data Provider, Partner (November 2009)

*英国泰晤士报*选择汤森路透作为其全球大学排行榜的数据提供方与合作者（2009年11月）

Indicator	Explanation	Weighting
Academic Peer Review	Composite score drawn from peer review survey (which is divided into five subject areas). 9,386 responses in 2009 (6,354 in 2008).	**40%**
Employer Review	Score based on responses to employer survey. 3,281 responses in 2009 (2,339 in 2008).	**10%**
Faculty Student Ratio	Score based on student faculty ratio	**20%**
Citations per Faculty	Score based on research performance factored against the size of the research body	**20%**
International Faculty	Score based on proportion of international faculty	**5%**
International Students	Score based on proportion of international students	**5%**
Total		100%

Citation Indexes for Science
科学引文索引



Eugene Garfield

Pioneer Information Scientist

and Inventor of Citation Indexes for Sciences, Social Sciences & Humanities

Citation Indexing: Retrieval and Analysis
引文索引：信息检索和分析

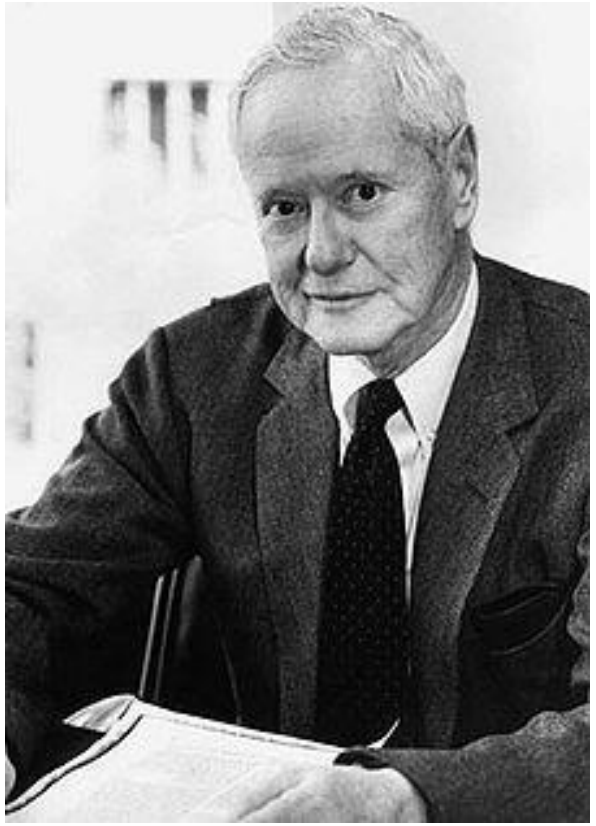
- Eugene Garfield, “Citation indexes for science: a new dimension in documentation through association of ideas,” *Science* 122(3159):108-11, 15 July 1955
- New method of information retrieval for sciences, although used in legal literature (Shepard’s Citations)
- **一种新的科技信息检索方法，在此之前应用于法律文档中(谢泼得引文)**
- Avoids lexical problems in indexing and retrieval
- **克服了信息索引和检索中与词汇处理相关的问题**

Citation Indexing: Retrieval and Analysis
引文索引：信息检索和分析

- Allows searching “forward in time”
- **使得人们可以沿着文献发表的年代向前追溯**
- Reveals socio-cognitive connections of researchers, as well as the organic structure and hierarchy of science
- **揭示了研究人员之间的社会认知联系，以及科学体系的组织结构和层次**
- Permits quantitative investigations and descriptions of research enterprise – “turning the tools of science on science itself,” Derek de Solla Price (1963)
- **能够辅助进行研究机构的定量评估与描述—“将科学研究的工具用于科学本身” Derek de Solla Price (1963)**

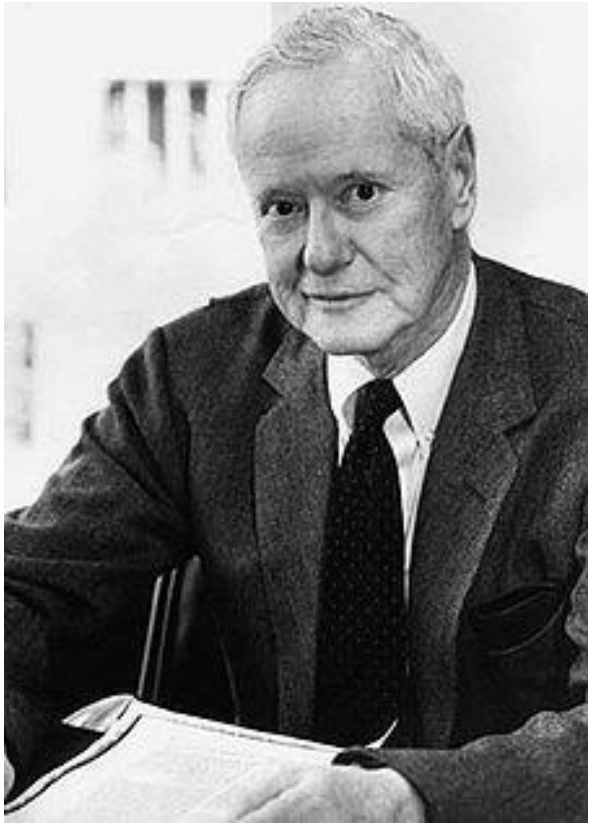
Theories of Citation
引文的原理

- Robert K. Merton, (1910-2003), sociologist of science, Columbia University. Normative theory.
- Citations as currency used to repay intellectual debts. Those with many citations have gained “credits” from their peers.
- **引文是科学系统中用来偿还研究债务的货币。论文的被引用次数较高表明它同同行那里赢得了较高的“信用”。**



Theories of Citation
引文的原理

- The formal nature of publication and the moral imperative to cite.
- **科学出版物的正规形式和出于学术道德必须引用他人研究成果的要求**
- Other theories, including citations as rhetorical devices, constructivist theories, “schools”
- **其他一些理论，包括将引文作为修辞工具、建构主义理论**



Validation Studies: Citation Frequency and Its Correlation with Other Measures of Peer Esteem
实证研究: 被引频次和同行认可程度之间的相关性

Name	Field	Year
Kenneth E. Clark	Psychology	1957
Jonathan R. Cole & Stephen Cole	Physics	1967, 1973
Henry G. Small	Collagen research	1977
Julie A. Virgo	Cancer research	1977
Michael E.D. Koenig	Pharmaceutical research	1983
Eugene Garfield	Nobel Prize winners	1992
Charles Oppenheim	University rankings (RAE)	Mid 1990s-
Andy T. Smith & Michael Eysenck	Psychology	2002

Typical findings, r = .7 to .9

Smith and Eysenck, comparing 1996 and 2001 RAE scores given to psychologists at 38 UK universities (peer review) with their citation counts, concluded:

"The two approaches measure broadly the same thing."

Performance Indicators: Publication Counts as Units of Productivity
研究绩效指标:用发表论文数量作为产出的度量

- Articles in peer-reviewed journals, especially internationally influential journals (books may be important to count in the social sciences and humanities)
- 在同行评议的科技期刊中发表的论文，尤其是具有国际影响力的期刊（对于社会科学和人文领域来说书籍也比较重要）
- Whole or fractional counting? In some fields (large clinical trials, high energy physics), articles list hundreds of authors. Who is an author?
- 整体计数还是部分计数？在某些领域（大型临床试验，高能物理）的论文中经常列出上百位作者，那么谁是真正的作者？

Performance Indicators: Citation Counts as Measures of Impact
研究绩效指标:用被引频次作为影响力的度量

- Total citations to papers over some period
- 在一段时间内论文的总被引次数
- Total citations during period compared with expected citations (expected citation rates provide paper-by-paper averages based on year, field, and article type)
- 某一段时间内的总被引次数相对于期望被引次数（期望被引次数能够提供同一年、同一领域和同一类文献类型的论文平均的被引次数）

Performance Indicators: Citation Counts as Measures of Impact
研究绩效指标:用引文数量作为影响力的度量

- Citations per paper over some period, especially when compared to baselines for field
- 在某一段时间内平均每篇论文的被引次数，特别可以用于和某学科领域内的基准线对比;
- Number of highly cited papers (analyzed using percentiles of citation within field for specific years)
- 高被引论文数（在特定年份某学科领域内按被引次数排序的百分位数据进行分析）
- h-index, its variants, and many other measures
- h指数以及其他变体形式的指标

Different Fields Exhibit Different Citation Rates; Older Papers More Cited Than Younger Papers
不同领域呈现出不同的篇均被引频次；较早发表的文章具有较高的被引频次

Fields	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	All
All Fields	18.24	17.67	16.48	15.09	13.24	11.49	9.14	6.52	4.18	1.68	0.26	10.06
Agricultural Sciences	12.10	12.22	11.13	10.23	9.35	8.02	6.19	4.51	2.69	0.93	0.14	6.40
Biochemistry	29.24	28.53	26.10	23.56	20.79	17.60	13.65	9.62	6.12	2.52	0.36	16.35
Chemistry	16.68	16.83	15.39	15.02	13.31	11.81	9.77	7.13	4.69	2.06	0.32	10.10
Clinical Medicine	21.29	20.65	19.52	18.18	16.38	14.24	11.55	8.21	5.17	1.96	0.30	12.14
Computer Science	6.84	6.27	6.58	6.66	4.32	3.12	2.50	1.54	1.57	0.60	0.10	3.25
Economics & Business	10.67	10.07	9.00	8.89	7.56	6.35	4.71	3.08	1.76	0.63	0.13	5.37
Engineering	7.28	7.13	6.90	6.26	5.66	5.10	4.00	2.86	1.97	0.76	0.14	4.18
Environment/Ecology	19.46	19.66	17.21	15.87	14.01	11.95	9.25	6.55	4.12	1.49	0.26	10.10
Geosciences	17.74	16.16	15.15	12.83	11.55	9.76	7.72	5.83	3.25	1.38	0.32	8.91
Immunology	34.47	34.80	32.79	29.27	25.74	23.09	18.16	13.26	8.66	3.48	0.48	20.66
Materials Science	10.18	10.49	9.90	8.98	8.63	7.39	5.93	4.46	2.89	1.21	0.19	6.09
Mathematics	6.38	5.78	5.09	4.91	4.26	3.65	2.97	2.13	1.31	0.56	0.12	3.17
Microbiology	28.14	26.51	24.52	22.11	19.58	17.05	14.18	9.57	5.85	2.38	0.30	14.98
Molecular Biology	46.55	44.58	41.32	37.24	31.82	27.30	21.17	15.21	9.54	3.97	0.55	24.71
Neurosciences	33.69	32.14	30.51	26.91	22.76	19.64	15.72	11.32	6.92	2.72	0.38	18.29
Pharmacology	19.39	19.24	18.63	17.82	15.05	13.93	10.54	8.29	5.07	2.04	0.28	11.32
Physics	14.15	14.01	12.76	11.54	10.35	9.43	7.72	5.73	3.42	1.59	0.25	8.45
Plant, Animal Science	13.22	12.84	11.84	10.82	9.48	8.23	6.29	4.49	2.76	1.10	0.20	7.16
Psychiatry/Psychology	19.97	18.56	17.57	15.33	14.11	11.83	9.03	6.30	3.62	1.35	0.23	10.21
Social Sciences	8.00	7.83	7.13	6.72	5.95	5.31	4.26	2.91	1.69	0.62	0.14	4.26
Space Science	24.42	19.35	21.21	16.83	17.61	14.97	12.97	9.83	7.31	3.00	0.76	13.52

The h-index: A New Measure of Productivity and Influence
h指数：一个用于衡量产出数量和影响力的新指标

Jorge E. Hirsch, “An index to quantify an individual's scientific research output” *PNAS*, 102(46): 16569-16572, 2005.

- A researcher with an index of *h* has published *h* papers each of which has been cited at least *h* times.
- 一个科学家的h指数等于*h*，意味着该科学家发表的所有论文中有*h*篇论文的被引用次数都大于等于*h*。
- Represents an attempt to combine measures of productivity and influence. Like other measures, it is field dependent.
- 该指标能够结合论文的数量和影响力两方面。和其他指标一样，该指标的使用也应该在同一学科领域当中。

The h-index: A New Measure of Productivity and Influence
h指数：一个用于衡量产出数量和影响力的新指标

- Strengths: simple to calculate, combines output and impact, depicts “durable” performance and not single achievements, correlates with other measures of significance.
- 优势：便于计算，结合了论文数量与影响力，能够体现多方面的成就而不仅仅局限于单项的成绩，与其他影响力指标的结果高度相关
- Weaknesses: discriminates against young researchers, will not capture small but high-quality output, may not depict recent performance, h will never decline so one can “rest on one’s laurels.”
- 劣势：对青年科学家会有一定的歧视，只能够捕捉到少数高影响力的研究成果，但是近期的研究成果无法体现。h指数随着时间的推移不会衰减。

Citation Analysis and Research Evaluation: National and Institutional to Individual
引文分析和研究绩效评估: 从国家到个人

General Principles基本准则

- Basic better than applied sciences
  基础研究优于应用研究
- Aggregate better than individual datasets
  整体优于个体
- Long better than short period
  长期优于短期
- Relative better than absolute measures
  相对指标优于绝对指标
- Multiple better than single measures
  多指标优于单指标

Above all: Compare like with like, not "apples with oranges"
总的来说：同类对比而非"拿苹果与橘子比较"
Henk F. Moed, *Citation Analysis in Research Evaluation*, (Springer 2005)

Specific Observations
其他启示

- Citation analysis is not “a royal road to evaluation.” It is not a short-cut method, but actually requires more work, more thought.
- 引文分析并不是“评估的捷径”，而需要做更多的工作和思考
- Quantitative results should always be combined with qualitative judgments (peer review). Each reinforces the other…..
- 定量分析结果应该与定性判断（同行评议）相结合。二者互相补充，相辅相成。

“The goal in science…”
科学研究的目的

“The goal in science should be to find out things – not to win a prize….Yet, in conversations with some of my younger colleagues, I get a sense that it has become a goal, and that is not good. I think it would be better if there were no prizes.”

-- Salvador Luria, Nobel Laureate in Physiology or Medicine, 1969

Citizens, Scientists, Policymakers: Some Conclusions
科学家, 政策制定者, 纳税人：一些结论

- Support for science from citizens requires policymakers and administrators to ensure effectiveness and efficiency. Scientists are accountable for the support they receive.
- **从纳税人的角度来说，他们需要政策制定者和管理者确保用于科学研究经费的有效性和高效率。而科学家应该对合理使用这些研究经费负责**
- Citation analysis combined with peer review can often add substantially to research assessment and improve decisions made by administrators and policymakers.
- **引文分析和同行评议相结合的方法可以在很大程度上支持研究绩效评估，并辅助管理者和政策制定者更好的做出决策**

Citizens, Scientists, Policymakers: Some Conclusions
科学家, 政策制定者, 纳税人：一些结论

- But using metrics in simple ways to control outcomes can change behavior and actually institutionalize uniformity or even mediocrity in research.
- 但是仅仅简单的使用指标去控制研究产出会改变研究人员的行为，并会使科学研究走上制度化、平庸化的道路
- This may dampen creativity and derail “revolutionary science” (Thomas Kuhn), the type recognized as excellent.
- 这一方式会很大的打击研究人员的创造性并对“科学革命”(Thomas Kuhn)造成伤害，而这些都是人们所认可的科学精神
- The ideal is informed, thoughtful, and wise assessment coupled with directed support related to national and institutional goals.
- 理想的方法应该是有根据的、全面的、客观的评价，同时伴随着与国家和机构的研究使命相吻合的经费支持。

AGENDA

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- From Ranking to Benchmark

  — 构建科研绩效“仪表板”
- 华中科技大学学术论文及重点学科分析
- 汤森路透简介
- 讨论

ESI和InCites

—基于引文的综合性科研评估工具

高质量的

权威数据

Web of Science

Thomson Reuters

专业的数据规范和处理

大学/机构名称的规范

数据清理

高附加值的

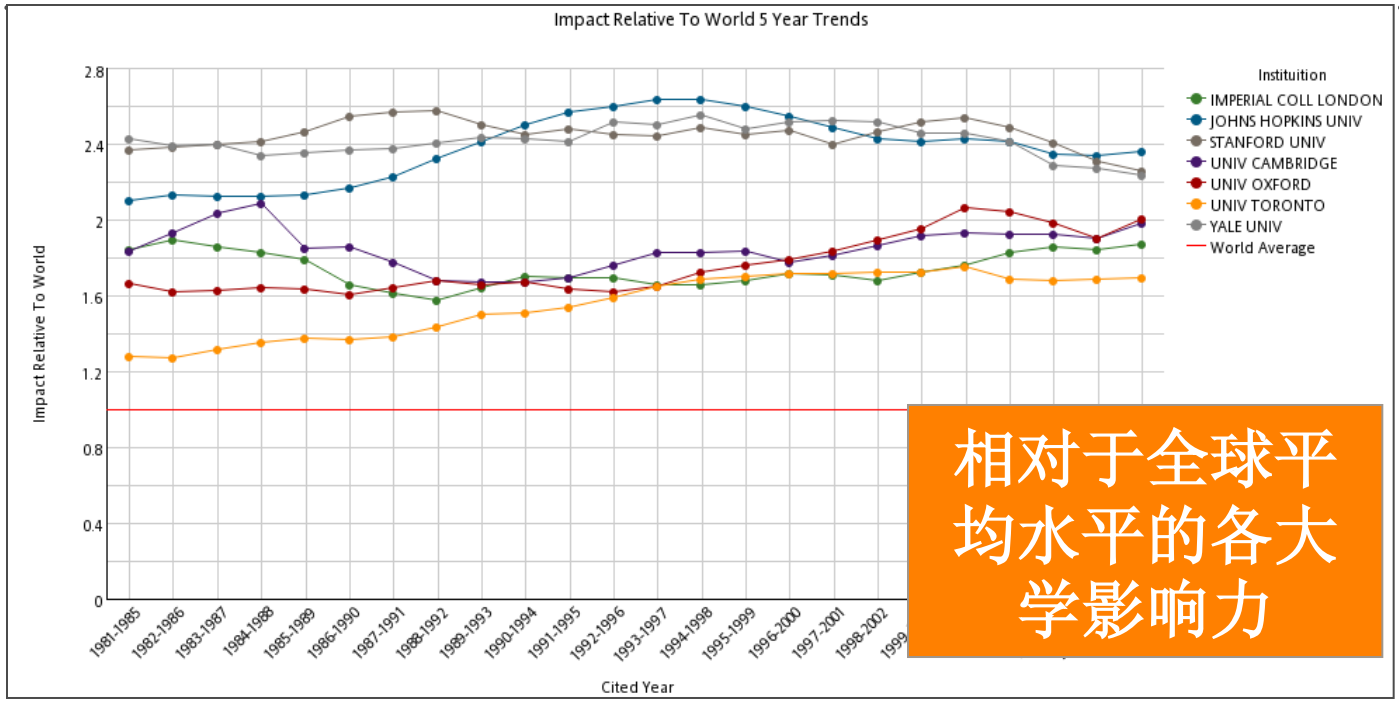
全球/国家/领域

基准数据

ESI 和 InCites

- 评估数据来源于高质量的Web of Science引文数据库各学科领域近30年的数据
- 可灵活定制所需分析的数据内容范围
- 一站式的网络信息平台为用户提供快速全面的分析结果
- 从宏观的国家、机构、领域分析到微观的每篇论文、每个科研人员的绩效评估

InCites
– 基于引文的综合性科研评估工具



InCites呈现的不止是简单的机构论文和引文的数量，而是能够揭示数字背后的深远意义。全球学术论文的平均水平，各学科的基准数据，高影响力论文百分比和各种相对指标帮助用户有效地对比分析本机构的研究绩效，帮助科研管理人员做出正确的科研决策.

InCites能够帮助您的机构:

- 实时跟踪机构的研究产出和影响力
- 将本机构的研究绩效与其他机构以及全球和学科领域的平均水平进行对比
- 发掘机构内具有学术影响力和发展潜力的研究人员
- 建立评价基准，准确、合理的分配项目基金
- 监测机构的科研合作活动，并寻求潜在的合作机会
- 制定基于计量指标、可以长期跟踪的科研战略与政策

InCites: 丰富的科研管理信息资源

- 机构引文报告
  - 以科研机构为单位，定制该机构研究人员所发表的论文及引用信息，同时提供高附加值的文献计量学指标进行深入的分析和有效的科研评估，帮助科研机构及时了解本机构的科研产出，影响力和合作情况；
- 国家指标数据
  - 以国家及地区为单位，提供了全球170多个国家与若干个地区（亚太， 亚太（不包括日本），欧洲共同体，拉丁美洲，中东，北欧，OECD）在各学科领域的综合科研效绩评估指标；
- 机构指标数据
  - 以大学或研究机构为单位，汇总其论文与引文总数。提供各国大学/研究机构在各学科领域的综合研究绩效评估指标；

InCites: 丰富的科研管理信息资源

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RESEARCH PERFORMANCE PROFILES | GLOBAL COMPARISONS | FOLDERS

CALIBRATE YOUR STRATEGIC RESEARCH VISION

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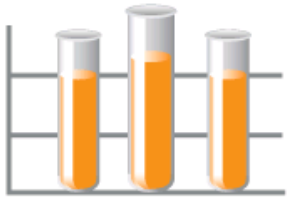

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- Identify field strengths within countries/territories

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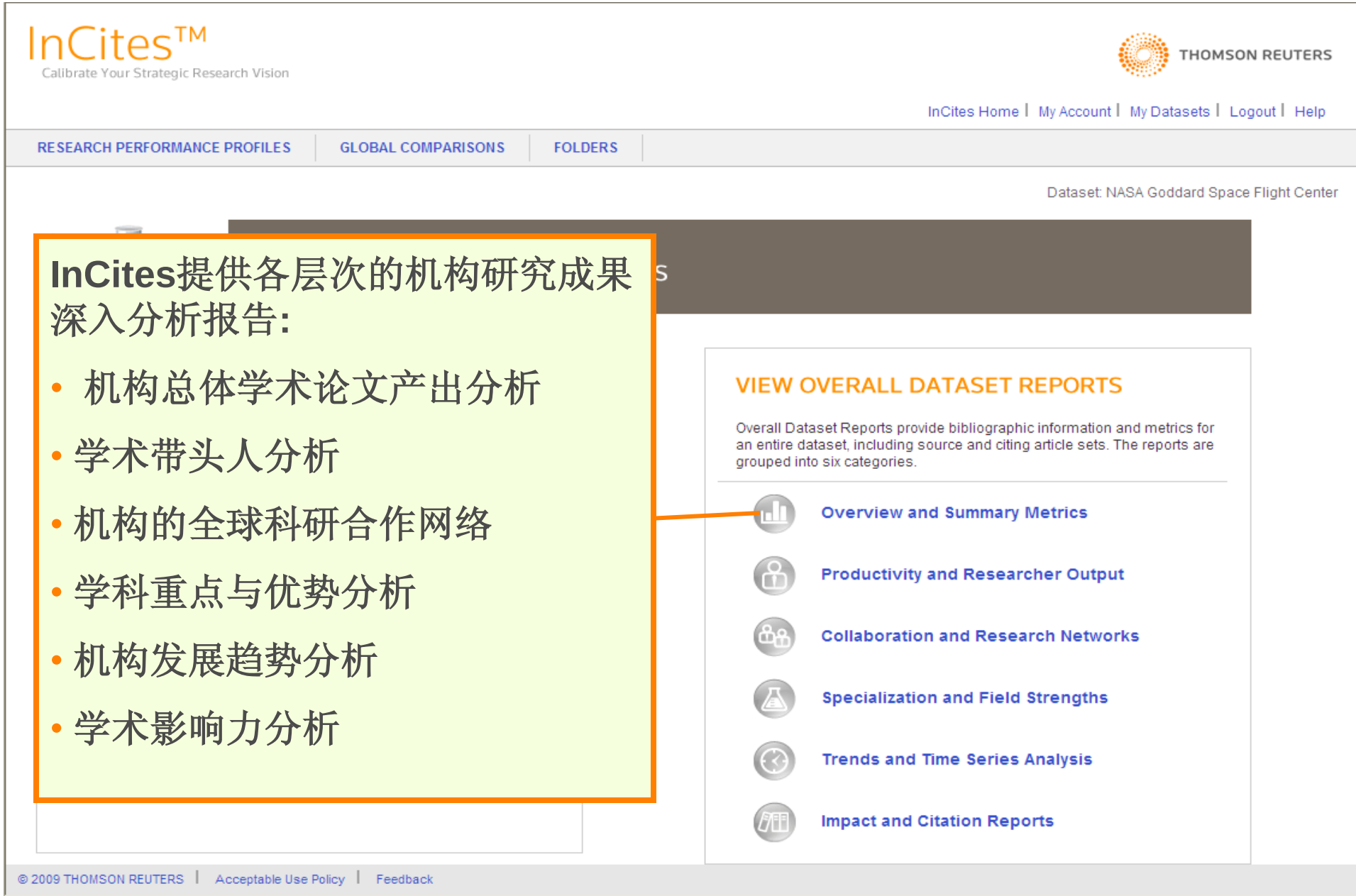
定制机构研究绩效数据– 能够从论文、作者、合作等方面进行深入分析

对比分析本机构与其它机构的科研绩效

InCites: 强大的科研管理分析评估工具



InCites提供各层次的机构研究成果深入分析报告:

- 机构总体学术论文产出分析
- 学术带头人分析
- 机构的全球科研合作网络
- 学科重点与优势分析
- 机构发展趋势分析
- 学术影响力分析

机构总体指标面板：对机构的总体影响力、学科分布、科研合作，以及与国际平均水平的对比

Viewing Dataset: NASA

Summary Metrics

引文指标

Citation Metrics

Total citations	573,706
Total articles	23257
Cites per article	24.67
h-index	220
Median cites	11
2nd generation cites	13,284,083
2nd generation cites per citing article	60.04

Disciplinarity Metrics

Disciplinarity index	0.15
Interdisciplinarity index	0.49

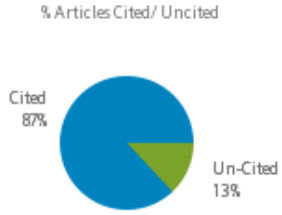
学科指标

Collaboration Metrics

Unique Authors	32,824
Average Authors per article	6.44
Unique Organizations	5,189
Average Organizations per article	3.51
Average Countries per article	1.64

合作指标

View Citation Frequency Distribution



40.20

Category actual/ Expected Cites (CXC)

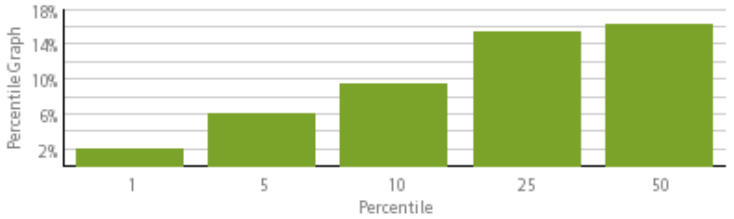
1.61

Journal actual / Expected Cites (JXC)

1.08

国际基准对比指标

Percentage articles above / below Expected Level



Percentile	1	5	10	25	50
Number of articles	655	2412	4296	8910	14654
Percent of articles	2.96%	10.91%	19.43%	40.30%	66.29%

InCites: 机构中的学术带头人分析

Author Ranking (source articles)

Sort By: Total Citations

Rank	Author	Total Citations	Total Articles	Avg Cites per Article	h-index	Journal Actual/Expected Cites (JXC)	Category Actual/Expected Cites (CXC)	Mean Percentile
1	WRIGHT, EL	21528	76	283.26	52	5.15	14.30	5.49
2	BENNETT, CL	20213	95	212.77	49	4.45	10.46	15.86
3	KOGUT, A	18600	97	191.75	44	4.57	10.63	23.95
4	HINSHAW, G	18413	71	259.34	43	[illegible]	13.44	8.32
5	MEYER, SS	17421	58	300.36	35	[illegible]	17.01	15.80
6	PAGE, L	14136	39	362.46	27	[illegible]	22.07	11.02
7	LIMON, M	14072	47	299.40	26	[illegible]	20.18	27.04
8	WOLLACK, E	14052	42	334.57	26	[illegible]	26.67	22.73
9	SPERGEL, DN	14050	30	468.33	26	6.69	30.37	4.03
10	HALPERN, M	14019	32	438.09	26	6.51	30.24	7.31
11	JAROSIK, N	14015	31	452.10	26	6.52	30.56	6.17
12	TUCKER, GS	13964	29	481.52	25	6.52	30.68	4.51
13	WEILAND, JL	13389	40	334.73	31	5.36	15.05	5.48
14	MUSHOTZKY, RF	13337	237	56.27	63	1.65	2.64	22.38
15	KAUFMAN, YJ	12199	187	65.24	59	1.98	4.12	14.35
16	KOMATSU, E	11960	17	703.53	16	9.09	48.68	3.53
17	NOLTA, MR	11912	20	595.60	18	8.34	42.55	3.19
18	HOLBEN, BN	10332	171	60.42	48	2.63	4.31	21.47
19	TUCKER, CJ	10092	133	75.88	52	2.08	5.16	13.49
20	RIND, D	9321	156	59.75	52	1.22	3.23	19.31

他们的h指数分别是多少？

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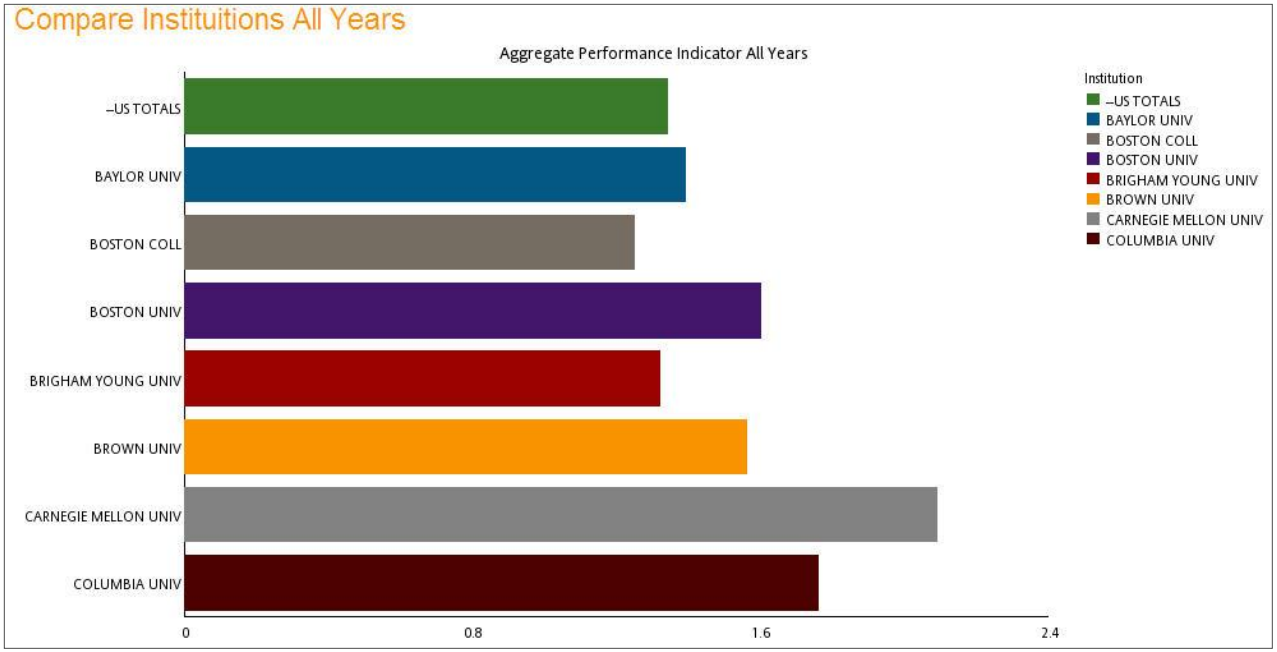
InCites: 本机构和其他研究机构的学术成果对比

SAVE PRINT EXCEL PDF

Compare Institutions All Years

Sort By: Organization/Region

Organization/Region	Articles View Graph	Total Citations View Graph	Citations per Article (Impact) View Graph	% Articles Cited View Graph	Impact Relative To World View Graph	% Articles in World View Graph	% Articles Cited Relative To World View Graph	Aggregate Performance Indicator View Graph
--US TOTALS	6,981,020	150,656,760	21.58	83.76	1.47	35.48	1.07	1.34
BAYLOR UNIV	6,184	154,153	24.93	81.68	1.69	0.03	1.04	1.39
BOSTON COLL	7,482	112,848	15.08	78.58	1.02	0.04	1.00	1.25
BOSTON UNIV	46,756	1,258,170	26.91	87.07	1.83	0.24	1.11	1.60
BRIGHAM YOUNG UNIV	12,289	164,022	13.35	77.77	0.91	0.06	0.99	1.32
BROWN UNIV	32,483	790,968	24.35	86.51	1.65	0.17	1.10	1.56
CARNEGIE MELLON UNIV	25,159	607,196	24.13	84.17	1.64	0.13	1.07	2.09
COLUMBIA UNIV	90,056	2,668,505	29.63	86.34	2.01	0.46	1.10	1.76



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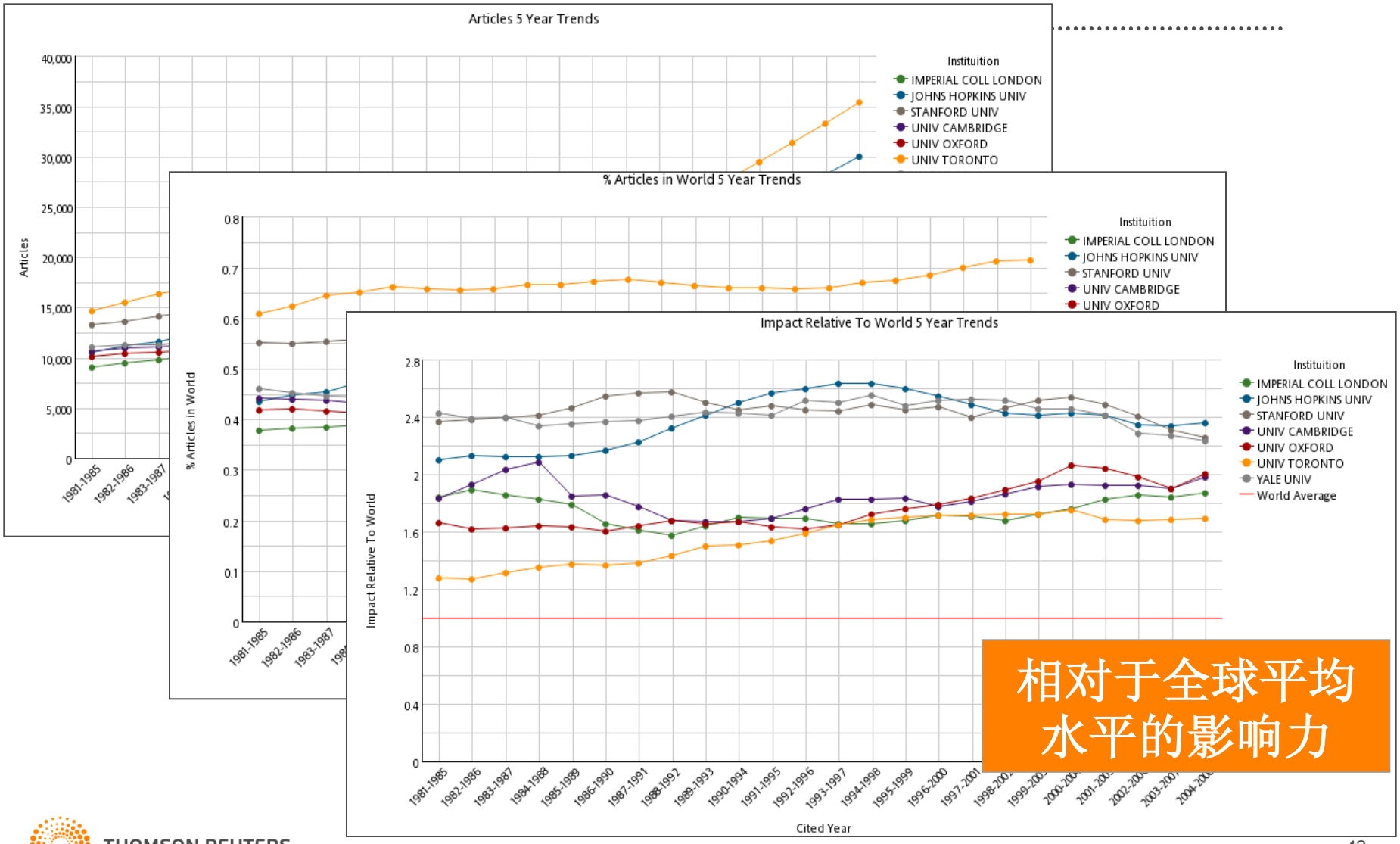
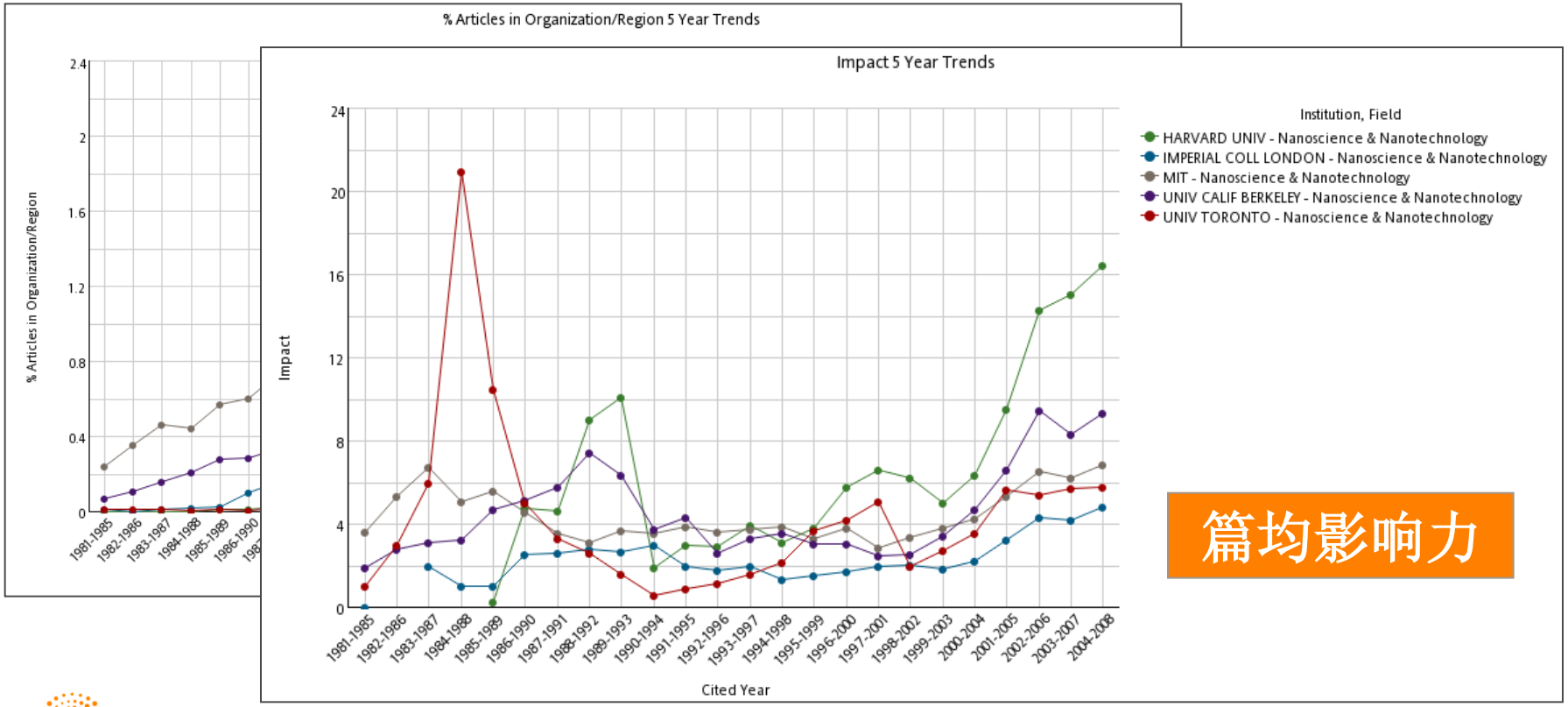
InCites: 本机构和其他研究机构的学术成果对比



InCites: 本机构和其他研究机构的学术成果对比
纳米科学和纳米技术学科

Organization/Region	Field	Years	Articles View Graph	Total Citations View Graph	Citations per Article (Impact) View Graph	% Articles Cited View Graph	Impact Relative to Field View Graph	Impact Relative to Organization/Region View Graph	% Articles in Field View Graph	% Articles in Organization/Region View Graph	% Articles Cited Relative to Field View Graph	% Articles Cited Relative to Organization/Region View Graph
HARVARD UNIV	Nanoscience & Nanotechnology	2002-2006	158	2,260	14.30	78.48	3.67	1.16	0.48	0.28	1.31	1.02
HARVARD UNIV	Nanoscience & Nanotechnology	2003-2007	210	3,167	15.08	80.48	3.88	1.22	0.52	0.35	1.36	1.04
HARVARD UNIV	Nanoscience & Nanotechnology	2004-2008	251	4,138	16.49	81.27	3.90	1.31	0.49	0.39	1.31	1.05
IMPERIAL COLL LONDON	Nanoscience & Nanotechnology	1994-1998	43	56	1.30	34.88	0.69	0.21	0.32	0.25	0.77	0.52
IMPERIAL COLL LONDON	Nanoscience & Nanotechnology	1995-1999	47	71	1.51	53.19	0.79	0.24	0.34	0.27	1.08	0.77
IMPERIAL COLL LONDON	Nanoscience & Nanotechnology	1996-2000	59	102	1.73	47.46	0.90	0.27	0.37	0.33	0.94	0.68

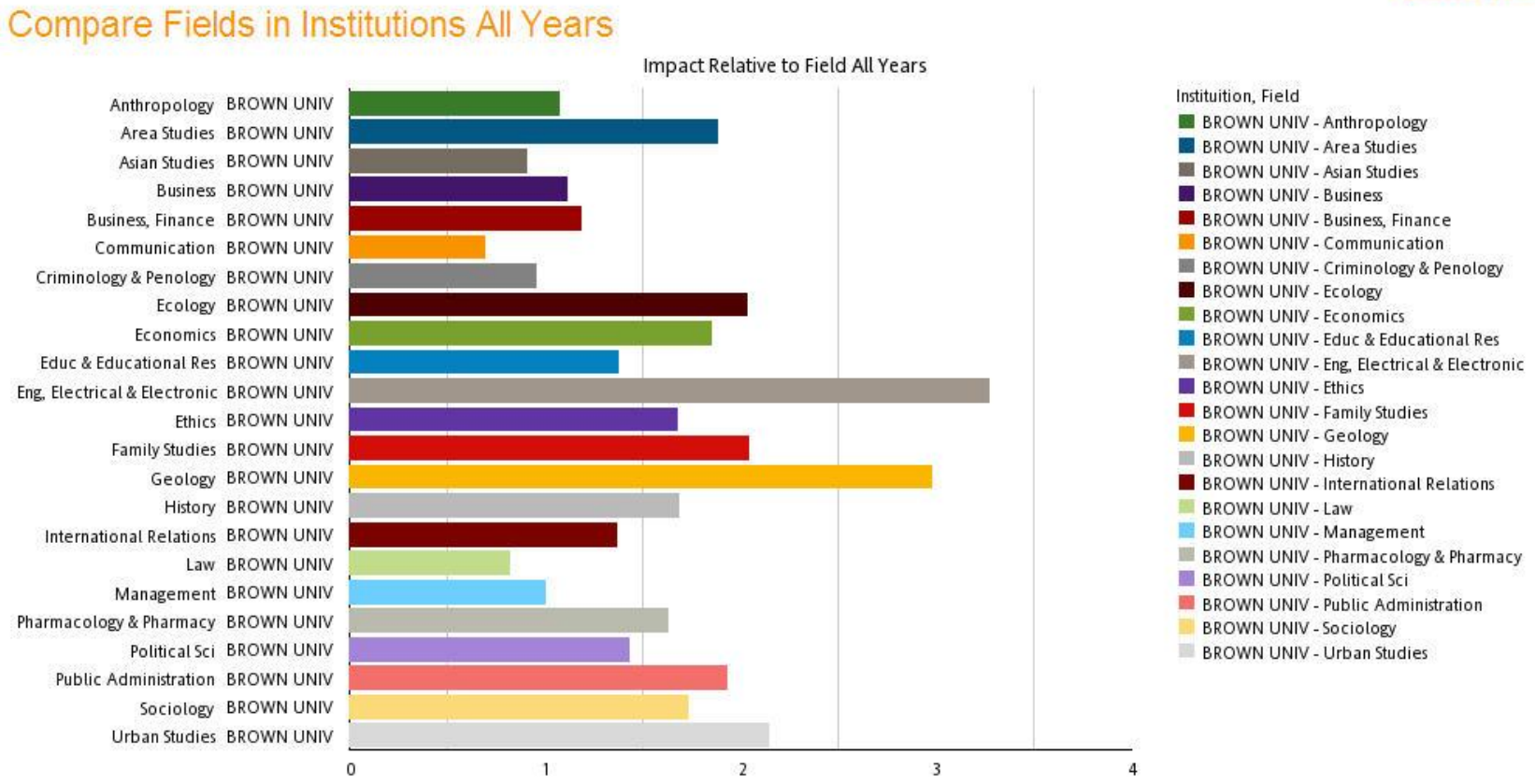


篇均影响力

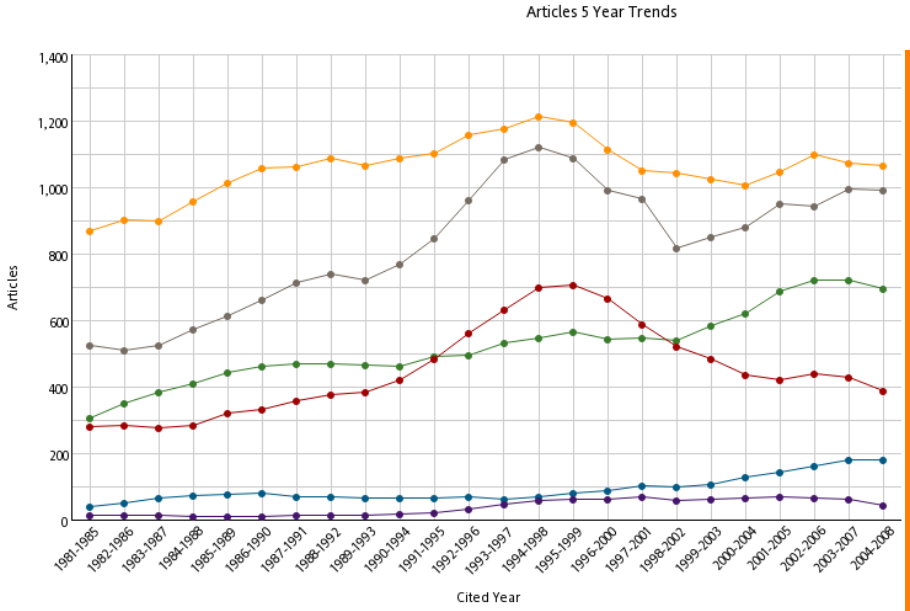
InCites: 重点学科和相对于全球的平均影响力分析

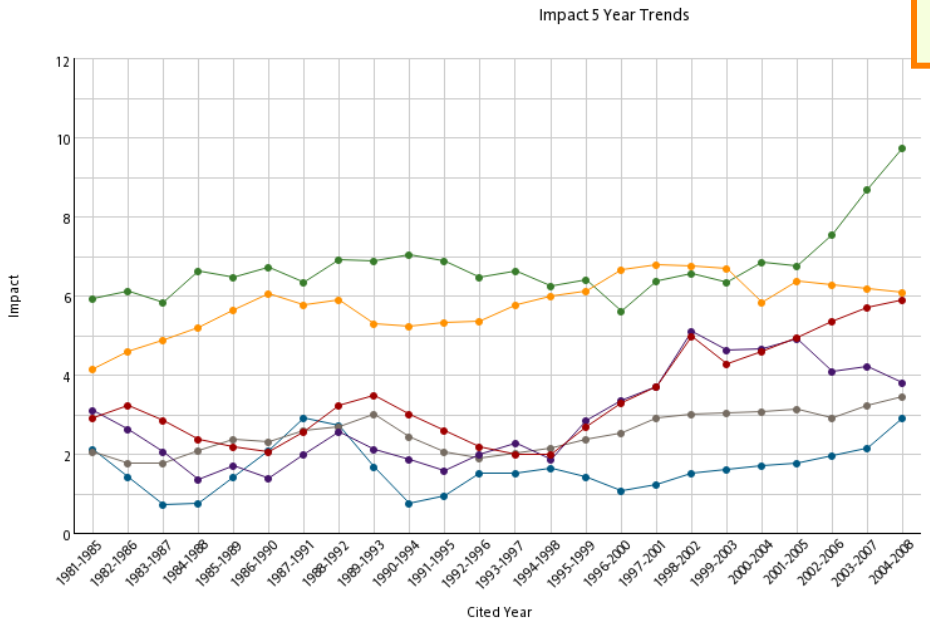
通过对比该机构各个学科的相对影响力，可以看到：该机构在电子与电气工程、地学领域的影响力远远高于世界平均水平，而传媒、法学等领域则低于世界平均水平

SAVE PRINT EXCEL PDF



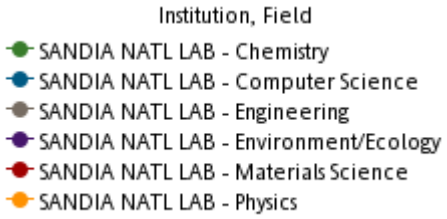
InCites: 机构的研究重点转变趋势分析





以**Sandia National Laboratories**为例，左上图显示了研究论文的数量，左下图显示了同样几个研究领域的总被引次数

用户可以看到材料科学在论文数量方面发生的变化，也可以看到化学、和环境与生态学在学术影响力方面的增长



InCites - 基于引文的综合性科研评估工具

- **InCites是基于Web of Science高质量的权威数据，经过数据清理与机构名称规范化处理生成的研究绩效评价工具；**
- **能够为科研管理人员提供科研项目管理、人才评估、学科建设、科研合作等方面决策的分析结果与数据支撑；**
- **能够提供全球基准数据用于将本机构与其他机构进行横向对比，掌握本机构在全球各学科领域的相对位置；**
- **基于网络平台的分析型数据资源，每季度更新，为评估分析工作提供最新结果**

AGENDA

- 引文分析应用于科研绩效分析与评估的理论基础和若干问题
- From Ranking to Benchmark

  — 构建科研绩效“仪表板”
- 华中科技大学学术论文及重点学科分析
- 汤森路透简介
- 讨论

THE KNOWLEDGE ECONOMY 知识经济

"In an economy where the only certainty is uncertaintity, the one source of lasting competitive advantage is knowledge"

Ikujiro Nonaka in *Harvard Business Review*

THE KNOWLEDGE PYRAMID 从数据到知识

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医疗

传媒

路透新闻每天送达10亿多人

全球2千多万研究人员使用。

科技

金融

全球50多万专业用户

全美前100 家会计事务所，99家使用Checkpoint

税务和会计

法律

世界98%的律师行信赖 Westlaw

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汤森路透：Global Institutional Profiles Project

World University Rankings 2010

THE

Times Higher Education's annual World University Rankings are changing

We have signed an agreement with Thomson Reuters, the world's leading research data specialist, to provide all the data for our annual World University Rankings from 2010 and beyond.

We have decided to end our relationship with QS, who will have no further involvement in Times Higher Education's annual World University Rankings.

We will develop a new rankings methodology over the coming months in consultation with our editorial board of higher education experts and Thomson Reuters. But we want your views.

With your help, and with the combined expertise of Times Higher Education and Thomson Reuters, we will publish a revamped and improved Times Higher Education World

Q&A

谢谢！

联系：

david.liu@thomsonreuters.com