

# CITATION STRATEGY

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# INTRODUCTION

## AIM

**To increase staff citations at Ulster University**

## OBJECTIVES

- **Increase research output with at least one international author**
- **Increase research output in the top Q1 of journals**
- **Increase citations of other relevant Ulster research**
- **Increase use of social media, research discovery sites and altmetrics**

The development and implementation of an Ulster University Citation Strategy, leading to increased citations, will have benefits at an individual level, at subject/UoA level, and for the institution as a whole.

At an individual level, staff can be pro-active in their approach to increasing their citations. When academics/researchers publish, they are seeking to contribute to the knowledge base in their field, and a key indicator of scholarly impact is when that published output is cited by others. It is nonetheless important to be aware of the caveats in using citations as a proxy for research impact. The three main issues of concern are that (i) citation is not necessarily an indication of quality or that the citer agrees with the work that is being cited; (ii) self-citations can skew the analysis; and (iii) there may be field-dependent factors that mean citation practices differ in different disciplines.

Analysis of citations at subject level enables benchmarking against performance in other institutions and the UK as a whole, as well as being useful in terms of providing quantitative evidence of the research environment, for example for the REF. Both The Metric Tide (2015) and The Leiden Manifesto (2015), amongst others, call for the responsible use of research metrics (including citation metrics) in research evaluation and it is important that the guidelines and principles outlined in these publications are adhered to.

At the institutional level, citations are a key component in the calculation of world university rankings. Citations count towards 30% of the overall scoring in the Times Higher Education World University Rankings and 20% in the QS World University Rankings. Citation data can also contribute to metrics relating to the research environment at the institutional level.

# WHAT ARE THE CITATION RATES AT ULSTER?

Tables 1 and 2 show the overall numbers of scholarly output<sup>1</sup> from Ulster over the time-periods 2014-2017 and 2008-2013. The tables have been produced by the University's Sub-Librarian for Research Support Services using SciVal with underlying data from Scopus. They also include the average citations per publication and the field-weighted citation impact for the university overall and for various subject areas. Comparative data is provided for Queen's University Belfast (for two reasons: geographic proximity and because they are our main institutional collaborator) and for the United Kingdom as a whole. For both time periods, Ulster University figures are below the UK and QUB figures for overall citations per publication and fieldweighted citation impact.

Citation figures for different subject areas should not be compared with each other, due to differing citation cultures across disciplines. However it can be useful to examine the citation impact in a subject area in one institution with performance in the same subject in a comparable institution or across the UK as a whole as a benchmarking exercise. It must also be noted that citation data is updated regularly within the Scopus and SciVal databases and that reports are therefore accurate for the date on which they were run. The accuracy of reports is also dependent on the data within Scopus and SciVal being accurate.

Subject areas at Ulster that have performed above the UK mean in relation to field-weighted citation impact for scholarly output published between 2014 and 2017 are: Materials Science; Energy; Chemical Engineering; Chemistry; Decision Sciences (which includes Information Systems and Management, Management Science and Operations Research, and Statistics); and Health Professions. For information regarding citation impact at UoA level, see the example provided in Appendix B (further reports can be generated when UoA membership is confirmed).

<sup>1</sup>See Appendix A: Definitions of key terms used in relation to metrics for a definition of what is included under Scholarly Output, and explanations of other key terms used in this document.

**TABLE 1:****Subject-area metrics for research output 2014-2017** (calculated January 2018)

SUBJECT AREA	ULSTER UNIVERSITY			UNITED KINGDOM		QUEEN'S UNIVERSITY BELFAST		
	Citations per Publication	Field-Weighted Citation Impact	Scholarly Output (2014-2017)	Citations per Publication	Field-Weighted Citation Impact	Citations per Publication	Field-Weighted Citation Impact	Scholarly Output (2014-2017)
Overall	3.8	1.2	3702	5.1	1.6	6.1	1.8	10182
Arts & Humanities	1.8	0.9	292	1.7	1.5	2.0	1.6	698
Agricultural & Biological Sciences	5.5	1.2	176	5.7	1.6	6.8	2.0	809
Biochemistry, Genetics & Molecular Biology	5.4	1.2	378	8.4	1.7	9.2	1.9	1192
Business, Management & Accounting	2.4	1.0	239	2.8	1.6	3.3	1.7	245
Chemical Engineering	6.3	2.3	116	7.4	1.5	6.7	1.8	372
Chemistry	6.6	1.6	176	8.1	1.6	6.7	1.5	746
Computer Science	2.4	1.0	620	3.2	1.5	3.8	2.3	1042
Decision Sciences	4.1	1.4	53	3.7	1.3	4.3	1.8	78
Earth & Planetary Sciences	4.3	1.2	119	6.3	1.6	7.1	1.6	725
Economics & Finance	1.2	0.8	134	2.4	1.5	3.0	1.9	192
Energy	5.8	1.5	135	5.4	1.6	5.2	1.8	335
Engineering	2.9	1.3	482	3.8	1.5	4.5	1.8	1631
Environmental Sciences	4.3	1.5	185	5.9	1.8	5.8	1.8	634
Health Professions	4.7	1.7	148	3.6	1.5	3.1	1.1	93
Immunology & Microbiology	4.2	1.4	74	8.3	1.7	6.8	1.7	324
Materials Science	5.4	1.8	190	5.6	1.5	5.6	1.8	654
Mathematics	1.6	0.8	214	2.8	1.4	2.7	1.7	483
Medicine	4.9	1.5	1227	6.2	1.7	8.3	2.2	2792
Neuroscience	6.9	1.4	151	7.1	1.6	5.2	1.4	223
Nursing	4.5	1.3	260	3.3	1.3	2.6	1.2	322
Pharmacology	5.2	1.3	75	5.8	1.5	5.1	1.6	357
Physics	4.1	1.0	150	6.4	1.6	6.6	1.6	1392
Psychology	4.6	1.5	277	3.8	1.4	3.2	1.1	369
Social Sciences	1.9	0.9	723	2.2	1.5	2.1	1.2	1388

**TABLE 2:****Subject-area metrics for research output 2008-2013** (calculated April 2018)

SUBJECT AREA	ULSTER UNIVERSITY			UNITED KINGDOM		QUEEN'S UNIVERSITY BELFAST		
	Citations per Publication	Field-Weighted Citation Impact	Scholarly Output (2014-2017)	Citations per Publication	Field-Weighted Citation Impact	Citations per Publication	Field-Weighted Citation Impact	Scholarly Output (2014-2017)
Overall	16.6	1.4	5835	20.0	1.5	21.2	1.6	13357
Arts & Humanities	19.7	1.3	284	25.8	1.7	23.6	1.7	1023
Agricultural & Biological Sciences	8.1	1.1	410	8.1	1.5	15.6	2.0	943
Biochemistry, Genetics & Molecular Biology	21.9	1.1	533	35.1	1.6	34.7	1.6	1612
Business, Management & Accounting	11.8	1.3	405	13.3	1.5	17.1	1.8	288
Chemical Engineering	35.5	2.1	181	27.7	1.6	29.0	1.8	181
Chemistry	31.8	1.8	241	28.3	1.6	30.3	1.6	1076
Computer Science	8.9	1.2	1255	12.2	1.5	9.3	1.3	1414
Decision Sciences	13.5	1.6	109	17.3	1.6	20.9	1.5	106
Earth & Planetary Sciences	15.6	1.6	180	25.4	1.6	35.1	2.3	841
Economics & Finance	6.8	1.1	186	12.4	1.5	13.8	1.3	251
Energy	44.5	2.2	158	18.1	1.6	21.9	2.0	316
Engineering	11.8	1.5	846	13.0	1.5	12.7	1.4	2055
Environmental Sciences	27.3	1.9	265	24.5	1.8	24.9	1.7	783
Health Professions	14.2	1.3	197	15.5	1.4	16.1	1.3	125
Immunology & Microbiology	20.3	0.9	145	35.8	1.7	27.1	1.5	456
Materials Science	21.5	1.4	337	19.6	1.5	19.1	1.4	868
Mathematics	7.2	0.8	356	13.0	1.5	10.3	1.4	620
Medicine	23.0	1.7	1512	23.5	1.7	28.8	2.0	3043
Neuroscience	26.0	1.4	212	33.0	1.6	22.8	1.3	313
Nursing	15.3	1.6	444	12.5	1.2	16.1	1.4	418
Pharmacology	24.3	1.3	151	22.5	1.4	24.6	1.5	429
Physics	20.6	1.6	218	21.0	1.5	21.1	1.5	2056
Psychology	15.5	1.1	302	20.0	1.4	15.4	1.1	405
Social Sciences	9.0	1.2	1033	10.5	1.5	9.6	1.4	1780

# WHAT FACTORS HAVE AN IMPACT ON CITATIONS?

Tahamtan et al. (2016) undertook a comprehensive review of the scholarly literature looking at the factors that can increase citations. The wider literature consistently shows that there is quite a range of factors that can influence whether a paper is cited, and that there is variance regarding the strength of impact of various factors across different disciplines.

From their review of 198 papers, the authors categorise 28 factors affecting citations under three headings: those related to the paper, those related to the journal, and those related to the author(s).

**TABLE 3:**  
**28 factors influencing the frequency of citations** (Tahamtan et al., 2016)

'PAPER' RELATED FACTORS	'JOURNAL' RELATED FACTORS	'AUTHOR' RELATED FACTORS
Quality of paper	Journal impact factor and prestige	Number of authors and co-authorship
Novelty, popularity and interest of subject	Language of journal (paper's language)	Author's reputation and previous citations
Characteristics of fields/subfields of a discipline and study subject/topics	Scope and coverage of journal	Author's academic rank
Methodology	Form of publication and presentation (conference, journal)	Self-citation
Document type		International and national collaboration of authors
Study design		Authors' country
Characteristics of results, discussions and other sections		The gender, age and race of authors
Use of figures and appendix in papers		Author's productivity
Characteristics of the title, abstract and keywords		Organizational features of authors
Characteristics of references		Funding and grants received by authors
Length of paper		
Age of cited paper (age effect)		
Early citation and speed of citation		
Accessibility and visibility of papers		

Tahamtan et al. (2016) highlight factors such as the **quality of the paper**, the **journal impact metrics**, the **number of authors**, and the visibility and **international collaboration** as stronger predictors for citation than some of the other factors.

## QUALITY OF THE PAPER

It can be difficult to assess the quality of a paper, and indeed the number of citations of a paper is often used as a proxy for measuring quality. Tahamtan et al. (2016) cite a number of studies that support the view that there is a positive relationship between paper quality and number of citations. While this is not a given, clearly academic/research staff should aim to produce the highest quality research output possible.

The REF criteria of rigour, significance and originality, along with internal and external peer reviews of research output using these criteria are helpful in terms of enabling staff to see where their research output sits in terms of the level or quality of their work.

**TABLE 4:**

**REF2014 Assessment criteria and level definitions**

(<http://www.ref.ac.uk/2014/panels/assessmentcriteriaandleveldefinitions/>)

The criteria for assessing the quality of outputs were 'originality, significance and rigour'.

RATING	CRITERIA
Four star	Quality that is world-leading in terms of originality, significance and rigour
Three star	Quality that is internationally excellent in terms of originality, significance and rigour but which falls short of the highest standards of excellence.
Two star	Quality that is recognised internationally in terms of originality, significance and rigour.
One star	Quality that is recognised nationally in terms of originality, significance and rigour.
Unclassified	Quality that falls below the standard of nationally recognised work. Or work which does not meet the published definition of research for the purposes of this assessment.

To some extent judgements about what criteria apply in measuring quality are subject specific:

*Researchers have differing attitudes toward quality, so that some consider accuracy and importance of research as higher quality, while for others it is creativity and novelty (Tahamtan et al., 2016). Citing authors frequently assess quality based on the prestige of a document's journal, authors, institutions, and its citation status (whether it has been already cited by others) (Wang & Soergel, 1998). (Tahamtan & Bornmann, 2018, p 206).*

It should also be pointed out that there is also some evidence that suggests that citation is not necessarily related to article quality. For example, Akcan et al. (2013) looked at whether bibliometric indicators such as citation counts were a predictor of methodological research quality in clinical research and found that there were no significant differences in citation counts between high, moderate or low quality articles. Nonetheless, staff should be striving to produce work of the highest possible quality in order to have an impact on their field.

## JOURNAL IMPACT METRICS (JIF)

*Researchers try to publish their papers in journals with high impact factors to increase their visibility and achieve more citations. Publishing papers in journals with high impact factors would result in more citations than publishing in low impact factor journals (Tahamtan et al., 2016, p 1206).*

Just as the number of citations a paper has is often considered a proxy for paper quality, so too the journal impact factor is considered as evidence of paper quality. This is because high quality journals have increased visibility, are more likely to be read, and therefore cited. As with the quality of the paper, while most articles on citations and journal impact factors agree that there is a positive relationship between journal impact factor and number of citations, there is also some research that does not support this (Tahamtan et al., 2016, p 1206), that is, good articles can also appear in lower ranked journals.

Quartile 1 (Q1) journals are those where the journal's impact factor is within the top 25% of the JIF distribution in that subject area, and quartile 4 (Q4) means it is within the lowest 25% of the JIF distribution.

While it is not realistic for most researchers to expect every publication to be in a Q1 journal, Bornmann and Marx (2014) suggest that there is an expectation that 25% of the research output of an individual would be in Q1 journals, and Liu, Hu and Gu (2015) argue that the figure could be higher than 25% based on the fact that Q1 journals typically have more issues and publish more articles than journals in the lower quartiles. In addition to journal impact factor staff should also consider journal circulation figures, which is another measure related to journal prestige.

## NUMBER OF AUTHORS

*The number of authors of a paper and co-authorship is correlated with the paper's impact so that the more authors a paper has, the more probably it will be cited (Tahamtan et al., 2016, p 1208).*

In addition to number of authors, Tahamtan et al. (2016) also list studies that have shown that having co-authors from different disciplines also increases the likelihood of citation. They refer to the concept of 'knowledge diffusion' - *in which the more the knowledge is distributed in the scientific network, the more it receives attention and citation* (Tahamtan et al., 2016, p 1208). In a study of ecology papers published between 2009 and 2012, Fox et al. (2016: 7717) found that *"longer papers, those with more authors, and those that cite more references are cited more."* Single-author papers are in decline in many subject areas, and have been since the 1960s. For example, writing about the 'extinction' of the single-authored paper in ecological research, Barlow et al. (2018: 1) state that single-authored papers have fallen from *"over 60% of all publications in the 1960s, single-authored papers now make up less than 4%."* The optimum number of authors, from a citation perspective, varies across subject areas. Based on a systematic review of disability related fields, Ahmed et al. (2016) recommend that the maximum number of co-authors is four. They found that two co-authors, rather than a single author increased the likelihood of citations, but that as the number of authors increased significantly citation declined. Consistent with other bibliometric research, Ahmed et al. (2016) emphasise that *"strategies to improve the citation count vary across disciplines."*

## INTERNATIONAL COLLABORATION

Internationally co-authored papers have also been found to have greater 'citation impact' than nationally co-authored papers (Nomaler et al., 2013, p 966). In their citation analysis of scientific papers published since 2000 and co-authored by two or more European countries, Nomaler et al. (2013) found that, on average, the greater the geographical distance between the collaborating countries the higher the number of citations.

According to Tahamtan et al. (2016, p 1210): *Highly-cited papers are shown to be the result of teamwork of researchers from different countries.*

As with the previous factors that can influence citation, there is also some conflicting evidence that suggests there are some exceptions for specific subject areas or publications (see Tahamtan et al., 2016, p 1210).

## CITATION IMPACT IN DIFFERENT SUBJECT AREAS

Research evidence, such as that by Marx and Bornmann (2014) shows that lower levels of citation can occur in some subjects, for example arts and humanities, because individuals are not publishing in output types that are indexed in bibliographic databases such as Web of Science (WoS) or Scopus (rather than having a lower average number of references per paper).

## OPEN ACCESS AND INCREASING VISIBILITY

*Open access (OA) can effectively increase the accessibility and visibility of scientific articles and thus potentially confer them with citation advantages. (Tang et al., 2017, p1).*

A study by Tang et al. (2017) that compared citations for OA and non-OA articles in hybrid ecology journals (that published both gold OA articles and non-OA articles) found that "OA articles received significantly more citations than non-OA articles." Similarly, Piwowar et al. (2018), amongst others, confirms a 'citation advantage' with OA articles. They found "OA articles receive 18% more citations than average, an effect mainly driven by Green and Hybrid OA."

*"Once a paper is cited, its visibility is increased and this leads to further citations (Aksnes, 2003). This phenomenon has been named as accumulative advantage" (Tahamtan et al., 2016, 1205).*

Open access is part of the 'visibility picture', and as Tahamtan et al. (2016) point out in addition to open access (via whatever route), tweeting about outputs and having them featured in newspaper articles can also increase visibility and citation impact.

# HOW CITATION FACTORS HAVE HAD AN IMPACT ON CITATIONS AT ULSTER WITH COMPARATIVE QUB AND UK DATA

Tables 5 and 6 show the citation impact of scholarly publications at Ulster for the time-periods 2014-2017 and 2008-2013.

Correlations were run on the 2014-2017 data to determine how strong the associations were between the number of citations per publication and the other variables. International collaboration (%) and Outputs in Top Citation Percentiles were very strongly and positively associated with citations per publication (see Table 7).

**TABLE 5:****Citations relating to scholarly output 2014-2017** (calculated January 2018)

Subject Area	Ulster University							United Kingdom						Queen's University Belfast						
	Citations per Publication	Field-Weighted Citation Impact	International Collaboration (%)	Outputs in Top Citation Percentiles (10%)	Publications in Top Journal Percentiles (10%)	Publications in Top Journal Percentiles (25%)	Scholarly Output (2014-2017)	Citations per Publication	Field-Weighted Citation Impact	International Collaboration (%)	Outputs in Top Citation Percentiles (10%)	Publications in Top Journal Percentiles (10%)	Publications in Top Journal Percentiles (25%)	Citations per Publication	Field-Weighted Citation Impact	International Collaboration (%)	Outputs in Top Citation Percentiles (10%)	Publications in Top Journal Percentiles (10%)	Publications in Top Journal Percentiles (25%)	Scholarly Output (2014-2017)
Overall	3.8	1.2	50.7	17.4	35.1	62.8	3702	5.1	1.6	50.6	20.8	37.9	64.1	6.1	1.8	57.7	23.7	40.2	69.7	10182
Arts & Humanities	1.8	0.9	33.6	7.1	26.7	53.9	292	1.7	1.5	21.0	6.6	29.2	56.5	2.0	1.6	25.4	8.0	36.0	59.3	698
Agricultural & Biological Sciences	5.5	1.2	67.1	20.9	66.1	89.3	176	5.7	1.6	68.3	25.9	59.1	79.1	6.8	2.0	66.9	29.8	55.4	84.0	809
Biochemistry, Genetics & Molecular Biology	5.4	1.2	63.0	26.6	14.1	49.1	378	8.4	1.7	63.8	34.1	28.2	63.9	9.2	1.9	65.5	35.2	26.6	62.4	1192
Business, Management & Accounting	2.4	1.0	39.8	7.3	18.0	39.9	239	2.8	1.6	46.1	12.3	28.0	53.3	3.3	1.7	44.9	10.6	28.4	56.9	245
Chemical Engineering	6.3	2.3	68.1	35.9	30.2	58.5	116	7.4	1.5	58.4	32.7	37.1	68.6	6.7	1.8	68.6	36.3	33.6	76.5	372
Chemistry	6.6	1.6	61.9	32.8	30.6	65.3	176	8.1	1.6	62.3	34.9	44.0	72.2	6.7	1.5	62.6	34.7	41.1	76.1	746
Computer Science	2.4	1.0	45.0	9.4	12.7	28.1	620	3.2	1.5	55.5	12.7	19.6	37.1	3.8	2.3	63.9	15.5	25.2	43.5	1042
Decision Sciences	4.1	1.4	49.1	10.9	38.5	71.8	53	3.7	1.3	58.9	16.6	26.7	52.3	4.3	1.8	59.0	17.9	27.8	55.6	78
Earth & Planetary Sciences	4.3	1.2	73.1	16.8	32.4	65.8	119	6.3	1.6	70.6	28.2	36.4	75.4	7.1	1.6	79.6	34.2	24.0	85.4	725
Economics & Finance	1.2	0.8	37.3	1.5	17.1	31.6	134	2.4	1.5	47.5	10.2	20.8	49.5	3.0	1.9	55.2	12.5	25.3	55.1	192
Energy	5.8	1.5	54.1	38.8	54.6	69.2	135	5.4	1.6	54.1	27.0	42.6	69.1	5.2	1.8	65.1	30.4	53.4	79.4	335
Engineering	2.9	1.3	46.7	14.8	27.0	56.3	482	3.8	1.5	53.7	16.6	32.7	57.0	4.5	1.8	64.4	20.6	41.6	62.6	1631
Environmental Sciences	4.3	1.5	67.6	25.3	44.5	69.9	185	5.9	1.8	61.2	28.0	42.2	69.2	5.8	1.8	66.1	29.8	36.2	72.5	634
Health Professions	4.7	1.7	61.5	23.8	48.3	68.7	148	3.6	1.5	45.0	16.4	32.4	58.8	3.1	1.1	45.2	12.9	29.7	67.0	93
Immunology & Microbiology	4.2	1.4	74.3	31.6	8.1	41.9	74	8.3	1.7	67.1	34.5	21.3	59.7	6.8	1.7	68.5	34.9	22.0	54.1	324
Materials Science	5.4	1.8	56.3	30.6	32.4	68.2	190	5.6	1.5	61.7	24.4	36.2	63.1	5.6	1.8	68.3	27.8	42.2	71.1	654
Mathematics	1.6	0.8	44.4	6.4	18.1	24.5	214	2.8	1.4	58.1	11.7	23.4	43.0	2.7	1.7	68.5	15.3	31.3	43.9	483
Medicine	4.9	1.5	58.3	23.5	33.0	66.3	1227	6.2	1.7	48.7	23.7	34.3	61.5	8.3	2.2	55.3	28.0	40.2	70.4	2792
Neuroscience	6.9	1.4	58.9	24.8	15.9	36.6	151	7.1	1.6	61.3	31.6	23.8	53.9	5.2	1.4	65.5	26.9	26.1	57.5	223
Nursing	4.5	1.3	56.2	19.9	33.3	65.1	260	3.3	1.3	31.7	14.3	23.3	44.9	2.6	1.2	37.6	11.8	23.2	42.9	322
Pharmacology	5.2	1.3	60.0	20.8	39.7	61.6	75	5.8	1.5	58.1	26.8	29.9	59.2	5.1	1.6	51.0	30.0	34.7	62.4	357
Physics	4.1	1.0	61.3	19.7	36.5	72.3	150	6.4	1.6	67.4	26.5	29.5	64.7	6.6	1.6	75.1	29.3	21.8	68.9	1392
Psychology	4.6	1.5	59.6	19.8	29.4	62.3	277	3.8	1.4	44.0	17.6	25.8	55.8	3.2	1.1	41.2	14.9	19.8	50.6	369
Social Sciences	1.9	0.9	34.7	6.0	27.4	53.5	723	2.2	1.5	28.4	9.3	27.6	53.6	2.1	1.2	28.9	7.9	24.4	51.5	1388

**TABLE 6:****Citations relating to scholarly output 2008-2013** (calculated April 2018)

Subject Area	Ulster University							United Kingdom						Queen's University Belfast						
	Citations per Publication	Field-Weighted Citation Impact	International Collaboration (%)	Outputs in Top Citation Percentiles (10%)	Publications in Top Journal Percentiles (10%)	Publications in Top Journal Percentiles (25%)	Scholarly Output (2008-2013)	Citations per Publication	Field-Weighted Citation Impact	International Collaboration (%)	Outputs in Top Citation Percentiles (10%)	Publications in Top Journal Percentiles (10%)	Publications in Top Journal Percentiles (25%)	Citations per Publication	Field-Weighted Citation Impact	International Collaboration (%)	Outputs in Top Citation Percentiles (10%)	Publications in Top Journal Percentiles (10%)	Publications in Top Journal Percentiles (25%)	Scholarly Output (2008-2013)
Overall	16.6	1.4	40.0	17.0	27.6	52.9	5,835	20.0	1.5	40.7	17.0	34.0	59.6	21.2	1.6	47.1	17.9	16.8	64.1	13,357
Arts & Humanities	19.7	1.3	59.1	20.8	49.8	72.7	284	25.8	1.7	60.9	25.4	52.7	74.4	23.6	1.7	60.5	22.5	47.8	76.2	1,023
Agricultural & Biological Sciences	8.1	1.1	21.9	6.6	25.2	51.7	410	8.1	1.5	14.8	5.7	23.7	49.2	15.6	2.0	20.5	5.8	33.3	54.3	943
Biochemistry, Genetics & Molecular Biology	21.9	1.1	52.0	24.4	10.9	44.4	533	35.1	1.6	54.3	32.5	27.1	61.9	34.7	1.6	55.1	28.7	22.2	61.2	1,612
Business, Management & Accounting	11.8	1.3	32.8	9.9	11.8	36.3	405	13.3	1.5	34.9	11.5	16.0	40.6	17.1	1.8	30.2	16.7	20.9	43.5	288
Chemical Engineering	35.5	2.1	49.7	26.0	27.0	50.7	181	27.7	1.6	46.4	25.5	32.5	64.5	29.0	1.8	55.5	31.4	26.6	65.7	181
Chemistry	31.8	1.8	58.1	29.0	27.4	64.2	241	28.3	1.6	52.2	26.2	37.7	68.1	30.3	1.6	59.9	28.3	38.1	73.6	1,076
Computer Science	8.9	1.2	40.0	5.9	9.8	24.8	1,255	12.2	1.5	46.0	8.9	14.6	29.6	9.3	1.3	45.5	6.3	14.3	30.1	1,414
Decision Sciences	13.5	1.6	35.8	13.8	17.4	33.7	109	17.3	1.6	47.4	14.7	20.4	38.6	20.9	1.5	43.4	25.5	22.1	40.0	106
Earth & Planetary Sciences	15.6	1.6	45.0	11.7	30.1	57.2	180	25.4	1.6	63.9	24.8	39.0	72.2	35.1	2.3	74.2	28.8	37.5	83.7	841
Economics & Finance	6.8	1.1	40.3	3.8	7.7	22.3	186	12.4	1.5	39.8	10.3	17.0	42.2	13.8	1.3	40.2	11.2	17.5	40.7	251
Energy	44.5	2.2	44.2	17.5	32.2	83.8	158	18.1	1.6	44.2	17.5	32.2	67.1	21.9	2.0	53.8	19.3	47.1	76.2	316
Engineering	11.8	1.5	40.0	10.5	25.6	45.9	846	13.0	1.5	43.3	10.5	25.6	47.6	12.7	1.4	44.8	10.8	27.2	48.3	2,055
Environmental Sciences	27.3	1.9	47.9	24.5	34.6	62.1	265	24.5	1.8	49.9	24.1	36.5	62.9	24.9	1.7	53.9	23.9	33.6	68.6	783
Health Professions	14.2	1.3	38.1	9.6	24.5	46.0	197	15.5	1.4	33.9	13.7	20.9	50.6	16.1	1.3	35.2	10.4	19.4	61.2	125
Immunology & Microbiology	20.3	0.9	68.3	15.9	5.8	33.3	145	35.8	1.7	60.1	33.7	25.9	61.2	27.1	1.5	53.5	27.6	18.6	50.1	456
Materials Science	21.5	1.4	42.7	18.7	23.5	58.8	337	19.6	1.5	52.7	17.0	33.2	59.1	19.1	1.4	52.5	19.5	40.2	63.2	868
Mathematics	7.2	0.8	44.7	3.7	17.6	27.9	356	13.0	1.5	50.3	8.5	21.2	37.5	10.3	1.4	54.7	7.7	17.5	34.1	620
Medicine	23.0	1.7	42.6	18.0	26.4	53.3	1,512	23.5	1.7	37.0	20.2	31.8	59.1	28.8	2.0	45.1	24.6	40.0	69.9	3,043
Neuroscience	26.0	1.4	52.4	25.9	17.9	35.9	212	33.0	1.6	52.0	31.6	25.1	50.5	22.8	1.3	57.2	24.3	24.8	48.7	313
Nursing	15.3	1.6	42.1	13.1	26.9	52.3	444	12.5	1.2	20.7	10.5	22.7	41.0	16.1	1.4	28.2	15.3	30.5	48.4	418
Pharmacology	24.3	1.3	53.6	26.5	15.9	57.2	151	22.5	1.4	44.6	21.6	26.2	58.0	24.6	1.5	44.5	25.9	25.5	56.6	429
Physics	20.6	1.6	56.4	17.0	29.0	64.5	218	21.0	1.5	60.9	18.6	30.4	61.7	21.1	1.5	70.5	21.5	27.2	63.3	2,056
Psychology	15.5	1.1	40.4	13.6	17.5	47.9	302	20.0	1.4	34.7	18.3	24.1	50.9	15.4	1.1	34.6	14.8	22.1	44.5	405
Social Sciences	9.0	1.2	24.0	6.3	22.4	44.2	1,033	10.5	1.5	20.8	8.2	23.9	47.3	9.6	1.4	20.1	7.0	24.2	47.7	1,780

**TABLE 7:****Correlations between citations per publication and other variables** (based on the January 2018 2014-2017 report)

SUBJECT AREA		ULSTER UNIVERSITY	UNITED KINGDOM	QUEEN'S UNIVERSITY BELFAST
		Citations per Publication	Citations per Publication	Citations per Publication
<b>Field-Weighted Citation Impact</b>	Pearson Correlation	<b>.764**</b>	<b>.620**</b>	<b>.480*</b>
	Sig. (2-tailed)	.000	.003	.018
	N	24	21	24
<b>International Collaboration (%)</b>	Pearson Correlation	<b>.748**</b>	<b>.720**</b>	<b>.685**</b>
	Sig. (2-tailed)	.000	.000	.000
	N	24	21	24
<b>Outputs in Top Citation Percentiles</b>	Pearson Correlation	<b>.875**</b>	<b>.988**</b>	<b>.912**</b>
	Sig. (2-tailed)	.000	.000	.000
	N	24	21	24
<b>Publications in Top Journal Percentiles (10%)</b>	Pearson Correlation	<b>.376</b>	<b>.355</b>	<b>.249</b>
	Sig. (2-tailed)	.070	.114	.240
	N	24	21	24
<b>Publications in Top Journal Percentiles (25%)</b>	Pearson Correlation	<b>.517**</b>	<b>.632**</b>	<b>.637**</b>
	Sig. (2-tailed)	.010	.002	.001
	N	24	21	24
<b>Scholarly Output (2014-2017)</b>	Pearson Correlation	<b>-.217</b>	<b>.c</b>	<b>.398</b>
	Sig. (2-tailed)	.309	.	.054
	N	24		24

# WHAT CAN STAFF, UNITS OF ASSESSMENT (UOAS), & THE WIDER UNIVERSITY DO TO PROMOTE RESEARCH & INCREASE CITATIONS?

Any strategy for increasing citations of staff needs to recognise both the factors that can help increase the likelihood of citation and also the discipline-specific context and citation practices within the field in which the researcher operates. Therefore citation expertise needs to be developed and shared at a subject/UoA level. Experienced scholars and research leaders (for example, but not necessarily, Research Directors) will be best placed to do this, in conjunction with library staff who can generate bibliometric reports relating to their unit. Ultimately, however, all academic/research staff need to take responsibility for ensuring they are doing everything they can to improve the citation impact of their work.

The more staff can become 'citation literate' in relation to the practices and factors that influence citation in their field, and the factors that are more consistent in supporting citations of their work, the better placed they will be to take steps to try to increase citations. This will need to be supported at UoA and Faculty levels, by the Library, the Department for Research & Impact and by the PVC for Research & Impact.

The University's Research Librarian and the Department for Research & Impact are pro-actively engaged in providing staff training and resources in the area of citation impact.

A website on Bibliometrics and Citation Analysis has been produced (<http://guides.library.ulster.ac.uk/citations>). Library workshops are run throughout the year for academic/research staff, library staff and doctoral students. The workshops cover the following:

- The importance of having an accurate researcher profile and steps to correct it if necessary;
- The importance of open access;
- Finding journal impact metrics and other useful metrics;
- Using citation databases to measure and track research impact;
- Identifying impactful collaborators;
- Tips on metadata and writing good practice to improve search rankings with a view to increase citations; and
- Altmetrics.

A number of research support staff and academics have received SciVal training, and information and guidance on journal metrics and benchmark reports have been produced for Research Directors (although with possible changes to staff that will be included in each UoA, this will need to be revisited).

In order to meet the aim of increasing staff citations Ulster University makes the following commitments:

**TABLE 8:**  
**Commitments**

#### ESTABLISH BASELINE DATA

- Reports need to be generated for each Unit of Assessment, from the Sub-Librarian for Research Support Services, so that each UoA will have benchmark data about citation impact for their unit.
- Once UoA membership has been confirmed, following the consultation into Ulster's definition of staff with a significant research responsibility (SRR), UoA level reports for each UoA can be run.

#### IMPROVE THE QUALITY OF RESEARCH OUTPUT

- **Academic/Research staff:** Staff need to focus on research output that are likely to be reviewed as 3 or 4 star. Peer review and feedback from colleagues prior to publication will help with this. Further feedback from an external reviewer post-publication will give staff useful indicators of the level of their work and should be timely enough to enable them to improve the quality of their outputs for subsequent publications should that be necessary.
- **UoA:** It is important that the UoA is providing appropriate support and guidance for staff to ensure that they have a solid understanding of what they need to do in their work to ensure that it will be reviewed as 3 or 4 star within their subject area. Mechanisms should be in place for timely internal (pre-publication) and external (post-publication) reviews of research output.
- **Department for Research & Impact/UoA:** There also needs to be university-wide guidance, support, and research training for staff in terms of writing 3 and 4 star research output.
- At a university level: SOARING training and library workshops
- More robust/systematic implementation of internal peer review process
- Communications to Research Directors from the Research and Impact Leadership Team, and from Research Directors to academic/research staff
- Research Directors
- SOARING

#### PUBLISH IN HIGH QUALITY JOURNALS/Q1 JOURNALS (JOURNAL IMPACT FACTOR)

- Provide guides to finding high impact journals for each discipline and communicate to all staff.
- Academic/Research staff should aim to publish research in high impact international peer-review journals where possible, or comparable prestige publications for their subject area.
- Guides for subject areas / UoAs will be produced by the Sub-librarian for Research Support.
- Research Directors to discuss the reports with staff
- Individual staff to follow up

#### CO-AUTHORSHIP

- Where possible, and appropriate, staff should be involved in collaborative research projects which lead to co-authorship of research output. It can also be helpful to co-author(s) from different discipline, and to work with international, rather than local or national partners. PURE can be used to identify potential co-authors.
- PURE workshops to include guidance on how to identify potential co-authors/collaborators
- Research Directors to discuss how increased co-authorship could be achieved with staff
- Individual staff to follow up e.g. through use of PURE

#### PROVIDE STAFF WITH INFORMATION ABOUT HOW TO IMPROVE THEIR CITATIONS

- Use the '10 things' on the next page as a 'print out and keep' guide for academic staff and researchers.
- Department for Research and Impact have produced a website and PDF of this document for download or print.

#### IDENTIFY AND ESTABLISH CITATION EXPERTS AT FACULTY/UoA LEVEL

- Citation experts at Faculty/UoA will provide subject-specific leadership in relation to the citation practices in their subject area with a view to increasing citations in their Faculty/UoA.
- To be identified by the Department for Research and Impact and the Research and Impact Leadership team.
- Role to be discussed and rolled out.

# 10 THINGS INDIVIDUAL ACADEMICS/ RESEARCHERS SHOULD BE DOING TO INCREASE THEIR CITATIONS & THE SCHOLARLY IMPACT OF THEIR WORK

- 1. Have an ORCID and use it.** This ID is a unique identifier and is used to connect an individual to their published output and contributions to research. Register at <https://orcid.org/> for an ID. Use it when submitting journal articles. Most online article submission areas will have a space for entering your ORCID ID. Read: <https://www.elsevier.com/connect/authors-update/ten-reasons-to-get-and-use-an-orcid-id>! See the Library Guide <http://guides.library.ulster.ac.uk/c.php?g=614163&p=4266621>.
- 2. Co-author with international author(s)** Existing research and Ulster citation analysis shows that articles with international author(s) are more likely to get cited. Potential international co-authors can be identified within PURE.
- 3. Cite yourself, and the work of other Ulster colleagues, where appropriate.** This is an opportunity to promote other relevant published output that you have authored and bring it to the attention of those reading your work. You also have an opportunity to raise the profile of other, relevant Ulster research and give it wider visibility and attention.
- 4. Ensure the journal you are publishing in is indexed in Scopus.** Check: <https://www.elsevier.com/solutions/scopus/content>. See: <https://blog.scopus.com/posts/is-a-title-indexed-in-scopus-a-reminder-to-check-before-you-publish>. The journal that you are submitting to should be of sufficient quality to be indexed in Scopus.
- 5. Publish in the top ranking journals in your subject.** Using <http://library.ulster.ac.uk/electronic/check/eiscard.php?eisno=276> go to Select Categories to select the subject area, e.g. Education and Educational Research, the most recent year, and the JIF Quartile (Q1 or Q1 and Q2), then Submit to get the list of journals in the subject area ranked by Journal Impact Factor. Aim to publish in the top Q1 (top quartile/top 25%) of journals in your subject. If that is not possible, then move to the Q2 journals. If you are not able to publish in Q1 or Q2 journals then it is important to consider what you could do to bring the work up to a level where it would be accepted by a Q1 or Q2 journal. Journal impact metrics based on Scopus data are also available from the Journal Metrics website <http://scopus.com/source>. Existing research, and Ulster citations statistics demonstrates that publishing in the top 25% of journals in a subject increases citations. See the Library Guide <http://guides.library.ulster.ac.uk/c.php?g=614163&p=4266620>.
- 6. Ensure your work is Open Access.** Evidence shows that open access (regardless of route) can increase citation impact. 'Green' open access can be achieved by ensuring you deposit a version of your final accepted author manuscript to the institutional repository (through PURE) so that everyone can access it. In addition, you may also wish to upload to a subject repository for wider visibility. See website on Open Access <https://www.ulster.ac.uk/internal/research/openaccess> and further information in PURE support website <https://www.ulster.ac.uk/internal/research/puresupport> as well as <http://www.hefce.ac.uk/rsrch/oa/whatis/>

- 7. Use your free author prints/e-copies.** Share them with other people working in your area (inside and outside the university), who may wish to cite your work in their own writing.
- 8. Promote your publications on social media** (Twitter and LinkedIn) and on research discovery sites such as Google Scholar, ResearchGate and Kudos. See the Library Guide <http://guides.library.ulster.ac.uk/c.php?g=614163&p=4266624>
- 9. Know what your h-index is and focus on increasing the visibility of, and promoting, your output that will increase your h-index.** Look up your h-index in Scopus. (Library > databases > Scopus) Select Author search. Ensure that you have only one Scopus entry. If you have multiple entries (either in different subject areas or from working in different institutions), you can ask Scopus to merge them. See the Library Guide <http://guides.library.ulster.ac.uk/c.php?g=614163&p=4266622>
- 10. Read more about how to increase your citations.** See: Tahamtan et al. (2016) Factors affecting number of citations: a comprehensive review of the literature. *Scientometrics*, 107 (3): 1195-1225 and the Ulster Library Guides on <http://guides.library.ulster.ac.uk/citations>. **Get support from the Library:** <http://guides.library.ulster.ac.uk/citations/support>

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## FURTHER READING

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# APPENDICES

## APPENDIX A:

### Definitions of key terms used in relation to metrics

#### *The Metrics*

The chosen metrics are all 'snowball metrics' – standardised research metrics which have been agreed on and are transparent.

#### *Citation Count*

Total citations received by publications of the selected entities. Includes self-citations. All publication types.

#### *Field-Weighted Citation Impact*

The ratio of citations received relative to the expected world average for the subject field, publication type and publication year. The world average is 1.0. Includes self-citations. All publication types.

#### *International Collaboration*

The extent of international co-authorship. Results show a percentage of all publication types (journal articles, conference papers, reviews, editorials).

#### *Outputs in Top Citation Percentiles*

The number of publications of a selected entity that are highly cited, having reached a particular threshold of citations received. Includes self-citations. All publication types. Shows the outputs in the top 10%.

#### *Publications in Top Journal Percentiles*

The number of publications of a selected entity that have been published in the world's top journals. Includes self-citations. All publication types. Shows the outputs in the top 10% using CiteScore Percentile (CiteScore is essentially the average citations per document that a title receives over a three-year period. CiteScore Percentile indicates the relative standing of a title in its subject field, and also corrects for the different sizes of subject areas).

#### *Scholarly Output*

The number of publications of a selected entity. The type of publications included are journal articles, reviews, conference papers, editorials, short surveys, books and book chapters indexed in Scopus.

#### *Subject Areas*

The Subject Area breakdown in the tables corresponds to Scopus' All Science Journal Classification scheme, which allocates each source title (journal, conference proceeding etc) indexed in Scopus to at least one subject category. There are 27 main subject categories, and 334 sub-categories in total. Some titles are allocated more than one subject category.

#### *Pearson Correlation*

This is a measure of the strength of a linear association between two variables.

## APPENDIX B:

### Example of UoA-level citation data 2014-2017 (report run April 2018)

## Ulster UoA 20 Social Work & Policy

2014 to 2017 | no subject area filter selected | [ASJC](#)

### Overall research performance

Scholarly Output

128 ▲

Researchers

32 ▲

Field-Weighted Citation Impact

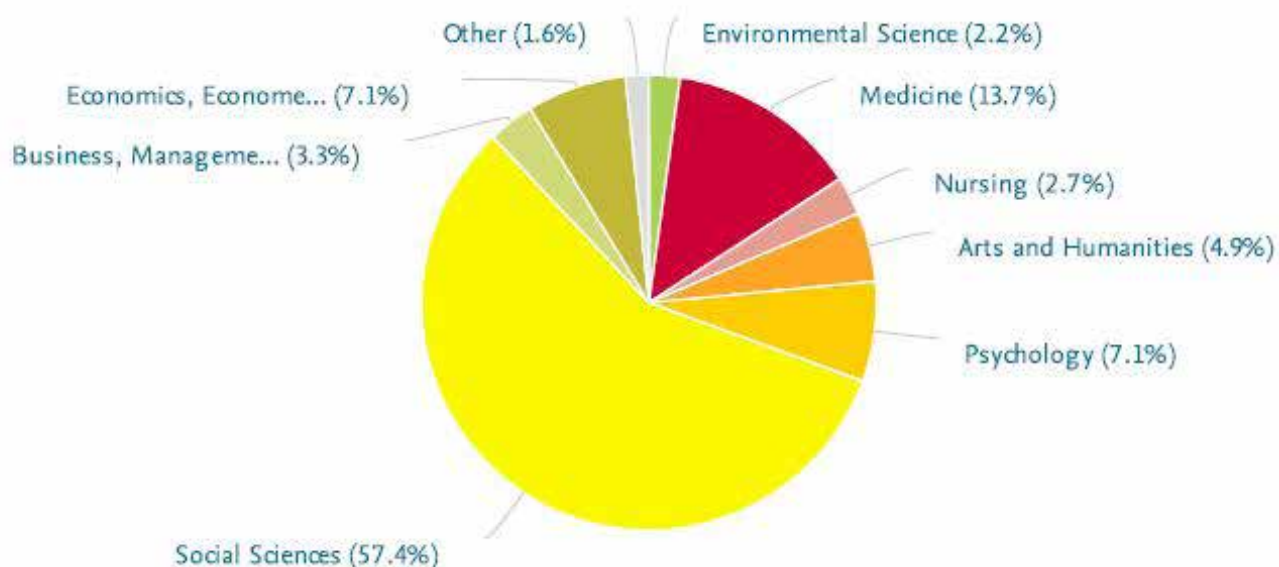
1.03

Citation Count

336

Citations per Publication

2.6



## Research Topics

Top 5 Topics, by Scholarly Output

Topic	By this Group of Researchers		Worldwide
	Scholarly Output	Field-Weighted Citation Impact	Prominence percentile
Great Britain; conflict; divided societies ... T.9823	16	0.83	<div></div>
abortion; Great Britain; gender equality ... T.36431	7	1.40	<div></div>
PubMed; MEDLINE; search filters ... T.15938	4	0.88	<div></div>
Elder Abuse; Violence; elder mistreatment ... T.1338	3	2.02	<div></div>
Athens; Democracy; public finance ... T.5356	3	1.49	<div></div>

## Performance indicators

### Outputs in Top Citation Percentiles

Publications in top 10% most cited worldwide



### Publications in Top Journal Percentiles

Publications in top 10% journals by CiteScore Percentile



### International Collaboration

Publications co-authored with researchers in other countries



### Academic-Corporate Collaboration

Publications with both academic and corporate affiliations



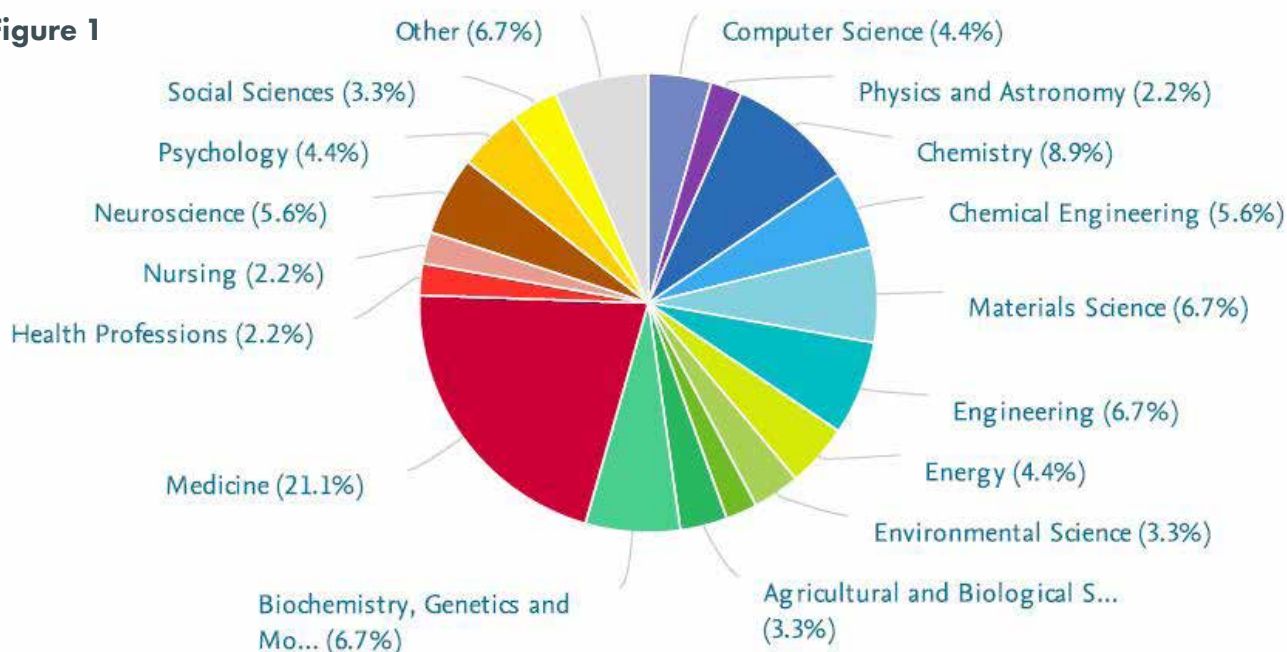
## APPENDIX C:

### Top 50 cited articles written by Ulster University authors (2014-2017)

The top 50 articles authored/co-authored by Ulster staff, published between 2014-2017, are listed below (from a SciVal report that was run on 13 April 2018 and based on Scopus information). The 50 outputs have been cited a total of 3047 times. It is important to note that this report is accurate on the date that it was run based on the SciVal data on that date. There may be some minor differences between Scopus and SciVal data on a given date due to differences in when each database is updated with new data.

Figure 1 below shows the range of subject areas of the top 50 outputs. Just over a fifth of the papers (21.1%) are from medicine.

**Figure 1**



The most cited paper published during this period is:

Banerjee, S., Pillai, S.C., Falaras, P., O'Shea, K.E., Byrne, J.A., Dionysiou, D.D. (2014) New insights into the mechanism of visible light photocatalysis. *Journal of Physical Chemistry Letters*, 5 (15): 2543-2554.

This article has been cited 191 times since it was published in 2014. It has six co-authors – Professor John (Tony) Byrne, School of Engineering, is the Ulster author. The authors are from six different institutions, and four countries (Ireland, Greece, USA, and UK).

What is immediately apparent from the list of 50 (see below) is the extent of co-authorship. Only one paper is single authored. That is no 37 in the list and is by Stephanie McKeown, Emeritus Professor, Biomedical Sciences Research Institute.

Four from the list of fifty have two authors (nos 2, 6, 15, and 48). The co-authors are respectively from a US institution, another UK institution, Ulster University, and an Italian institution.

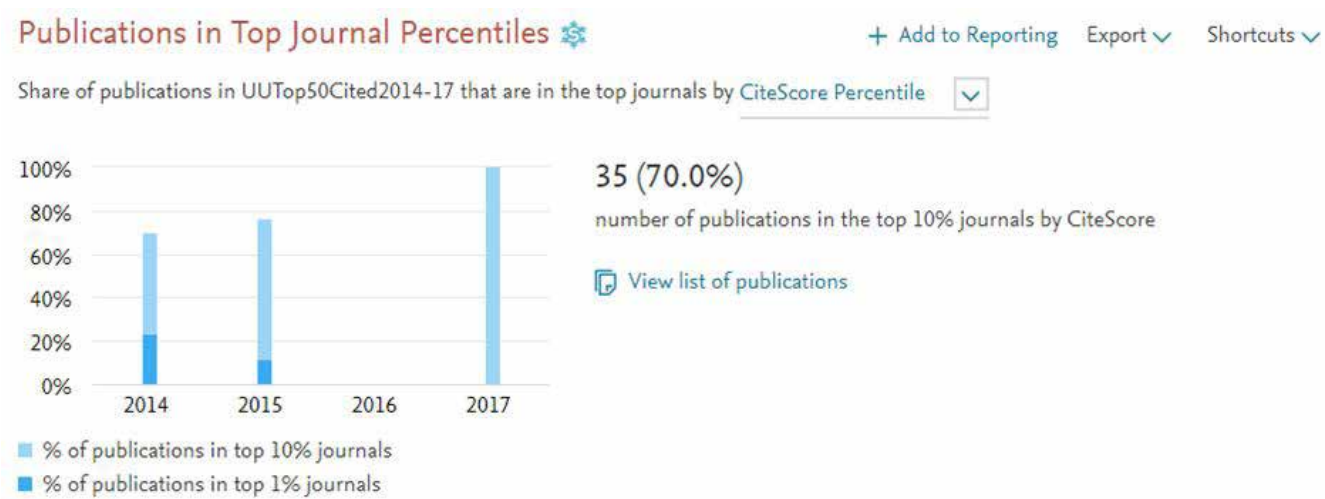
At the other end of the spectrum, the paper with the most co-authors is item no 9, which has 77 co-authors. Sixteen of the fifty (32%) have ten or more co-authors. The mean number of co-authors is 12.2.

International collaboration is another striking feature and linked to co-authorship. Eighty-two percent of the Top 50 outputs are co-authored with one or more institutions in other countries.



Thirty-five of the outputs are articles and the remaining 15 are reviews.

The figures below shows that 70% of the journals from the top 50 are in the top 10% journals by CiteScore.



Ulster authors are highlighted in bold in the table below. There are 36 authors that are currently Ulster staff and these individuals are highlighted in bold and italics. Six of these 36 staff have more than one item in the list (Professor Cherie Armour, Professor John (Tony) Byrne, Dr Patrick Dunlop, Dr Jeremy Hamilton, Professor Helene McNulty, and Professor Pagona Papakonstantinou). Professor John (Tony) Byrne, School of Engineering, has the greatest number of items in the list (6). His six papers have been cited a total of 435 times.

Twenty of the 36 current staff in the Top 50 list are professors, three are senior lecturers, four are lecturers, two are readers, two are research fellows, three are research associates, and two have other designations.

The subject areas that the 36 staff are working in are as follows:

Biomedical Sciences	9
Engineering	9
Psychology	6
Computing	3
Built Environment	2
Nursing	2
Pharmacology	2
Business & Mgmt	1
Environmental Sci	1
Social Policy	1

NO	AUTHOR(S)	DATE	TITLE	JOURNAL	NO OF CITATIONS	TYPE OF PUBLICATION
1	Banerjee, S., Pillai, S.C., Falaras, P., O'Shea, K.E., <b>Byrne, J.A.</b> , Dionysiou, D.D.	2014	New insights into the mechanism of visible light photocatalysis	Journal of Physical Chemistry Letters	191	Article
2	Tognoli, E., Kelso, J.	2014	The Metastable Brain	Neuron	125	Review
3	Guo, F., Li, X., Liang, D., Li, T., Zhu, P., Guo, H., Wu, X., Wen, L., Gu, T.-P., Hu, B., <b>Walsh, C.P.</b> , Li, J., Tang, F., Xu, G.-L.	2014	Active and passive demethylation of male and female pronuclear DNA in the mammalian zygote	Cell Stem Cell	114	Article
4	Andrade, L.H., Alonso, J., Mneimneh, Z., Wells, J.E., Al-Hamzawi, A., Borges, G., Bromet, E., Bruffaerts, R., De Girolamo, G., De Graaf, R., Florescu, S., Gureje, O., Hinkov, H.R., Hu, C., Huang, Y., Hwang, I., Jin, R., Karam, E.G., Kovess-Masfety, V., Levinson, D., Matschinger, H., <b>O'Neill, S.</b> , Posada-Villa, J., Sagar, R., Sampson, N.A., Sasu, C., Stein, D.J., Takeshima, T., Viana, M.C., Xavier, M., Kessler, R.C.	2014	Barriers to mental health treatment: Results from the WHO World Mental Health surveys	Psychological Medicine	107	Article
5	Fang, Y., Qureshi, I., Sun, H., McCole, P., <b>Ramsey, E.</b> , Lim, K.H.	2014	Trust, satisfaction, and online repurchase intention: The moderating role of perceived effectiveness of e-commerce institutional mechanisms	MIS Quarterly: Management Information Systems	98	Article
6	<b>McClean, P.L.</b> , Hölscher, C.	2014	Liraglutide can reverse memory impairment, synaptic loss and reduce plaque load in aged APP/PS1 mice, a model of Alzheimer's disease	Neuropharmacology	82	Article

NO	AUTHOR(S)	DATE	TITLE	JOURNAL	NO OF CITATIONS	TYPE OF PUBLICATION
7	<b>Politis, A.</b> , Stengel, F., Hall, Z., Hernández, H., Leitner, A., Walzthoeni, T., Robinson, C.V., Aebersold, R.	2014	A mass spectrometry-based hybrid method for structural modeling of protein complexes	Nature Methods	81	Article
8	<b>Benson, J.</b> , Li, M., Wang, S., Wang, P., <b>Papakonstantinou, P.</b>	2015	Electrocatalytic Hydrogen Evolution Reaction on Edges of a Few Layer Molybdenum Disulfide Nanodots	ACS Applied Materials and Interfaces	73	Article
9	Newton, J.N., Briggs, A.D.M., Murray, C. J.L., Dicker, D., Foreman, K.J., Wang, H., Naghavi, M., Forouzanfar, M.H., Ohno, S.L., Barber, R.M., Vos, T., Stanaway, J.D., Schmidt, J.C., Hughes, A.J., Fay, D.F.J., Ecob, R., Gresser, C., McKee, M., Rutter, H., Abubakar, I., Ali, R., Anderson, H.R., Banerjee, A., Bennett, D.A., Bernabé, E., Bhui, K.S., Biryukov, S.M., Bourne, R.R., Brayne, C.E.G., Bruce, N.G., Brugha, T.S., Burch, M., Capewell, S., Casey, D., Chowdhury, R., Coates, M.M., Cooper, C., Critchley, J.A., Dargan, P.I., Dherani, M.K., Elliott, P., Ezzati, M., Fenton, K.A., Fraser, M.S., Fürst, T., Greaves, F., Green, M.A., Gunnell, D.J., <b>Hannigan, B.M.</b> , Hay, R.J., Hay, S.I., Hemingway, H., Larson, H.J., Looker, K.J., Lunevicius, R., Lyons, R.A., Marcenes, W., Mason-Jones, A.J., Matthews, F.E., Moller, H., Murdoch, M.E., Newton, C.R., Pearce, N., Piel, F.B., Pope, D., Rahimi, K., Rodriguez, A., Scarborough, P., Schumacher, A.E., Shive, I., Smeeth, L., Tedstone, A., Valabhji, J., Williams, H.C., Wolfe, C.D.A., Woolf, A.D., Davis, A.C.J.	2015	Changes in health in England, with analysis by English regions and areas of deprivation, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	The Lancet	73	Review
10	<b>Armour, C.</b> , Tsai, J., Durham, T.A., Charak, R., Biehn, T.L., Elhai, J.D., Pietrzak, R.H.	2015	Dimensional structure of DSM-5 posttraumatic stress symptoms: Support for a hybrid Anhedonia and Externalizing Behaviors model	Journal of Psychiatric Research	72	Article
11	<b>Best, P., Manktelow, R., Taylor, B.</b>	2014	Online communication, social media and adolescent wellbeing: A systematic narrative review	Children and Youth Services Review	71	Article
12	Bruggeman, P.J., Kushner, M.J., Locke, B.R., Gardeniers, J.G.E., Graham, W.G., Graves, D.B., Hofman-Caris, R.C.H.M., Maric, D., Reid, J.P., Ceriani, E., Fernandez Rivas, D., Foster, J.E., Garrick, S.C., Gorbanev, Y., Hamaguchi, S., Iza, F., Jablonowski, H., Klimova, E., Kolb, J., Krcma, F., Lukes, P., MacHala, Z., Marinov, I., <b>Mariotti, D.</b> , Mededovic Thagard, S., Minakata, D., Neyts, E.C., Pawlat, J., Petrovic, Z.Lj., Pflieger, R., Reuter, S., Schram, D.C., Schröter, S., Shiraiwa, M., Tarabová, B., Tsai, P.A., Verlet, J.R.R., Von Woedtko, T., Wilson, K.R., Yasui, K., Zvereva, G.	2016	Plasma-liquid interactions: A review and roadmap	Plasma Sources Science and Technology	71	Review

NO	AUTHOR(S)	DATE	TITLE	JOURNAL	NO OF CITATIONS	TYPE OF PUBLICATION
13	Keane, D.A., McGuigan, K.G., Ibáñez, P.F., Polo-López, M.I., <b>Byrne, J.A., Dunlop, P.S.M.</b> , O'Shea, K., Dionysiou, D.D., Pillai, S.C.	2014	Solar photocatalysis for water disinfection: Materials and reactor design	Catalysis Science and Technology	69	Review
14	<b>Conlon, J.M.</b> , Mechkarska, M., Lukic, <b>M.L., Flatt, P.R.</b>	2014	Potential therapeutic applications of multifunctional host-defense peptides from frog skin as anti-cancer, anti-viral, immunomodulatory, and anti-diabetic agents	Peptides	64	Review
15	<b>Bikkarolla, S.K., Papakonstantinou, P.</b>	2015	CuCo <sub>2</sub> O <sub>4</sub> nanoparticles on nitrogenated graphene as highly efficient oxygen evolution catalyst	Journal of Power Sources	64	Article
16	Karam, E.G., Friedman, M.J., Hill, E.D., Kessler, R.C., McLaughlin, K.A., Petukhova, M., Sampson, L., Shahly, V., Angermeyer, M.C., Bromet, E.J., De Girolamo, G., De Graaf, R., Demyttenaere, K., <b>Ferry, F.</b> , Florescu, S.E., Haro, J.M., He, Y., Karam, A.N., Kawakami, N., Kovess-Masfety, V., Medina-Mora, M.E., Browne, M.A.O., Posada-Villa, J.A., Shalev, A.Y., Stein, D.J., Viana, M.C., Zarkov, Z., Koenen, K.C.	2014	Cumulative traumas and risk thresholds: 12-month ptsd in the world mental health (WMH) surveys	Depression and Anxiety	62	Article
17	Gribble, P.A., Delahunt, E., <b>Bleakley, C.M.</b> , Caulfield, B., Docherty, C.L., Fong, D.T.-P., Fourchet, F., Hertel, J., Hiller, C.E., Kaminski, T.W., McKeon, P.O., Refshaug, K.M., Van Der Wees, P., Vicenzino, W., Wikstrom, E.A.	2014	Selection criteria for patients with chronic ankle instability in controlled research: A position statement of the international ankle consortium	Journal of Athletic Training	62	Article
18	<b>Banat, I.M.</b> , Satpute, S.K., Cameotra, S.S., Patil, R., Nyayanit, N.V.	2014	Cost effective technologies and renewable substrates for biosurfactants' production	Frontiers in Microbiology	61	Review
19	<b>Hamilton, G.R.C.</b> , Sahoo, S.K., <b>Kamila, S.</b> , Singh, N., Kaur, N., <b>Hyland, B.W., Callan, J.F.</b>	2014	Optical probes for the detection of protons, and alkali and alkaline earth metal cations	Chemical Society Reviews	61	Article
20	Bailey, L.B., Stover, P.J., <b>McNulty, H.</b> , Fenech, M.F., Gregory, J.F., Mills, J.L., Pfeiffer, C.M., Fazili, Z., Zhang, M., Ueland, P.M., Molloy, A.M., Caudill, M.A., Shane, B., Berry, R.J., Bailey, R.L., Hausman, D.B., Raghavan, R., Raiten, D.J.	2015	Biomarkers of nutrition for development-Folate review	Journal of Nutrition	59	Review
21	<b>Kent, L.</b> , Reix, P., Innes, J.A., Zielen, S., Le Bourgeois, M., Braggion, C., Lever, S., Arets, H.G.M., Brownlee, K., <b>Bradley, J.M.</b> , Bayfield, K., O'Neill, K., Savi, D., Bilton, D., Lindblad, A., Davies, J.C., Sermet, I., De Boeck, K.	2014	Lung clearance index: Evidence for use in clinical trials in cystic fibrosis	Journal of Cystic Fibrosis	57	Review
22	ElMekawy, A., Srikanth, S., Bajracharya, S., Hegab, H.M., <b>Nigam, P.S.</b> , Singh, A., Mohan, S.V., Pant, D.	2015	Food and agricultural wastes as substrates for bioelectrochemical system (BES): The synchronized recovery of sustainable energy and waste treatment	Food Research International	56	Review

NO	AUTHOR(S)	DATE	TITLE	JOURNAL	NO OF CITATIONS	TYPE OF PUBLICATION
23	<b>Bikkarolla, S.K.</b> , Yu, F., Zhou, W., Joseph, P., Cumpson, P., <b>Papakonstantinou, P.</b>	2014	A three-dimensional Mn <sub>3</sub> O <sub>4</sub> network supported on a nitrogenated graphene electrocatalyst for efficient oxygen reduction reaction in alkaline media	Journal of Materials Chemistry A	55	Article
24	<b>Eftekhari, A.</b> , Jian, Z., Ji, X.	2017	Potassium Secondary Batteries	ACS Applied Materials and Interfaces	55	Review
25	Sirko, K., Bentall, R.P., <b>Shevlin, M.</b> , O'Sullivan, N., Sellwood, W.	2014	Associations between specific psychotic symptoms and specific childhood adversities are mediated by attachment styles: An analysis of the National Comorbidity Survey	Psychiatry Research	54	Article
26	Laird, E., <b>McNulty, H.</b> , <b>Ward, M.</b> , <b>Hoey, L.</b> , <b>McSorley, E.</b> , <b>Wallace, J.M.W.</b> , <b>Carson, E.</b> , Molloy, A.M., Healy, M., Casey, M.C., Cunningham, C., <b>Strain, J.J.</b>	2014	Vitamin D deficiency is associated with inflammation in older Irish adults	Journal of Clinical Endocrinology and Metabolism	52	Article
27	<b>Zhou, M.</b> , <b>Politis, A.</b> , Davies, R.B., Liko, I., Wu, K.-J., Stewart, A.G., Stock, D., Robinson, C.V.	2014	Ion mobility-mass spectrometry of a rotary ATPase reveals ATP-induced reduction in conformational flexibility	Nature Chemistry	52	Article
28	Zhao, C., Pelaez, M., Dionysiou, D.D., Pillai, S.C., <b>Byrne, J.A.</b> , O'Shea, K.E.	2014	UV and visible light activated TiO <sub>2</sub> photocatalysis of 6-hydroxymethyl uracil, a model compound for the potent cyanotoxin cylindrospermopsin	Catalysis Today	51	Article
29	<b>Okeyo, G.</b> , <b>Chen, L.</b> , <b>Wang, H.</b> , <b>Sterritt, R.</b>	2014	Dynamic sensor data segmentation for real-time knowledge-driven activity recognition	Pervasive and Mobile Computing	51	Article
30	Gribble, P.A., Delahunt, E., <b>Bleakley, C.</b> , Caulfield, B., Docherty, C., Fouchet, F., Fong, D.T-P., Hertel, J., Hiller, C., Kaminski, T., McKeon, P., Refshauge, K., Van Der Wees, P., Vincenzino, B., Wikstrom, E.	2014	Selection criteria for patients with chronic ankle instability in controlled research: A position statement of the International Ankle Consortium	British Journal of Sports Medicine	48	Article
31	Ballantyne, C.K., Sandeman, G.F., Stone, J.O., <b>Wilson, P.</b>	2014	Rock-slope failure following Late Pleistocene deglaciation on tectonically stable mountainous terrain	Quaternary Science Reviews	47	Article
32	Khoshnood, B., <b>Loane, M.</b> , De Walle, H., Arriola, L., Addor, M.-C., Barisic, I., Beres, J., Bianchi, F., Dias, C., Draper, E., Garne, E., Gatt, M., Haesler, M., Klungsoyr, K., Latos-Bielenska, A., Lynch, C., McDonnell, B., Nelen, V., Neville, A.J., O'Mahony, M.T., Queisser-Luft, A., Rankin, J., Rissmann, A., Ritvanen, A., Rounding, C., Sipek, A., Tucker, D., Verellen-Dumoulin, C., Wellesley, D., <b>Dolk, H.</b>	2015	Long term trends in prevalence of neural tube defects in Europe: Population based study	BMJ (Online)	47	Article

NO	AUTHOR(S)	DATE	TITLE	JOURNAL	NO OF CITATIONS	TYPE OF PUBLICATION
33	Chen, L., <b>Nugent, C., Okeyo, G.</b>	2014	An ontology-based hybrid approach to activity modeling for smart homes	IEEE Transactions on Human-Machine Systems	46	Article
34	Hurst, J.R., Elborn, J.S., De Soyza, A., Bilton, D., <b>Bradley, J.</b> , Brown, J.S., Copeland, F., Duckers, J., Floto, R.A., Foweraker, J., Haworth, C., Hill, A.T., Hubbard, R., Loebinger, M.R., McGuire, A., Muirhead, C.R., Navaratnam, V., Sullivan, A., Wilkinson, T.M., Winstanley, C.	2015	COPD-bronchiectasis overlap syndrome	European Respiratory Journal	46	Review
35	Kaur, S.J., <b>McKeown, S.R.</b> , Rashid, S.	2016	Mutant SOD1 mediated pathogenesis of Amyotrophic Lateral Sclerosis	Gene	46	Review
36	Fernández-Ibáñez, P., Polo-López, M.I., Malato, S., <b>Wadhwa, S., Hamilton, J.W.J., Dunlop, P.S.M., D'Sa, R., Magee, E.</b> , O'Shea, K., Dionysiou, D.D., Byrne, J.A.	2015	Solar photocatalytic disinfection of water using titanium dioxide graphene composites	Chemical Engineering Journal	45	Article
37	Kessler, R.C., Rose, S., Koenen, K.C., Karam, E.G., Stang, P.E., Stein, D.J., Heeringa, S.G., Hill, E.D., Liberzon, I., McLaughlin, K.A., McLean, S.A., Pennell, B.E., Petukhova, M., Rosellini, A.J., Ruscio, A.M., Shahly, V., Shalev, A.Y., Silove, D., Zaslavsky, A.M., Angermeyer, M.C., Bromet, E.J., De Almeida, J.M.C., De Girolamo, G., De Jonge, P., Demyttenaere, K., Florescu, S.E., Gureje, O., Haro, J.M., Hinkov, H., Kawakami, N., Kovess-Masfety, V., Lee, S., Medina-Mora, M.E., <b>Murphy, S.D.</b> , Navarro-Mateu, F., Piazza, M., Posada-Villa, J., Scott, K., Torres, Y., Viana, M.C.	2014	How well can post-traumatic stress disorder be predicted from pre-trauma risk factors? An exploratory study in the WHO World Mental Health Surveys	World Psychiatry	45	Article
38	<b>McKeown, S.R.</b>	2014	Defining normoxia, physoxia and hypoxia in tumours-implications for treatment response.	The British journal of radiology	44	Review
39	McGivern, M.R., Best, K.E., Rankin, J., Wellesley, D., <b>Greenlees, R.</b> , Addor, M.-C., Arriola, L., De Walle, H., Barisic, I., Beres, J., Bianchi, F., Calzolari, E., Doray, B., Draper, E.S., Garne, E., Gatt, M., Haessler, M., Khoshnood, B., Klungsoyr, K., Latos-Bielenska, A., O'mahony, M., Braz, P., McDonnell, B., Mullaney, C., Nelen, V., Queisser-Luft, A., Randrianaivo, H., Rissmann, A., Rounding, C., Sipek, A., Thompson, R., Tucker, D., Wertelecki, W., Martos, C.	2015	Epidemiology of congenital diaphragmatic hernia in Europe: A register-based study	Archives of Disease in Childhood: Fetal and Neonatal Edition	44	Article

NO	AUTHOR(S)	DATE	TITLE	JOURNAL	NO OF CITATIONS	TYPE OF PUBLICATION
40	Kessler, R.C., Sampson, N.A., Berglund, P., Gruber, M.J., Al-Hamzawi, A., Andrade, L., <b>Bunting, B.</b> , Demyttenaere, K., Florescu, S., De Girolamo, G., Gureje, O., He, Y., Hu, C., Huang, Y., Karam, E., Kovess-Masfety, V., Lee, S., Levinson, D., Medina Mora, M.E., Moskalewicz, J., Nakamura, Y., Navarro-Mateu, F., Browne, M.A.O., Piazza, M., Posada-Villa, J., Slade, T., Ten Have, M., Torres, Y., Vilagut, G., Xavier, M., Zarkov, Z., Shahly, V., Wilcox, M.A.	2015	Anxious and non-anxious major depressive disorder in the World Health Organization World Mental Health Surveys	Epidemiology and Psychiatric Sciences	43	Article
41	Tsai, J., Harpaz-Rotem, I., <b>Armour, C.</b> , Southwick, S.M., Krystal, J.H., Pietrzak, R.H.	2015	Dimensional structure of DSM-5 posttraumatic stress disorder symptoms: Results from the national health and resilience in veterans study	Journal of Clinical Psychiatry	43	Article
42	Van Rooij, A.J., Kuss, D.J., Griffiths, M.D., <b>Shorter, G.W.</b> , Schoenmakers, T.M., Van De Mheen, D.	2014	The (co-)occurrence of problematic video gaming, substance use, and psychosocial problems in adolescents	Journal of Behavioral Addictions	42	Article
43	<b>Boyd, A.R., Rutledge, L.</b> , Randolph, L.D., <b>Meenan, B.J.</b>	2015	Strontium-substituted hydroxyapatite coatings deposited via a co-deposition sputter technique	Materials Science and Engineering C	41	Article
44	<b>Byrne, J.A., Dunlop, P.S.M., Hamilton, J.W.J.</b> , Fernández-Ibáñez, P., Polo-López, I., <b>Sharma, P.K., Vennard, A.S.M.</b>	2015	A review of heterogeneous photocatalysis for water and surface disinfection	Molecules	41	Article
45	Withers, P.J.A., <b>Jordan, P.</b> , May, L., Jarvie, H.P., Deal, N.E.	2014	Do septic tank systems pose a hidden threat to water quality?	Frontiers in Ecology and the Environment	40	Review
46	Bean, C.J., De Barros, L., Lokmer, I., Métaixian, J.-P., O'Brien, G., <b>Murphy, S.</b>	2014	Long-period seismicity in the shallow volcanic edifice formed from slow-rupture earthquakes	Nature Geoscience	40	Article
47	Kumar, H., Salminen, S., <b>Verhagen, H.</b> , Rowland, I., Heimbach, J., Bañares, S., Young, T., Nomoto, K., Lalonde, M.	2015	Novel probiotics and prebiotics: Road to the market	Current Opinion in Biotechnology	40	Review
48	<b>Brandoni, C.</b> , Renzi, M.	2015	Optimal sizing of hybrid solar micro-CHP systems for the household sector	Applied Thermal Engineering	39	Article
49	Hasan, A., McCormack, S.J., <b>Huang, M.J.</b> , Norton, B.	2014	Energy and cost saving of a photovoltaic-phase change materials (PV-PCM) System through temperature regulation and performance enhancement of photovoltaics	Energies	39	Article
50	<b>Hamilton, J.W.J., Byrne, J.A., Dunlop, P.S.M.</b> , Dionysiou, D.D., Pelaez, M., O'Shea, K., Synnott, D., Pillai, S.C.	2014	Evaluating the mechanism of visible light activity for N,F-TiO <sub>2</sub> using photoelectrochemistry	Journal of Physical Chemistry C	38	Article