

Indicadores bibliométricos y matemáticas crónica de un peligroso desencuentro

Domingo Docampo

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atlantTIC

UniversidadeVigo



- No todo lo que se puede contar cuenta, ni todo lo que cuenta se puede contar.
- Medir no es inocuo. Lo que se mide puede convertirse en lo único importante.

Nada es extraño en esta tabla

NUMBER OF HCPs AND % OF CLINICAL MEDICINE PAPERS (Docs)							
Country	Docs	HCPs	%	Country	Docs	HCPs	%
BELGIUM	27898	688	2.5%	CANADA	78305	1369	1.7%
DENMARK	23588	537	2.3%	UK	144567	2471	1.7%
GREECE	16289	353	2.2%	ITALY	98899	1665	1.7%
SWITZERLAND	39735	837	2.1%	GERMANY	104334	1634	1.6%
NETHERLANDS	52945	1113	2.1%	AUSTRALIA	72246	1087	1.5%
FRANCE	65719	1349	2.1%	BRAZIL	36302	476	1.3%
SWEDEN	28604	585	2.0%	USA	545623	5503	1.0%
AUSTRIA	19966	403	2.0%	S KOREA	47072	443	0.9%
ISRAEL	16767	333	2.0%	INDIA	42538	393	0.9%
POLAND	20675	392	1.9%	JAPAN	87891	702	0.8%
SPAIN	63438	1112	1.8%	CHINA	240609	1407	0.6%

Nada es normal en esta otra

NUMBER OF HCPs AND % OF MATH PAPERS (Docs)							
Country	Docs	HCPs	%	Country	Docs	HCPs	%
PAKISTAN	3872	224	5.8%	CHINA	46690	710	1.5%
EGYPT	2606	130	5.0%	INDIA	8854	125	1.4%
SAUDI ARABIA	7381	324	4.4%	S KOREA	4496	52	1.2%
THAILAND	1423	59	4.1%	ITALY	8149	83	1.0%
TAIWAN	3301	128	3.9%	SPAIN	6479	50	0.8%
TURKIYE	4716	128	2.7%	GERMANY	9350	61	0.7%
SOUTH AFRICA	1300	35	2.7%	CANADA	5362	33	0.6%
ROMANIA	2802	72	2.6%	UK	7847	47	0.6%
IRAN	4608	80	1.7%	USA	28378	158	0.6%
VIETNAM	1746	29	1.7%	RUSSIA	6662	29	0.4%
AUSTRALIA	2723	42	1.5%	FRANCE	9057	25	0.3%

TOP 10 INSTITUTIONS BY NUMBER OF TOP 1% PAPERS (2008-2010)

Name	WoS Docs	Top 1%	% Top 1%
UCLA	495	28	5.66
Princeton	460	27	5.87
Paris Cite	1157	27	2.33
UC Berkeley	570	26	4.56
Michigan	559	26	4.65
Stanford	418	25	5.98
Sorbonne	1104	23	2.08
Minnesota Twin Cities	430	21	4.88
MIT	460	18	3.91
Chicago	355	16	4.51

¿Qué está pasando?

TOP 10 INSTITUTIONS BY NUMBER OF MATH HCPs (2021-2023)		
Name	Country	PUB
CHINA MEDICAL UNIVERSITY TAIWAN	TAIWAN	102
KING ABDULAZIZ UNIVERSITY	SAUDI ARABIA	67
HANGZHOU NORMAL UNIVERSITY	CHINA	65
HENAN POLYTECHNIC UNIVERSITY	CHINA	50
COMSATS UNIVERSITY ISLAMABAD CUI	PAKISTAN	43
TAIF UNIVERSITY	SAUDI ARABIA	43
HUZHOU UNIVERSITY	CHINA	42
KHON KAEN UNIVERSITY	THAILAND	38
KING KHALID UNIVERSITY	SAUDI ARABIA	34
PRINCE SATTAM BIN ABDULAZIZ UNIVERSITY	SAUDI ARABIA	33

TOP 15 MATHS SHANGHAI RANKING: NUMBER OF MATHS HCPs (2021-2023)

Name	Country	PUB
Princeton University	USA	9
Universite Paris Saclay	FRANCE	1
University of Oxford	UK	7
Sorbonne Universite	FRANCE	6
University of Cambridge	UK	7
Massachusetts Institute of Technology (MIT)	USA	5
ETH Zurich	SWITZERLAND	5
Stanford University	USA	11
University of Texas Austin	USA	2
SUNY Stony Brook	USA	0
New York University	USA	2
Ecole Polytechnique Federale de Lausanne	SWITZERLAND	4
Rutgers State University New Brunswick	USA	2
University of California Los Angeles	USA	3
University of Wisconsin Madison	USA	1

Citation ring's modus operandi

- In 2023, Yanlin Li, Symmetry (MDPI) editor, and co-authors. 17 HCPs (4 Symmetry): 396 citations from 84 (21 in Symmetry) papers.
- 75 citing papers constitute either self or co-author citations (collaboration distance ≤ 1).
- What kind of citations?:
 - For future research directions, we hope [sic] to do some related work on singularity theory and symmetry (see [13–20]). 13-20 Li et al.
 - From a different source: ...Moreover, some of the latest connected studies about symmetry and singularity can be seen in [15–23]. 15-23 Li et al.

From Hangzhou Normal University webpage

On September 8, 2022, Essential Science Indicator (ESI) released the latest statistics suggesting Mathematics of Hangzhou Normal University (HZNU) entered the global top 1% for the first time, realizing a new breakthrough.

In 2023, Hangzhou Normal (Escuela de Magisterio) goes from nothing to third position in Top 1%. Yanlin Li is a professor at Hangzhou.

WHERE (JOURNALS) DO CITATIONS TO HCPs IN 2021-2023 COME FROM?

Publication Titles	CITATIONS	MATH PAPERS	PUBLISHER
MATHEMATICS	1195	12420	MDPI
AIMS MATHEMATICS	776	3396	AIMS
SYMMETRY-BASEL	670	720	MDPI
FRACTAL AND FRACTIONAL	569	1770	MDPI
CHAOS SOLITONS FRACTALS	429	3273	ELSEVIER
MATHEMATICAL METHODS APPL SCIENCES	407	3051	WILEY
RESULTS IN PHYSICS	396		ELSEVIER
ALEXANDRIA ENGINEERING JOURNAL	340		ELSEVIER
FRACTALS COMPLEX GEOMETRY PATTERNS...	331	1060	WORLD SCI PUBL
AXIOMS	306	2040	MDPI
NONLINEAR DYNAMICS	297		SPRINGER
IEEE ACCESS	284		IEEE
APPLIED MATHEMATICS AND COMPUTATION	257	2171	ELSEVIER
SUSTAINABILITY	239		MDPI

WHERE (INSTITUTIONS) DO CITATIONS TO HCPs IN 2021-2023 COME FROM?		
Affiliations	cit papers	math cit papers
EGYPTIAN KNOWLEDGE BANK EKB	1980	591
CHINA MEDICAL UNIVERSITY TAIWAN	1008	550
KING ABDULAZIZ UNIVERSITY	959	351
PRINCE SATTAM BIN ABDULAZIZ UNIVERSITY	807	192
KING KHALID UNIVERSITY	617	163
COMSATS UNIVERSITY ISLAMABAD (CUI)	521	201
TAIF UNIVERSITY	506	192
PRINCESS NOURAH BINT ABDULRAHMAN UNIVERSITY	442	172
ISLAMIC AZAD UNIVERSITY	409	58
CHINESE ACADEMY OF SCIENCES	406	76

Experimental Design

Double-check the scientific influence of the HCRs included in the Clarivate Analytics lists, using Fields Medalists, Abel, and other prestigious prize recipients as a control group.

1. Measure the percentage of citations coming from two kinds of venues: ten prestigious institutions in mathematics and ten newcomers.
2. Use principal components to reduce the dimensionality of the set of citation percentages.

Characteristics of the sample

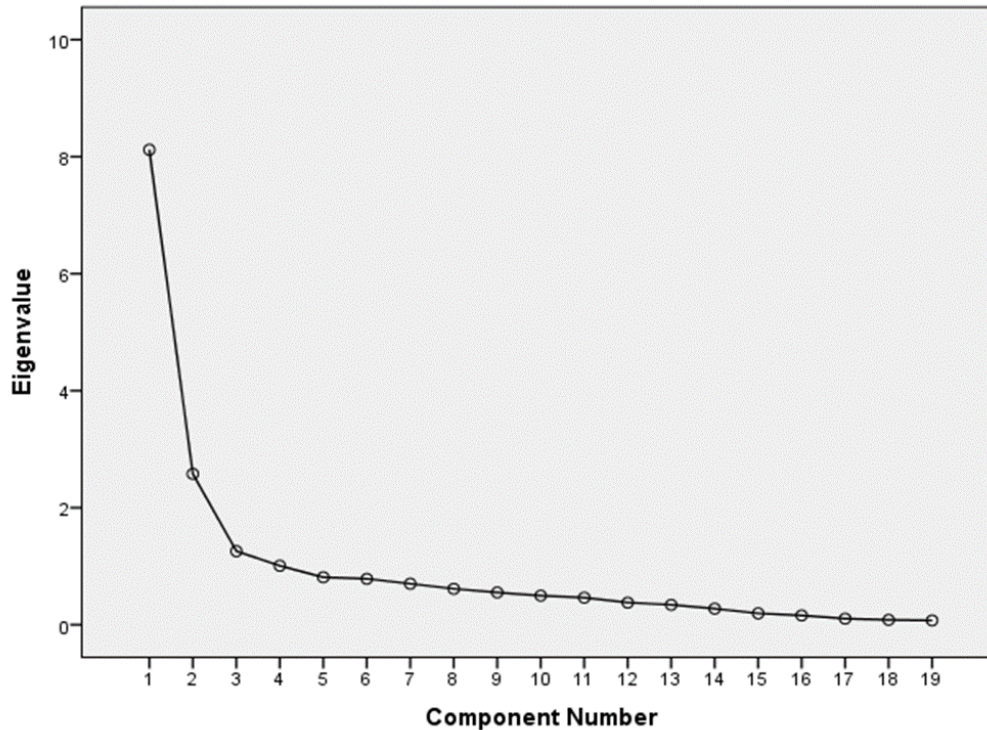
Assessing sampling adequacy

Kaiser-Meyer-Olkin Measure

0.87

Correlation matrix structure

Scree Plot



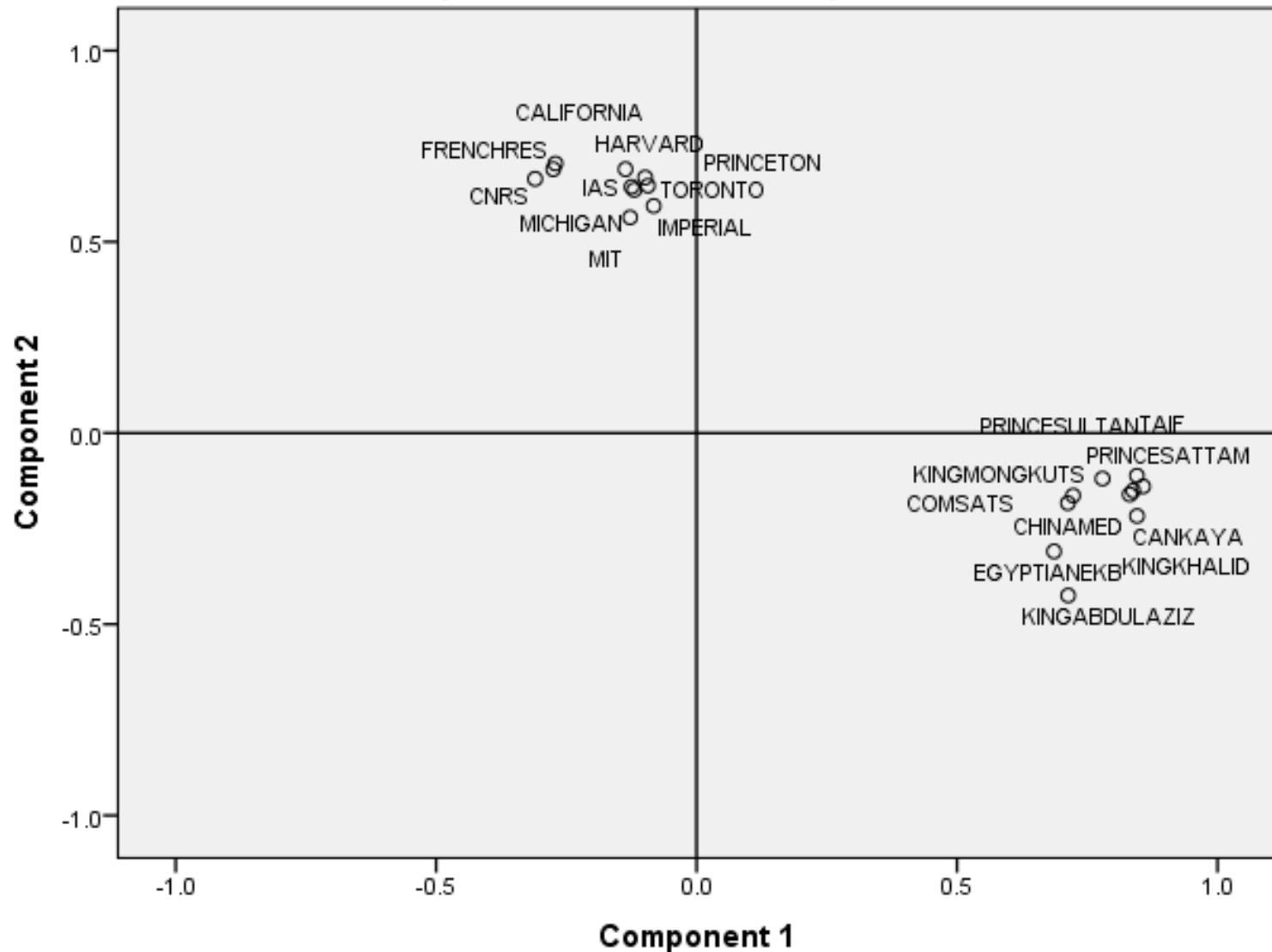
Variance Explained

Rotated factors

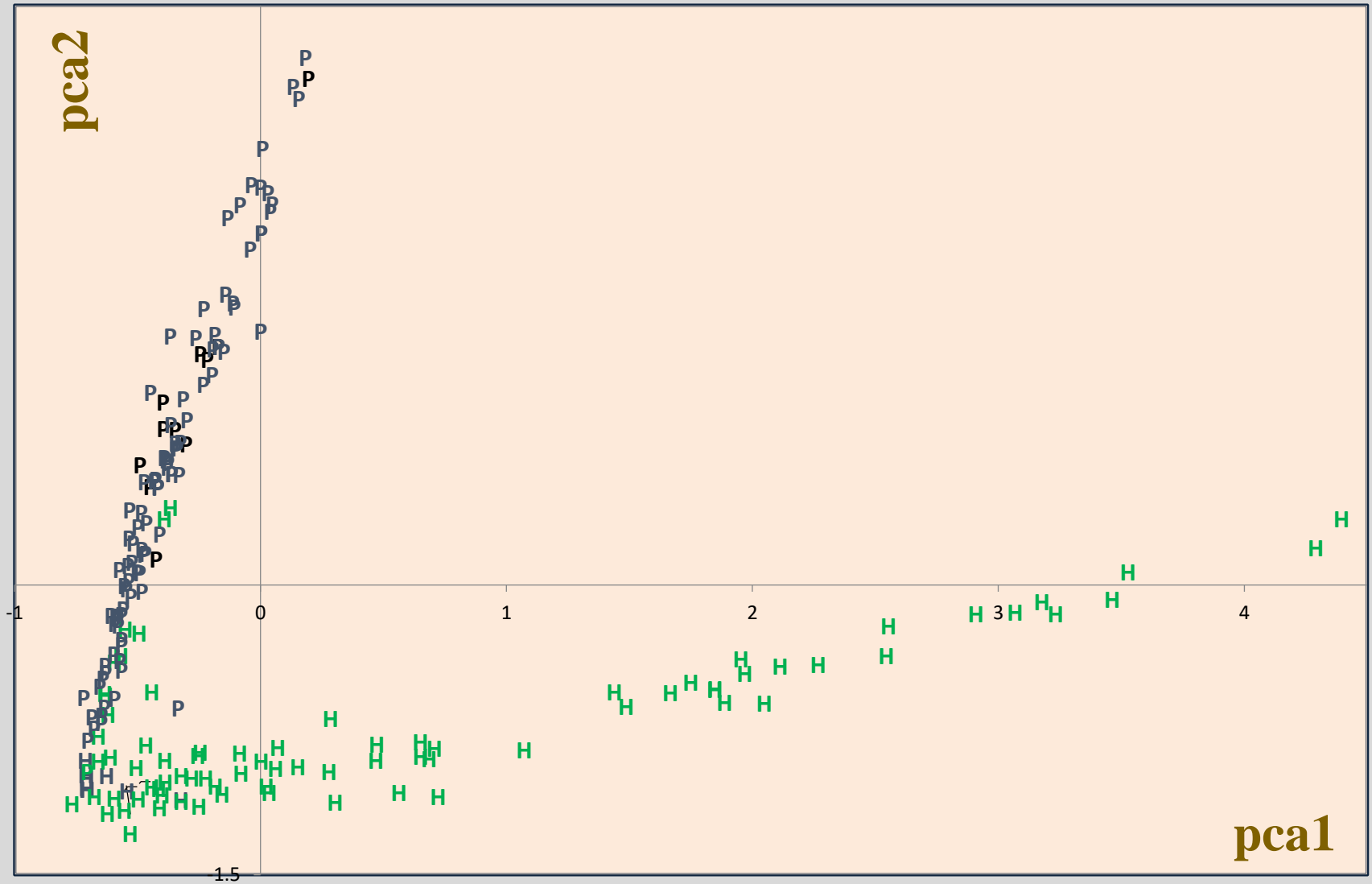
PC	% of Var	Cum %
1	32.6	32.6
2	23.6	56.2

Principal Component Analysis

Component Plot in Rotated Space



2 PCA COMPONENTS



Work in progress: Reputed Citation

Weight the citations by quality of the journal and the institution. In-field influence: only citations from Math journal count.

300 individuals, 2 groups: 150 Fields, Abel, ERC grant holders (ERC); 150 with more than 10 HCPs (HCP)

First and last tier for in-field influence:

1-100	201-300	
85	6	ERC
15	94	HCP

SOME IMPLICATIONS

- ✓ International league tables create perverse incentives for researchers and institutions.
- ✓ Undesirable behaviors enter the mainstream.
- ✓ Researchers move in the wrong direction, along with their institutions.
- ✓ Benchmarking of institutional performance is severely compromised.

It does not end in Top 1%

- ✓ The Top 1% is the target, but the manipulation of citations goes down to the rest of the bibliometric indicators.
- ✓ Next, we will see how the citation rings contaminate (trickling down from Top 1%) the whole bibliometric landscape, making benchmarking all but impossible.

Trickling down from Top 1% (Q1)

TOP 10 INSTITUTIONS BY % Q1 (2021-2023)

RANK	Name	Country	PUB	%Q1
1	Ajman University	UNITED ARAB EMIRATE	141	85.2
2	University of Malakand	PAKISTAN	139	82.4
3	Alexandria University	EGYPT	117	80.9
4	Near East University	TURKIYE	155	80.6
5	Asia University Taiwan	TAIWAN	106	80.2
6	University Ha'il	SAUDI ARABIA	337	77.4
7	University of Salamanca	SPAIN	187	77.3
8	Menofia University	EGYPT	157	77.3
9	Prince Sultan University	SAUDI ARABIA	533	76.9
10	Sejong University	SOUTH KOREA	279	76.8
325	BCAM	SPAIN	168	43.8

PERFORMANCE OF TOP INSTITUTIONS IN % Q1 (2021-2023)

RANK	Name	Country	PUB	%Q1
210	Princeton University	USA	570	48.3
238	University College Londo	ENGLAND	426	46.6
273	New York University	USA	391	45.3
282	UC Berkeley	USA	651	45.1
303	Stanford University	USA	611	44.3
325	BCAM	SPAIN	168	43.8
399	Imperial College London	ENGLAND	508	40.6
409	University of Cambridge	ENGLAND	621	40.4
412	MIT	USA	760	40.4
523	University of Oxford	ENGLAND	929	36.1
527	Universite PSL	FRANCE	476	36.0

Trickling down from Top 1% (CNCI)

TOP 10 INSTITUTIONS BY NORMALIZED IMPACT (CNCI) (2021-2023)				
RANK	Name	Country	PUB	CNCI
1	Huzhou University	CHINA MAINLAND	237	9.5
2	Hangzhou Normal University	CHINA MAINLAND	367	9.4
3	Abdul Wali Khan University	PAKISTAN	120	7.3
4	Sejong University	SOUTH KOREA	279	5.8
5	Siirt University	TURKIYE	136	5.7
6	Near East University	TURKIYE	155	5.1
7	Khon Kaen University	THAILAND	351	4.8
8	University of Malakand	PAKISTAN	139	4.7
9	Hunan Univ of Science & Tech	CHINA MAINLAND	124	4.5
10	Changsha Univ of Science & Tech	CHINA MAINLAND	184	4.2
471	BCAM	SPAIN	168	0.89

PERFORMANCE OF TOP INSTITUTIONS IN CNCI (2021-2023)

RANK	Name	Country	PUB	CNCI
234	Stanford University	USA	611	1.3
263	ETH Zurich	SWITZERLAND	693	1.2
373	University of Cambridge	ENGLAND	621	1.0
414	New York University	USA	391	1.0
418	University of Oxford	ENGLAND	929	1.0
466	Sorbonne Universite	FRANCE	1212	0.9
471	BCAM	SPAIN	168	0.9
529	Universite Paris Cite	FRANCE	1383	0.8
575	Universite Paris Saclay	FRANCE	971	0.8
617	Universite PSL	FRANCE	476	0.7
634	University of Barcelona	SPAIN	275	0.7

MDPI: The Elephant in the Room

Name	Country	PUB	%Q1	MDPI	%MDPI
Ajman University	UNITED ARAB EMIRATES	141	85.2	75	53%
University of Malakand	PAKISTAN	139	82.4	44	32%
Alexandria University	EGYPT	117	80.9	64	55%
Near East University	TURKIYE	155	80.6	60	39%
Asia University Taiwan	TAIWAN	106	80.2	41	39%
University Ha'il	SAUDI ARABIA	337	77.4	254	75%
University of Salamanca	SPAIN	187	77.3	82	44%
Menofia University	EGYPT	157	77.3	104	66%
Prince Sultan University	SAUDI ARABIA	533	76.9	198	37%
Sejong University	SOUTH KOREA	279	76.8	208	75%
Princeton University	USA	570	48.3	3	1%
University College London	ENGLAND	426	46.6	16	4%
New York University	USA	391	45.3	1	0%
UC Berkeley	USA	651	45.1	11	2%
Stanford University	USA	611	44.3	10	2%
BCAM	SPAIN	168	43.8	2	1%
Imperial College London	ENGLAND	508	40.6	14	3%
University of Cambridge	ENGLAND	621	40.4	8	1%
MIT	USA	760	40.4	6	1%
University of Oxford	ENGLAND	929	36.1	8	1%
Universite PSL	FRANCE	476	36.0	8	2%

THE MDPI TIDE IS RISING

Journal	PUB	YEAR	PUB	Journal	RATIO
MATHEMATICS	84	2017	44	ANNALS OF MATHEMATICS	52.4%
	336	2018	34		10.1%
	1246	2019	37		3.0%
	2259	2020	37		1.6%
	3329	2021	34		1.0%
	4836	2022	29		0.6%
	4986	2023	24		0.5%

THE MDPI TIDE BY COUNTRY

2021-2023 MATHEMATICS		
INSTITUTIONS WITH MORE THAN 40 MDPI ARTICLES		
COUNTRY	NUMBER UNIVS	
CHINA	40	24%
SAUDI ARABIA	17	10%
EGYPT	14	8%
SPAIN	14	8%
ROMANIA	8	5%
RUSSIA	6	4%
MALAYSIA	5	3%
TAIWAN	5	3%
PAKISTAN	7	4%
INDIA	4	2%
TOTAL	167	100%

2021-2013	MATHEMATICS		ALL CATEGORIES	
Institution	MDPI	%	MDPI	%
Politécnica de Valencia	135	38%	1612	28%
Granada	110	25%	1926	21%
País Vasco	102	32%	1313	17%
Salamanca	76	42%	926	27%
Complutense	64	17%	1850	18%
Zaragoza	54	23%	1182	22%
Valencia	50	17%	1669	18%
UCLM	47	52%	932	25%
Sevilla	46	11%	1647	21%
UPM	44	25%	1421	26%
UPCT	44	45%	317	32%
Carlos III	43	19%	389	15%
Barcelona	42	16%	2120	13%
Oviedo	40	28%	690	19%
BASELINE		11%		10%

Some good news

	SPAIN		
Journal	PUB	YEAR	%
MATHEMATICS	5	2017	6%
	16	2018	5%
	76	2019	6%
	377	2020	17%
	625	2021	19%
	429	2022	9%
	244	2023	5%

IMPLICATIONS FOR YOUNG RESEARCHERS

- Young and mid-career researchers should be exploring the boundaries of knowledge.
- To do so, they need help and guidance from senior academics and the commitment of political and university officials.
- That may not happen under current evaluation practices.