

# 从选题到撰文，如何更好利用 ProQuest学术期刊数据库

—结合Web of Science等学术资源，速成信息利用达人

## 讲座目标

# 本讲座结束后将会学习到

- 了解ProQuest Central数据库，及ProQuest平台所收录学术资源及其优势
- 结合Web of Science等学术资源，如何在学习和研究过程中更好利用ProQuest Central数据库学术资源，让选题、检索、获取、保存、解读、撰文变得更加轻松和高效



# 今日讲座相关资源





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▶ 煤炭高校数字图书馆联盟文献检索平台	
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▶ EI工程索引	
▶ Elsevier ScienceDirect 电子期刊 (2007-)	在线培训
▶ Wiley 电子期刊 创刊-1997回溯	培训资料
▶ IEEE/IET电子图书馆(IEL) 2021年IEEE会议列表 2022年IEEE会议列表	培训资料
▶ ACS (美国化学会) 电子期刊 电子书	
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▶ ASME (美国机械工程师学会) 电子期刊 (2000-)、会议录 (2002-) 及电子书	
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▶ IOP (英国皇家物理学会) 电子期刊CALIS镜像	
▶ ProQuest学术期刊	
▶ PQDT学位论文全文库 (2012-)	培训资料





# 了解ProQuest Central 数据库学术资源

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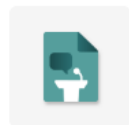
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会议论文

1st EAI International Conference on Computer Science and Engineering; Penang 提供全文

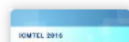
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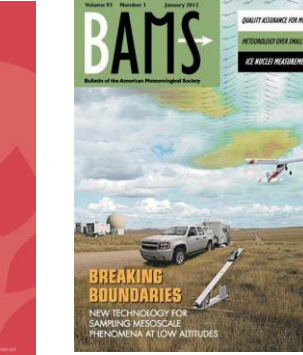
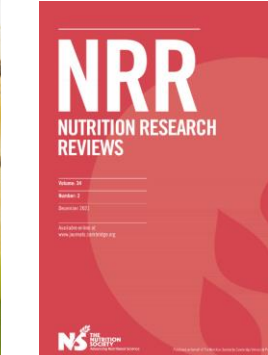
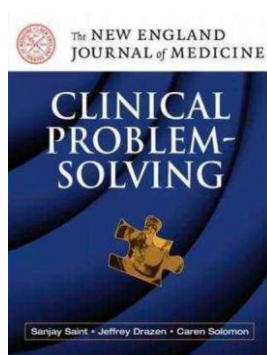
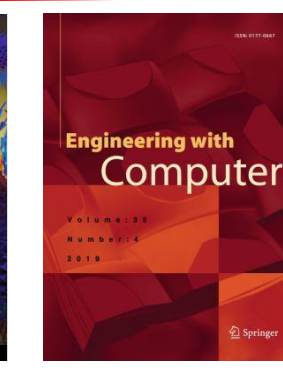
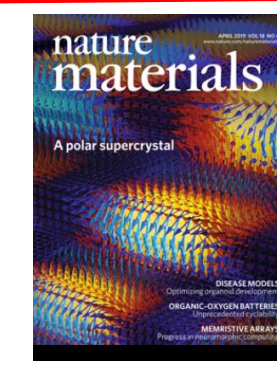
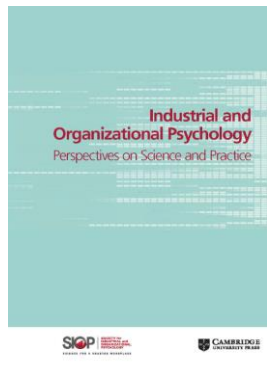
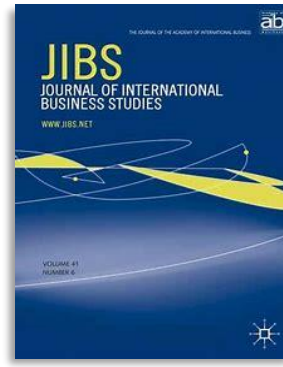
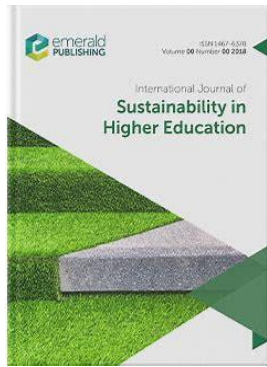
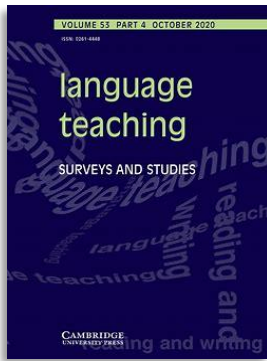
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2



The 1st EAI International Conference on Multimedia Technology and Enhanced Learning; Inner Mongolia 提供全文

# 收录内容 - 举例

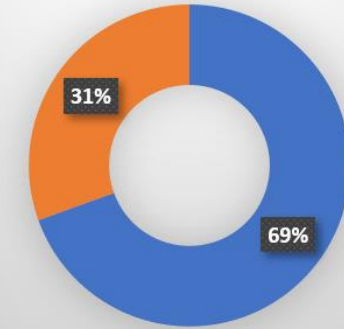


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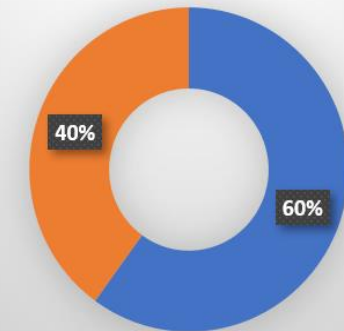
SCIE收录了自然科学、工程技术、生物医学等各个研究领域最具影响力的9,500多种核心学术期刊。PQ Central中2,900多种科技领域学科全文刊被SCIE索引

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PQ Central中约1,400种社科领域全文刊被SSCI索引

全文刊在SSCI中占比





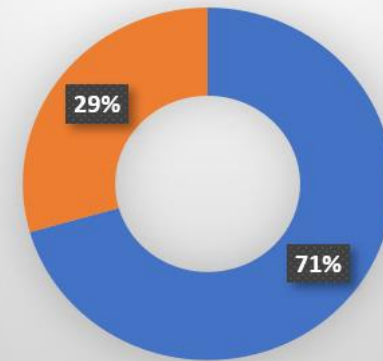
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A&HCI 收录了人文艺术研究领域最具影响力的1,700多种核心学术期刊。

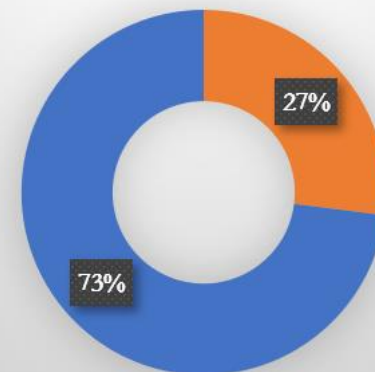
PQ Central中500多种人文艺术领域全文刊被A&HCI索引

全文刊在AHCI中占比



ERIC收录教育学领域1,200多种学术期刊。  
PQ期刊中约300种教育学全文刊被ERIC索引

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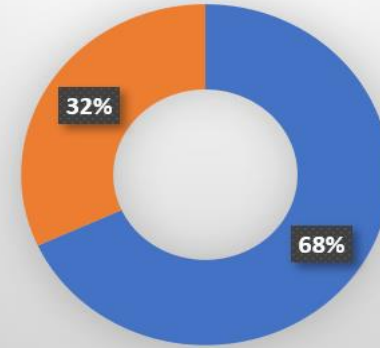
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PsycINFO收录了心理学研究领域最具影响力的2,200多种核心学术期刊。

PQ期刊中700多种心理学全文刊被PsycINFO索引

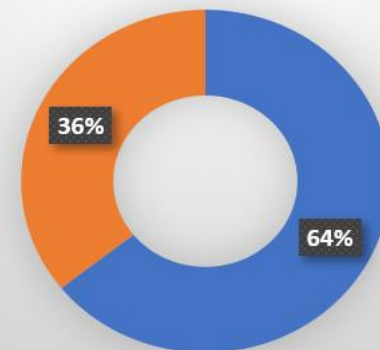
全文刊在PsycInfo中占比



PubMed收录生命医学相关领域全球5,600种学术期刊

PQ期刊中约2,000种多种生物医学及相关学科全文刊被PubMed索引

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# PQDT Global – 论文来源



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参考：泰晤士高等教育世界大学前200，收录了其中75所高校论文，部分举例

# ProQuest 收录内容举例

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全文文献 | 学术期刊

## Deep learning

LeCun, Yann; Bengio, Yoshua; Hinton, Geoffrey. *Nature*; London Vol. 521, Iss. 7553, (May 28, 2015): 436-444. DOI:10.1038/nature14539

全文文献

全文 - PDF 格式

摘要/索引

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# REVIEW

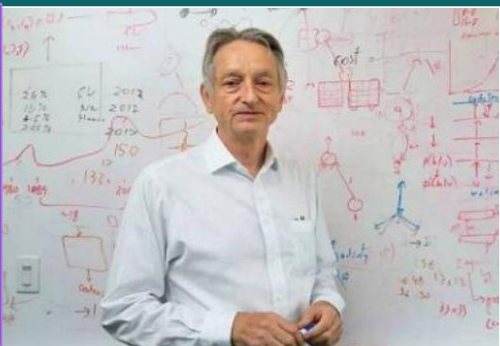
## Deep learning

Yann LeCun<sup>1,2</sup>, Yoshua Bengio<sup>3</sup> & Geoffrey Hinton<sup>4,5</sup>

Deep learning allows computational models that are composed of multiple processing layers that can learn representations from data with multiple levels of abstraction. These methods have dramatically improved visual object recognition, visual object recognition, object detection and many other domains such as natural language processing. Deep learning discovers intricate structure in large data sets by using the backpropagation algorithm to adjust the weights of the model. This enables a model to automatically find the representations that are useful for the task at hand. Deep convolutional neural networks have brought about breakthroughs in visual object recognition, whereas recurrent neural networks have shined light on sequential data such as text and speech.

Machine-learning technology powers many aspects of modern society: from web searches to content filtering on social networks to recommendations on e-commerce websites, and from spam filtering to fraud detection. Deep learning has made possible the discovery of intricate structures in high-dimensional data, such as the human genome, and has led to beating records in image classification, machine translation, and speech recognition.

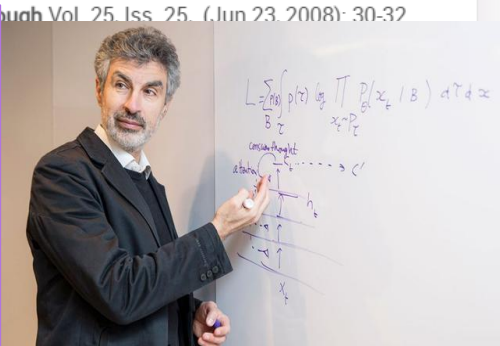
Geoffrey Hinton 杰弗里·辛顿，多伦多大学的特聘教授，被称为“神经网络之父”、“深度学习鼻祖”，荣获 2018 年图灵奖。



Yann LeCun 杨立昆，纽约大学教授，Meta 首席人工智能科学家，被誉为“卷积网络之父”，荣获 2018 年图灵奖。



Yoshua Bengio 约书亚·本吉奥，蒙特利尔大学教授。他在神经网络的应用方面做出了巨大贡献，荣获 2018 年图灵奖。



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## Distinctive Image Features from Scale-Invariant Keypoints

Lowe, David G. [International Journal of Computer Vision](#); New York Vol. 60, Iss. 2, (Nov 2004): 91-110. DOI:10.1023/B:VISI.0000029664.99615.94

全文文献

全文 - PDF 格式

摘要/索引

33k 引用次数 Web of Science

David G. Lowe 大卫·劳伊，美国加州大学伯克利分校教授，计算机视觉领域的重要创新者和领军人物，SIFT算法的发明者。



International Journal of Computer Vision 60(2), 91-110, 2004  
© 2004 Kluwer Academic Publishers. Manufactured in The Netherlands.

### Distinctive Image Features from Scale-Invariant Keypoints

DAVID G. LOWE  
Computer Science Department, University of British Columbia, Vancouver, B.C., Canada  
Lowe@cs.ubc.ca

Received January 10, 2003; Revised January 7, 2004; Accepted January 22, 2004

- Dissertations  
Identifying h...  
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Jablons, Zachary. Rensselaer Polytechnic Institute  
ProQuest Dissertations Publishing, 2016. 10124545.
- An Affordable and Practical 3D Solution for  
the Aesthetic Evaluation of Breast Cancer  
Conservative Treatment  
Oliveira, Hélder Filipe Pinto de. Universidade do  
Porto (Portugal) ProQuest Dissertations Publishing,  
2013. 10596311.
- Automated Diagnosis of Alzheimer Disease



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全文献 | 学术期刊

## Electric Field Effect in Atomically Thin Carbon Films

Novoselov, K S; Geim, A K; Morozov, S V; Jiang, D; et al. *Science*; Washington Vol. 306, Iss. 5696, (Oct 22, 2004): 666-9.



Andre Geim 安德烈·海姆, 石墨烯之父, 诺贝尔物理学奖获得者

- 全文献
- 全文 - PDF 格式
- 摘要/索引

REPORTS

**Table 1.** Conditional probabilities  $P(I|S)$  to detect the idler photon in state  $I$  given detection of the signal photon in state  $S$ , at the point of maximum correlation for  $\Delta t = 100$  ns delay between read and write pulses; all the errors are based on counting statistics of coincidence events.

Basis	$P(H_i H_s)$	$P(V_i H_s)$	$P(V_i V_s)$	$P(H_i V_s)$
$0^\circ$	$0.92 \pm 0.02$	$0.08 \pm 0.02$	$0.88 \pm 0.03$	$0.12 \pm 0.03$
$45^\circ$	$0.75 \pm 0.02$	$0.25 \pm 0.02$	$0.81 \pm 0.02$	$0.19 \pm 0.02$

photonic qubits with the atom-photon quantum state transfer. By implementing the second node at a different location and performing a joint detection of the signal photons from the two nodes, the quantum repeater protocol (11), as well as distant teleportation of an atomic qubit, may be realized. Based on this work, we estimate the rate for these protocols to be  $R_2 \cong (\beta \xi \alpha \tau)^2 R \cong 3 \times 10^{-7} s^{-1}$ . However, improvements in  $\xi$  that are based on increasing the optical thickness of atomic samples (16), as well as

2. S. Haroche, J. M. Raimond, M. Brune, in *Experimental Quantum Computation and Information*, F. de Martini, C. Monroe, Eds. (Proceedings of the International School of Physics Enrico Fermi, course CXLVIII, IOS Press, Amsterdam, 2002), pp. 37-66.

3. C. A. Sackett et al., *Nature* **404**, 256 (2000).

4. M. D. Barrett et al., *Nature* **429**, 737 (2004).

5. M. Riebe et al., *Nature* **429**, 734 (2004).

6. B. B. Blinov, D. L. Moehring, L.-M. Duan, C. Monroe, *Nature* **428**, 153 (2004).

7. S. Bose, P. L. Knight, M. B. Plenio, V. Vedral, *Phys. Rev. Lett.* **83**, 5158 (1999).

8. H. J. Kimble, *Phys. Scr.* **76**, 127 (1998).

9. A. Kuzmich, E. S. Polzik, in *Quantum Information with Continuous Variables*, S. L. Braunstein, A. K. Pati, Eds. (Kluwer, Dordrecht, 2003).

10. M. D. Lukin, *Rev. Mod. Phys.* **75**, 457 (2003).

11. L.-M. Duan, M. D. Lukin, I. J. Cirac, P. Zoller, *Nature* **414**, 413 (2001).

12. A. Kuzmich et al., *Nature* **423**, 731 (2003).

13. C. H. van der Wal et al., *Science* **301**, 196 (2003).

14. W. Jiang, C. Han, P. Xue, L.-M. Duan, G. C. Guo, *Phys. Rev. A* **69**, 043819 (2004).

15. C. W. Chou, S. V. Polyakov, A. Kuzmich, H. J. Kimble, *Phys. Rev. Lett.* **92**, 213601 (2004).

16. L.-M. Duan, J. I. Cirac, P. Zoller, *Phys. Rev. A* **66**, 023818 (2002).

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- Carbon Films
- Novoselov, K S  
*Science* (Wash  
2004): 666-669
- Large-scale pattern growth of graphene  
films for stretchable transparent electrodes  
Kim, Keun Soo; Zhao, Yue; Jang, Houk; Lee, Sang  
Yoon; Kim, Jong Min; 等. *Nature*;  
*London* Vol. 457, Iss. 7230, (Feb 5, 2009): 706-10.
- High-throughput solution processing of  
large-scale graphene  
Tung, Vincent C; Allen, Matthew J; Yang,  
Yang; Kaner, Richard B. *Nature Nanotechnology*;  
*London* Vol. 4, Iss. 1, (Jan 2009): 25-9.

# ProQuest 收录内容举例

< 返回检索结果页 < 8 篇文档, 共 75,681 篇 >

全文献 | 学术期刊

## Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement

Moher, David; Liberati, Alessandro; Tetzlaff, Jennifer; Altman, Douglas G; The PRISMA Group; 等. *Journal of Clinical Epidemiology*; Elmsford Vol. 62, Iss. 10, (Oct 2009): 1006-12. DOI:10.1016/j.jclinepi.2009.06.005

David Moher 大卫·莫赫, 渥太华医院  
研究所临床流行病学项目资深科学家



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索引

3k 在 ProQuest 中引用的次数

9k 引用次数 Web of Science

ELSEVIER

Journal of Clinical Epidemiology 62 (2009) 1006–1012

**METHODS OF SYSTEMATIC REVIEWS AND META-ANALYSIS**

**Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement**

David Moher<sup>1,2,\*</sup>, Alessandro Liberati<sup>3,4</sup>, Jennifer Tetzlaff<sup>1</sup>, Douglas G. Altman<sup>5</sup>, The PRISMA Group<sup>1</sup>

<sup>1</sup>Ottawa Methods Centre, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada  
<sup>2</sup>Department of Epidemiology and Community Medicine, Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada  
<sup>3</sup>Università di Modena e Reggio Emilia, Modena, Italy  
<sup>4</sup>Centro Cochrane Italiano, Istituto Ricerche Farmacologiche Mario Negri, Milan, Italy  
<sup>5</sup>Centre for Statistics in Medicine, University of Oxford, Oxford, United Kingdom

Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement.

Moher, David; Liberati, Alessandro; Tetzlaff, Jennifer; Altman, Douglas G; PRISMA Group; 等. *PLoS medicine* Vol. 6, Iss. 7, (July 21, 2009): e1000097.

Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement: e1000097

Moher, David; Liberati, Alessandro; Tetzlaff, Jennifer; Altman, Douglas G; Group, The PRISMA; 等. *PLoS Medicine*; San Francisco Vol. 6, Iss. 7, (Jul 2009): e1000097.

Delayed reward discounting and addictive behavior: a meta-analysis

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全文献 | 学术期刊

## THE EVOLUTION OF INTERSTATE SECURITY CRISIS-MANAGEMENT THEORY AND PRACTICE IN CHINA

Johnston, Alastair Iain. *Naval War College Review*; Washington Vol. 69, Iss. 1, (Winter 2016): 28-71,1.

全文献  
全文 - PDF 格式  
摘要/索引  
2 在 ProQuest 中引用的次数

THE EVOLUTION OF INTERSTATE SECURITY CRISIS-MANAGEMENT THEORY AND PRACTICE IN CHINA

Alastair Iain Johnston

As the frequency and scope of China's paramilitary and military presence activities in the East and South China Seas have increased in the last few years, officials and analysts inside and outside China have worried more and more about the potential for military crises erupting between China and other

Johnston, Alastair Iain 江忆恩, 美国哈佛大学政府系教授, 被誉为“当今美国新生代中最出色的中国问题专家”。



- Behaviour 1995
- Data
- Johnston, Alastair Iain. *China's Foreign Policy: A New Paradigm*. New York: W
- 293. New York: W
- Networks and I
- military disobedience in the Sino-French War
- Hundman, Eric. The University of Chicago ProQuest Dissertations Publishing, 2016. 10157989.
- Organizational Perception Management: A Framework to Overcome Crisis Events
- Hargis, Michael; Watt, John D. *Organization Development Journal*; Chesterland Vol. 28, Iss. 1, (Spring 2010): 73-87.
- Decision by Design: National Security



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< 返回检索结果页 < 32 篇文档, 共 352 篇 >

全文文献 | 学术期刊

## Behavioral Economics: Past, Present, and Future

Thaler, Richard H. *The American Economic Review*; Nashville Vol. 106, Iss. 7, (Jul 2016): 1577-1600. DOI:10.1257/aer.106.7.1577

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索引

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Richard Thaler 理查德·塞勒, 2017年诺贝尔经济学奖得主, 行为金融学奠基人之一。

*American Economic Review* 2016, 106(7): 1577-1600  
<http://dx.doi.org/10.1257/aer.106.7.1577>

### Behavioral Economics: Past, Present, and Future<sup>†</sup>

By RICHARD H. THALER\*

In recent years there has been growing interest in the mixture of psychology and economics that has come to be known as “behavioral economics.” As is true with many seemingly overnight success stories, this one has been brewing for quite a while. My first paper on the subject was published in 1980, hot on the heels of Kahneman and Tversky’s (1979) blockbuster on prospect theory, and there were earlier forerunners, most notably Simon (1955, 1957) and Katona (1951, 1953).



- 博客文章. *American Economic Review* Jun 19, 2016
- Rationality and the eye  
Felin, Teppo; Koenderink, Jan; Krueger, Joachim I. *Psychonomic Bulletin & Review*; New York Vol. 24, Iss. 4, (Aug 2017): 1040-1059.
- Richard H. Thaler, *Misbehaving: The Making of Behavioral Economics*: New York, NY: W.W. Norton & Company, New, 2015. xiv + 4 ...
- Rajagopalan, Shruti. *Review of Austrian Economics*; New York Vol. 30, Iss. 1, (Mar 2017): 137-141.
- Narrative Economics: How Stories Go Viral

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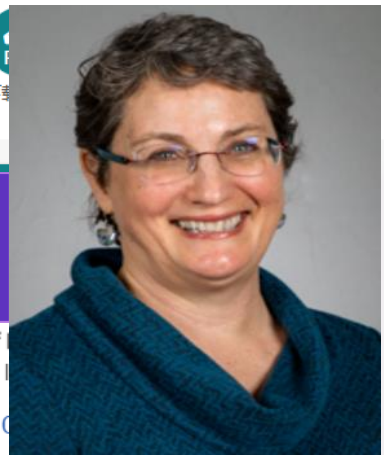
## Teacher efficacy: Its meaning and measure

Tschannen-Moran, Megan; Anita Woolfolk Hoy; Hoy, Wayne K. *Review of Educational Research*; Washington Vol. 68, Iss. 2, (Summer 1998): 202-248.

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Megan Tschannen-Moran莫兰, 美国威廉玛丽学院教授等, 1998年 教师效能: 含义与度量



*Review of Educational Research*  
Summer 1998, Vol. 68, No. 2, pp. 202-248

### Teacher Efficacy: Its Meaning and Measure

Megan Tschannen-Moran, Anita Woolfolk Hoy, and Wayne K. Hoy  
The Ohio State University

*The theoretical and empirical underpinnings of teacher efficacy are examined to bring coherence to the construct and its measurement. First, we explore the correlates of teacher efficacy revealed using various instruments*

Wayne K. *Review of Educational Research*; Washington Vol. 68, Iss. 2, (Summer 1998): 202-248.

Teacher Efficacy: Construct

Tschannen-Moran, Megan; Hoy, Anita Woolfolk. *Teaching and Teacher Education* Vol. 17, Iss. 7, (Oct 2001): 783-805.

Impact of teacher efficacy on teacher attitudes toward classroom inclusion

Schaefer, Julie. Capella University ProQuest Dissertations Publishing, 2010. 3403243.

Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement

Goddard, Roger D; Hoy, Wayne K; Hoy, Anita Woolfolk. *American Educational Research Journal*; Washington Vol. 37, Iss. 2, (Jan 2000): 479-507.



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17 Influence of connected and **autonomous vehicles** on traffic flow stability and throughput  
Talebpour, A and Mahmassani, HS  
Oct 2016 | TRANSPORTATION RESEARCH PART C-EMERGING TECHNOLOGIES 71, pp.143-163  
The introduction of connected and **autonomous vehicles** will bring changes to the highway driving environment. Connected **vehicle** technology provides real-time information about the surrounding traffic condition and the traffic management center's decisions. Such information is expected to improve drivers' efficiency, response, and comfort while enhancing safety and mobility. Connected **vehicle** tec ... Show more  
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18 A multiagent approach to **autonomous** intersection management  
Dresner, K and Stone, P  
2008 | JOURNAL OF ARTIFICIAL INTELLIGENCE RESEARCH 31, pp.591-656  
Artificial intelligence research is ushering in a new era of sophisticated, mass-market transportation technology. While computers can already fly a passenger jet better than a trained human pilot, people are still faced with the dangerous yet tedious task of driving automobiles. Intelligent Transportation Systems (ITS) is the field that focuses on integrating information technology with vehicl ... Show more  
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19 Seaglider: A long-range **autonomous** underwater **vehicle** for oceanographic research  
Eriksen, CC; Osse, TJ; (...); Chiodi, AM  
Oct 2001 | IEEE JOURNAL OF OCEANIC ENGINEERING 26 (4), pp.424-436  
Seagliders are small, reusable **autonomous** underwater **vehicles** designed to glide from the ocean surface to a programmed depth and back while measuring temperature, salinity, depth-averaged current, and other quantities along a sawtooth trajectory through the water. Their low hydrodynamic drag and wide pitch control range allows glide slopes in the range 0.2 to 3. They are designed for missions i ... Show more  
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Science and technology of advanced materials, 12/2018, 卷 19, 期 1

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Perovskite solar cells: must lead be replaced – and can it be done?

Zhang, Qi; Feng, Hao; Li, Jianbao; Zhou, Yangying; Yaxuan Wei; 等 Science and Technology of Advanced Materials; Abingdon Vol. 19, Iss. 1, (Dec 2018): 442. DOI:10.1080/14686996.2018.1460176

SCIENCE AND TECHNOLOGY OF ADVANCED MATERIALS, 2018  
VOL. 19, NO. 1, 425-442  
<https://doi.org/10.1080/14686996.2018.1460176>

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FOCUS ISSUE REVIEW

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Perovskite solar cells: must lead be replaced – and can it be done?

Qi Zhang<sup>a</sup>, Feng Hao<sup>b</sup>, Jianbao Li<sup>a,c</sup>, Yangying Zhou<sup>a</sup>, Yaxuan Wei<sup>a</sup> and Hong Lin<sup>a</sup>

<sup>a</sup>State Key Laboratory of New Ceramics & Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China;  
<sup>b</sup>School of Materials and Energy, University of Electronic Science and Technology of China, Chengdu, China;  
<sup>c</sup>State Key Laboratory of Marine Resource Utilization in South China Sea, Materials and Chemical Engineering Institute, Hainan University, Haikou, China

ABSTRACT

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AND

+ 添加一行

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 阿拉伯语  
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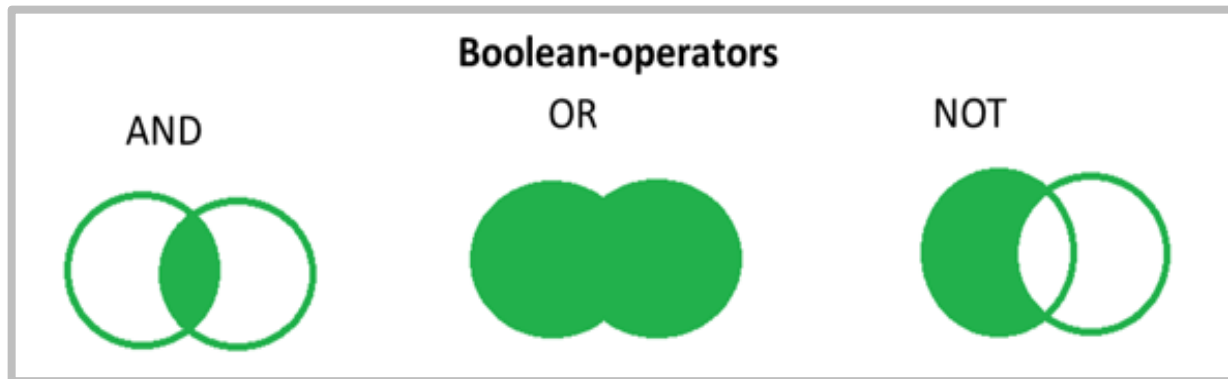
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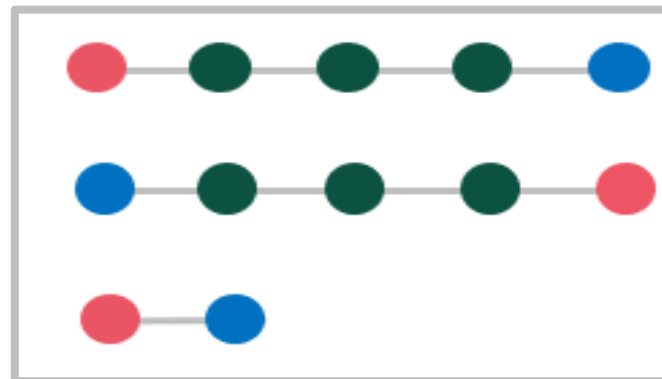
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OR	查找包含您的任何字词或短语的文档。使用 OR 可扩大您的检索范围并获取更多的结果。	food OR nutrition
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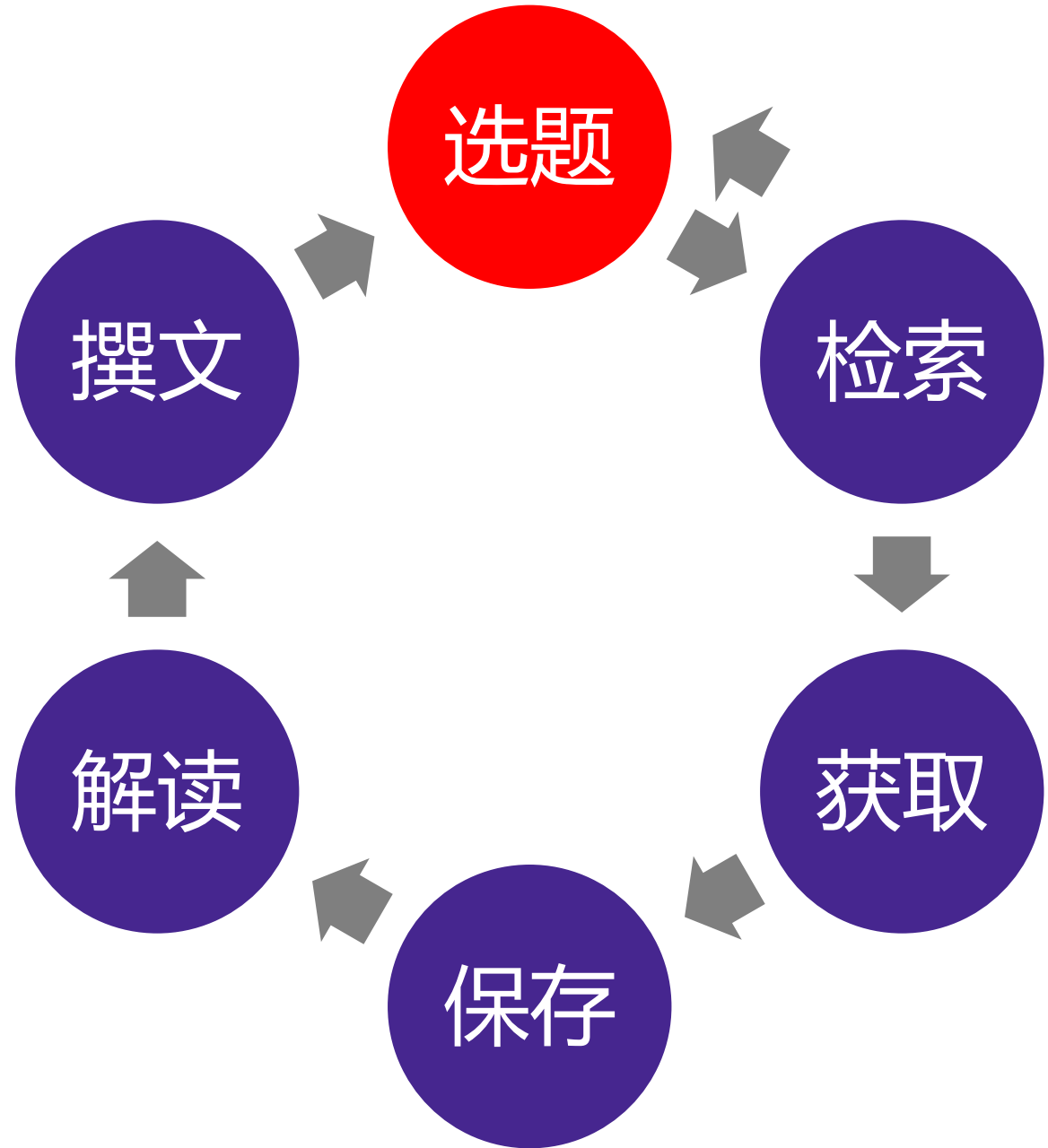


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# 文献调研举例



## 6

### 化学与材料科学领域发展趋势与重点研究问题

#### 发展趋势

实现高效、精准的化学合成一直是化学研究的重要目标之一。人工智能的发展不仅为实现这一目标提供了新的机遇，而且智能化、自动化合成成为新的发展趋势。化学与材料科学、生命科学、信息科学、环境科学、能源科学等密切交叉和相互渗透，通过创造具有优异性能的新物质推动材料、能源、医药等产业发展。

#### 重点研究问题

本期报告揭示的该领域重点研究问题包括：

1. 单原子催化、纳米酶等精准合成方法；
2. 机器学习辅助化学合成等智能合成过程；
3. 锌金属电池、锂硫电池、钙钛矿型太阳能电池等新一代电池；
4. 新冠病毒检测、药物精准递送等生物化学研究；
5. 自供电可穿戴织物、热激活延迟荧光材料等新材料。

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- CESIUM TITANIUM(IV) BROMIDE
- CS2AGBIBR6 DOUBLE PEROVS
- DAMAGED LEAD HALIDE PERO
- EFFICIENT ENVIRONMENT-FRIE
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Report View by Selection Customize

Total: 10	Research Fronts	Top Papers	Mean Year
1	EFFICIENT FLEXIBLE PEROVSKITE SOLAR CELLS; STABLE PLANAR PEROVSKITE SOLAR CELLS; EFFICIENT PEROVSKITE SOLAR CELLS; CATION YIELDING STABLE PEROVSKITE SOLAR CELLS; STABLE N-I-P PEROVSKITE SOLAR CELLS	37	2
2	EFFICIENT ENVIRONMENT-FRIENDLY LEAD-FREE TIN PEROVSKITE SOLAR CELLS ENABLED; LEAD-FREE TIN PEROVSKITE SOLAR CELLS; EFFICIENT TIN PEROVSKITE SOLAR CELLS; EFFICIENT ALL-INORGANIC LEAD-FREE PEROVSKITE SOLAR CELLS; EFFICIENT LEAD-FREE PEROVSKITE SOLAR CELLS	33	2
3	CS2AGBIBR6 DOUBLE PEROVSKITE SOLAR CELLS; CS2AGBIBR6 LEAD-FREE INORGANIC PEROVSKITE SOLAR CELL; HIGHLY EFFICIENT LEAD-FREE PEROVSKITE SOLAR CELLS; STABLE DOUBLE PEROVSKITE SOLAR CELLS; LEAD-FREE DOUBLE PEROVSKITE CS2AGBIBR6	10	2
4	8% SLOT-DIE COATED MAPBI(3) PEROVSKITE SOLAR CELLS; SLOT-DIE COATING LARGE-AREA FORMAMIDIUM-CESIUM PEROVSKITE FILM; HIGH-PERFORMANCE PEROVSKITE MODULES; EFFICIENT PHOTOVOLTAIC MODULES; HIGHLY EFFICIENT SOLAR MINI-MODULES	7	2
-	24% EFFICIENT MA-FREE CS(X)FA(1-X)PBX(3) PEROVSKITE SOLAR CELLS; HIGHLY EFFICIENT THERMALLY CO-EVAPORATED PEROVSKITE SOLAR CELLS: HIGH-		

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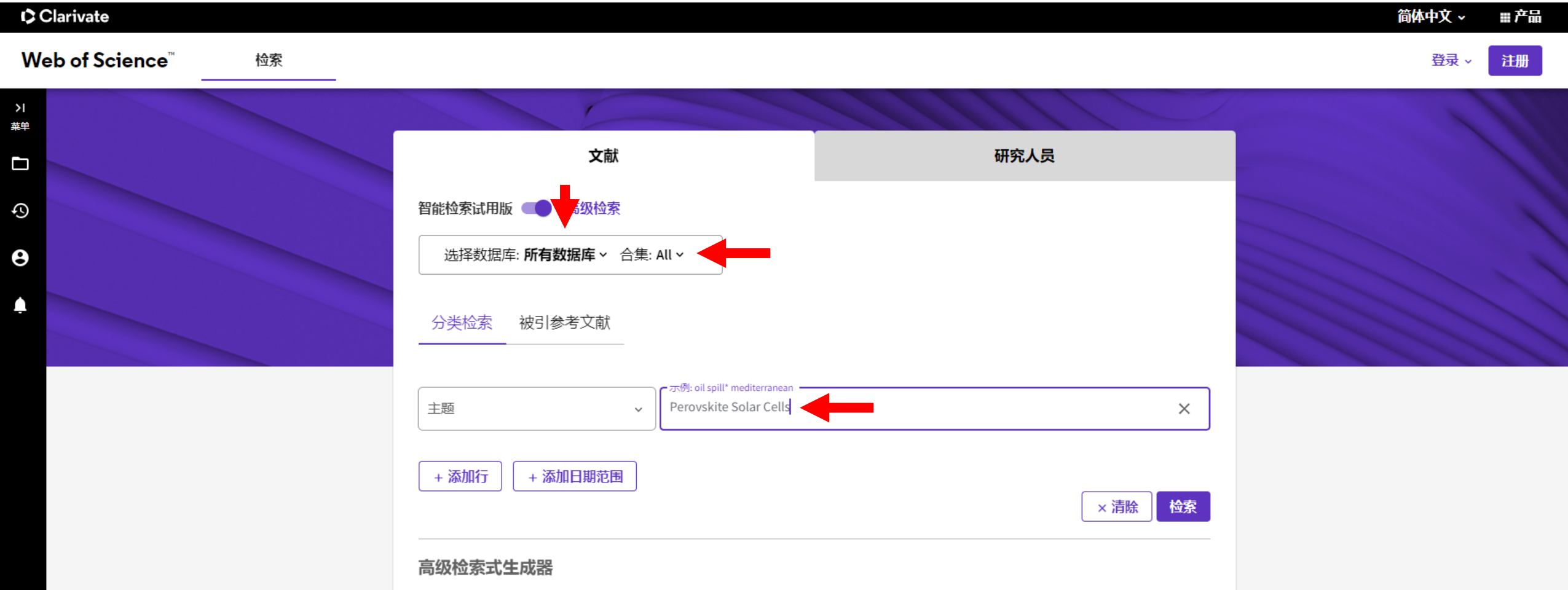
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1 / 680

1 Organometal Halide Perovskites as Visible-Light Sensitizers for Photovoltaic Cells 16,071 被引频次 21 参考文献

Kojima, A; Teshima, K; (...); Miyasaka, T

May 6 2009 | JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 131 (17), pp.6050-+

Two organometal halide perovskite nanocrystals, CH<sub>3</sub>NH<sub>2</sub>PbBr<sub>2</sub> and CH<sub>3</sub>NH<sub>2</sub>PbI<sub>2</sub>, were found to efficiently sensitize TiO<sub>2</sub> for visible light conversion in solar cells with broad absorption spectra.




日本东京大学教授Tsutomu Miyasaka宫坂力等：有机金属卤化物钙钛矿作为光敏剂应用在光伏电池

2 Efficient Hybrid Solar Cells Based on Meso-Superstructured Organometal Halide Perovskites 8,591 被引频次 39 参考文献

Lee, MM; Teuscher, J; (...); Snaith, HJ

Nov 2 2012 | SCIENCE 338 (6107), pp.643-647

The energy disordered processable meso-superstructured organometal halide perovskite solar cells consisting of hole-transporting materials (spiro-OMeTAD, poly(2,2',6,6'-tetrakis(methylphenyl)pyrrole) and electron-accepting materials (lead halide perovskite) and electron-transporting materials (TiO<sub>2</sub>, ZnO, SnO<sub>2</sub>) were fabricated and used as sensitizers for visible light absorption.



英国牛津大学教授Henry Snaith亨利·斯奈斯等，基于介孔超结构有机金属卤化物钙钛矿的高效混合太阳能电池

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1 Organometal Halide Perovskites as Visible-Light Sensitizers for Photovoltaic Cells

Kojima, A; Teshima, K; (...); Miyasaka, T

May 6 2009 | JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 131 (17), pp.6050+

Two organolead halide perovskite nanocrystals, CH<sub>3</sub>NH<sub>3</sub>PbBr<sub>3</sub> and CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub>, were found to efficiently sensitize TiO<sub>2</sub> for visible-light conversion in photoelectrochemical cells. When self-assembled on mesoporous TiO<sub>2</sub> films, the nanocrystalline perovskites exhibit strong band-gap absorptions as semiconductors. The CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub>-based photocell with spectral sensitivity of up to 800 nm yie ... 显示更多

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Lee, MM; Teuscher, J; (...); Snaith, HJ

Nov 2 2012 | SCIENCE 338 (6107), pp.643-647

The energy costs associated with separating tightly bound excitons (photoinduced electron-hole pairs) and extracting free charges from highly disordered low-mobility networks represent fundamental losses for many low-cost photovoltaic technologies. We report a low-cost, solution-processable solar cell, based on a highly crystalline perovskite absorber with intense visible to near-infrared absor ... 显示更多

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2021	5100
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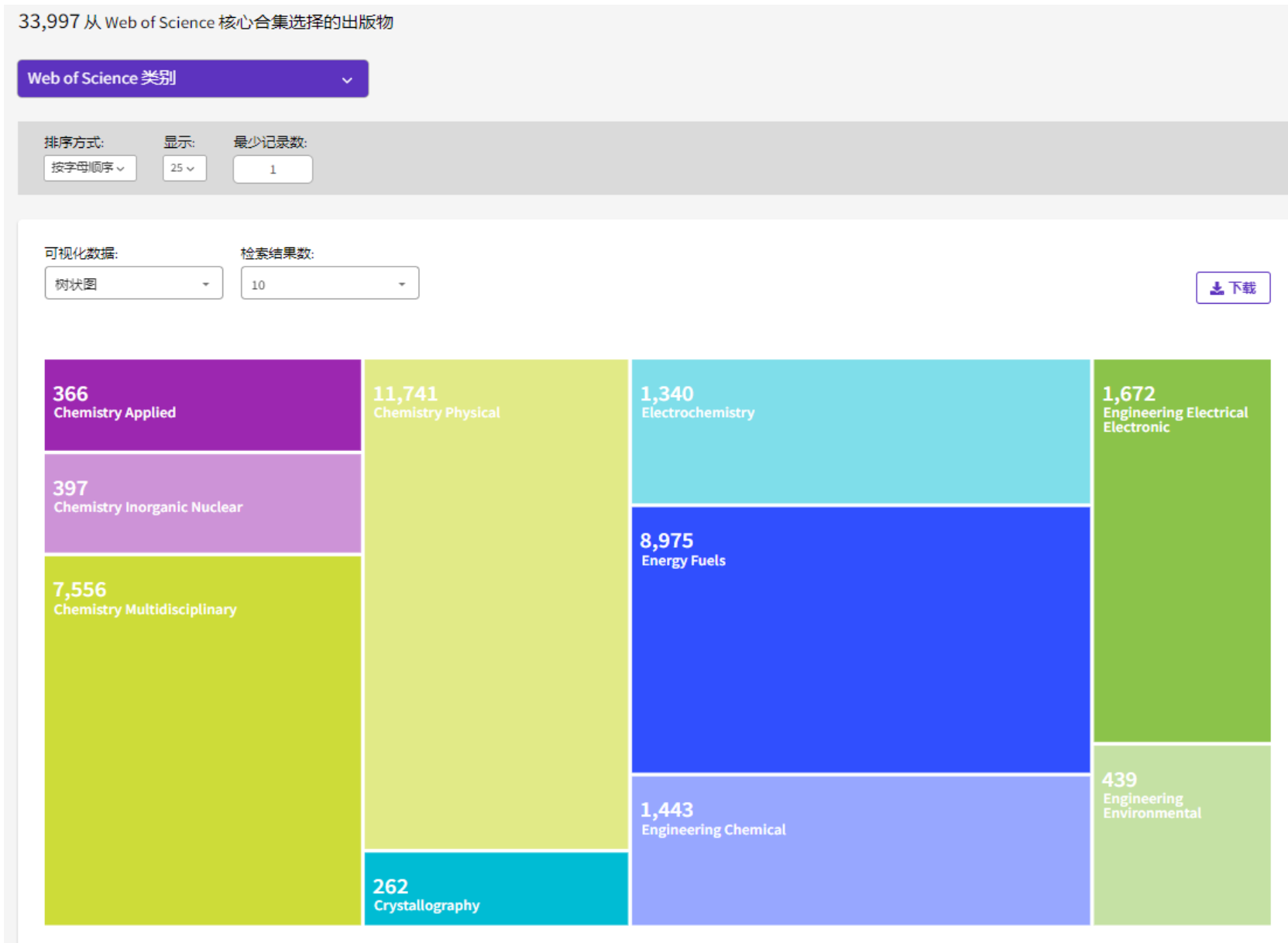
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1 Pseudo-halide anion engineering for  $\alpha$ -FAPb<sub>3</sub> perovskite solar cells  
Jeong, J.; Kim, M.; Kim, J.Y. Apr 15 2021 | NATURE 592 (7854), pp.381-+  
Enriched Cited References  
Metal halide perovskites of the general formula ABX<sub>3</sub> where A is a monovalent cation such as caesium, methylammonium or formamidinium; B is divalent lead, tin or germanium; and X is a halide anion have shown great potential as light harvesters for thin-film photovoltaics(1-5). Among a large number of compositions investigated, the cubic  $\alpha$ -phase of formamidinium lead triiodide (FAPbI<sub>3</sub>) has emerged as the most efficient and low-cost solution-processable photovoltaic technology. ... Show more

2 Efficient perovskite solar cells via improved carrier management  
Yoo, J.; Seo, G.; Seo, J. Feb 25 2021 | NATURE 590 (7847)  
Metal halide perovskite solar cells (PSCs) are an emerging photovoltaic technology with the potential to disrupt the mature silicon solar cell market. Great improvements in device performance over the past few years, thanks to the development of fabrication protocols(1-3), chemical compositions(4,5) and phase stabilization methods(6-10), have made PSCs one of the most efficient and low-cost solar technologies. ... Show more

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Yoo, Jason J.; Seo, Gabkyung; Chua, Matthew R.; Park, Tae Gwan; Lu, Yongli; et al. Nature; London Vol. 590, Iss. 7847, (Feb 25, 2021): 587-2,593A. DOI:10.1038/s41586-021-03285-w

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摘要  
Metal halide perovskite solar cells (PSCs) are an emerging photovoltaic technology with the potential to disrupt the mature silicon solar cell market. Great improvements in device performance over the past few years, thanks to the development of fabrication protocols1-3, chemical compositions4,5 and phase stabilization methods6-10, have made PSCs one of the most efficient and low-cost solution-processable photovoltaic technologies. However, the light-harvesting performance of these devices is still limited by excessive charge carrier recombination. Despite much effort, the performance of the best-performing PSCs is capped by relatively low fill factors and high open-circuit voltage deficits (the radiative open-circuit voltage limit minus the high open-circuit voltage)11. Improvements in charge carrier management, which is closely tied to the fill factor and the open-circuit voltage, thus provide a path towards increasing the device performance of PSCs, and reaching their theoretical efficiency limit12. Here we report a holistic approach to improving the performance of PSCs through enhanced charge carrier management. First, we develop an electron transport layer with an ideal film coverage, thickness and composition by tuning the chemical bath deposition of tin dioxide (SnO<sub>2</sub>). Second, we decouple the passivation strategy between the bulk and the interface, leading to improved properties, while minimizing the bandgap penalty. In forward bias, our

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VOL. 19, NO. 1, 425–442  
<https://doi.org/10.1080/14686996.2018.1460176>



FOCUS ISSUE REVIEW



## Perovskite solar cells: must lead be replaced – and can it be done?

Qi Zhang<sup>a</sup>, Feng Hao<sup>b</sup>, Jianbao Li<sup>a,c</sup>, Yangying Zhou<sup>a</sup>, Yaxuan Wei<sup>a</sup> and Hong Lin<sup>a</sup>

<sup>a</sup>State Key Laboratory of New Ceramics & Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing, China;  
<sup>b</sup>School of Materials and Energy, University of Electronic Science and Technology of China, Chengdu, China;

<sup>c</sup>State Key Laboratory of Marine Resource Utilization in South China Sea, Materials and Chemical Engineering Institute, Hainan University, Haikou, China

### ABSTRACT

Perovskite solar cells have recently drawn significant attention for photovoltaic applications with a certified power conversion efficiency of more than 22%. Unfortunately, the toxicity of the dissolvable lead content in these materials presents a critical concern for future commercial development. This review outlines some criteria for the possible replacement of lead by less toxic elements and highlights current research progress in the application of low-lead halide

### ARTICLE HISTORY

Received 21 December 2017  
Revised 29 March 2018  
Accepted 29 March 2018

### KEYWORDS

### 1. Introduction

Perovskite solar cells (PSCs), for use in superior photovoltaic (PV) devices with a high power conversion efficiency (PCE) and low cost in third-generation PV technologies, have undergone rapid progress during the last decade as a result of their numerous advantages including low density, and flexibility, as well as cost-effective production [1–5]. Such unique advantages have contributed directly to the competitiveness of PSCs versus earlier PV technologies based on commercial silicon (20%), GaAs (18.4%), cadmium telluride (CdTe, 19.6%), and copper indium gallium selenide/sulfide (CIGS, 19.6%) where the figures in parenthesis indicate the maximum PCE of commercial devices for each, and have helped to drive a sustained research interest toward

alternative PV materials produced with cost-competitive, facile, and environmentally friendly technologies [6–8]. Through their role in the exploitation and development of novel materials, device architectures, and fabrication technologies, the development of PSCs has resulted in a “catfish effect” for other PV technologies [9,10]. It is noteworthy that the maximum PCE of PSCs has been improved from 3.8 to 22.7% in just 7 years. This great success essentially arises from the exceptional optoelectronic properties of semiconducting halide perovskites, namely a high optical absorption coefficient, a tunable band gap, long carrier recombination lifetimes, and a high electron/hole mobility and transmission quality, along with small electron/hole effective masses and exciton binding energy [11–19].

**CONTACT** Hong Lin [hong-lin@mails.tsinghua.edu.cn](mailto:hong-lin@mails.tsinghua.edu.cn); Feng Hao [haofeng@uestc.edu.cn](mailto:haofeng@uestc.edu.cn)

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钙钛矿太阳能电池 (PSCs) 在过去十年中经历了快速的发展, 以下是其研究进程的概述:

初期发展: 钙钛矿太阳能电池的研究起始于对有机-无机杂化钙钛矿材料的光电性质的研究。

效率提升: 从最初的较低转换效率, PSCs的PCE迅速提升, 从3.8%增长至超过22%。

材料优化: 研究者们通过调整钙钛矿材料的组成, 如使用不同的有机阳离子和卤素阴离子, 来优化其光电性能。

器件结构改进: 开发了多种器件结构, 包括平面型和介孔型, 以提高PSCs的性能。

界面工程: 通过界面工程改善了电子和空穴的传输, 降低了复合损失。

稳定性研究: 稳定性是商业化的关键因素, 研究者们致力于提高钙钛矿材料及其器件的稳定性。

铅毒性问题: 随着对环境和健康影响的认识增加, 研究者开始寻找替代铅的材料。

替代材料探索: 探索了多种可能的铅替代元素, 如锡 (Sn)、锗 (Ge)、铋 (Bi) 等。

理论模拟与计算: 利用计算模拟来预测和设计新的钙钛矿材料, 以替代铅并保持高效能。

低维钙钛矿: 研究了低维钙钛矿材料, 如二维 (2D) 和一维 (1D) 钙钛矿, 以提高稳定性和降低毒性。

商业化挑战: 尽管效率提升显著, 但PSCs的商业化仍面临稳定性、大规模生产和环境毒性等挑战。……

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3. Morris LR, Robinson WR. Crystal structure of Cs<sub>2</sub>NaBiCl<sub>6</sub>. J. Chem. Phys. 1978; 68: 1000-1001. 10.1016/0022-2313(78)90026-1

4. Scaife DE, Weller PF, Fisher WG, et al. Crystal preparation of Cs<sub>2</sub>NaBiCl<sub>6</sub>. J. Chem. Phys. 1978; 68: 1002-1003. 10.1016/0022-2313(78)90027-2

5. Pelle F, Jacquier B, Denis J, et al. Optical properties of Cs<sub>2</sub>NaBiCl<sub>6</sub>. J. Lumin. 1978; 17: 61 - 72. 10.1016/0022-2313(78)90026-1



根据文档文末的参考文献，钙钛矿太阳能电池的发展进程可以按以下年代和研究进展进行总结：

- 2012年:**
  - Lee等人报道了基于钙钛矿的高效混合太阳能电池，这是钙钛矿太阳能电池的一个重要起点 [1].
- 2013年:**
  - Burschka等人提出了一种新的钙钛矿敏化太阳能电池的顺序沉积方法，这有助于高性能钙钛矿太阳能电池的开发 [2].
- 2014年:**
  - Zhou等
  - Mei等人报道了无需空穴导体的全打印介观钙钛矿太阳能电池，展示了高稳定性 [5].
- 2015年:**
  - Cui等人回顾了高效混合铅卤化物钙钛矿太阳能电池的最新进展 [6].
  - Noel等人研究了用于光电应用的无铅有机-无机锡卤化物钙钛矿 [36].
- 2016年:**
  - Luo等人研究了用于高效无空穴导体钙钛矿太阳能电池的交叉堆叠超对齐碳纳米管电极 [16].

英国牛津大学教授Henry Snaith亨利·斯奈斯等

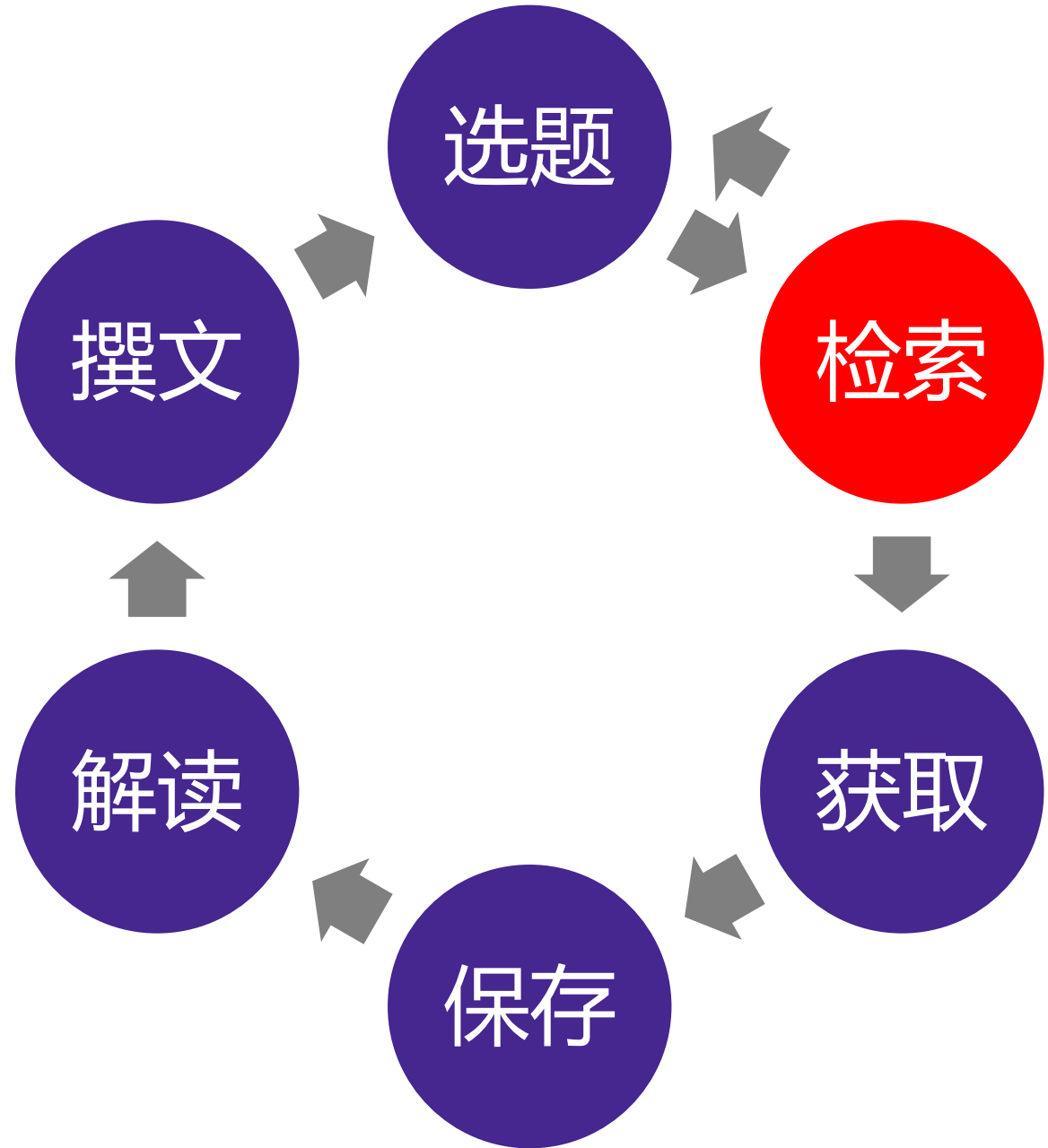
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Ju Sucheol, Byun Minseop, Kim Minjin, Jun Junho, Huh Daihong, 等. *Nano Research, Beijing* Vol. 13, Iss. 4, (Apr 2020): 1156-1161.  
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2 Improved the Performance and Stability at High Humidity of Perovskite Solar Cells by Mixed Cesium-Methylammonium Cations  
Ayi Bahtiar, Yazibarrahmah, Rizka, Aprilia, Annisa, Hideyat, Darmawan. *Key Engineering Materials, Zurich* Vol. 860, (Aug 2020): 9-14.  
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3 Fabrication of perovskite solar cell with high short-circuit current density ( $J_{SC}$ ) using moth-eye structure of  $SiO_x$  ...  
Ju Sucheol, Byun Minseop, Kim Minjin, Jun Junho, Huh Daihong, 等. *Nano Research, Beijing* Vol. 13, Iss. 4, (Apr 2020): 1156-1161.  
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4 Perovskite Solar Cells: Sputtered Indium-Zinc Oxide for Buffer Layer Free Semitransparent Perovskite Photovoltaic Devices in Perovskite/Silicon 4T-Tandem Solar Cells  
Zhiqin Ying, Zhu, Yudong, Feng, Xiuyan, Xiu, Jingwei, Zheng, Rui, 等. *Advanced Materials Interfaces, Weinheim* Vol. 8, Iss. 6, (Mar 2021).  
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5 Numerical Investigation of Power Conversion Efficiency of Sustainable Perovskite Solar Cells  
Bhojak, Vivek, Jain, Praveen K, Bhatia, Deepak, Dargar, Shashi Kant, Jasinski, Michal, 等. *Electronics, Basel* Vol. 12, Iss. 8, (2023): 1762.  
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## 条件2: quantum dots

title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*")

The screenshot shows the ProQuest Central search interface. At the top, there is a dark green header with the ProQuest Central logo and navigation icons. Below the header, the search interface is titled "高级检索" (Advanced Search). There are several tabs: "命令行" (Command Line), "近期检索" (Recent Searches), "词库" (Thesaurus), "字段代码" (Field Codes), and "检索技巧" (Search Tips). The main search area contains three rows of search criteria, each with a search box, a logical operator dropdown, and a field dropdown. The first row has the search box containing "quantum dot\*", the operator set to "OR", and the field set to "文档标题 - TITLE". The second row has the search box containing "quantum dot\*", the operator set to "OR", and the field set to "摘要 - ABSTRACT". The third row has the search box containing "quantum dot\*", the operator set to "OR", and the field set to "所有主题和索引 - SUBJECT". Below the search rows, there are options to "添加一行" (Add Row) and "删除一行" (Delete Row). There are also checkboxes for "限定条件: 全文文献" (Limit Conditions: Full Text Documents) and "同行评审" (Peer Review). At the bottom, there is a "出版日期: 所有日期" (Publication Date: All Dates) dropdown. On the right side, there is a "检索" (Search) button and a "清空检索表格" (Clear Search Table) link. A red arrow points to a refresh icon in the top right corner of the interface.

# 组合检索

## 近期检索

要保存检索，选择操作菜单内的保存检索。了解更多信息



[S1] AND [S2]

检索

检索技巧

示例: [S1] AND ([S3] OR [S6])  
([S1] AND [S3]) OR ([S1] AND [S2])  
[S3] NOT treatment

所选条目: 2   Combine with   **AND**   **OR**   删除   保存   显示 所有详情   导出全部搜索



<input checked="" type="checkbox"/>	集 ▾	检索	数据库	结果	保存检索/提醒	其他操作
<input checked="" type="checkbox"/>	S2	⊕ title("quantum dot*") OR abstract("quantum dot*") OR subject("quantum dot*")	5 个数据库	75,185	保存检索/提醒 ▾	其他操作 ▾
<input checked="" type="checkbox"/>	S1	⊕ title(Perovskite* near/10 (solar or photovoltaic*)) OR abstract(Perovskite* near/10 (solar or photovoltaic*)) OR subject(Perovskite* near/10 (solar or photovoltaic*))	5 个数据库	11,524	保存检索/提醒 ▾	其他操作 ▾





# 或在高级检索-命令行检索 中直接编写检索策略

命令行检索 高级检索 近期检索

运算符: i

选择运算符 ▼

检索字段:

选择字段 ▼

添加到表格

```
(title(Perovskite* near/10 (solar or photovoltaic*)) OR abstract(Perovskite* near/10 (solar or photovoltaic*)) OR subject(Perovskite* near/10 (solar or photovoltaic*))) AND (title("quantum dot*") OR abstract("quantum dot*") OR subject("quantum dot*"))
```

全文文献  同行评审 i

出版日期: 所有日期 ▼

检索结果页面选项 ▼

检索 清空检索表格

- 检索工具
- 词库
  - 查找条目
  - 字段代码
  - 命令行帮助
  - 提示

# 命中文献来源刊物举例

ProQuest Central

[S1] AND [S2]

473 个检索结果

修改检索 近期检索 保存检索/提醒

排序条件  
相关性

限定条件  
 全文文献  
 同行评审

出版物类型

Discipline

出版日期

出版物名称

文档类型

主题

选择 1-20

Nanomaterials	6-21123.	全文文献
Advanced Science		
Advanced Energy Materials		
Angewandte Chemie		
Small	9): 1-8.	全文文献
Nature Communications		
Solar Energy		
Journal of Materials Science. Materials in Electronics	taics ec 2022).	引文/摘要
MRS Bulletin		
Advanced Optical Materials		

# 2-1-2 学者检索



英国牛津大学教授Henry Snaith亨利·斯奈斯，主要从事新型光伏材料的开发、有机-无机杂化的钙钛矿太阳能电池等方面研究

## 高级检索

命令行 近期检索 词库 字段代码 检索技巧

(Henry NEAR/1 Snaith)

于

作者 - AUTHOR



查找作者

AND

"University of Oxford"

于

作者 - AUTHOR



查找作者

+ 添加一行

限定条件:  全文文献  同行评审

出版日期: 所有日期

检索 清空检索表格



author((Henry NEAR/1 Snaith)) AND author("University of Oxford")



## 68 个检索结果

[修改检索](#) [近期检索](#) [保存检索/提醒](#)

排序条件

相关性

限定条件

- 全文文献
- 同行评审

出版物类型

- 学术期刊 (66)
- 会议论文及记录 (2)

Discipline

Advanced Technologies & Aerospace (50)

选择 1-20



学术期刊

[Synergistic Surface Modification for High-Efficiency Perovskite Nanocrystal Light-Emitting Diodes: Divalent Metal Ion Doping and Halide-Based Ligand Passivation](#)

Woo Hyeon Jeong; Lee, Seongbeom; Song, Hochan; Shen, Xinyu; Choi, Hyuk; 等. **Advanced Science; Weinheim** Vol. 11, Iss. 4, (Jan 2024).

摘要/索引

全文文献

全文 - PDF 格式 (2 MB)

Times cited

1 on Web of Science

37 参考文献

全文文献



学术期刊

[Engineered charge transport layers for improving indoor perovskite photovoltaic performance](#)

Datt, Ram; Caprioglio, Pietro; Choudhary, Saqlain; Lan, Weixia; **Snaith, Henry**; 等. **JPhys Energy; Bristol** Vol. 6, Iss. 2, (Apr 2024): 025014.

摘要/索引

全文 - PDF 格式 (983 KB)

全文文献



学术期刊

[Intermediate-phase engineering via dimethylammonium cation additive for stable perovskite solar cells](#)

McMeekin, David P; Holzhey, Philippe; Furer, Sebastian O; Harvey, Steven P; Schelhas, Laura T; 等. **Nature Materials; London** Vol. 22, Iss. 1, (Jan 2023): 73-83.

全文文献

# 2-2 检索定题跟踪-电邮与RSS

ProQuest Central

author((Henry NEAR/1 Snaith)) AND author("University of Oxford")

68 个检索结果

排序条件: 相关性

限定条件:  全文文献  同行评审

出版物类型:  学术期刊 (66)  会议论文及记录 (2)

Discipline:  Advanced Technologies & Aerospace (50)

选择 1-20

- 1 学术期刊
- 2 学术期刊
- 3 学术期刊

### 创建定题通告

创建并设定定题通告, 以便在 ProQuest 中获取与您的检索匹配的新文档时投递这些文档。  
创建我的检索帐户, 用于修改、删除或查看您的所有定题通告。

**必填\***

**步骤 1-评审检索详情**

命名此定题通告: \*

检索目标: author((Henry NEAR/1 Snaith)) AND author("University...")

数据库: 检索到 5 个数据库 [查看列表](#)  
按照您的查询中的部分内容检索这些数据库。

**步骤 2-定义您的定题通告电子邮件**

发送至: \*

此处输入的电子邮件地址仅用于发送定题通告。

主题: author((Henry NEAR/1 Snaith)) AND author("Univ

### 创建 RSS 荟萃

您的 RSS 荟萃: <https://feeds.proquest.com/rss/1378719>

**检索详情**

荟萃名称: ProQuest: author((Henry NEAR/1 Snaith)) AND author("University of Oxford")

检索目标: author((Henry NEAR/1 Snaith)) AND author("University...")

数据库: 检索到 5 个数据库 [查看列表](#)  
按照您的查询中的部分内容检索这些数据库。

**您的 RSS 荟萃个性化检索设置**

包含检索详情: No

包括: 包括历史条目在内的最新添加的文档。

到期: 如果 3 个月没有访问, 荟萃将到期

关闭

近期检索 保存检索/提醒

and [”](#) [✉](#) [📁](#) 全文文献

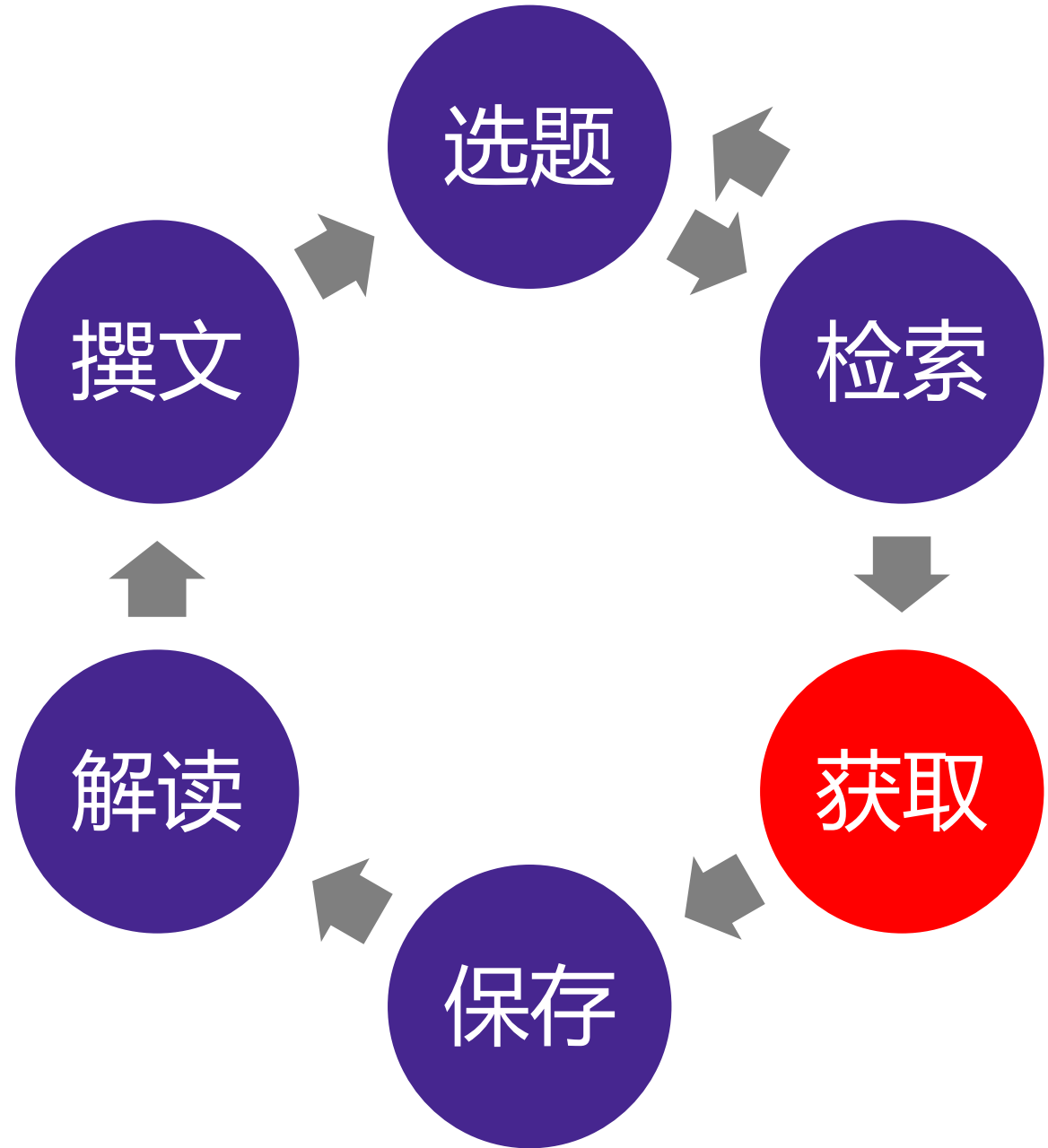
[”](#) [✉](#) [📁](#) 全文文献

2023): [”](#) [✉](#) [📁](#) 全文文献



# 在学习研究中运用 ProQuest Central

案例研究：从选题  
到撰文



# 3. 检索结果 - 全文

The screenshot shows the ProQuest Central search results page. The search bar contains the query: (title(Perovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Perovskite\* near/10 (solar or photovoltaic\*)) OR subject(Perovskite\* near/10 (solar or photovoltaic\*))) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*")). The results list shows three items:

- Item 11: **Black Phosphorus Quantum Dots Used for Boosting Light Harvesting in Organic Photovoltaics**. Journal: *Angewandte Chemie, International ed. in English*. Includes a button for **获取全文链接** (Get Full Text Link).
- Item 12: **Vertically Aligned Nanowires and Quantum Dots: Promises and Results in Light Energy Harvesting**. Journal: *Materials*. Includes a button for **全文 - PDF 格式** (Full Text - PDF Format).
- Item 13: **Ligand Engineering and Recrystallization**. Journal: *Small*. Includes a button for **DOI** and a link to <https://doi.org/10.1002/smll.202204070>.

Annotations include red arrows pointing to the '全文文献' (Full Text) filter in the left sidebar, the '获取全文链接' button for item 11, the '全文 - PDF 格式' button for item 12, and the 'DOI' button for item 13. A red arrow also points to the DOI link itself.

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链接到出版商文章网址

# 检索结果 - 多种文献类型

ProQuest Central

(title(Perovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Perovskite\* near/10 (solar or photovoltaic\*)) OR subject(Perovskite\* near/10 (solar or photovoltaic\*)) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*"))

473 个检索结果

修改检索 近期检索 保存检索/提醒

排序条件

相关性

限定条件

- 全文文献
- 同行评审

出版物类型

- 学术期刊 (383)
- 学位论文 (4)
- 杂志 (1)
- 行业杂志 (6)
- 公司新闻 (42)
- 更多 >

Discipline

选择 1-10

1 Optimization of sensitized perovskite solar cells with Zn-Cu-In-Se quantum dots to increase quantum efficiency  
Hajian Tohid; Sahbasadat, Rajamand. **Journal of Materials Science. Materials in Electronics; New York** Vol. 32, Iss. 16, (Aug 2021): 21106-21123.  
摘要/索引 全文 - PDF 格式 (3 MB) 52 参考文献 全文文献

2 Nondestructive purification process for inorganic perovskite quantum dot solar cells  
Yang, Tonghui; Zhang, Zhe; Ding, Yanli; Yin, Naiqiang; Liu, Xiaolan. **Journal of Nanoparticle Research; Dordrecht** Vol. 21, Iss. 5, (May 2019): 1-8.  
摘要/索引 全文 - PDF 格式 (2 MB) Times cited 11 on Web of Science 26 参考文献 全文文献

3 Quantum Dot/Polymer Bulk Heterostructure Interlayer for Enhanced Charge Collection in AgBiS<sub>2</sub> Quantum Dot Photovoltaics  
Park, Youngsang; Kim, Hyoin; Shin, Daekwon; Kim, Taewan; Choi, Mahnmin; 等. **Advanced Optical Materials; Weinheim** Vol. 10, Iss. 23, (Dec 2022).  
摘要/索引 Times cited 6 on Web of Science 50 参考文献 引文/摘要

# 检索结果 (Web of Science中被引频次)

11  **Black Phosphorus Quantum Dots Used for Boosting Light Harvesting in Organic Photovoltaics**  
Liu, Shenghua; Lin, Shenghuang; You, Peng; Surya, Charles; Lau, Shu Ping; 等. *Angewandte Chemie, International ed. in English; Weinheim* Vol. 56, Iss. 44, (Oct 2017): 13717-13721.

摘要/索引 获取全文文献 **Times cited 113 on Web of Science** 35 参考文献

12  **Vertically Aligned Nanowires and Quantum Dots: Promises and Results in Light Energy Harvesting**  
Prestopino, Giuseppe; Orsini, Andrea; Baretin, Daniele; Arrabito, Giuseppe; Pignataro, Bruno; 等. *Materials; Basel* Vol. 16, Iss. 12, (2023): 4297.

摘要/索引 全文文献 全文 - PDF 格式 (15 MB) **Times cited 3 on Web of Science** 130 参考文献

< 返回检索结果页 < 12 篇文档, 共 473 篇 >

全文文献 | 学术期刊

## Vertically Aligned Nanowires and Quantum Dots: Promises and Results in Light

Prestopino, Giuseppe; Orsini, Andrea; Baretin, Daniele; Arrabito, Giuseppe; Pignataro, Bruno; 等. *Materials; Basel* Vol. 16, Iss. 12, (2023): 4297.  
DOI:10.3390/ma16124297

全文文献  
全文 - PDF 格式  
摘要/索引  
**130 参考文献**  
3 引用次数  
Web of Science  
215 包含共享参考文献的文档

包含共享参考文献的文档 (215)

作者姓名

51. **Carrier Transport in Colloidal Quantum Dot Intermediate Band Solar Cell Materials Usi**  
Cuadra, Lucas; Salcedo-Sanz, Sancho; Nieto-Borge, José Carlos. *International Journal of Molecular Sciences; I*  
参考文献 (159) 摘要/索引 全文文献 全文 - PDF 格式 (17 MB)

52. **Organic Disordered Semiconductors as Networks Embedded in Space and Energy**  
Cuadra, Lucas; Salcedo-Sanz, Sancho; Nieto-Borge, José Carlos. *Nanomaterials; Basel* Vol. 12, Iss. 23, (2022):  
引用次数 **1 在 Web of Science 上** 参考文献 (102) 摘要/索引 全文文献 全文 - PDF 格式 (1

53. **Evaluation of Atlas-Based Mobile Application in Undergraduate Teaching in Oral Histo**  
Deng, Shuangshan; Li, Zucen; Ma, Xinyu; Wei, Yali; Lyu, Ping; 等. *Healthcare; Basel* Vol. 11, Iss. 14, (2023): 208

检索结果及引用人、参考文献，共享参考文献记录将显示Web of Science中被引频次，如有访问权限，可直接链接显示该组文献记录

# 检索结果 - 期刊文章页

< 返回检索结果页 > < 14 篇文档, 共 473 篇 >

全文献 | 学术期刊

## Synthesis and evaluation of composite TiO<sub>2</sub>@ZnO quantum dots on solar cell

Pezhooli, Negin; Rahimi, Jamal; Hasti, Farzam; Maleki, Ali. *Scientific Reports (Nature Publisher Group)*; London Vol. 12, Iss. 1, (2022). DOI:10.1038/s41598-022-13903-w

引用

直接将引文复制到您的论文中

IEEE - Institute of Electrical and Electronics Engineers

[1] N. Pezhooli *et al.*, "Synthesis and evaluation of composite TiO<sub>2</sub>@ZnO quantum dots on hybrid nanostructure perovskite solar cell," *Scientific Reports (Nature Publisher Group)*, vol. 12, (1), 2022. Available: <https://www.proquest.com/scholarly-journals/synthesis-evaluation-composite-tio-sub-2-zno/docview/2676410065/se-2>. DOI: <https://doi.org/10.1038/s41598-022-13903-w>.

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全文 - PDF 格式

摘要/索引

36 参考文献

15 引用次数  
Web of Science

1 包含共享参考文献的文档

摘要

翻译 ^

自 英语 至 简体中文 翻译

This research is an interdisciplinary study aimed at helping the environment and producing clean energy. Therefore, one of the goals of this research towards the field of nanotechnology is the application of nanotechnology in the preparation of solar cells and the provision of optimal and efficient cells. Perovskite solar cells are of particular importance because of the high efficiencies that they have achieved in recent years. The use of quantum dots has also played an important role in the efficiency of these cells and their efficiency. The TiO<sub>2</sub>@ZnO nanocomposite was selected and synthesized for this study. The application of this nanocomposite with different ratios of TiO<sub>2</sub> and ZnO quantum dots was investigated and their efficiency was determined. Although the efficiency of the fabricated cell was reported to be about 5% in a solar cell made of TiO<sub>2</sub>@ZnO composite, the efficiency can be increased by optimizing conditions such as the optimal location for these cells or by compositing with other materials.

索引

主题 [Photovoltaic cells;](#) [Quantum dots;](#) [Nanocomposites;](#)

建议来源

Luminescent solar concentrators and all-inorganic nanoparticle solar cells for solar energy harvesting  
Sholin, Veronica. University of California, Santa Cruz ProQuest Dissertations Publishing, 2008. 3317410.

Thin Film Solar Cells: Research in an Industrial Perspective  
Edoff, Marika. *Ambio*, 增刊 Supplement; Stockholm Vol. 41, (Mar 2012): 112-8.

Design, fabrication, characterization and analysis of wide band gap gallium phosphide solar cells  
Lu, Xuesong. University of Delaware ProQuest Dissertations Publishing, 2011. 3473700.

SOLAR CELL FABRICATION STUDIES PERTINENT TO DEVELOPING COUNTRIES  
PRAH, JOSEPH HENRY. State University of New York at Albany ProQuest Dissertations Publishing, 1983. 8314521.

平台大部分文献html格式文摘/全文提供了翻译功能, Full Text格式全文提供在线聆听和下载mp3文件; 提供了参考文献、引用人、共享参考文献、相关条目, 便于获得相关研究资料; 提供了单篇文献的信息处理: 引用、电邮、打印、保存



# 检索结果 - 博硕论文举例

< 返回检索结果页 1 篇文档, 共 4 篇 >

全文文献 | 学位论文



## A Microscopic Understanding of Solar Cell Materials Using Scanning Tunneling Microscopy and Spectroscopy

Yost, Andrew J. University of Wyoming ProQuest Dissertations Publishing, 2017. 10278345.

利用扫描隧道显微镜和光谱学对太阳能电池材料进行微观理解 Yost, Andrew J 怀俄明大学

- 全文 - PDF 格式
- 预览 - PDF 格式
- 摘要/索引
- 208 参考文献**
- 2k 包含共享参考文献的文档
- 发现技巧 - 揭开学位论文的神秘面纱 >>

1 / 157

Chapter 1 Introduction .....1

1.1 Motivation.....1

1.2 Background: Organic-Inorganic Perovskite Solar Cells.....3

1.3 Background Mn doped PbS Quantum Dots and Dilute Magnetic Semiconductors.....4

1.4 Background CdS Quantum Dots and II-VI Semiconductors.....7

1.5 Background ZnS Quantum Dots and Mn Dopants.....9

Jinke Tang

此研究生作品已出版并开放浏览。

基础研究 关于此主题

Efficient hybrid solar cells based on meso-structured organometal halide perovskites  
Lee, M. M.

英国牛津大学教授Henry Snath亨利·斯奈斯等，基于介孔超结构有机金属卤化物钙钛矿的高效混合太阳能电池

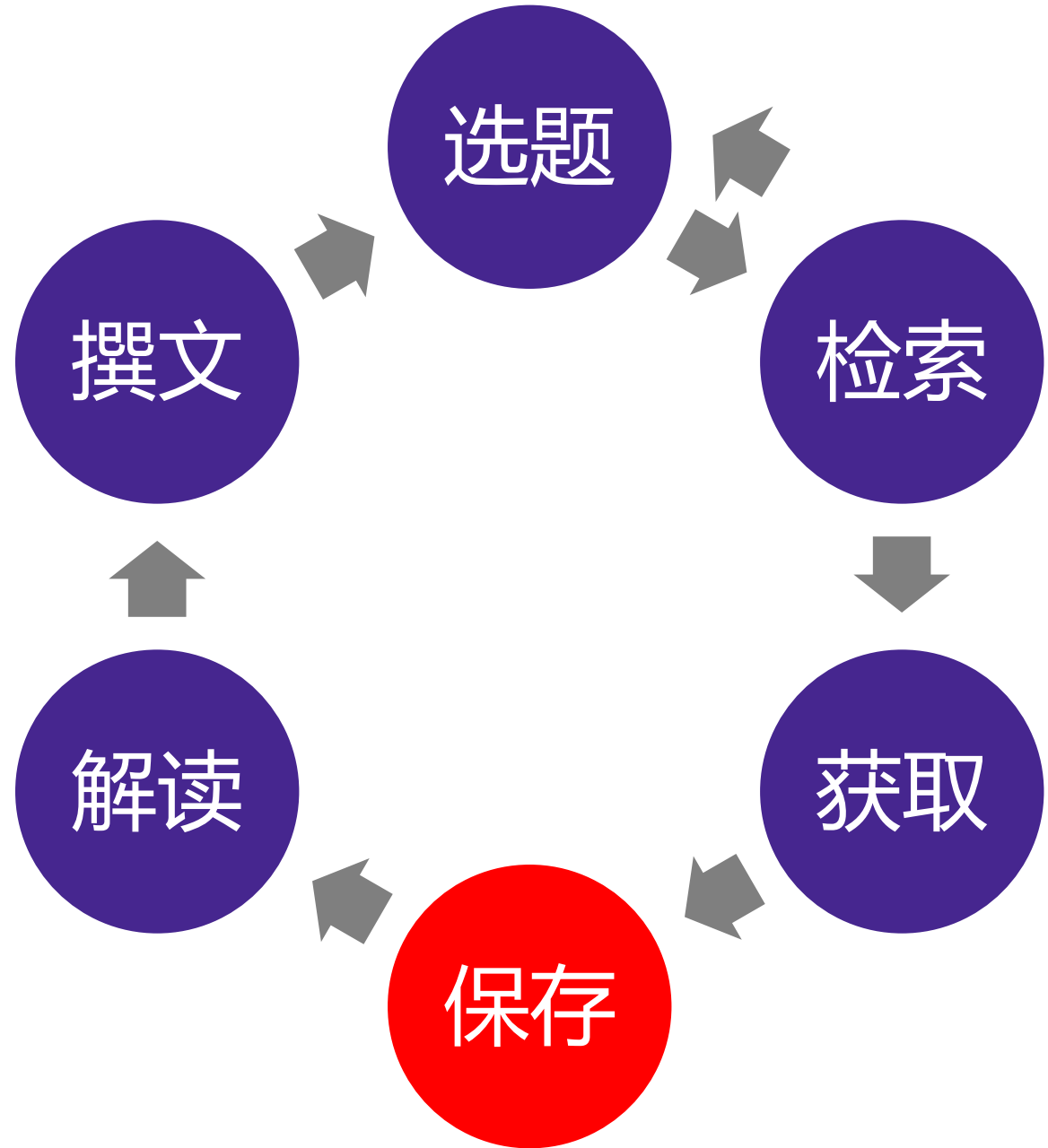
Nature Vol. 501, (2013): 395398.  
Cited by 44

High-efficiency solution-processed perovskite solar

丰富的综述内容和参考文献

# 在学习研究中运用 ProQuest Central

案例研究：从选题  
到撰文




# 4-1 在线保存

先创建个人账户

ProQuest 访问权限提供者 ProQuest Internal Demo Account

ProQuest Central

(title(Perovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Perovskite\* near/10 (solar or photovoltaic\*)) OR subject(Perovskite\* near/10 (solar or photovoltaic\*)) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*"))



302 个检索结果

修改检索 近期检索 保存检索/提醒

应用的筛选器

清除全部筛选器

Scholarly Journals x

2019 - 2024 x

排序条件

相关性 v

限定条件

全文文献

同行评审

出版物类型

学术期刊 (302) x

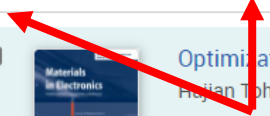
Discipline

选择 1-20 20 个所选条目 清除

1 Optimization of sensitized perovskite solar cells with Zn-Cu-In-Se quantum dots to increase quantum efficiency  
Hajian Tohid; Sahbasadat, Rajamand. *Journal of Materials Science. Materials in Electronics; New York* Vol. 32, Iss. 16, (Aug 2021): 21106-21123.

2 Nondestructive characterization of ZnO quantum dots  
Yang, Tong. *Journal of Nanoparticle Research* Vol. 21, Iss. 5, (May 2019): 1-8.

3 Quantum dot photovoltaics  
Park, Young. *Journal of Applied Physics* Vol. 10, Iss. 23, (Dec 2022).



### 保存到“我的检索”

选定的条目: 20

完成时取消条目选中

保存于: 新建文件夹...

文件夹名称: ProQuest钙钛矿太阳能电池与量子点

文件夹位置: 所有文档

不要再次询问。

备注(可选):

取消 保存



## 我的检索

文档 (500) 检索 (0) 定题通告 (0) RSS 荟萃 (0) 检索插件 帐户

### 文档 (20) (在 ProQuest钙钛矿太阳能电池与量子点 中)

所有文档 > ProQuest钙钛矿太阳能电池与量子点

选择条目 1-20



1



Synthesis and characterization of TiO<sub>2</sub>-graphene heterostructured quantum dots by electrochemical process

Thanasanvorakun, Siripatsorn; Sintiam, Thanakrit; Choopun, Supab; Phadunghitidhada, Surachet; Sucharitakul, Sukrit.  
**Journal of Physics: Conference Series, Bristol** Vol. 2653, Iss. 1, : IOP Publishing. (Dec 2023): 012058.

摘要/索引

全文 - PDF 格式 (2 MB)

备注: [添加备注](#)

位于以下文件夹 ProQuest钙钛矿太阳能电池与量子点 中:

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[删除](#) [添加至文件夹](#)

排序条件:

已添加日期

排序

视图

所有文档  
不在文件夹中的文档

文件夹

管理文件夹  
新建文件夹

# 4-2 本地保存

(title(Perovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Perovskite\* near/10 (solar or photovoltaic\*)) OR subject(Perovskite\* near/10 (solar or photovoltaic\*\*)) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*"))

302 个检索结果

修改检索 近期检索 保存检索/提醒

应用的筛选器  
清除全部筛选器

Scholarly Journals x  
2019 - 2024 x

排序条件  
相关性 v

限定条件

全文文献  
 同行评审

出版物类型

学术期刊 (302) x

Discipline

选择 1-20 20 个所选条目 清除

所有保存和导出选项

引用 电子邮件 保存到“我的检索”

引文导出

RefWorks EN RIS NoodleTools EasyBib  
EndNote Citavi, Mendeley 等

其他选项

打印 PDF XLS RTF TXT  
PDF Microsoft Excel 格式 Microsoft Word 格式 仅文本

支持批量保存成PDF, WORD, TXT等格式文件、以及批量生成引文、电邮、打印等



# 4-3 保存到信息管理工具，例：EndNote

The screenshot displays the ProQuest Central interface. At the top, the search bar contains a complex query: (title(Perovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Perovskite\* near/10 (solar or photovoltaic\*)) OR subject(Perovskite\* near/10 (solar or photovoltaic\*))) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*")). Below the search bar, it shows 302 search results. On the left, there are filters for '应用的筛选器' (Applied filters) including 'Scholarly Journals' and '2019 - 2024', and '排序条件' (Sort by) set to '相关性' (Relevance). A '限定条件' (Limit conditions) section shows '全文文献' (Full text) and '同行评审' (Peer reviewed) selected. The '出版物类型' (Publication type) section shows '学术期刊 (302)' (Academic journals (302)) selected. A 'Discipline' dropdown is visible at the bottom left. A modal window titled '所有保存和导出选项' (All save and export options) is open, showing various options: '引用' (Cite), '电子邮件' (Email), '保存到“我的检索”' (Save to My Search), '引文导出' (Citation export) with options for RefWorks, EndNote, RIS, NoodleTools, and EasyBib, and '其他选项' (Other options) with XLS, RTF, and TXT. A red box highlights the '引文导出' section, and a red arrow points to the 'EndNote' icon. Another red arrow points from the 'EndNote' icon to the '导出/保存' (Export/Save) modal window. This window shows '所选条目: 20' (Selected items: 20) and '输出至: RIS (与 EndNote, Citavi, Mendeley 等一同使用)' (Export to: RIS). It also includes a reCAPTCHA verification step and a '继续' (Continue) button. A red arrow points from the '继续' button to a file name 'ProQuestDocuments-2024-05-04' in a box at the bottom right. A purple text box at the bottom left of the search results area contains the text: '支持批量导出到信息管理工具 比如EndNote RefWorks等' (Supports batch export to information management tools such as EndNote, RefWorks, etc.).

# 导出到EndNote

Clarivate | EndNote™

我的参考文献 收集 组织 格式化 匹配 选项 下载项

在线检索 新建参考文献 导入参考文献

在线检索

第1步

请选择数据库或文献库目录连接。

选择... 选择收藏夹

连接

Web of Science (SCIE ESI InCites JCR)

简体中文 产品

Web of Science

Master Journal List

InCites Benchmarking & Analytics

Journal Citation Reports™

Essential Science Indicators

Reference Manager

EndNote

EndNote Click

Web of Science 检索平台右上角产品 - EndNote

ProQuestDocuments-2024-05-04

- 上传RIS格式文件
- 导入格式 Refman RIS
- 可新建一个文件夹

导入参考文献

从 EndNote 导入?

文件: 选择文件 ProQuestDocu...-2024-05-04.ris

导入选项: RefMan RIS 选择收藏夹

保存位置: - ProQuest钙钛矿太阳能电池与量子点

导入

# 导出到EndNote

## 快速检索

检索范围 我的所有参考文献

检索

## 我的参考文献

我的所有参考文献(342)

[未归档] (18)

临时列表(0)

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### ▼ 我的组

2022-2023 (1)

2023-2024 (1)

ABI低碳供应链 (20)

CNKI-低碳供应链 (2)

PQDT 新冠与心脏损伤 (20)

PQDT 碳税 (20)

PQDT 联邦学习 202308 (20)

PQDT 土壤碳固存 (20)

PQDT 钙钛矿太阳能电池 (20)

ProQuest Research Library教师效能... (17)

ProQuest 教师效能感 (7)

ProQuest 新冠与心脏损伤 (20)

ProQuest 石墨块 (20)

ProQuest-The Mysteries of Udo... (6)

ProQuest土壤碳固存 (20)

ProQuest碳固存, 可持续发展, 中国 (20)

ProQuest自动驾驶汽车 (20)

ProQuest钙钛矿太阳能电池与量子点 (20)

PsycArticles - 儿童抑郁与社会支持 (20)

Test - Groups (0)

## ProQuest钙钛矿太阳能电池与量子点

每页显示 10 个

◀◀ 当前页 1 / 2 开始 ▶▶

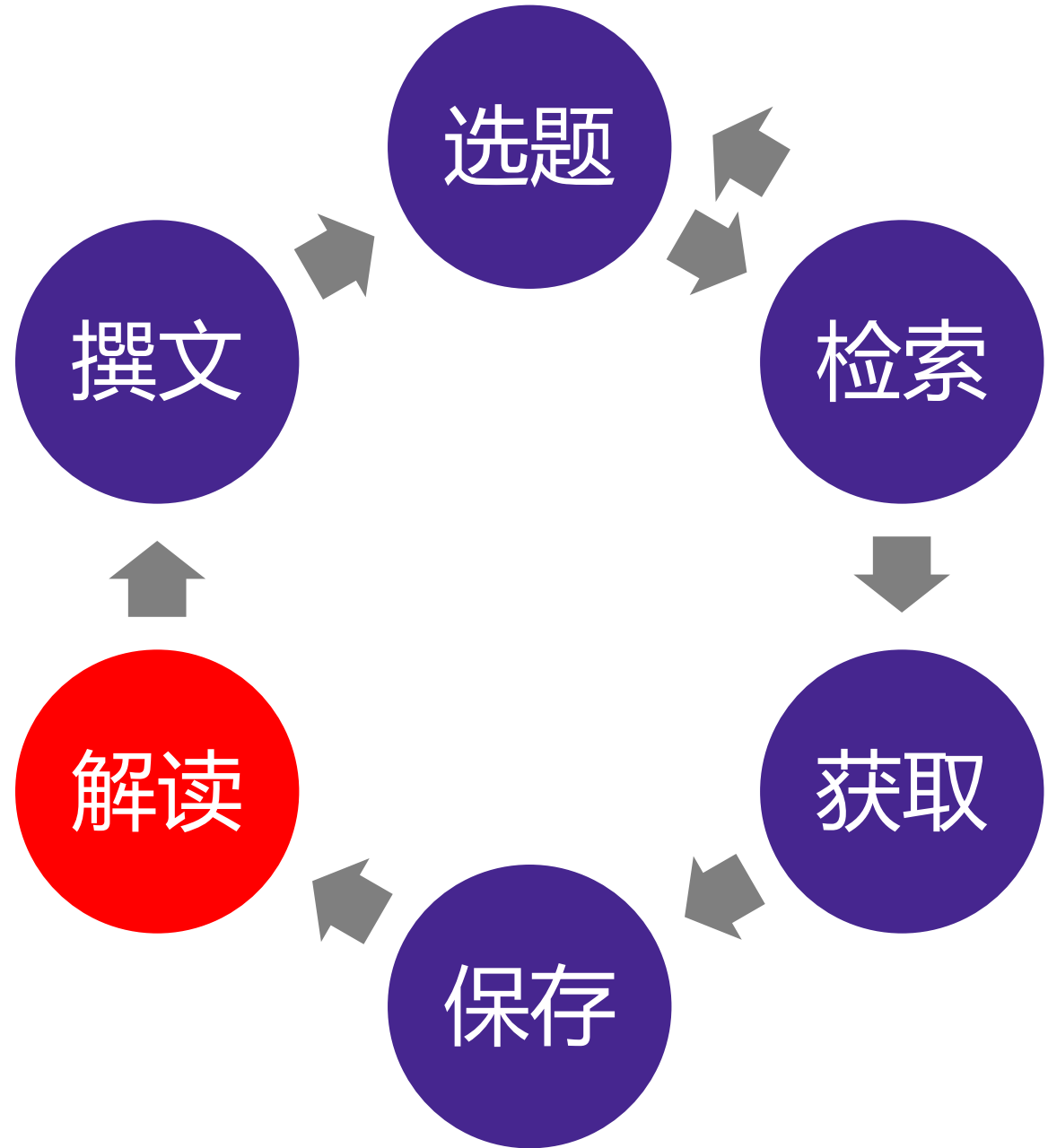
全部  当前页 添加到组...

排序方式: 第一作者 (升序)

作者	出版年	标题
<input type="checkbox"/> Agbolaghi, Samira	2022	Stabilized perovskite photovoltaics via Supramolecules composed of carbon/graphene quantum dots and Triiso-Propylsilylethynyl agents International Journal of Energy Research 添加到文献库: 04 May 2024 上次更新日期: 04 May 2024 在线链接→ 转到 URL 
<input type="checkbox"/> Hajian, Tohid	2021	Optimization of sensitized perovskite solar cells with Zn-Cu-In-Se quantum dots to increase quantum efficiency Journal of Materials Science. Materials in Electronics 添加到文献库: 04 May 2024 上次更新日期: 04 May 2024 在线链接→ 转到 URL 
<input type="checkbox"/> Hao, Mengmeng	2020	Ligand-assisted cation-exchange engineering for high-efficiency colloidal Cs1-xFAPbI3 quantum dot solar cells with reduced phase segregation Nature Energy 添加到文献库: 04 May 2024 上次更新日期: 04 May 2024 在线链接→ 转到 URL 
<input type="checkbox"/> Hosokawa, Hiroji	2019	Solution-processed intermediate-band solar cells with lead sulfide quantum dots and lead halide perovskites Nature Communications 添加到文献库: 04 May 2024 上次更新日期: 04 May 2024 在线链接→ 转到 URL 
<input type="checkbox"/> Hu, Long	2021	Flexible and efficient perovskite quantum dot solar cells via hybrid interfacial architecture Nature Communications 添加到文献库: 04 May 2024 上次更新日期: 04 May 2024 在线链接→ 转到 URL 
<input type="checkbox"/> Huang, Chien-Yu	2023	Inorganic Halide Perovskite Quantum Dots: A Versatile Nanomaterial Platform for Electronic Applications Nano-Micro Letters 添加到文献库: 04 May 2024 上次更新日期: 04 May 2024

# 在学习研究中运用 ProQuest Central

案例研究：从选题  
到撰文



# 5.1 快速的文献初筛 – 保存中英文

(title(Ferovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Ferovskite\* near/10 (solar or photovoltaic\*)) OR subject(Ferovskite\* near/10 (solar or photovoltaic\*))) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*"))

302 个检索结果

修改检索 近期检索 保存检索/提醒

应用的筛选器  
清除全部筛选器  
Scholarly Journals  
2019 - 2024

排序条件  
相关性

限定条件  
 全文文献  
 同行评审

出版物类型  
Disci

所有保存和导出选项

选择 1-20 2 个所选条目

1 Optimization of sensitized perovskite solar cells  
Hajian Tohid; Sahbasadat, Rajamani  
摘要/索引 全文 - PDF 格式 (3)

2 Nondestructive purification pro  
Yang, Tonghui; Zhang, Zhe; Ding, Ya  
摘要/索引 全文 - PDF 格式 (4)

Quantum Dot/Polymer Bulk Het  
Park, Youngsang; Kim, Hyojin; Shin, I  
摘要/索引 Times cited 6 on Web of Science 50 参考文献

Quantum efficiency  
ss. 16, (Aug 2021): 21106-21123.

Vol. 21, Iss. 5, (May 2019): 1-8.

Quantum Dot Photovoltaics  
nheim Vol. 10, Iss. 23, (Dec 2022).

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RefWorks EndNote Citavi, Mendeley 等 NoodleTools EasyBib

打印 PDF XLS Microsoft Excel 格式 RTF Microsoft Word 格式 TXT 仅文本

保存至我的检索 全文文献

保存至我的检索 全文文献

保存至我的检索 全文文献

关闭

支持HTML摘要/全文  
在线翻译

批量保存成WORD格式文件



# 批量保存 (中英文)

## Optimization of sensitized perovskite solar cells with Zn—Cu—In—Se quantum dots to increase quantum efficiency

Hajian Tohid <sup>1</sup>; Sahbasadat, Rajamand <sup>1</sup>

<sup>1</sup> Kermanshah Branch, Islamic Azad University, Department of Electrical Engineering, Kermanshah, Iran (GRID:grid.472625.0)

[ProQuest 文档链接](#)

### 摘要 (ENGLISH)

Perovskite solar cells are efficient units in systems with modern renewable energy sources. Increasing the efficiency of solar cells is important in photovoltaic (PV) systems. In this paper, the effect of Zn—Cu—In—Se quantum dots on the performance of thin-film perovskite solar cells is analyzed. The effect of the specification of the perovskite layer, electrical connections and quantum dots has been discussed using modeling of solar cell open-circuit voltage, short-circuit current, spectral response, efficiency, and fill factor. Based on the simulation results, without using Zn—Cu—In—Se quantum dots, the optimal performance occurs in high and low electrode work function as 3.5 eV and 5.93 eV achieving 21.53% energy conversion efficiency. In the proposed perovskite solar cell including Zn—Cu—In—Se quantum dots, 33.56% efficiency can be obtained in the same conditions. More intensity of the electric field inside the perovskite layer and the quantum dots causes to increase the energy conversion efficiency compared to the case without quantum dots. The achievable power in case of Zn—Cu—In—Se quantum dots is 0.275 mW/cm<sup>2</sup>, which is 35% more than the case without these quantum dots in the solar cell. As shown in simulation results section, many improvements can be achieved via using Zn—Cu—In—Se quantum dots in the perovskite solar cell.

### 已翻译摘要 (概要)

钙钛矿太阳能电池是具有现代可再生能源系统中的高效单元。提高太阳能电池的效率在光伏 (PV) 系统中很重要。本文分析了 Zn—Cu—In—Se 量子点对薄膜钙钛矿太阳能电池性能的影响。使用太阳能电池开路电压、短路电流、光谱响应、效率和填充系数的建模, 讨论了钙钛矿层、电气连接和量子点规格的影响。根据仿真结果, 在不使用 Zn—Cu—In—Se 量子点的情况下, 最佳性能出现在高电极和低电极工作功能中, 为 3.5 eV 和 5.93 eV, 可实现 21.53% 的能量转换效率。在包括 Zn—Cu—In—Se 量子点在内的拟议钙钛矿太阳能电池中, 在相同条件下可以获得 33.56% 的效率。与没有量子点的情况相比, 钙钛矿层和量子点内部更强的电场强度可以提高能量转换效率。在 Zn—Cu—In—Se 量子点的情况下, 可实现的功率为 0.275 mW/cm<sup>2</sup>, 比太阳能电池中没有这些量子点的情况高 35%。如仿真结果部分所示, 通过在钙钛矿太阳能电池中使用 Zn—Cu—In—Se 量子点可以实现许多改进。

## Nondestructive purification process for inorganic perovskite quantum dot solar cells

Yang, Tonghui <sup>1</sup>; Zhang, Zhe <sup>2</sup>; Ding, Yanli <sup>1</sup>; Yin, Naiqiang <sup>1</sup>; Liu, Xiaolan <sup>1</sup> <sup>1</sup> School of Electronic and Electrical Engineering, Shangqiu Normal University, Shangqiu, People's Republic of China <sup>2</sup> School of Mechanical and Electrical Information Engineering, Shangqiu University, Shangqiu, People's Republic of China

可保存html格式的摘要和全文,  
及在线翻译后的信息等

# 5.2 AIGC助力快速的文献解读

ProQuest Central

(title(Perovskite\* near/10 (solar or photovoltaic\*)) OR abstract(Perovskite\* near/10 (solar or photovoltaic\*)) OR subject(Perovskite\* near/10 (solar or photovoltaic\*))) AND (title("quantum dot\*") OR abstract("quantum dot\*") OR subject("quantum dot\*"))

302 个检索结果

应用的筛选器  
清除全部筛选器  
Scholarly Journals  
2019 - 2024

排序条件  
相关性

限定条件  
 全文文献  
 同行评审

出版物类型  
学术期刊 (302)

Discipline

选择 1-20 2 个所选条目 清除 导出检索结果

1 Optimization of sensitized perovskite solar cells with Zn-Cu-In-Se quantum dots to improve their performance. Hajian Tohid; Sahbasadat, Rajamand. *Journal of Materials Science. Materials in Electronics; New York*

2 Nondestructive characterization of ZnO nanoparticles. Yang, Tonghua. *Journal of Nanoparticle Research*

3 Quantum Dot Solar Cells. Park, Youngsang. *Encyclopedia of Nanotechnology*

所有保存和导出选项

- 引用
- 电子邮件
- 保存到“我的检索”
- 引文导出
  - RefWorks
  - EndNote
  - RIS
  - NoodleTools
  - EasyBib
- 其他选项
  - 打印
  - PDF
  - XLS
  - RTF
  - TXT** (仅文本)

导出/保存

输出至: 仅文本

内容: 仅限引文与摘要

参考书目:  在最后包括书目引文

索引样式: AMA - American Medical Association, 10th Edition

包含:  
 近期检索  
 封面/标题  
 目录  
 文档计数

验证“我的检索”帐户 减少中断。  
进行人机身份验证

到每个文档的永久链接将与您的文件一起保存。  
输入所有必填信息, 即表示您同意 ProQuest 使用这些信息来实现特征和功能。

隐藏政策 取消 继续

批量保存记录的引文与摘要

# 运用AIGC工具快速解读文献记录

ProQuestDocuments-2024-05-04

整理这些文件的核心内容

ProQuestDocuments-...  
TXT, 3.47 KB

文件中包含两篇关于钙钛矿太阳能电池的学术文章摘要，以下是它们的核心内容：

1. 优化Zn-Cu-In-Se量子点敏化的钙钛矿太阳能电池以提高量子效率
  - 作者: Hajian Tohid; Sahbasadat, Rajamand.
  - 摘要: 钙钛矿太阳能电池是现代可再生能源系统中高效的单元。提高太阳能电池的效率对于光伏系统至关重要。本文分析了Zn-Cu-In-Se量子点对薄膜钙钛矿太阳能电池性能的影响。通过模拟太阳能电池的开路电压、短路电流、光谱响应、效率和填充因子，讨论了钙钛矿层的规格、电连接和量子点的影响。模拟结果显示，在不使用Zn-Cu-In-Se量子点的情况下，高和低电极工作函数为3.5 eV和5.93 eV时，最佳性能达到21.53%的能量转换效率。在包含Zn-Cu-In-Se量子点的提出的钙钛矿太阳能电池中，在相同条件下可以获得33.56%的效率。量子点内部电场的增强导致能量转换效率的提高，与没有量子点的情况相比。在Zn-Cu-In-Se量子点的情况下，可实现的功率为0.275 mW/cm<sup>2</sup>，比没有这些量子点的太阳能电池多35%。模拟结果部分显示，通过在钙钛矿太阳能电池中使用Zn-Cu-In-Se量子点可以实现许多改进。
2. 非破坏性提纯无机钙钛矿量子点太阳能电池
  - 作者: Yang, Tonghui; Zhang, Zhe; Ding, Yanli; Yin, Naiqiang; Liu, Xiaolan.
  - 摘要: 铅卤化物钙钛矿因其在光伏器件中的成功应用和令人印象深刻的功率转换效率而受到

Optimization of sensitized perovskite solar cells with Zn-Cu

作者: Hajian Tohid; Sahbasadat, Rajamand.

<https://www.proquest.com/scholarly-journals/optimization>

摘要: Perovskite solar cells are efficient units in systems with compared to the case without quantum dots. The achievable

Nondestructive purification process for inorganic perovskite

作者: Yang, Tonghui; Zhang, Zhe; Ding, Yanli; Yin, Naiqiang

<https://www.proquest.com/scholarly-journals/nondestruct>

摘要: Lead halide perovskites have attracted much attention for perfectly modified perovskite colloidal quantum dots, ideal for

# 5.3 AIGC助力文献精读



文件是一篇关于钙钛矿太阳能电池优化的学术论文，主要包括：

1. **标题:** Optimization of sensitized perovskite solar cells with Zn-Cu-In-Se quantum dots to increase quantum efficiency
2. **作者:** Tohid Hajian 和 Sahbasadat Rajamand
3. **单位:** Department of Electrical Engineering, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran
4. **摘要:** 论文研究了Zn-Cu-In-Se量子点对薄膜钙钛矿太阳能电池性能的影响。通过模拟太阳能电池的开路电压、短路电流、光谱响应、效率和填充因子，讨论了钙钛矿层、电连接和量子点的规格对性能的影响。
5. **主要发现:**
  - 不使用量子点时，最佳性能在高电极工作函数为3.5 eV和低电极工作函数为5.93 eV时达到，能量转换效率为21.53%。
  - 引入Zn-Cu-In-Se量子点的钙钛矿太阳能电池在相同条件下可达到33.56%的效率。
  - 量子点内部电场的增强有助于提高能量转换效率。
  - 使用量子点时，太阳能电池的可实现功率为0.275 mW/cm<sup>2</sup>，比不使用量子点的情况多35%。
6. **研究内容:**
  - 论文首先介绍了太阳能的有效利用是全球许多技术的主要目标，特别指出钙钛矿太阳能电池因其高效率（超过20%）和低成本而受到科学界的关注。
  - 详细讨论了钙钛矿太阳能电池的结构，包括作为光吸收层的钙钛矿化合物，以及电子传输层（ETL）的使用。
  - 论文提出了使用Zn-Cu-In-Se量子点和PTEG-1作为ETL的钙钛矿太阳能电池模型，并通过模拟结果展示了量子点对太阳能电池性能的积极影响。

整理这些文件的核心内容



Optimization\_of\_sens...

PDF, 2.71 MB

上传PDF文件

## 7. 模拟和分析方法:

- 使用三维Maxwell方程和有限差分方法（FDM）在时域内分析所提出的结构。
- 使用Newton-Raphson数值解来评估钙钛矿太阳能电池。
- Silvaco软件用于模拟结果，关注光谱特性和虚拟晶片制造。

8. **结论:** 量子点的使用可以显著提高钙钛矿太阳能电池的能量转换效率，并且通过改变量子点的周期性和钙钛矿层的摩尔系数可以进一步优化电池性能。

9. **版权声明:** 论文版权归作者所有，通过Springer Science+Business Media, LLC发布，并在2021年7月24日在线发表。

10. **参考文献:** 文章末尾列出了参考文献，表明研究建立在现有科学文献的基础之上。

论文的核心贡献在于提出了一种新的钙钛矿太阳能电池结构，通过使用Zn-Cu-In-Se量子点来提高太阳能电池的量子效率和能量转换效率。通过模拟和理论分析，论文展示了量子点如何影响电池性能，并确定了优化太阳能电池性能的关键参数。



# 多维度文献解读



Zn-Cu-In-Se量子点对钙钛矿太阳能电池性能的影响主要体现在以下几个方面：

- 增强光吸收：**量子点具有尺寸可调的带隙，这使得它们能够吸收特定波长的光。在钙钛矿太阳能电池中，量子点可以增强对太阳光谱中特定区域的吸收，从而提高光能的利用效率。
- 提高能量转换效率：**论文中的模拟结果表明，引入Zn-Cu-In-Se量子点的钙钛矿太阳能电池在相同条件下比不使用量子点的电池有更高的能量转换效率（高达33.56%，而后者为21.53%）。
- 电场强度增加：**量子点内部以及钙钛矿层内的电场强度增加，有助于减少载流子（电子和空穴）的复合，从而提高太阳能电池的能量转换效率。
- 优化电极工作函数：**通过调整量子点的规格，可以优化电极的工作函数，进而影响太阳能电池的开路电压和短路电流，这也是提高电池性能的一个重要因素。
- 提高功率输出：**使用Zn-Cu-In-Se量子点的太阳能电池可实现的功率为0.275 mW/cm<sup>2</sup>，比不使用量子点的电池多出35%。
- 光谱响应改善：**量子点的引入导致了在特定波长下的光谱响应改善，这有助于电池更有效地响应太阳光谱。
- 减少载流子复合：**量子点可以作为载流子的陷阱中心，减少电子-空穴对的复合，从而提高电池的效率。
- 结构和尺寸效应：**量子点的尺寸和周期性对太阳能电池的性能也有影响。论文中提到，量子点的周期性降低（即密度增加）时，太阳能电池的效率提高。
- 环境稳定性：**量子点可能有助于提高钙钛矿材料的环境稳定性，尽管论文中没有直接提及这一点，但这是量子点在太阳能电池中应用的一个潜在优势。

总的来说，Zn-Cu-In-Se量子点通过多种方式优化了钙钛矿太阳能电池的性能，包括增强光吸收、提高能量转换效率、增加电场强度、改善光谱响应以及减少载流子复合等。这些效应共同作用，使得太阳能电池的整体性能得到了显著提升。

复制 再试一次 分享



Zn-Cu-In-Se量子点在钙钛矿太阳能电池中的具体作用机制是什么？ >

除了Zn-Cu-In-Se量子点，还有哪些类型的量子点可以用于提升钙钛矿太阳能电池的性能？ >

随时@你想要的Kimi+ 使用各种能力



我想知道Zn-Cu-In-Se量子点是如何影响钙钛矿太阳能电池性能的？



随时@你想要的Kimi+ 使用

提出问题，生成内容

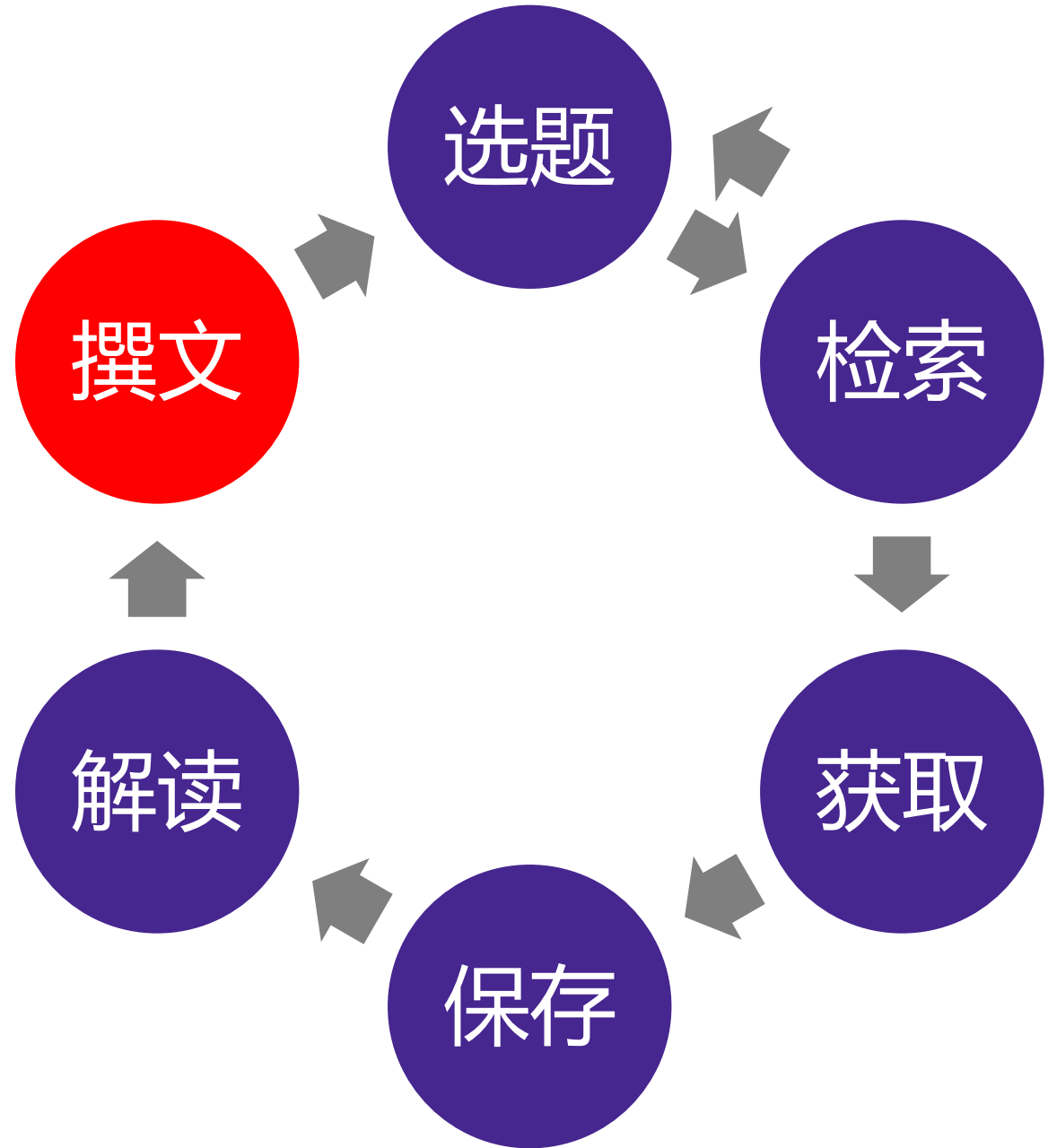


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# 在学习研究中运用 ProQuest Central

案例研究：从选题  
到撰文



# 6 撰文 (辅助完成参考文献)

自动保存 文档1 - Word 搜索 Jim Wang

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层属性保持一致。在本文中，我们从优化的角度说明了系统感知机器学习的影响，优化是制定和解决大多数机器学习问题的关键组成部分。[1, 2]

通常，优化方法的性能是根据精度来衡量的（也就是说，它是否实现了正确的机器学习模型？）和收敛率（经过多少次迭代？）。但是，在现代计算体系中，为了获得最佳的整体性能，还必须考虑与系统相关的许多方面。这些方面的范围可以从低级细节（例如数据结构或机器规格）到更高级的概念（例如通信和计算之间的权衡）不等。[3]

[1] Y. Huang, "Preservation of Patient Level Privacy: Federated Classification and Calibration Models," Ph.D., University of California, San Diego, United States -- California, 27540024, 2020. [Online]. Available: <https://www.proquest.com/dissertations-theses/preservation-patient-level-privacy-federated/docview/2388018445/se-2?accountid=211713>

[2] K. Lin, "Collaborative Learning: Theory, Algorithms, and Applications," Ph.D., Michigan State University, United States -- Michigan, 28087927, 2020. [Online]. Available: <https://www.proquest.com/dissertations-theses/collaborative-learning-theory-algorithms/docview/2444923940/se-2?accountid=211713>

[3] A. Marcedone, "Secure Computation in the Real World," Ph.D., Cornell University, United States -- New York, 13861475, 2019. [Online]. Available: <https://www.proquest.com/dissertations-theses/secure-computation-real-world/docview/2241639204/se-2?accountid=211713>

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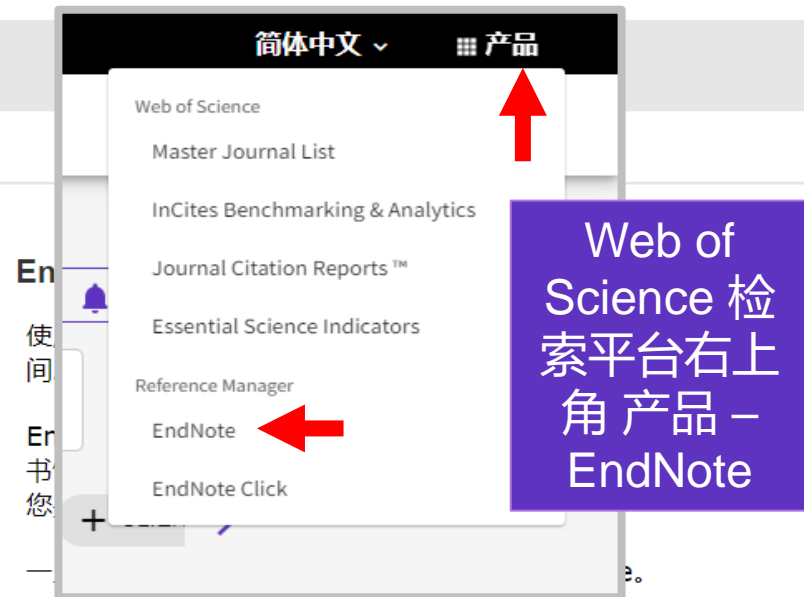
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## 讲座小结

# 通过本讲座，我们学习了

- 了解ProQuest Central数据库，及ProQuest平台所收录学术资源及其优势
- 结合Web of Science等学术资源，如何在学习和研究过程中更好利用ProQuest Central数据库学术资源，让选题、检索、获取、保存、解读、撰文变得更加轻松和高效

# 更多帮助

## 中文公开课

<https://proquest.libguides.com/webinar>  
(中文)



## 数据库在线指南

<https://proquest.libguides.com/>



## 全球公开课

<https://clarivate.com/research-solutions-live-training/> (英语等语种)



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# 谢谢!

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