



# Dades de recerca

30 de maig de 2024 a les 12.15h

ETS d'Enginyeria Industrial de Barcelona

Aula LS11, pavelló L (planta-1)

Organitzat per Biblioteca ETSEIB

## **Gema Mijancos**

BIOART - BIOsignal Analysis for Rehabilitation and Therapy

*Data in Biosignals: Our Experience*

## **Lluís Marco**

ADBD - Anàlisi de Dades Complexes per a les Decisions Empresarials

*Data quality: some examples, some tricks, some thoughts*

## **Massimo Cenciarini**

CREB - Centre de Recerca en Enginyeria Biomedica

BIOMECH - Biomechanical Engineering Lab

*Research data in human movement science: an international view over 2 decades*

## **Oriol Gomis**

CITCEA-UPC - Centre d'Innovació Tecnològica en Convertidors Estàtics i Accionaments

CER-H2 - Centre Específic de Recerca de l'Hidrogen de la UPC

*Research in electrical engineering and grid integration of renewables*

## **Juan Jesus Perez**

Associate Dean for International Relations, ETSEIB

*Chairman*

# The Research Paradigm

**HYPOTHESIS**



**METHODS**

**RESULTS**



Length /m $\pm 1 \text{ mm}$	Current /A $\pm 0.01 \text{ A}$	Potential Difference /V $\pm 0.01 \text{ V}$	Resistance / $\Omega$  No + possible because we did not measure it!
0,000	0,00	0,00	0,0
0,100	0,10	0,12	1,2
0,200	0,11	0,23	2,3
0,300	0,09	0,35	3,6
0,400	0,10	0,47	4,7



**CONCLUSIONS**

# Science is a Communal Endeavor

**HYPOTHESIS**



**RESULTS**



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**METHODS**



**CONCLUSIONS**



**SUBMITTED  
for  
PUBLICATION**

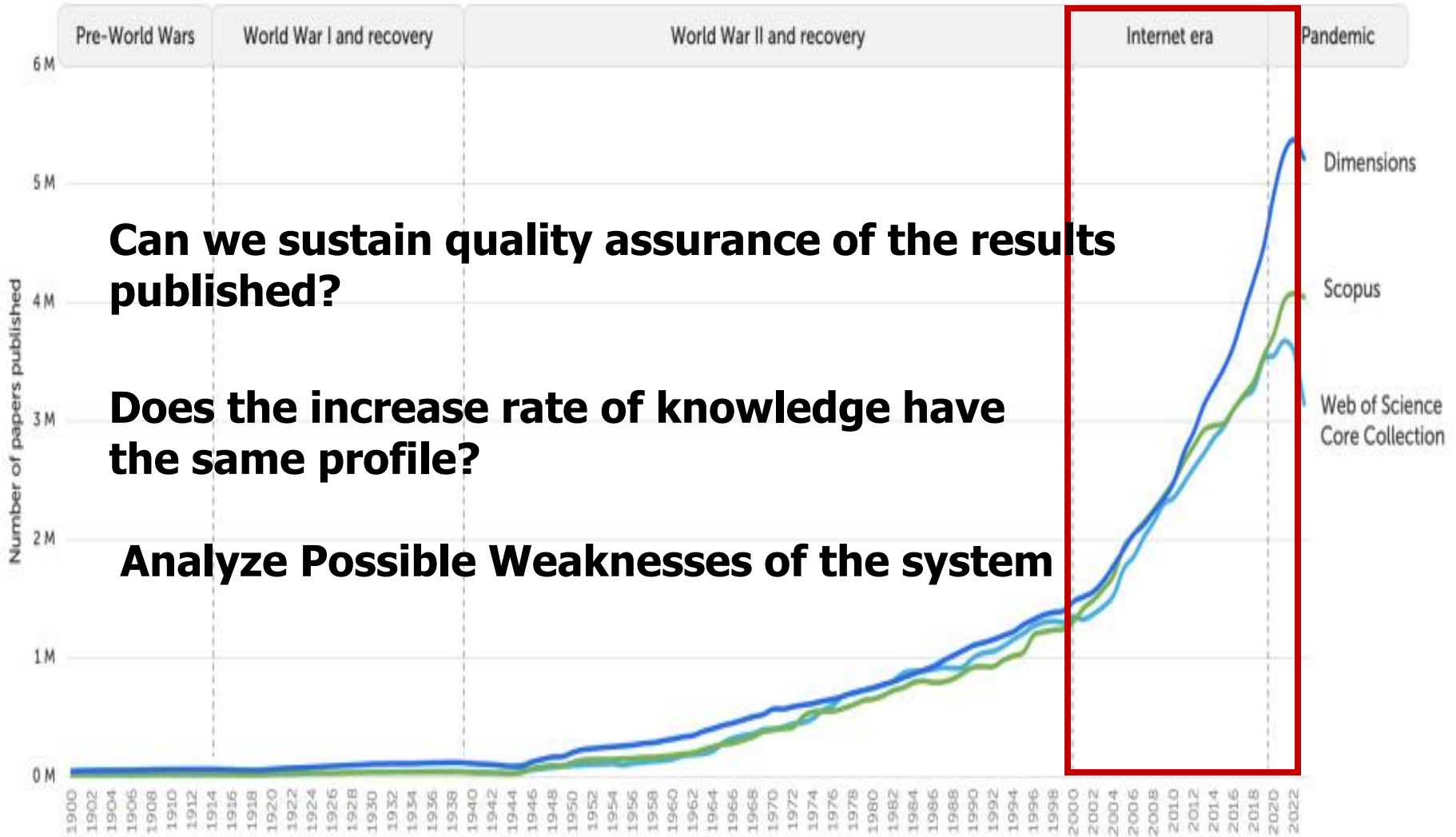


**Peer review  
process**

**PUBLISHED**



# Historical article growth



**Can we sustain quality assurance of the results published?**

**Does the increase rate of knowledge have the same profile?**

**Analyze Possible Weaknesses of the system**

# Present Pressures (publishers)



**PUBLISHERS**

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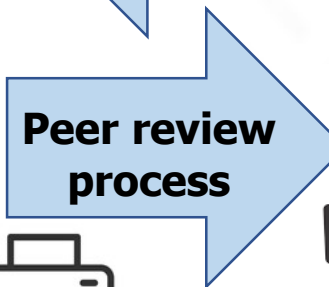


**INSTITUTIONS**

**High impact on budgets**



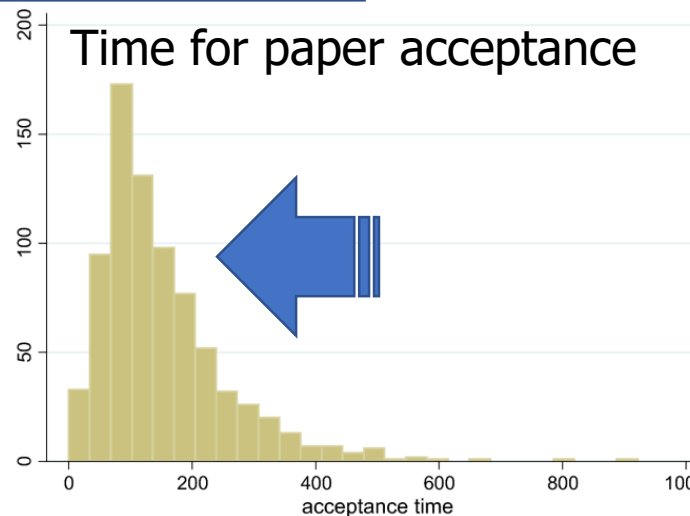
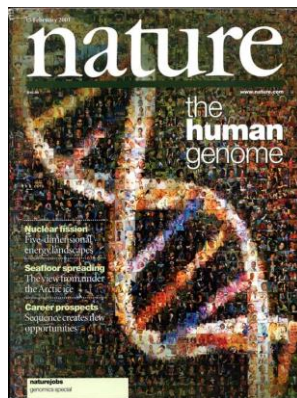
**Journal**



**Peer review process**



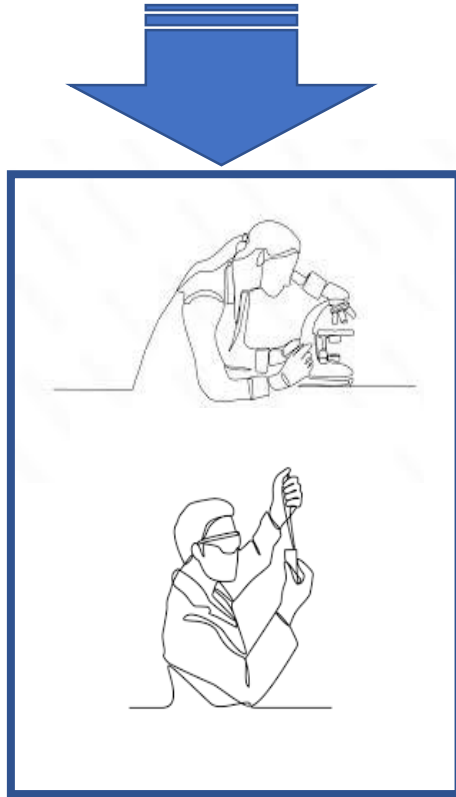
**Great Benefit**



**This pressure may lead to poorer process**



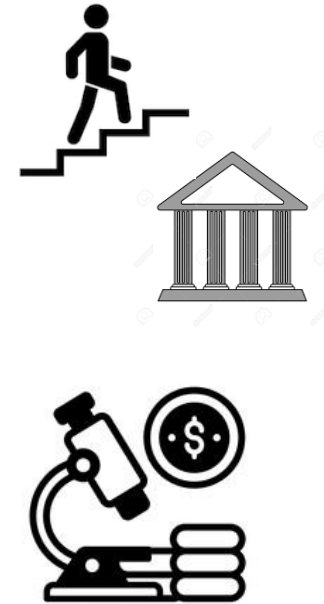
# Present Pressures (researchers)



**RESEARCHERS**



**IMPACT**



- Publish in high impact journals
- Publish in journals offering speeded publication
- Number of authors
- Trade off paying for publishing
- ....

**This pressure may lead to misconduct**



# Open Science Paradigm

Digitalization offer a new horizon

~1990 Open Access Initiative: Open access publishing

## RESEARCHERS AND INSTITUTIONS



- Accessibility
- Impact
- Spreading
- ...

## PUBLISHERS

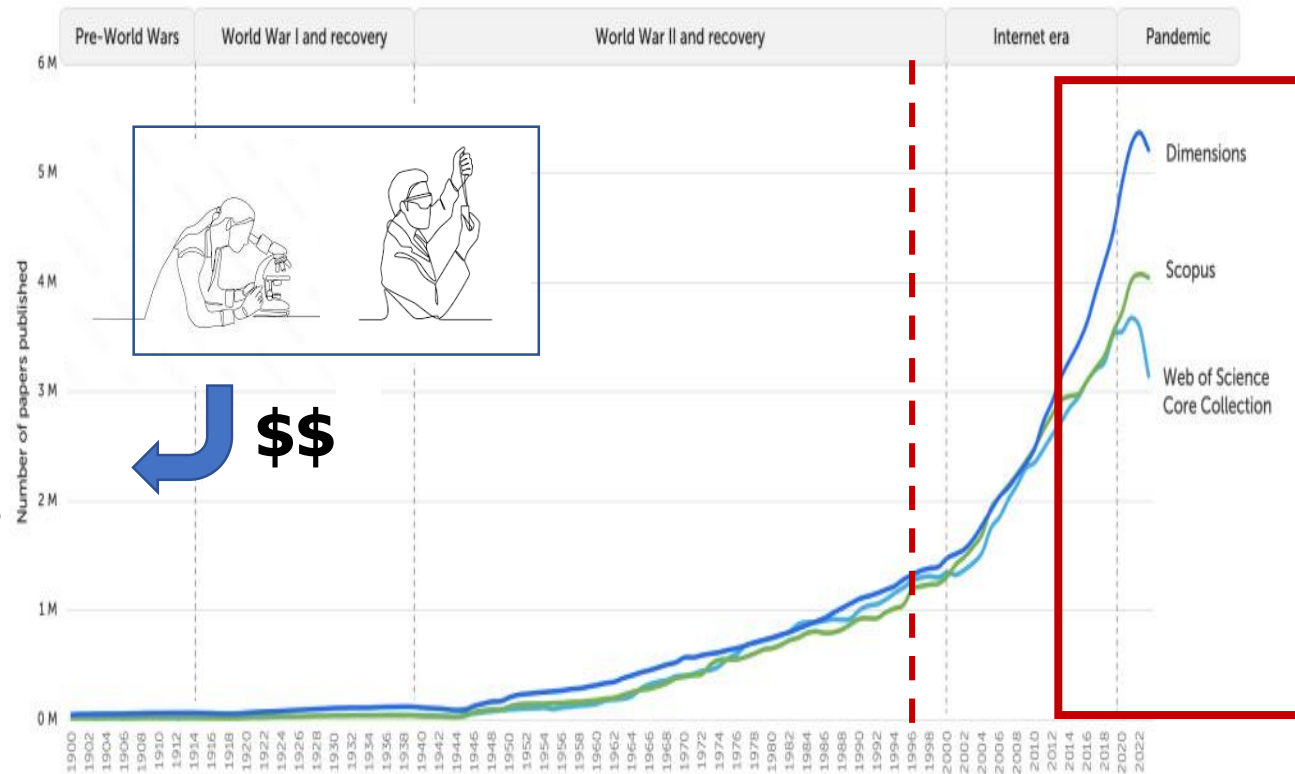


Newcomers have access to big business

Peer review process



time





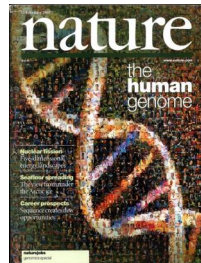
# A Delicate Problem

## Reproducibility and Replicability of the Results

- Bad experimental/computational design
- Biased methodology
- Wrong use of instrumentation
- Wrong conclusions
- ...



**Peer review  
process**



**Articles retracted**



~1500 articles retracted from WOS  
(First semester 2022)

~40% due to non-reproducible results

~50% due to non-replicable results  
bad practice, even fabricated results



# Open Science Paradigm

Publishing in Open Access increases accessibility



**IMPACT**

## Increasing accountability

- Detailed explanation of the procedures
- **Share raw data from the experiments and award recognition**
- ...

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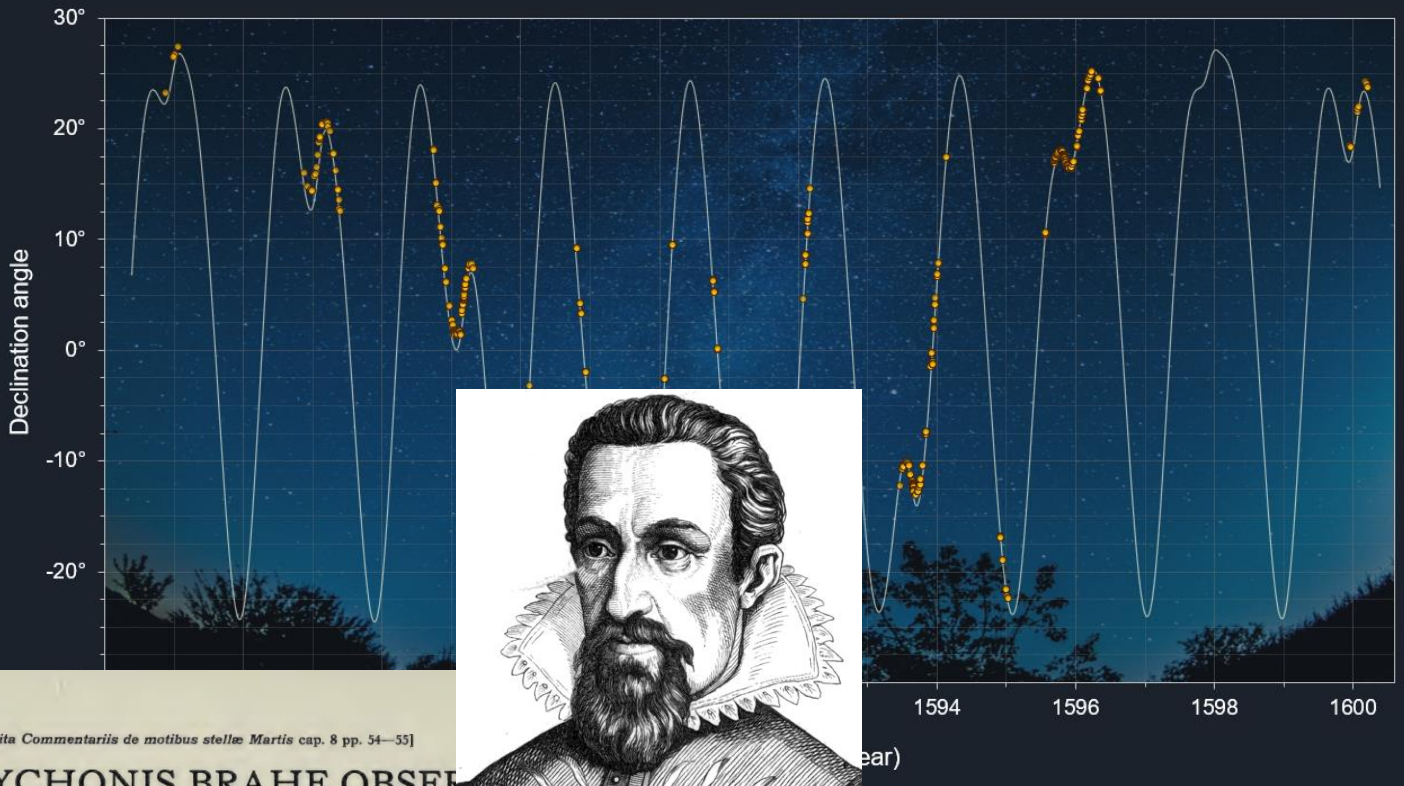


Steady increase of knowledge



1546-1601

Tycho Brahe's observations of the planet Mars (period 1582 – 1600)



⌚ [E Joannis Kepleri *Astronomia nova tradita Commentariis de motibus stellæ Martis* cap. 8 pp. 54—55]

† **VII. TABULA TYCHONIS BRAHE OBSERVATIONUM & COMPUTATARUM OPPOSITIONUM MARTIS CUM LINEA MOTUS SOLIS, EJUSQUE EXAMEN,**  
 5 PLANETÆ ♂ MOTUS IN SUO ECCENTRICO E CERTIS OBSERVATIONIBUS ACRISSIMIS PER ANNOS XX (AB LXXX USQUE MDC) SEDULO PER NOSTRA INSTRUMENTA HABITIS RESPECTU VARIARUM DISPOSITIONUM, UTI IN SUBJECTA TABULA PATET, ACCURATA RESTITUITO.

10	Tempus æquale ♂			Long. obf. resp. circuli ♂	Latitudo vera obf.	Long. obf. resp. eclipticæ	Differentia	Simpl. Long. ♂	Apog. ♂	Præcessio æquin. nostra	Supput.
	Anni	Menf.	D. H. M.								
	1580	Nov.	17 9 40	6 50 10	II 1 40 0 B.	6 46 10	4 10 A.	0 27 29 46	3 25 21 40	27 58 50	6 50 40
	1582	Dec.	28 12 16	16 51 30	4 6 0 B.	16 46 10	5 20 A.	2 11 34 56	3 25 22 17	28 0 38	16 51 26
	1585	Jan.	31 19 35	21 9 50	Ω 4 32 10 B.	21 10 26	0 36 S.	3 22 37 46	3 25 22 55	28 2 25	21 9 41
15	1587	Mart.	7 17 22	25 5 10	III 3 38 12 B.	25 10 20	5 10 S.	5 3 27 46	3 25 23 32	28 4 10	25 4 50
	1589	Apr.	15 13 34	3 54 35	II 1 6 45 B.	3 58 10	3 35 S.	6 16 53 7	3 25 24 10	28 5 55	3 54 33
†	1591	Jun.	8 16 25	26 40 30 P.	42 ON. X 3 59 0 M.	26 32 0	10 20 A.	8 7 47 30	3 25 24 48	28 7 47	26 40 23
	1593	Aug.	24 2 13	12 35 0	⊕ 6 3 0 M.	12 43 45	8 45 S.	10 10 53 50	3 25 25 26	28 9 40	12 34 36
	1595	Oct.	29 21 22	17 56 5	⊕ 0 5 15 B.	17 56 15	0 12 A.	0 8 26 47	3 25 27 35	28 11 27	17 57 14
20	1597	Dec.	13 13 35	2 34 0	⊕ 3 33 0 B.	2 28 0	6 0 A.	1 24 55 47	3 25 29 5	28 13 20	2 32 20
	1600	Jan.	19 9 40	8 18 45	Ω 4 30 50 B.	8 18 0	0 45 S.	3 6 46 16	3 25 30 6	28 15 5	8 19 57

COMMENTARIII

1571-1630



1642-1727

**UniProt:** the EMBL data base on protein sequences



**Google Scholar** is a freely accessible search engine that indexes the full text or metadata of scholarly literature across various formats and disciplines.

**UN Data.** A web-based data service for the global user community. It brings international statistical databases



**World Bank Open Data.** Free and open access to global development data



...

## **Paradigmatic Recent example**

Spotted in 2008 and subsequently studied.

Researchers poring over **Google Earth images** discovered one of **Earth's freshest impact craters** — a 45-meter-wide pock in **southwestern Egypt** that probably was excavated by a fast-moving iron meteorite no more than a **few thousand years ago**.

It was reported in Science in 2018

