



國立臺灣大學

NTUL-E-202419-0089

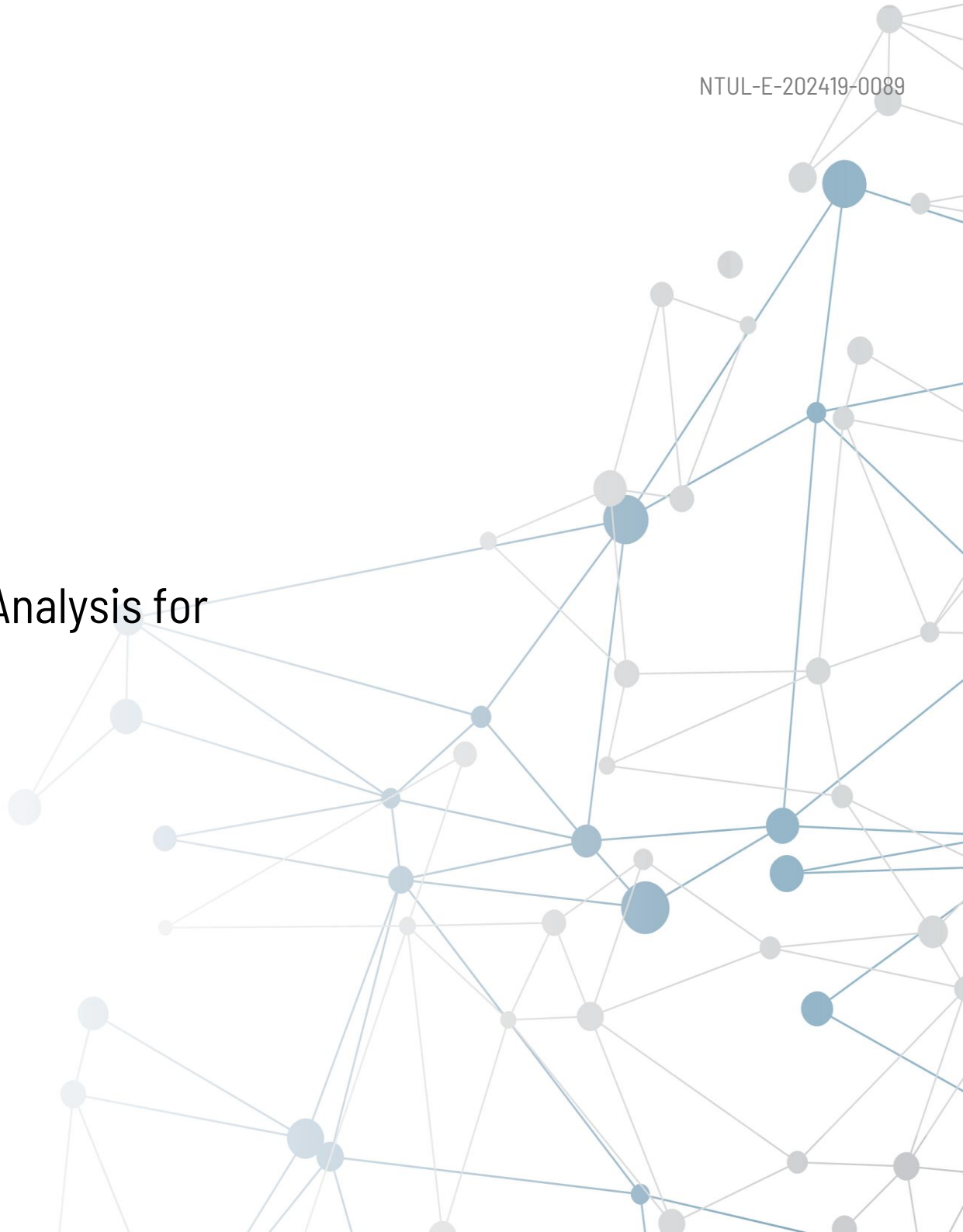
領域網絡分析概覽— 化學 2024

At a Glance — Domain Network Analysis for
Chemistry 2024

臺大圖書館研究支援組

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分析說明

- ▶ 領域類別以及評析學校係以 2024 年 QS 世界大學領域排名（QS World University Rankings by Subject）資訊為依據，並使用 QS 世界大學排名系統合作的 Scopus 和 SciVal 資料庫為數據來源。
- ▶ 運用書目計量及社會網絡分析等方法，側重分析各學科領域中全球及亞洲焦點學校之研究主題方向，提供本校教師及院系學術研究發展之參考。



The QS World University
Rankings by Subject 2024 共分
5 大領域 55 個學科主題。

[Methodology](#)：學科領域排名計算方法
及權重說明。

[QS Subject Categorization](#): QS WUR
2024 學科領域清單，以及與 Scopus ASJC
codes 對照方法。

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分析對象族群

- ▶ 以世界頂尖及亞洲精選各 10 所學校為焦點族群進行評析，非採個別單一學校方式。
- ▶ 「世界頂尖大學群」依 QS WUR 2024 於化學領域全球排名前 10 名學校。
- ▶ 「亞洲精選大學群」係挑選中國、香港、日本、南韓、新加坡等 5 個國家及地區於化學領域排名前 2 名學校。

● 世界頂尖大學群*

1		Harvard University
2		Massachusetts Institute of Technology
3		University of Cambridge
4		Stanford University
5		University of Oxford
6		University of California, Berkeley
7		National University of Singapore
8		ETH Zurich-Swiss Federal Institute of Technology
9		École polytechnique fédérale de Lausanne (EPFL)
10		Nanyang Technological University, Singapore

● 亞洲精選大學群*

13		Tsinghua University
14		Peking University
51		Hong Kong University of Science and Technology
64		University of Hong Kong
15		University of Tokyo
27		Kyoto University
31		Seoul National University
35		Korea Advanced Institute of Science & Technology
7		National University of Singapore
10		Nanyang Technological University

* 學校名稱前方數字為 QS World University Rankings by Subject 2024 — Chemistry 排名序位。

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研究主題分析

- ▶ 提供 2024 年 QS 世界大學排名化學領域全球排名前 10 名、亞洲 10 個精選大學以及臺灣大學，共3個族群之發展概況資訊。
- ▶ 研究主題（Topics）資料來源為 SciVal 資料庫，其以 Scopus 蒐錄文獻間的直接引用關係進行聚類，全球共分成近 1,500 個 Topic Clusters（上層主題）及 95,000 多個 Topics。

DATASET

Source	SciVal
Publication Year	2020-2023
Retrieved Date	2024.05.24-29

METHODOLOGY

1. SciVal之研究主題（Topics）屬文章層級（article-level）的聚類，每篇文章給予 1 個 Topic。不同於依文章的所屬期刊進行分類，給定1 到多個不等的複分學科方法。
2. 詳細說明：[How are Topics and Topic Clusters created](#)

02

世界頂尖大學群



Total
Scholarly Outputs
36,913

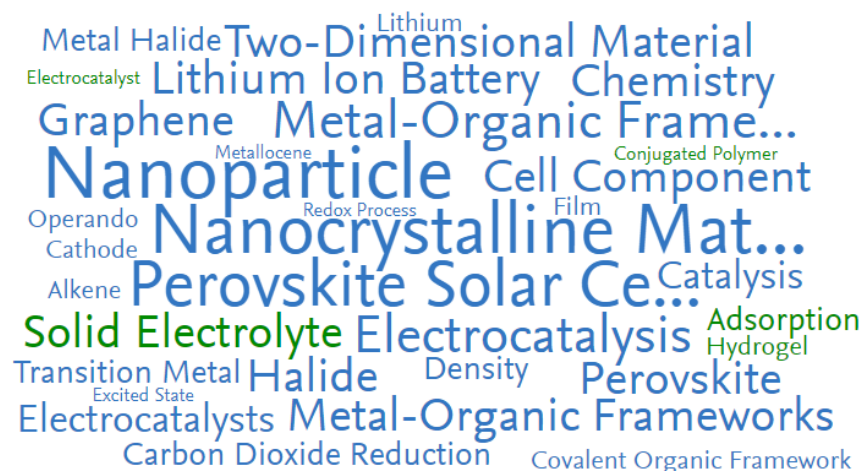


Citations
per Publication
21.9



Total
Topics
3,142

- Top 50 keyphrases* by relevance, based on 36,913 publications (2020-2023)



* Keyphrases產生方式說明：

https://service.elsevier.com/app/answers/detail/a_id/27763/supporthub/scival/

● Top 10 Topics by Scholarly Outputs

Topic ID	Scholarly Outputs	Topic 1st-3rd Relevance Keyphrases
T.264	320	Carbon Dioxide; Electrolytic Reduction; Electrocatalyst
T.3	227	Solar Cell; Grain Boundary; Perovskite
T.1	197	Electrocatalysts; Catalyst Activity; Oxygen Evolution
T.3332	170	Porosity; Metal Organic Framework; Carbon Dioxide
T.4092	163	Machine Learning; Density Functional Theory; Perovskite
T.719	151	Nanocrystalline Material; Quantum Dot; Perovskite
T.371	148	Transition Element; Exciton; Molybdenum
T.2295	144	Energy Storage; Zinc Ion; Battery (Electrochemical Energy Engineering)
T.787	139	Photoredox; Alkene; Oxidation-Reduction
T.1466	134	Lithium Molecular Entity; Seebeck Effect; Lithium Metal Anode

02

亞洲精選大學群



Total
Scholarly Outputs
49,465

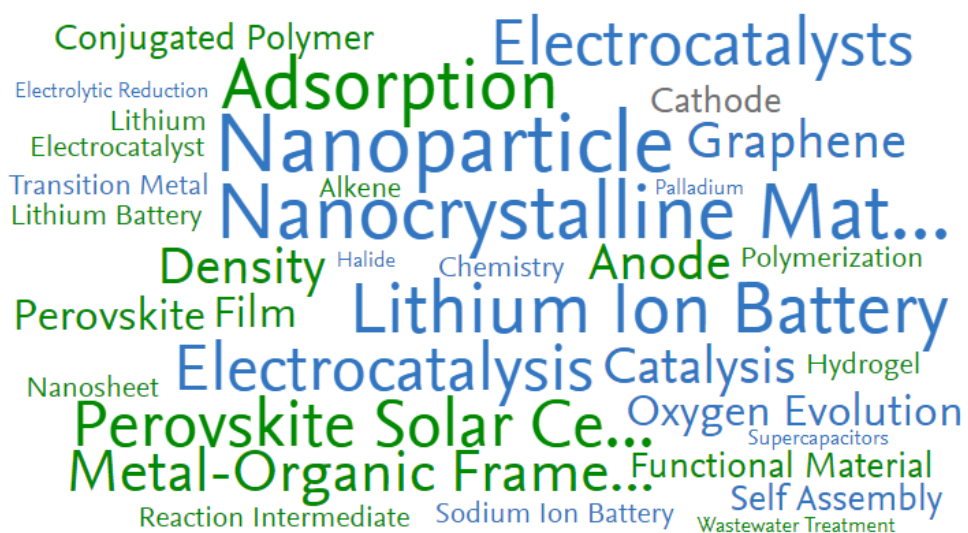


Citations
per Publication
19.0



Total
Topics
9,304

● Top 50 keyphrases by relevance, based on 49,465 publications



● Top 10 Topics by Scholarly Outputs

Topic ID	Scholarly Outputs	Topic 1st-3rd Relevance Keyphrases
T.498	443	Fullerene; Solar Cell; Non-Fullerene Acceptor
T.264	433	Carbon Dioxide; Electrolytic Reduction; Electrocatalyst
T.1	372	Electrocatalysts; Catalyst Activity; Oxygen Evolution
T.1466	327	Lithium Molecular Entity; Seebeck Effect; Lithium Metal Anode
T.3	301	Solar Cell; Grain Boundary; Perovskite
T.16	259	Electrolytic Reduction; Electrocatalysts; Oxygen Reduction Reaction
T.3332	257	Porosity; Metal Organic Framework; Carbon Dioxide
T.10806	246	Catalyst Activity; Nanoparticle; Single Atom Catalyst
T.51	245	Polysulfide; Lithium Molecular Entity; Lithium-Sulfur Battery
T.288	243	Chemical Activation; Sulfur Compounds; Advanced Oxidation Process

02

國立臺灣大學



Total
Scholarly Outputs
3,285

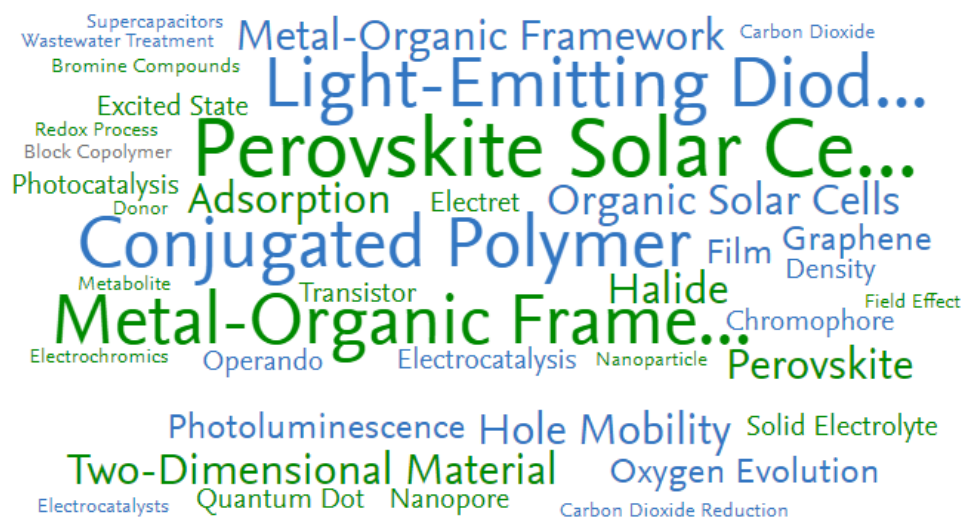


Citations
per Publication
13.6



Total
Topics
841

● Top 50 keyphrases by relevance, based on 3,285 publications



● Top 10 Topics by Scholarly Outputs

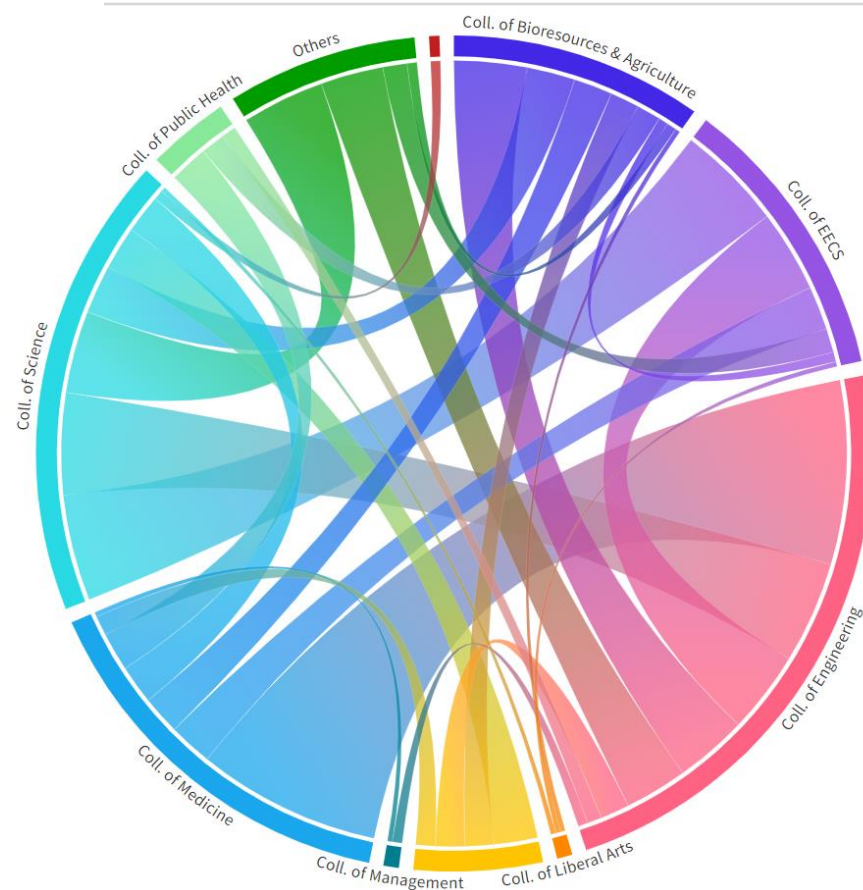
Topic ID	Scholarly Outputs	Topic 1st-3rd Relevance Keyphrases
T.3	34	Solar Cell; Grain Boundary; Perovskite
T.617	33	Delayed Fluorescence; Blue; Light-Emitting Diode
T.1107	32	Copolymer; Hole Mobility; Conjugated Polymer
T.719	29	Nanocrystalline Material; Quantum Dot; Perovskite
T.1	24	Electrocatalysts; Catalyst Activity; Oxygen Evolution
T.498	24	Fullerene; Solar Cell; Non-Fullerene Acceptor
T.8935	24	Nanoparticle; Thin Films; Organic Field Effect Transistors
T.6610	23	Diterpene; Anthozoa; Anti-Inflammatory Drug
T.3688	22	Energy Conservation; Extractive Distillation; Process Control
T.8250	22	Nanopore; Rectification; Biomimetics

02

本校學院參與情形

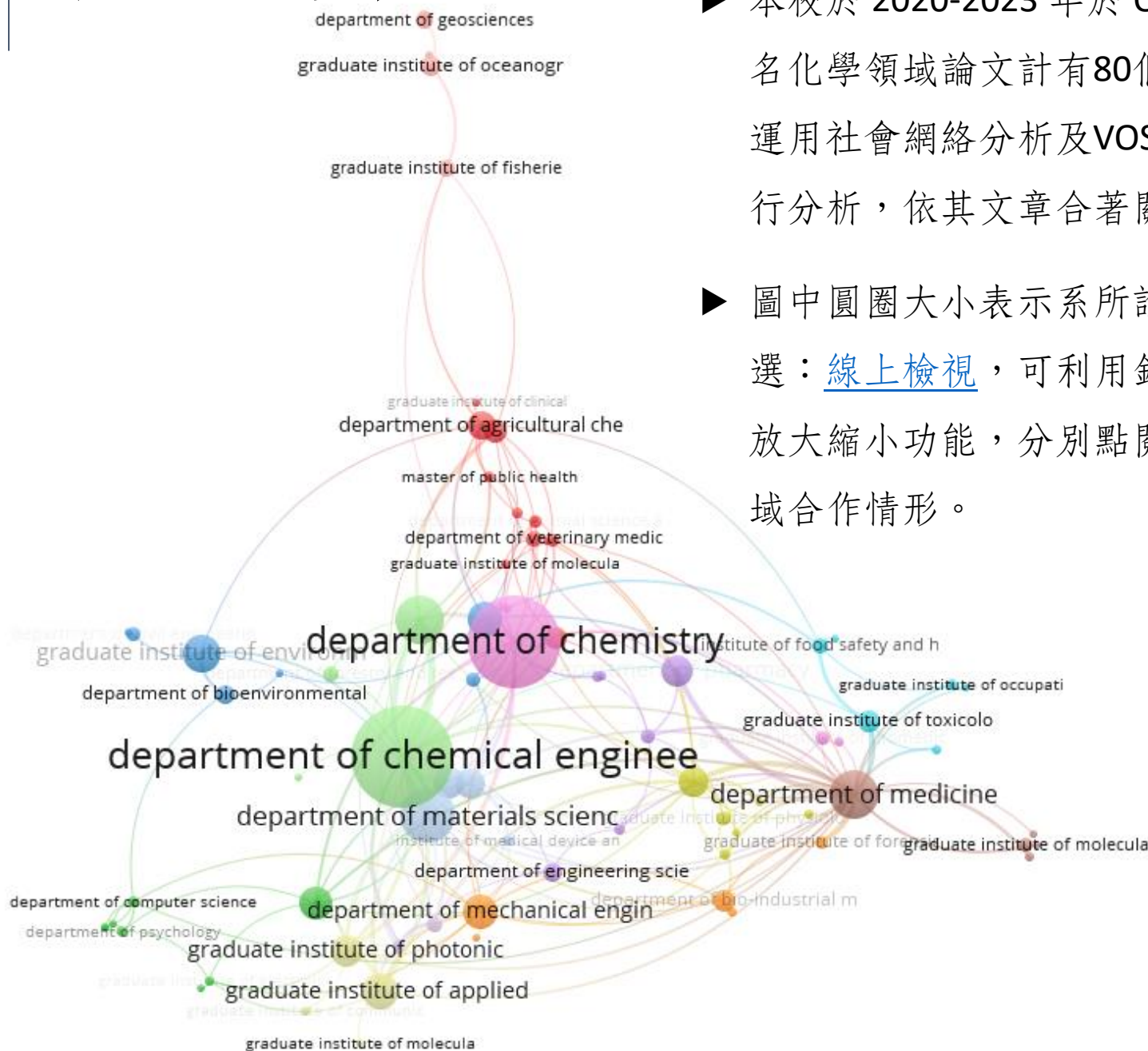
- ▶ 本校 2020-2023 年於 QS 世界大學排名化學領域計有論文 3,280 篇，運用可茲取得之本校教師 Scopus Author ID 進行所屬系所比對，共 2,692 篇可查得 ID 資料。
- ▶ 相同單位之 2 位以上作者之文章，於該單位統計時計數 1 篇。醫學院與臺大醫院合併統計，校級研究中心列入「others」。
- ▶ 各學院於 QS 世界大學排名化學領域論文數比例如右上圖。右下圖為各學院合著情形，點選[線上檢視](#)，可選擇學院分別檢視。

College of Bioresources and Agriculture	■
College of Electrical Engineering and Computer Science	■
College of Engineering	■
College of Liberal Arts	■
College of Life Science	■
College of Management	■
College of Medicine	■
College of Public Health	■
College of Science	■
Graduate School of Advanced Technology	■
Other	■



02

本校系所參與情形



- ▶ 本校於 2020-2023 年於 QS 世界大學排名化學領域論文計有80個系所合著發表。運用社會網絡分析及VOSViewer工具進行分析，依其文章合著關係共分14 群。
- ▶ 圖中圓圈大小表示系所論文數量，請點選：[線上檢視](#)，可利用釘選錨點，以及放大縮小功能，分別點閱各系所於此領域合作情形。

02

研究主題差異分析

- 下圖為全球頂尖大學群論文佔比排序前 15 位之研究主題。[線上檢視](#)可自行選擇排序群組，藉此瞭解學校群體間前500名研究主題領域發展之相近或差異情形。

論文數佔比: World Top 10 Universities  排序功能圖示

Topic ID	Topic 1st-3rd Relevance Keyphases	論文數佔比: World Top 10 Universities	論文數佔比: Asia Selected 10 Universities	論文數佔比: National Taiwan University
T.264	Carbon Dioxide; Electrolytic Reduction; Electrocatalyst	0.87%	0.88%	0.55%
T.3	Solar Cell; Grain Boundary; Perovskite	0.61%	0.61%	1.04%
T.1	Electrocatalysts; Catalyst Activity; Oxygen Evolution	0.53%	0.75%	0.73%
T.3332	Porosity; Metal Organic Framework; Carbon Dioxide	0.46%	0.52%	0.24%
T.4092	Machine Learning; Density Functional Theory; Perovskite	0.44%	0.16%	0.06%
T.719	Nanocrystalline Material; Quantum Dot; Perovskite	0.41%	0.38%	0.88%
T.371	Transition Element; Exciton; Molybdenum	0.40%	0.32%	0.30%
T.2295	Energy Storage; Zinc Ion; Battery (Electrochemical Energy Engineering)	0.39%	0.48%	0.03%
T.787	Photoredox; Alkene; Oxidation-Reduction	0.38%	0.45%	0.06%
T.1466	Lithium Molecular Entity; Seebeck Effect; Lithium Metal Anode	0.36%	0.66%	0.24%
T.1284	Lithium Molecular Entity; Ionic Conductivity; Solid Electrolyte	0.35%	0.41%	0.18%
T.11084	Neural Network; Density Functional Theory; Molecular Dynamics	0.35%	0.12%	0.15%
T.642	Nanofiltration; Polyamide; Desalination	0.34%	0.44%	0.21%
T.5961	Halide; Exciton; Perovskite	0.33%	0.30%	0.37%
T.16	Electrolytic Reduction; Electrocatalysts; Oxygen Reduction Reaction	0.32%	0.52%	0.40%

02

本校重點研究主題

- 依國立臺灣大學於化學領域各研究主題之論文百分比進行排序，其中論文佔比 0.5% 以上之研究主題項目如下圖。各群體研究主題論文百分比前500名資訊請詳參：[線上檢視](#)。

Topic ID	Topic 1st-3rd Relevance Keyphases	論文數占比: World Top 10 Universities	論文數占比: Asia Selected 10 Universities	論文數占比: National Taiwan University
T.3	Solar Cell; Grain Boundary; Perovskite	0.61%	0.61%	1.04%
T.617	Delayed Fluorescence; Blue; Light-Emitting Diode	0.07%	0.37%	1.01%
T.1107	Copolymer; Hole Mobility; Conjugated Polymer	0.15%	0.23%	0.98%
T.719	Nanocrystalline Material; Quantum Dot; Perovskite	0.41%	0.38%	0.88%
T.8935	Nanoparticle; Thin Films; Organic Field Effect Transistors	0.00%	0.00%	0.73%
T.498	Fullerene; Solar Cell; Non-Fullerene Acceptor	0.12%	0.90%	0.73%
T.1	Electrocatalysts; Catalyst Activity; Oxygen Evolution	0.53%	0.75%	0.73%
T.6610	Diterpene; Anthozoa; Anti-Inflammatory Drug	0.00%	0.00%	0.70%
T.8250	Nanopore; Rectification; Biomimetics	0.04%	0.07%	0.67%
T.3688	Energy Conservation; Extractive Distillation; Process Control	0.00%	0.00%	0.67%
T.71652	Near Infrared; Chromium Compound; Phosphor	0.00%	0.00%	0.58%
T.264	Carbon Dioxide; Electrolytic Reduction; Electrocatalyst	0.87%	0.88%	0.55%
T.17	Quantum Dot; Graphene; Nanodots	0.12%	0.15%	0.52%

03

國際合作



Worldwide
Scholarly Outputs
1,290,973



Worldwide
Citations per Publication
11.5



International
Collaboration
24.0%

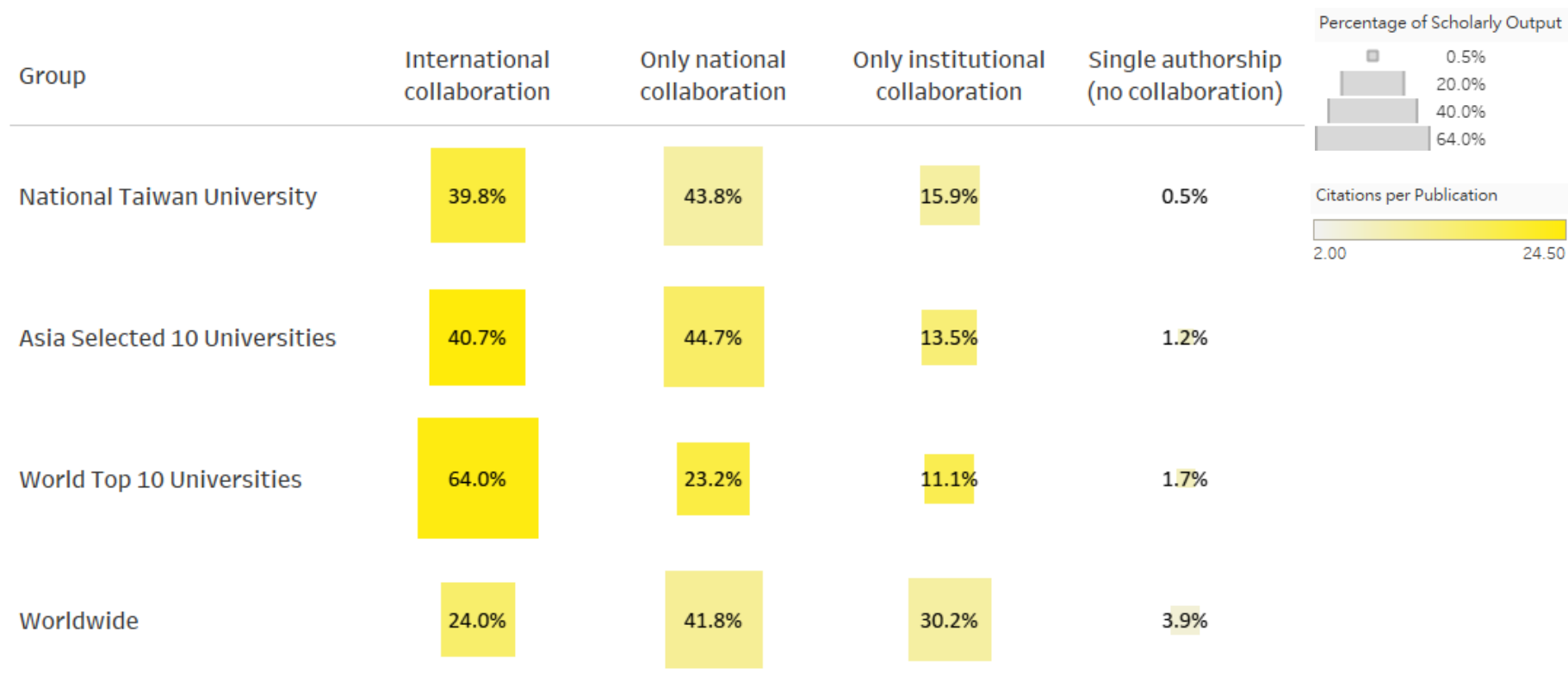
Institutions Collaborating with National Taiwan University



03

合作情形

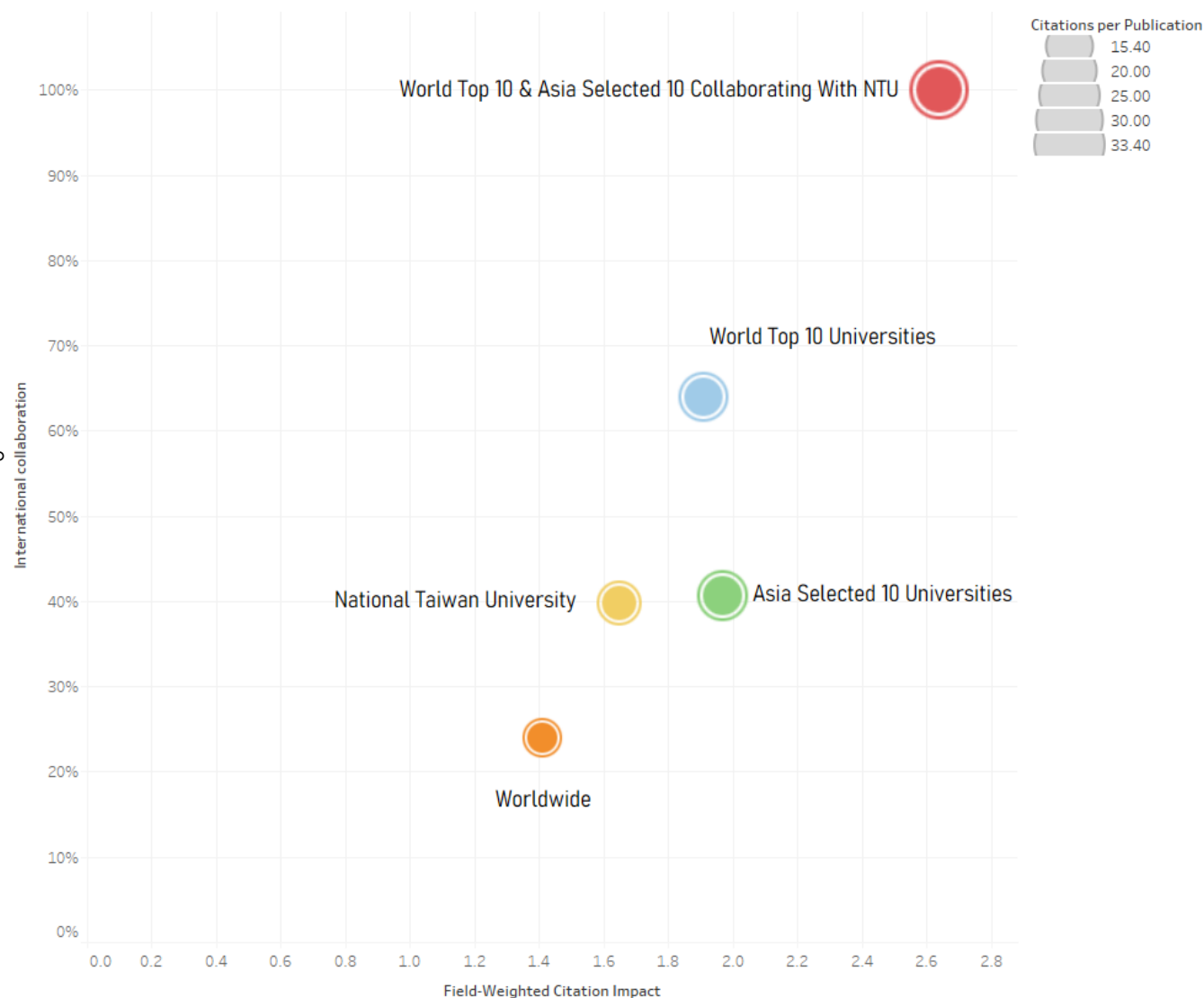
- ▶ 合作模式區分為個人著作、機構合作、國內合作與國外合作四種類型。
- ▶ 於 2024 年 QS 世界大學排名化學領域，四個群組皆以國際合作模式所取得的平均文章被引次數為最高。



03

國際合作表現

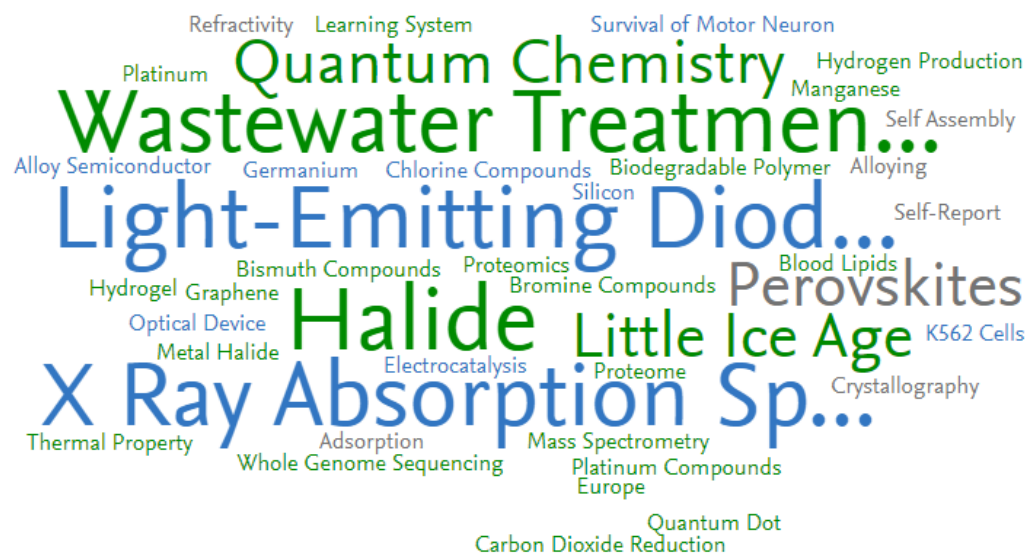
- ▶ 於 2024 年 QS 世界大學排名化學領域，本校與全球頂尖大學群以及亞洲精選大學群等19個學校合作論文發表共172篇。
- ▶ 本校與全球及亞洲頂尖學校之國際合作學術產出，由右圖可知其影響力高於其他群組的平均表現。



03

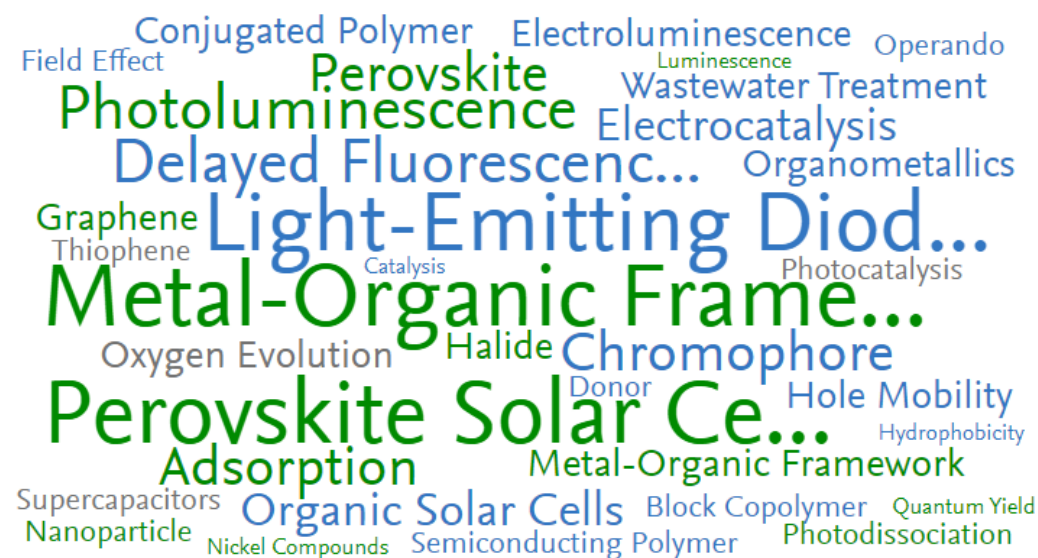
本校國際合作研究主題

- Top 50 keyphrases by relevance, based on 172 publications of World Top 10 & Asia Selected 10 Universities collaborating with NTU



AAA relevance of keyphrase | declining AAA growing (2020-2022)

- Top 50 keyphrases by relevance, based on 1,305 publications of international collaborating with NTU

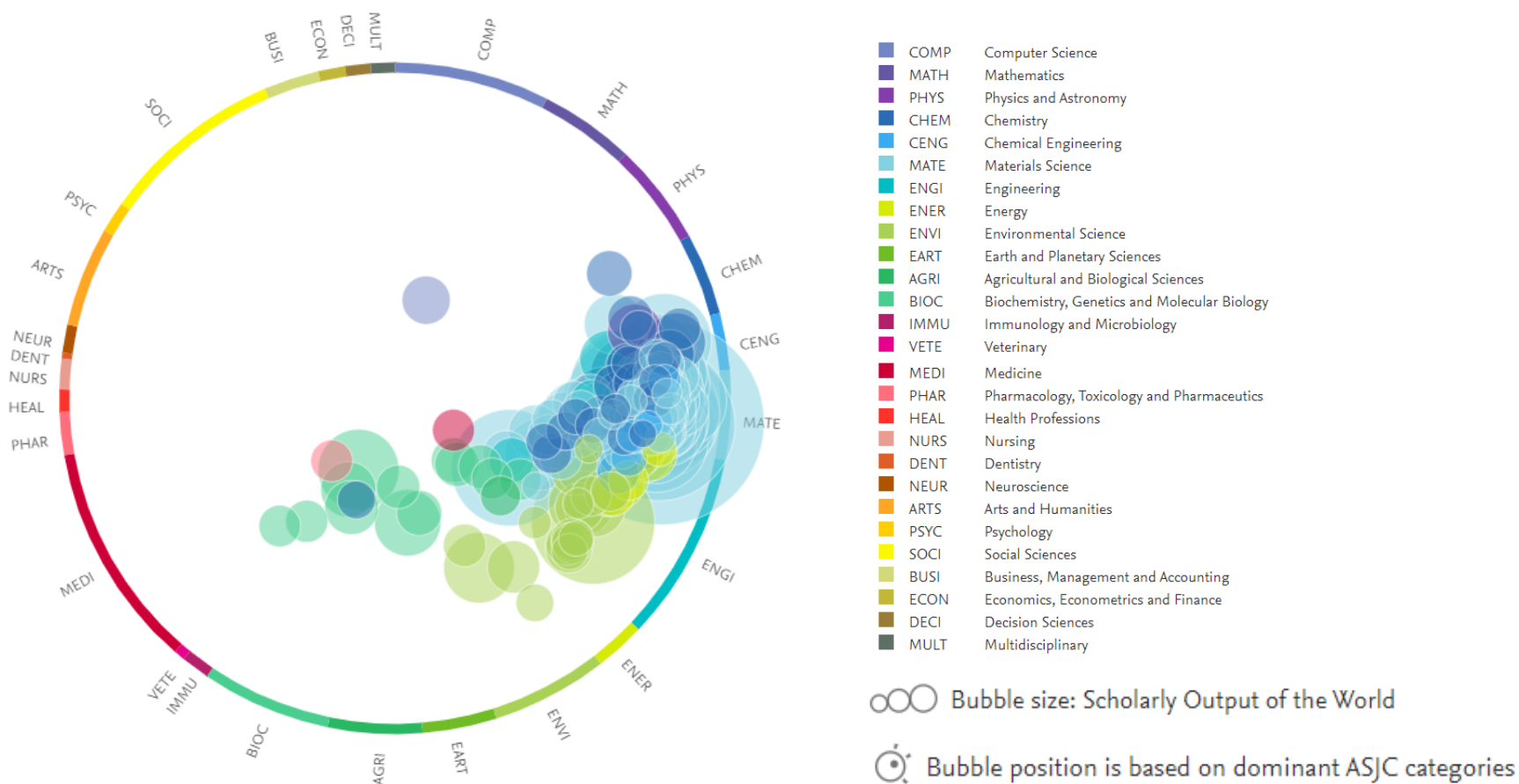


AAA relevance of keyphrase | declining AAA growing (2020-2022)

04

全球前 1% 熱門主題領域分布

- 研究主題熱門指數（Topic Prominence）是由 Scopus 近 2 年的引用次數、瀏覽次數和期刊影響指數三種指標綜合計算，排序後按照百分位表示，以顯示研究主題的發展趨勢（momentum）。

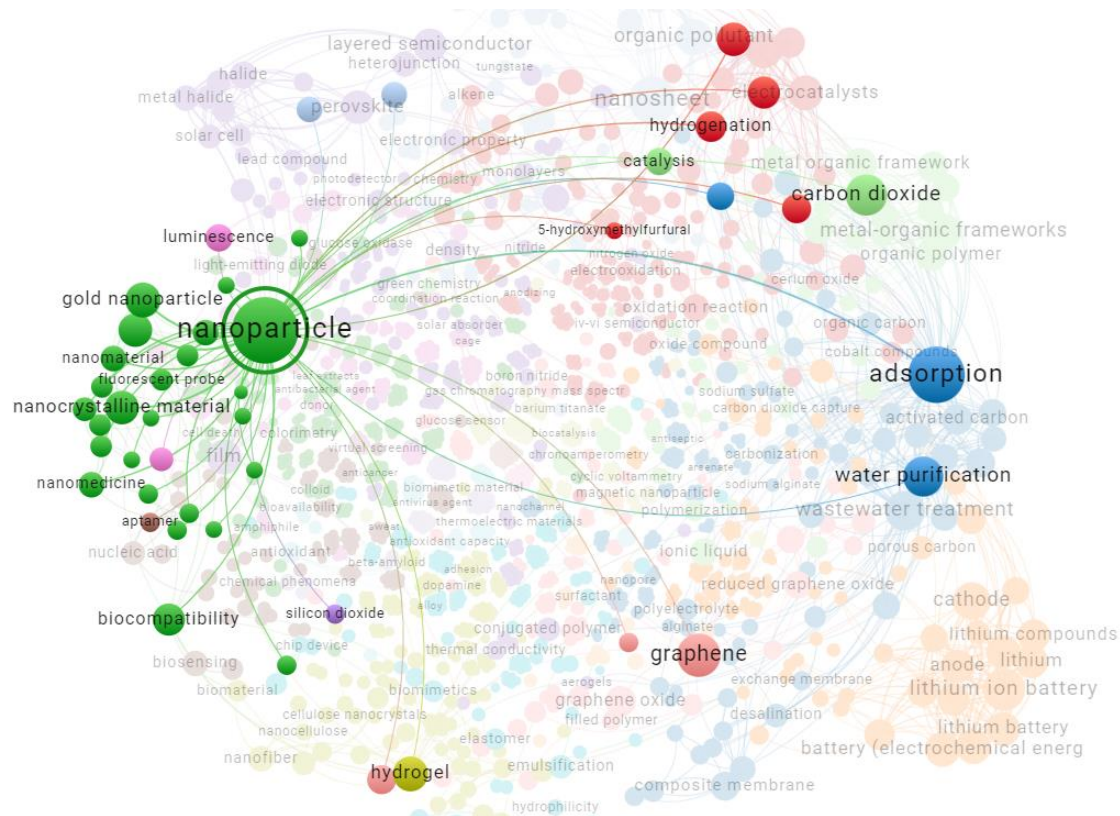


主題關鍵詞共現分析

- [illegible]

相關主題關鍵詞檢視

- ▶ 全球前 1% 熱門指數研究主題的關鍵詞共現分析，請點選：[線上檢視](#)，可利用釘選錨點，以及放大縮小功能查閱共同出現字詞，瞭解更多的共同出現詞彙，及其所組成的研究主題概念。
- ▶ 以出現次數最多的 nanoparticle 為例，選定詞彙後可放大檢視如下圖。



04 | 全球前 1% 熱門主題

- ▶ 依熱門指數排序，下圖列出全球前 10 位熱門指數之研究主題的全球論文數量、領域加權引用影響（FWCI*），以及三個群組共 19 個學校參與研究主題情形。
- ▶ 完整 250 個 Topics 資訊請點選：[線上檢視](#)，可利用 Topic ID、學校名稱進行交叉組合查閱資訊，自行依需求選擇排序欄位檢視。

Topic Number	Topic 1st-3rd Relevance Keyphrases	Prominence percentile	Worldwide FWCI	Worldwide Scholarly Output	University Name 計數 ★
T.1	Electrocatalysts; Catalyst Activity; Oxygen Evolution	99.997	2.42	12,837	19
T.288	Chemical Activation; Sulfur Compounds; Advanced Oxidation Process	99.996	2.5	7,157	14
T.3	Solar Cell; Grain Boundary; Perovskite	99.993	1.89	9,189	19
T.2295	Energy Storage; Zinc Ion; Battery (Electrochemical Energy Engineering)	99.992	3.72	5,755	18
T.264	Carbon Dioxide; Electrolytic Reduction; Electrocatalyst	99.99	2.39	6,359	19
T.16	Electrolytic Reduction; Electrocatalysts; Oxygen Reduction Reaction	99.986	2.22	6,468	19
T.43	Oxalonitrile; Photocatalytic; Graphitic Carbon Nitride	99.983	2.15	7,338	15
T.1166	MXene; Transition Metals; Titanium Carbide	99.982	2.49	5,639	18
T.1466	Lithium Molecular Entity; Seebeck Effect; Lithium Metal Anode	99.981	2.37	4,561	19
T.51	Polysulfide; Lithium Molecular Entity; Lithium-Sulfur Battery	99.98	2.01	5,878	18

* 領域加權引用影響（Field-Weighted Citation Impact, FWCI）說明：https://tw.service.elsevier.com/app/answers/detail/a_id/16216/supporthub/scopus/

04

各校熱門主題分析

- ▶ 本校全球前 1% 熱門指數研究主題佔論文百分比 0.55% 以上者計有 12 個，各校參與研究情形同時呈現如下圖，圓圈大小代表佔該校論文比例。
- ▶ 250 個 Topics 以及 19 個評析學校之完整資訊請點選：[線上檢視](#)。藉由各校研究主題、論文佔比情形等資訊，提供本校探索學術合作之參考。

Topic Number	Topic 1st-3rd Relevance Keyphrases	Natl Taiwan Univ	Harvard Univ	Hong Kong Univ of Sci & Tech	Korea Adv Inst of Sci and Tech	Kyoto Univ	MIT	Nanyang Tech Univ	Natl Univ of Singapore	Peking Univ	Seoul Natl Univ	Stanford Univ	Swiss Fed Inst of Tech Lausanne	Swiss Fed Inst of Tech Zurich	Tsinghua Univ	Univ of California, Berkeley	Univ of Cambridge	Univ of Hong Kong	Univ of Oxford	Univ of Tokyo
T.8250	Nanopore; Rectification; Biomimetics	●		●	●	●	●	●	●	●	●	●		●	●		●	●		
T.617	Delayed Fluorescence; Blue; Light-Emitting Diode	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.1578	Structure; Metallocene; Supramolecular Chemistry	●	●			●	●	●	●	●	●		●	●	●	●	●	●	●	●
T.6252	Metal Organic Framework; Zeolitic Imidazolate Framework; Carbon Dioxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.6591	Adsorption; Sodium Chloride; Desalination	●			●		●	●	●	●	●	●		●	●	●	●	●	●	
T.1563	Carbon Dioxide; Nanoparticle; Membranes Separation	●			●	●	●	●	●		●		●		●	●	●		●	
T.4417	Analytic Equipment; Microfluidic Device; Paper-Based Analytical Device	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
T.8639	Nanoparticle; Graphene; Surface-Enhanced Raman Spectroscopy	●	●	●	●	●		●	●	●	●				●	●	●	●	●	●
T.309	Amyloid; Beta-Peptide; Protein Aggregation	●	●		●	●	●	●	●	●	●		●	●	●		●		●	●
T.74	Metal Organic Framework; Crystalline Material; Carbon Dioxide	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
T.719	Nanocrystalline Material; Quantum Dot; Perovskite	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
T.20094	SARS Coronavirus; Genetic Procedures; COVID-19	●	●		●		●	●	●	●	●		●	●	●	●		●	●	

05

臺大圖書館領域網絡分析服務

本校專任教師或單位主管對本案分析報告有任何問題，或有個人研究領域 / 院系學術研究力之領域網絡分析服務需求，歡迎聯繫諮詢或[線上申請](#)。

▼ 點選獲得更多詳細說明 ▼



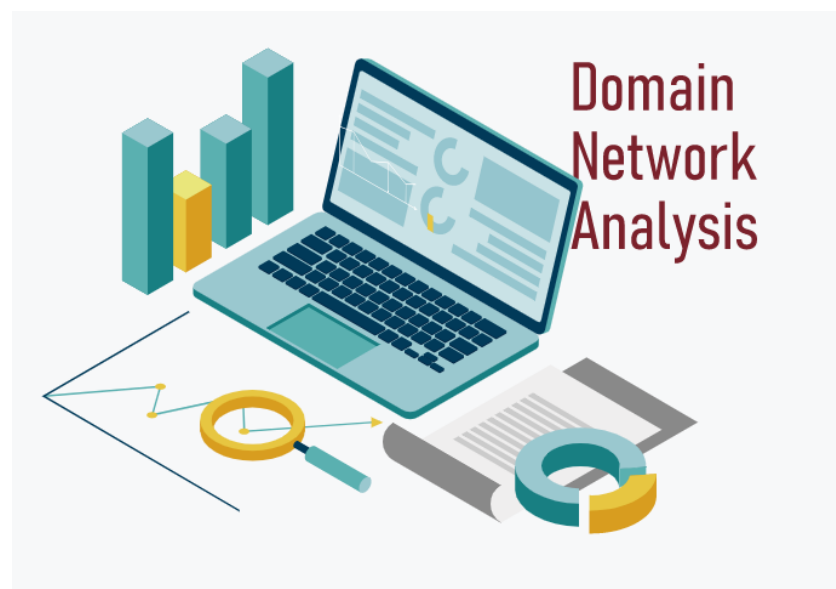
教師

- ◆ 領域熱點具像呈現
- ◆ 研究趨勢聚焦探索
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學院系所

- ◆ 評估單位研究動能
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