

Measuring the Impact of National Institute of Standards and Technology Research Publications

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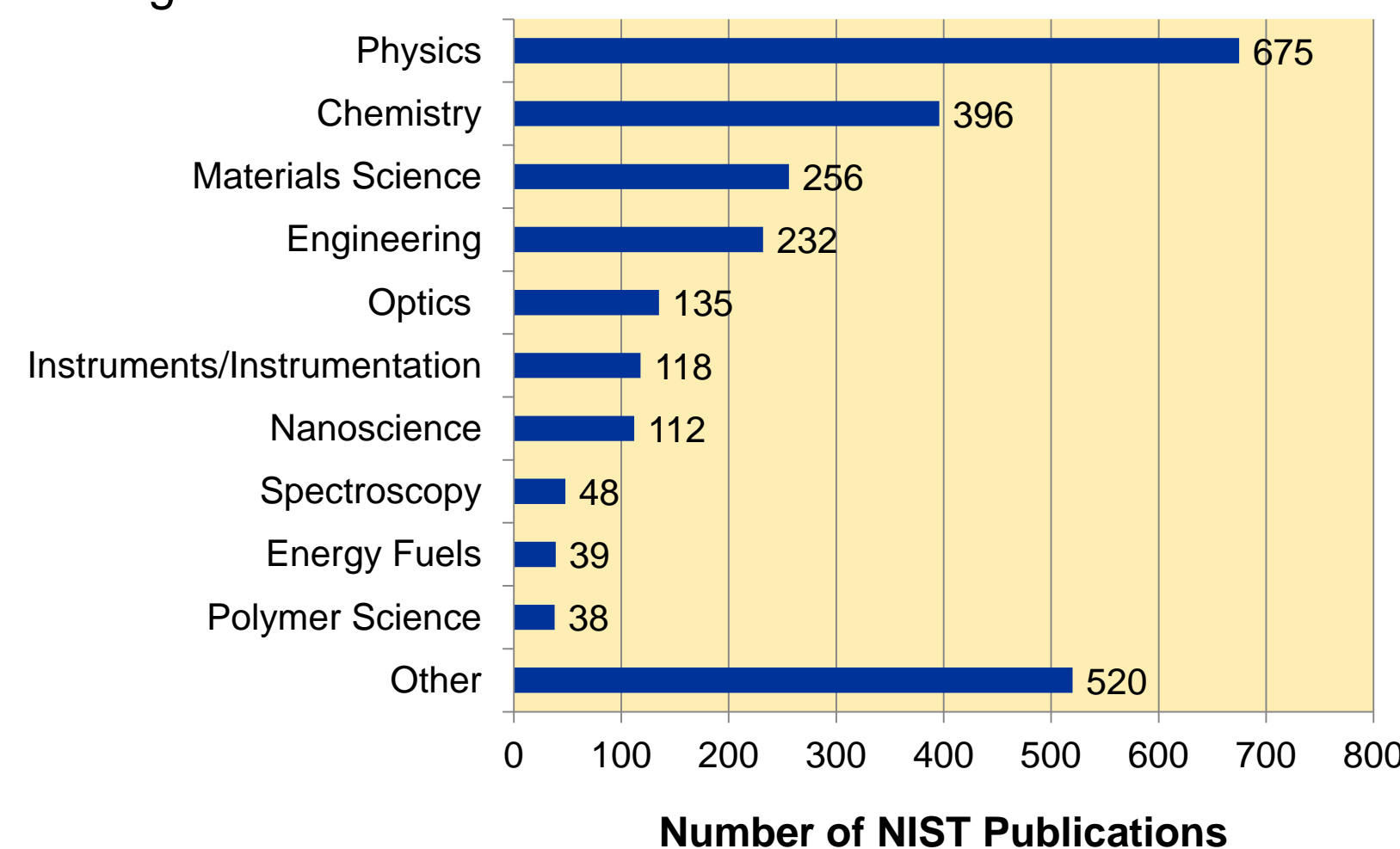
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Introduction

The Information Services Office (ISO) of the National Institute of Standards and Technology (NIST) conducted a publication impact study for NIST senior management that examined the NIST authored papers published in "top tier" journals. The first challenge was to find an objective way of determining the "top tier" journals in NIST's fields of research. As a result of conducting this study, ISO developed a methodology for assessing the impact of NIST research publications that can be replicated by others.

Overview of NIST Research Publications

The analysis, based on a *Web of Science (WoS)* search, yielded 1,354 NIST journal articles in 86 different *WoS* Subject Categories for 2011. Approximately 50% of the papers were in the field of physics. In the chart below, "other" represents the 53 *WoS* categories that had less than 35 articles. Publication numbers in the chart total more than 1,354 because a paper/journal can fall into multiple categories.

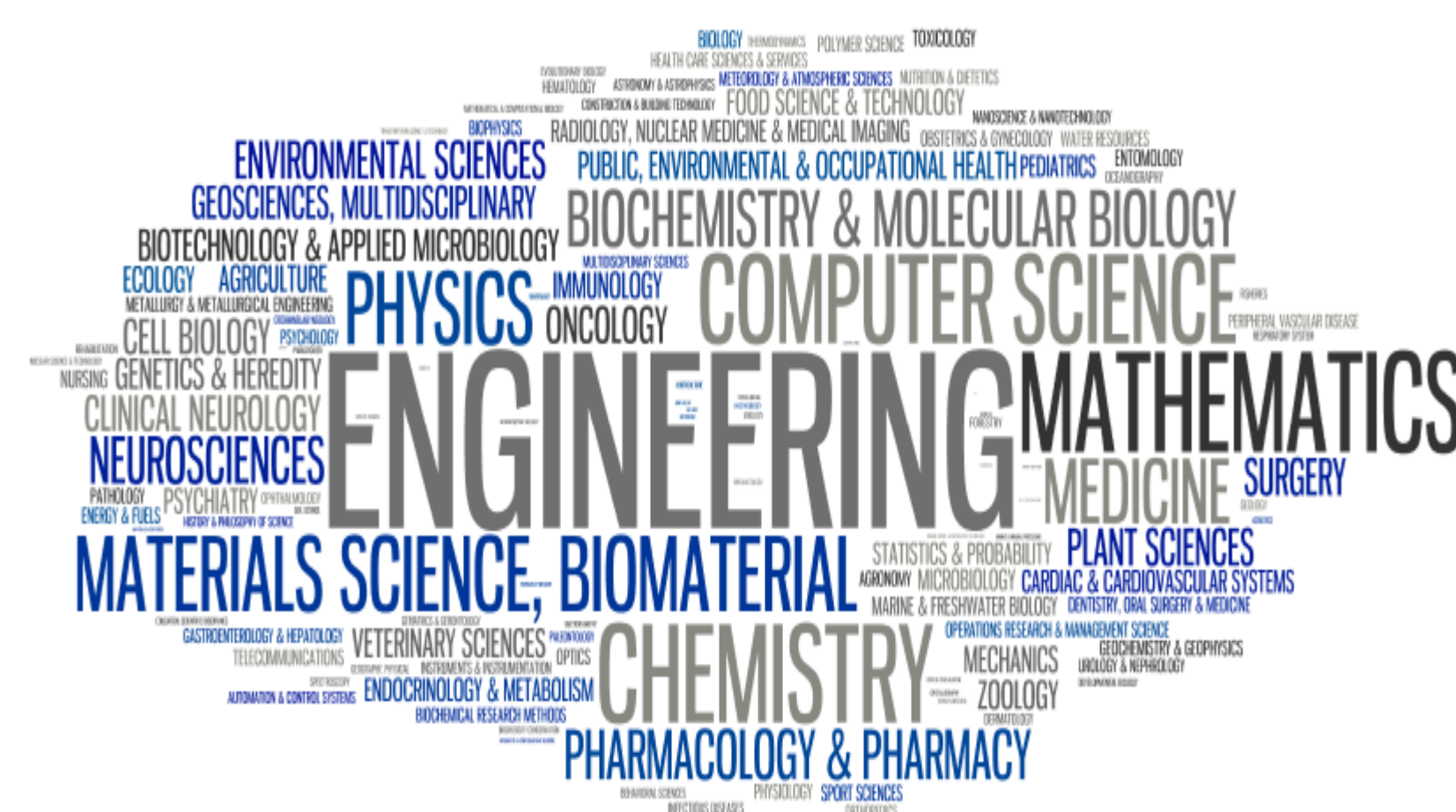


NOTE: Identification of commercial entities in this poster is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology.

Methodology

For the purposes of this study, ISO defined a "top tier" journal as any journal with a Thomson Reuters Impact Factor (IF) that ranks within the top 10 percentile in its *Web of Science* Subject Category. IFs are highly discipline-specific, and journal comparisons should only be made within the same field as IFs can vary widely between fields.

The top tier journals were determined by using Thomson Reuters *Journal Citation Reports* to identify the titles within the top 10 percentile by IF in each of the 173 *Web of Science* Subject Categories, and combining them into one list. The NIST authored papers identified in the *WoS* search were then compared to the list of top tier journals to identify those papers published in top tier journals.



The 173 categories represented in WoS by number of journals in each category.

Findings and Results

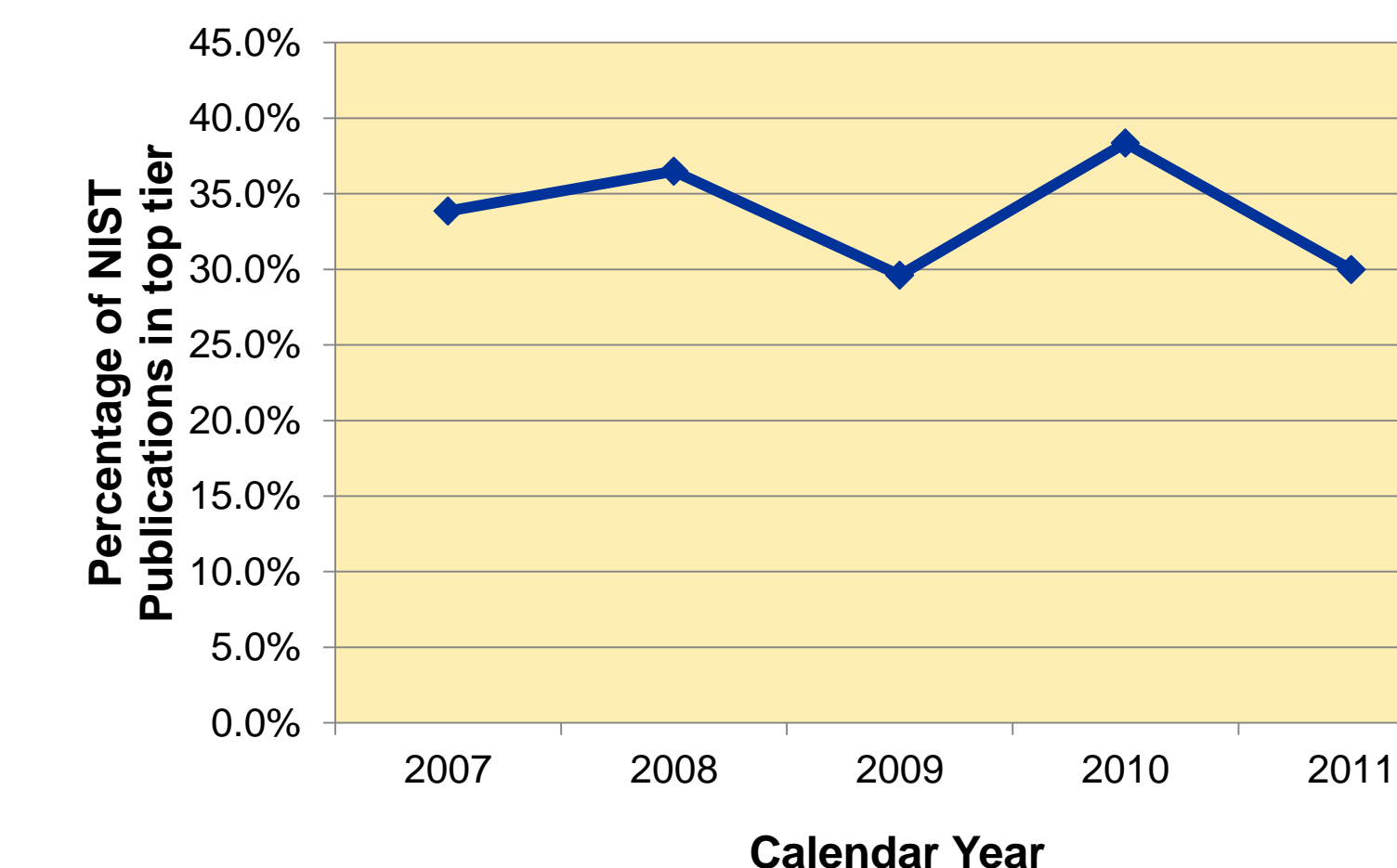
Four hundred six (406) or 30% of NIST authored papers were published in ninety top tier journals in the 2011 calendar year. The top tier journals with the most NIST authored papers are chemistry and physics titles as reflected in the table below. The top tier journal with the most NIST authored papers, *Physical Review Letters* with 56 NIST papers, has a 2010 IF of 7.622 and is ranked 5 out of 80 in the *Web of Science* category Physics, Multidisciplinary. Another title with a high number of NIST papers, *Optics Express* with 31 NIST papers, has an IF of 3.753 and is ranked 5 out of 78 in the category Optics. Many of the NIST papers published in top tier journals are in chemistry.

Journal Title	Number of NIST-authored papers
Physical Review Letters	56
Optics Express	31
ACS Nano	19
Astrophysical Journal	19
Journal of the American Chemical Society	18
Analytical Chemistry	17
Soft Matter	14
Advanced Materials	14
Journal of Physical Chemistry C	13
Optics Letters	10
Environmental Science & Technology	10

Conclusions and Recommendations

Using Thomson Reuters IF rankings within *WoS* Subject Categories removes subjectivity and provides an objective and consistent way to measure the impact or value of a journal. While obvious titles like *Nature* and *Science* made the top tier list, other less familiar titles with lower IFs were also included because they are premier titles within their fields.

As a follow-up to the original study, ISO performed a trend analysis to determine the percentage of NIST papers appearing in top tier journals for the years 2007-2010. While the graph below shows fluctuations, the percentages indicate that close to a third of all NIST authored papers are published in top tier journals in a given year.



ISO recommended to NIST senior management that an additional study compare NIST research publications with peer institutions. In the meantime, the results of the current study will be replicated on a quarterly basis to provide data for one of NIST's Balanced Scorecard metrics reported to the U.S. Department of Commerce.