

# **The Effect of Open Access on Citation Rates of Self-archived Articles at Chalmers**

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# Outline

- Introduction to bibliometrics
- The OA citation advantage
- Field differences
- Chalmers in figures
- Materials and methods
- Results
- Conclusions

# What is bibliometrics?

Quantitative studies of scientific publications, such as:

Assessment of scientific productivity and impact

Visualization of scientific networks and subject fields

Since 1980s used as a complement to 'peer review' in research evaluation



# Indicators for research evaluation

Productivity (quantity) - publications

Impact (quality) - citations (or publications in quality channels)

Collaboration - co-authorship

# Why an OA citation advantage?

- **A general OA advantage:** more scholars have access to papers and these therefore receive more citations
- **An early advantage:** the earlier a paper is made available, the earlier it can start accumulating citations
- **A selection bias / quality advantage:** authors choose to self-archive their best papers, and better papers attract more citations

# Field differences - problem

Differences in citation practice between scientific disciplines (publication types, publishing & citation rates)

Most studies have compared citations to OA and non-OA papers published in the same journal or in a set of journals





# Field differences - solution

Normalize for such differences and thus allow meaningful cross disciplinary comparisons of citation impact

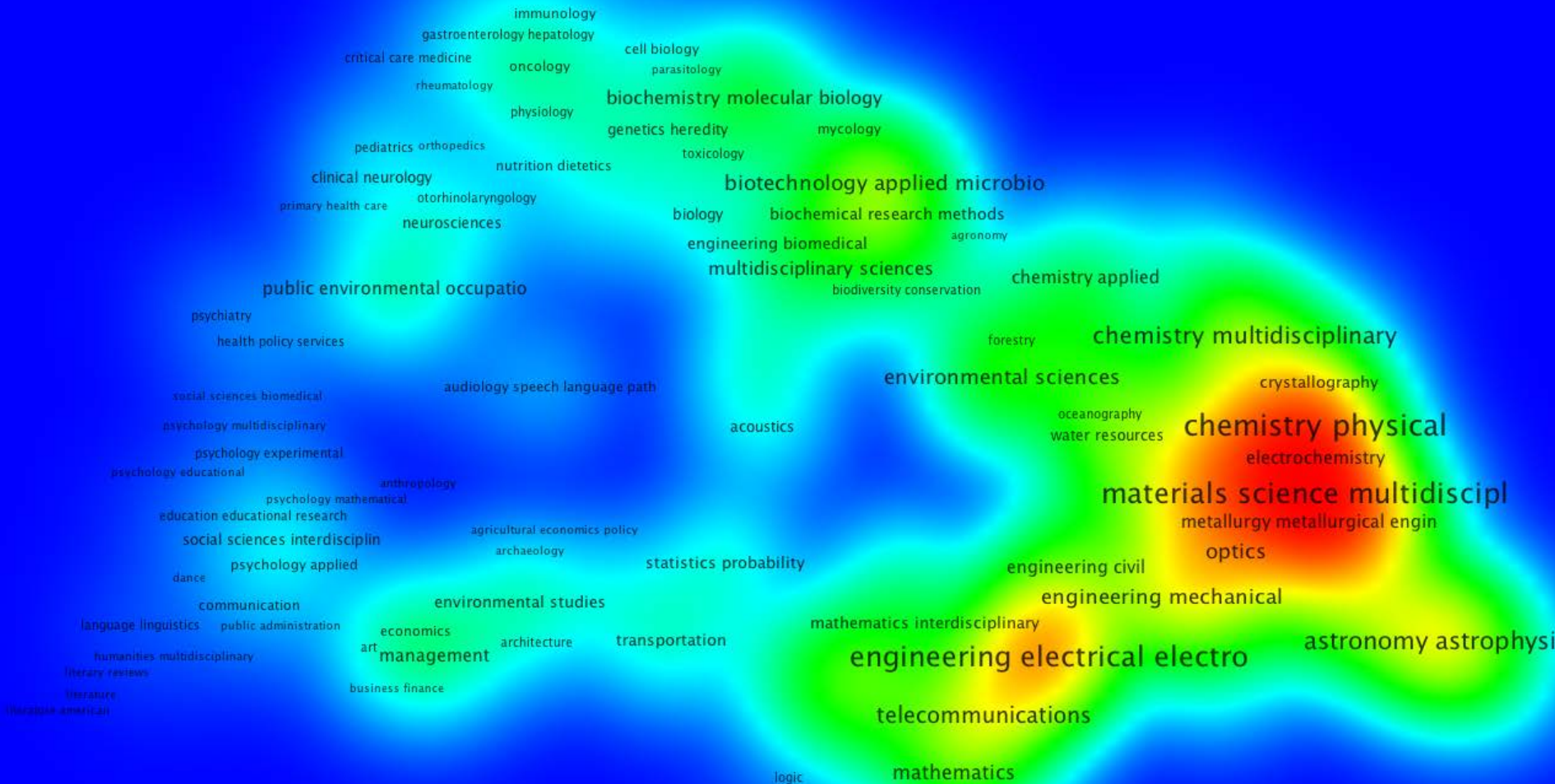


## **Chalmers some facts**

- 17 departments of varying size
- About 2000 research and teaching staff members
- About 1200 peer-reviewed articles are published yearly, 80 % of which are indexed by Thomson Reuters Web of Science
- About 25 % of the peer-reviewed articles are self-archived in CPL
- The share of OA varies to a great extent between the departments, from a few percent up to 80 percent



# Chalmers publication output (subject categories)



# Data sources

- **Web of Science** (Thomson Reuters)
  - > 11 500 journal titles, 120 000 conferences
  - Citation data from 1945
- Field normalized citation data from the Centre for Science and Technology Studies (**CWTS**) of Leiden University (based on the WoS data)
- Local database **Chalmers Publication Library (CPL)**
  - Better coverage, dept/div affiliation (No citation data)

# Bibliometrics database - Metri

PostgreSQL



pgAdmin III

Object browser: Server Groups > Servers (2) > Metri (bibpost.ita.chalmers.se:543) > Databases (3) > metri

Properties: Name: cooperations, OID: 16430, Owner: metri, Tablespace: pg\_default, Primary key: isi\_id, Rows (estimated): 5858

Query - metri on metri@bibpost.ita.chalmers.se:5436 \*

SQL Editor: `SELECT * FROM COOPERATIONS WHERE py = 2007`

Output pane: Data Output

	py integer	sl character(1)	ul character(1)	sf character(1)	uf character(1)	sa character(1)	ua character(1)	gu character(1)	isi_id character(15)	gupost character(1)
1	2007	x	x			x			00025025290	x
2	2007						x		00024966860	x
3	2007	x	x				x		00024778660	x
4	2007		x						00024786090	x
5	2007		x				x		00024535870	x
6	2007								00024599210	x
7	2007		x				x		00024608120	x
8	2007								00024424020	x

0.09 secs

OK. Unix Ln 1, Col 43, Ch 43 63 rows. 139 ms



# Data

- 3424 original articles published 2010-2012
- 899 published in full text in CPL
- 2571 only registered with bibliographical data

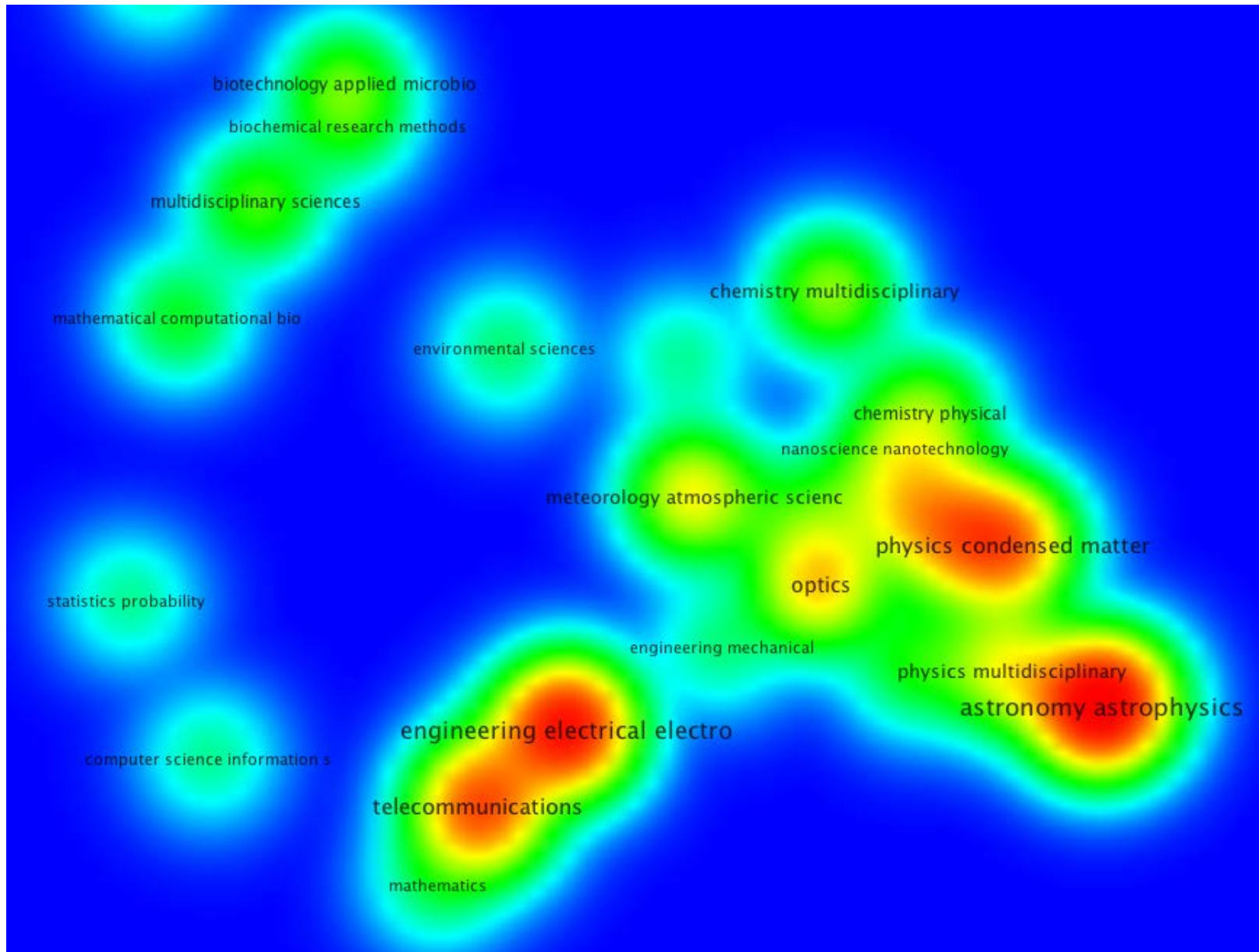
# Indicators used

Abbreviation	Description
MCS	Mean citation score counted on raw citations (not field normalized)
MNCS	Mean (field) normalized citation score. Citations per paper (article, review, letter) compared to world average for publications from the same year and subject field. Publication window: 3 years, citation window: $\leq 3$ years. Self-citations excluded.

# Results

Category	Publications	MCS	MNCS
Total	3470	4,43	1,08
OA	899	4,66	1,23
Non-OA	2571	4,27	1,01

# Chalmers OA output (subject categories)



# Conclusions

- This study confirms the results from many previous studies that there is an OA citation advantage.
- The OA articles studied in this paper have a 22% higher field normalized citation rate than the non-OA articles.
- The difference is statistically significant.
- A second theoretical contribution is that this study gives an example how make between field comparisons on the possible OA citation advantage using field-normalized citation data.