

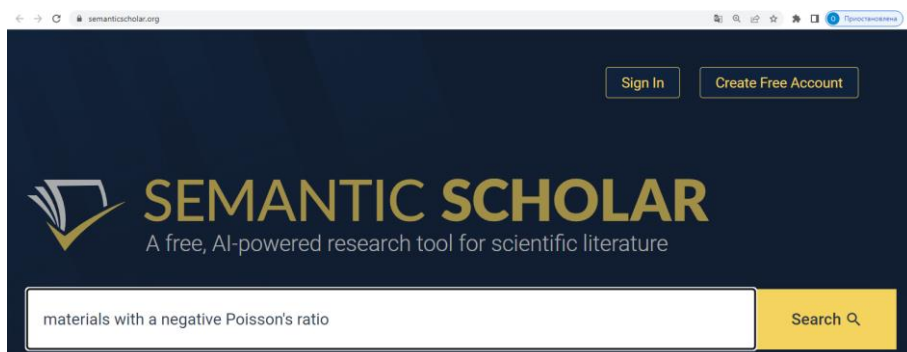
## Поиск статей

<b>Поисковой запрос</b>	Материалы с отрицательным коэффициентом Пуассона
<b>Виды работ</b>	Поиск статей. Сохранение статей в виде pdf файлов. Обзор статей. Получение файлов bib для списка литературы. Получение данных о цитировании и ссылках на другие статьи.
<b>Используемые ИИ-сервисы и нейросети</b>	Semanticscholar Elicit Litmaps
<b>Результат</b>	<p>Произведен поиск статей на заданную тему с помощью сервисов ИИ Semanticscholar, Elicit, Litmaps.</p> <p>Получены pdf файлы статей для дальнейшего изучения с помощью сервисов ИИ Semanticscholar, Elicit.</p> <p>С помощью сервиса ИИ Elicit для найденных статей получены данные о методах исследования (добавление столбца Methodology).</p> <p>С помощью сервиса Litmaps получены файлы bib (для создания списка литературы в файлах LaTeX).</p> <p>С помощью сервиса Litmaps получены данные о цитировании и ссылках на другие статьи.</p> <p>С помощью сервиса ИИ Elicit получено Summary – обзор статей на заданную тему.</p>

# Поиск статей

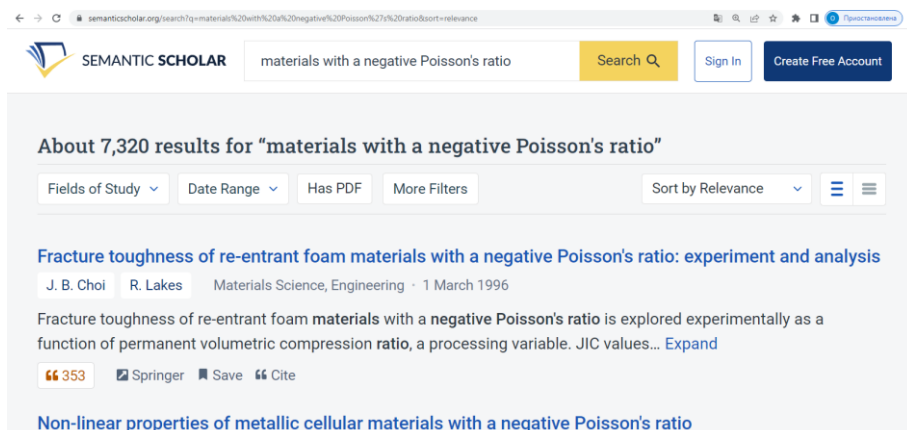
## Работа с Semantic Scholar <https://www.semanticscholar.org/>

Запрос: materials with a negative Poisson's ratio



## Результат поиска без фильтров

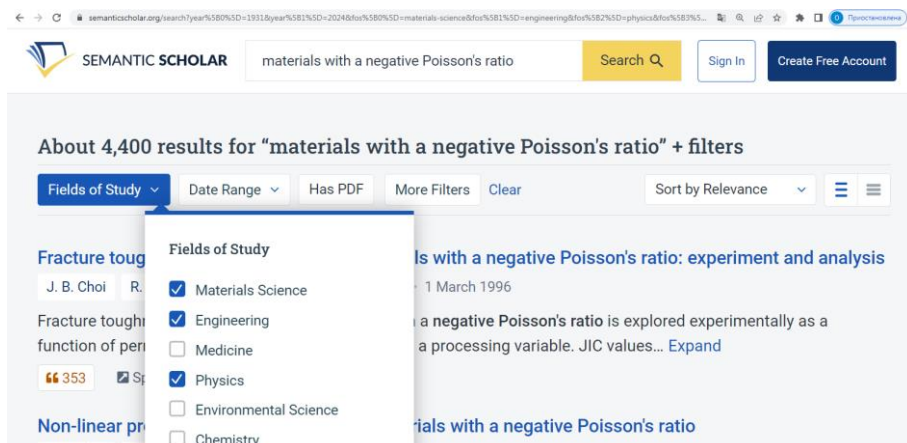
Найдено 7320 статей



## Настройка параметров поиска

### Области исследования. Fields of Study

Найдено 4400 статей



# Диапазон дат. Date Range

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About 2,780 results for "materials with a negative Poisson's ratio" + filters

Fields of Study Date Range Has PDF More Filters Clear Sort by Relevance

Three Decades of Auxetic Materials: A Review  
K. Saxena R. Das E. Calius  
Material properties can be tailored for smart materials, metamaterials, and architected materials. With this concept, a lot of  
440 Wiley Save Cite

Design and testing of 3D-printed micro-architected polymer materials exhibiting a negative Poisson's ratio

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Fields of Study Date Range Has PDF More Filters Clear Sort by Relevance

Design and testing of 3D-printed micro-architected polymer materials exhibiting a negative Poisson's ratio  
Filippo Agnelli A. Constantinescu Grigor Nika Materials Science, Engineering  
Continuum Mechanics and Thermodynamics · 7 September 2018  
This work proposes the complete design cycle for several auxetic materials where the cycle consists of three steps (i) the design of the micro-architecture, (ii) the manufacturing of the material and... Expand  
24 [PDF] Springer Save Cite

# Дополнительные фильтры

По авторам

More Filters

Authors

- Joseph N. Grima (20)
- K. Evans (3)
- A. Alderson (10)

# Ведущие журналы и конференции. Top Journals & Conferences

## Top Journals & Conferences

- Radiology (4)
- Materials (50)
- Scientific Reports (30)
- PLoS ONE (4)
- Physical Chemistry, Chemical Physics - PCCP (10)

Если применить фильтр:

## Authors

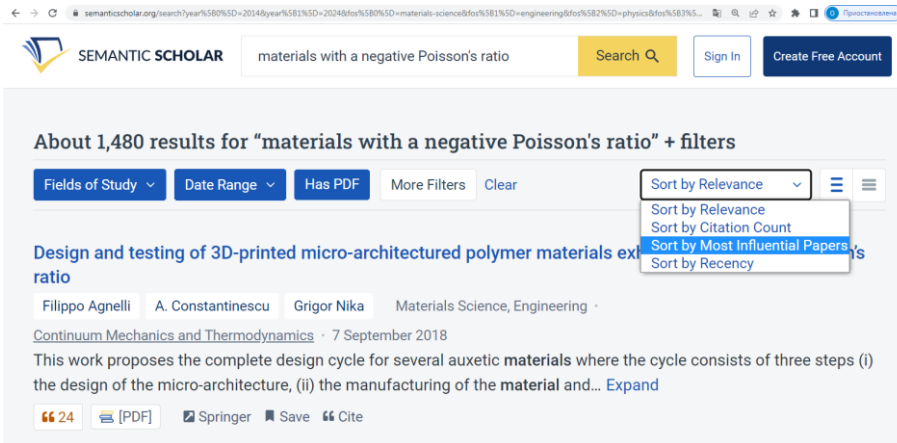
- Joseph N. Grima (0)
- K. Evans (0)
- A. Alderson (0)
- Fabrizio Scarpa (0)
- Dmitry S. Lisovenko (7)

То результат будет такой:

## Найдено 7 статей

The screenshot shows a search on Semantic Scholar for "materials with a negative Poisson's ratio". The search results are filtered to show 7 results. The first result is titled "Variability of elastic properties of chiral monoclinic tubes under extension and torsion" by Mikhail Volkov, V. Gorodtsov, and D. Lisovenko, published in *Letters on Materials* in May 2019. The abstract mentions the analysis of variability of Young's modulus, Poisson's ratios, and torsional properties. The second result is "The Extreme Values of Young's Modulus and the Negative Poisson's Ratios of Rhombic Crystals".

# Сортировка

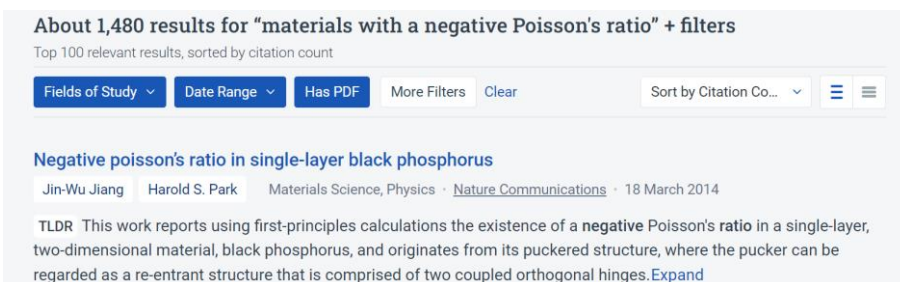


Доступна сортировка по следующим категориям:

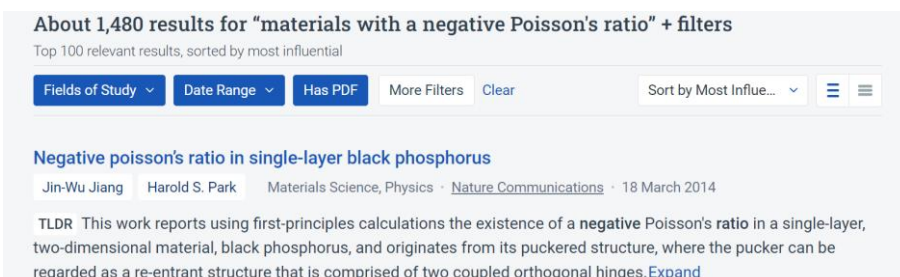
## Sort by Relevance. Сортировка по релевантности



## Sort by Citation Count. Сортировка по количеству цитат



## Sort by Most Influential Papers. Сортировка по наиболее значимым статьям



## Sort by Recency. Сортировка по новизне

About 1,480 results for "materials with a negative Poisson's ratio" + filters  
Top 100 relevant results, sorted by date

Fields of Study ▾ Date Range ▾ Has PDF More Filters Clear Sort by Recency ▾ ☰ ☰

**Interpenetrating Composites with Enhanced Stiffness, Desired Poisson's Ratio and Superior Conductivity**  
H. Zhu Z. Zhang Materials Science, Engineering · Proceedings of the Cardiff University School of... · 18 November 2024

Fibre matrix debonding, fibre pullout, delamination and mechanical anisotropy are the main common disadvantages of most fibre-reinforced composites. Interpenetrating phase composites (IPCs), however,... [Expand](#)

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**Negative Poisson's ratio of sulfides dominated by strong intralayer electron repulsion.**  
Yucheng Zhu Xiaofei Cao Shuaijun Yang Jun Hu Baotong Li Zhong Chen  
Materials Science, Physics · [Physical Chemistry, Chemical Physics - PCCP](#) · 24 July 2024  
Geometrical variations in a particular structure or other mechanical factors are often cited as the cause of a negative Poisson's ratio (NPR). These factors are independent of the electronic... [Expand](#)  
PubMed **Save** Cite

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Если статья доступна для скачивания – This paper has an available open access PDF, то можно открыть и скачать файл.

**Negative Poisson's Ratio Lattice Structure with Chiral and Re-Entrant Properties**  
Yifei Luo Fulun Dai Jing Shen Aiqiu Wang Xiongzhi Jiang Yangbo Li  
Materials Science, Engineering · [Applied Sciences](#) · 8 December 2023  
Materials exhibiting negative Poisson's ratio (NPR) effects possess several advantageous properties, including high specific strength, specific stiffness, and impact resistance. As a result, they... [Expand](#)  
3 [PDF] **PDF** Save Cite

Результат:



Article

### Negative Poisson's Ratio Lattice Structure with Chiral and Re-Entrant Properties

Yifei Luo <sup>1</sup>, Fulun Dai <sup>2</sup>, Jing Shen <sup>3</sup>, Aiqiu Wang <sup>1</sup>, Xiongzhi Jiang <sup>1</sup> and Yangbo Li <sup>1,\*</sup>

<sup>1</sup> College of Hydraulic and Environmental Engineering, China Three Gorges University, Yichang 443002, China

<sup>2</sup> Three Gorges Group China Huashui Hydropower Development Co., Ltd., Chengdu 610041, China

<sup>3</sup> School of Transportation Science and Engineering, Beihang University, Beijing 100191, China

\* Correspondence: liyangbo@ctgu.edu.cn

**Abstract:** Materials exhibiting negative Poisson's ratio (NPR) effects possess several advantageous properties, including high specific strength, specific stiffness, and impact resistance. As a result, they hold significant importance in various industries such as aerospace, medicine, transportation, sports, and other related fields. In the realm of natural materials, the NPR effect is infrequent. Consequently, the creation of an NPR structure necessitates a manual design. In this paper, we present an architected lattice system inspired by ancient Chinese window grills. The proposed system exhibits a unique combination of chiral and re-entrant properties. Experiments and numerical simulations were conducted in order to quantify the variation in NPR and elucidate the deformation mechanism of window grill structures. We observed a significant NPR effect in our designed structure, which was found to be dependent on the geometric parameters of the structure. The present study provides a foundation for the development of a new category of partially auxetic lattice metamaterials and the expansion of their design possibilities.

**Keywords:** mechanical metamaterial; negative Poisson's ratio; finite element analysis; tensile test



#### 1. Introduction

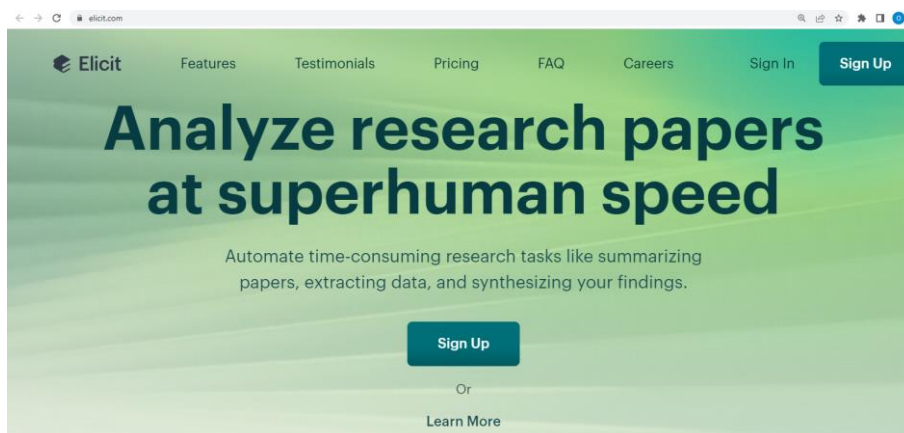
With the advancement of contemporary engineering technology, there is a growing



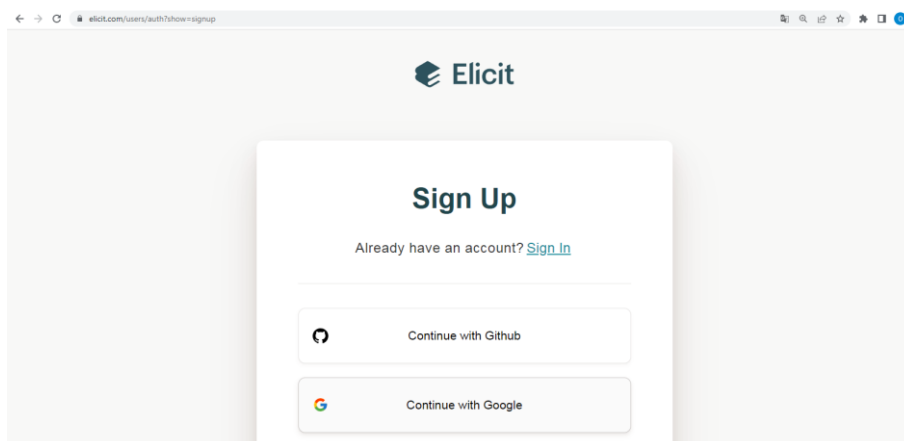
# Работа в сервисе ИИ Elicit

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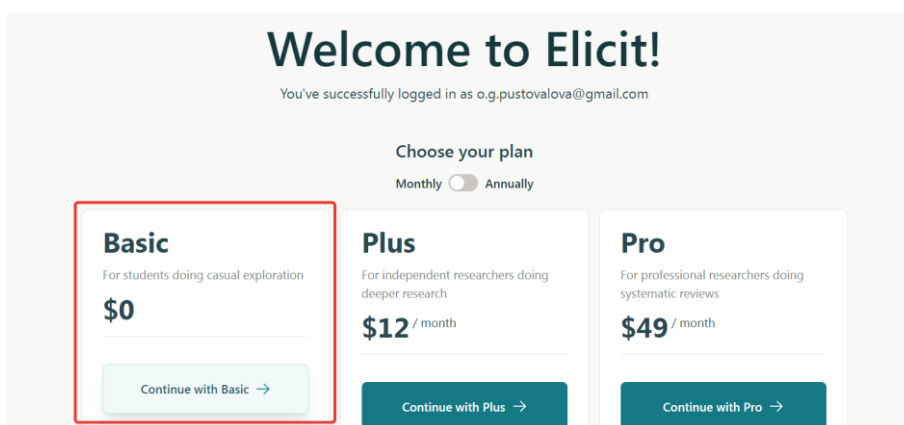
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# Tell us about yourself

1 → What's your name?\*

Type your answer here...

**OK** press Enter ↵

6 → How did you hear about Elicit?  
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<input type="checkbox"/> G Friend	<input type="checkbox"/> H Colleague	<input type="checkbox"/> I Teacher or professor
<input checked="" type="checkbox"/> J Through my institution ✓	<input type="checkbox"/> K Blog post	<input type="checkbox"/> L Other social media site
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### Запрос: materials with a negative Poisson's ratio

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## Exploring Negative Poisson's Ratio Materials

materials with a negative Poisson's ratio

Summary of top 4 papers Copy

Materials with negative Poisson's ratio, also known as auxetic materials, exhibit the unusual property of expanding laterally when stretched and contracting when compressed (Carneiro et al., 2013; Evans & Alderson, 2000). These materials have attracted significant attention due to their unique mechanical properties and potential applications in aerospace, defense, and other fields (Huang & Chen, 2016). The negative Poisson's ratio is closely related to the material's internal structure and can occur in various forms, including bulk materials and nanoscale structures (Huang & Chen, 2016). Auxetic materials have been shown to have unique properties compared to

Add new step

## Сортировка и фильтры

Sort: Most relevant Filters Export as UPGRADE

Paper	Abstract summary
<input type="checkbox"/> Negative Poisson's Ratio in Modern Functional Materials Chuanwei Huang +1 Advances in Materials 2016 - 257 citations DOI	Materials with a negative Poisson's ratio physical properties and promising applic
<input type="checkbox"/> Auxetic Materials: An Annotated Bibliography of Materials With Negative Poisson's Ratio P. Dubbelday 1993 - 3 citations	This paper provides an annotated bibliog with a negative Poisson's ratio, also know materials.

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- Most relevant ✓
- Most recent
- Least recent
- Most cited
- Least cited
- Title (alphabetical)

Paper	Abstract summary
<input type="checkbox"/> Negative Poisson's Ratio in Modern Functional Materials Chuanwei Huang +1 Advances in Materials 2016 - 257 citations DOI	Materials with a negative Poisson's ratio physical properties and promising applic
<input type="checkbox"/> Auxetic Materials: An Annotated Bibliography of Materials With Negative Poisson's Ratio P. Dubbelday 1993 - 3 citations	This paper provides an annotated bibliog with a negative Poisson's ratio, also know materials.

## Самые цитируемые:

The screenshot shows a search results interface. At the top, there is a navigation bar with a dropdown menu set to 'Sort: Most cited', a 'Filters' button, an 'Export as' dropdown, and an 'UPGRADE' button. Below this is a table with two columns: 'Paper' and 'Abstract summary'. The first row of the table contains the following information:

Paper	Abstract summary
<input type="checkbox"/> 3D Soft Metamaterials with Negative Poisson's Ratio Sahab Babaee +5 Advances in Materials 2013 · 664 citations DOI	The paper describes the design of 3D so with a negative Poisson's ratio.

## Виды фильтров

### Доступность PDF файла

### Год публикации

**Квартиль журнала** (отражает уровень цитируемости, Q1 – самый ВЫСОКИЙ)

The screenshot shows a filter panel with the following elements:

- Buttons: 'Cancel' and 'Apply'.
- Toggle: 'Has PDF' (currently off).
- Slider: 'Publication year' ranging from 'Any year' to '2024'.
- Slider: 'Journal quality' ranging from 'Q1' to 'All'.

## Тип исследования

### Review – обзорная статья

### RCT – рандомизированное контролируемое исследование

(тип научного эксперимента или исследования вмешательства, целью которого является уменьшение определенных источников предвзятости при тестировании эффективности новых методов лечения; это достигается путем случайного распределения испытуемых в две или более групп, лечения их по-разному, а затем сравнения их по отношению к измеренному ответу).

## Meta-Analysis – мета-анализ

(понятие научной методологии; означает объединение результатов нескольких исследований методами статистики для проверки одной или нескольких взаимосвязанных научных гипотез).

### Study Type

- Review
- Meta-Analysis
- Systematic Review
- RCT
- Longitudinal

## Применим фильтр – регулярное продолжительное исследование:

### Study Type

- Review
- Meta-Analysis
- Systematic Review
- RCT
- Longitudinal

## Наличие или отсутствие ключевых слов в тезисах

### Abstract Keywords

✓ Abstract contains

Contains

Add

⊗ Abstract does not contain

Does not contain

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## Скопировать DOI

The screenshot shows a search results interface with the following elements:

- Sort: Most relevant
- Filters
- Export as
- UPGRADE
- Abstract summary
- Negative Poisson's Ratio in Modern Functional Materials
- Chuanwei Huang
- Advances in
- 2016 · 257 citations
- DOI
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## Краткое изложение тезисов

Sort: Most relevant Filters Export as UPGRADE

Abstract summary

isson's Ratio in Modern Functional

Materials with a negative Poisson's ratio have intriguing physical properties and promising applications.

ei Huang +1

as in Materials

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<input checked="" type="checkbox"/>	<b>3D Soft Metamaterials with Negative Poisson's Ratio</b> Sahab Babae +5 Advances in Materials 2013 · 664 citations DOI	The paper describes the design of 3D so with a negative Poisson's ratio.	<b>Search or create a column</b> Describe what kind of data you want to extract e.g. Limitations, Survival time
<input checked="" type="checkbox"/>	<b>Microporous materials with negative Poisson's ratios. I. Microstructure and mechanical properties</b> B. D. Caddock +1 1989 · 426 citations DOI	Expanded polytetrafluoroethylene is a m with a large negative Poisson's ratio.	<b>ADD COLUMNS</b> + Summary + Main findings + Methodology + Intervention + Outcome measured

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**3D Soft Metamaterials with Negative Poisson's Ratio**

Sahab Babae, Jongmin Shim, J. Weaver, E. R. Chen, N. Patel, K...

Advances in Materials

2013 · 664 citations Semantic Scholar DOI

Buckling is exploited to design a new class of three-dimensional metamaterials with negative Poisson's ratio. A library of auxetic building blocks is identified and procedures are defined to guide their selection and assembly. The auxetic properties of these materials are demonstrated both through experiments and finite element simulations and exhibit excellent qualitative and quantitative agreement.

## Следующие шаги

3 selected + Show more like these Delete Sort: Most relevant Filters 1 Export as UPGRADE

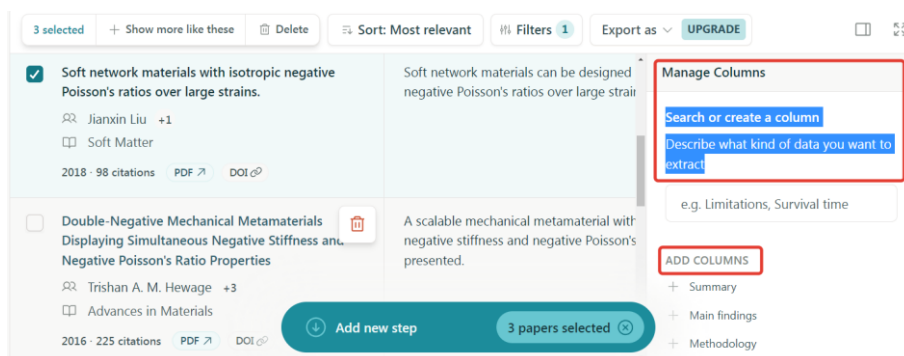
<input checked="" type="checkbox"/>	<b>Soft network materials with isotropic negative Poisson's ratios over large strains.</b> Jianxin Liu +1 Soft Matter 2018 · 98 citations PDF DOI	Soft network materials can be designed negative Poisson's ratios over large strain	<b>Manage Columns</b> <b>Search or create a column</b> Describe what kind of data you want to extract e.g. Limitations, Survival time
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Double-Negative Mechanical Metamaterials

Add new step 3 papers selected

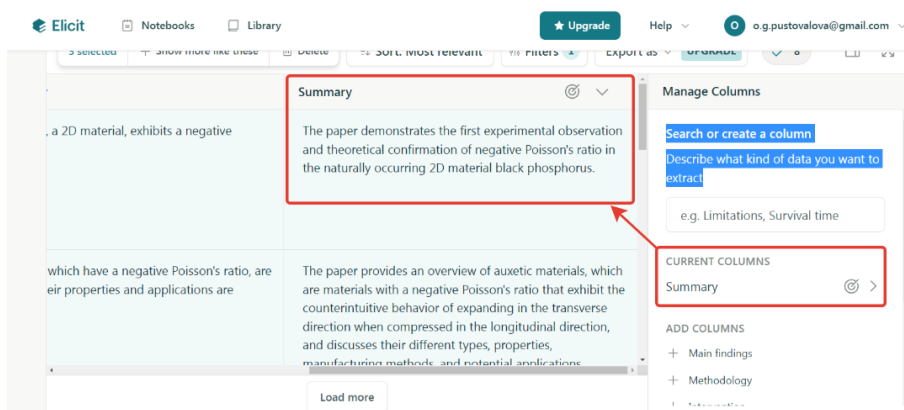
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Выполните поиск или создайте столбец. Опишите, какие данные вы хотите извлечь.



## Добавление столбца Summary

Summary: В статье демонстрируется первое экспериментальное наблюдение и теоретическое подтверждение отрицательного коэффициента Пуассона в природном двумерном материале черном фосфоре.



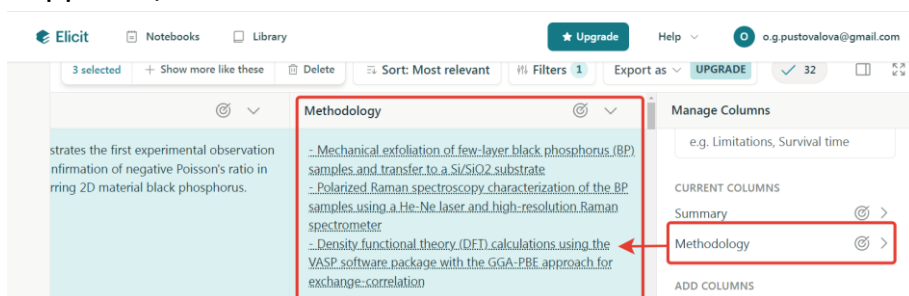
## Добавление столбца Methodology

Methodology:

- Механическое отслаивание образцов черного фосфора (ЧФ) и перенос их на подложку из Si/SiO<sub>2</sub>
- Определение характеристик образцов ЧФ методом поляризованной рамановской спектроскопии с использованием He-Ne лазера и рамановского спектрометра высокого разрешения

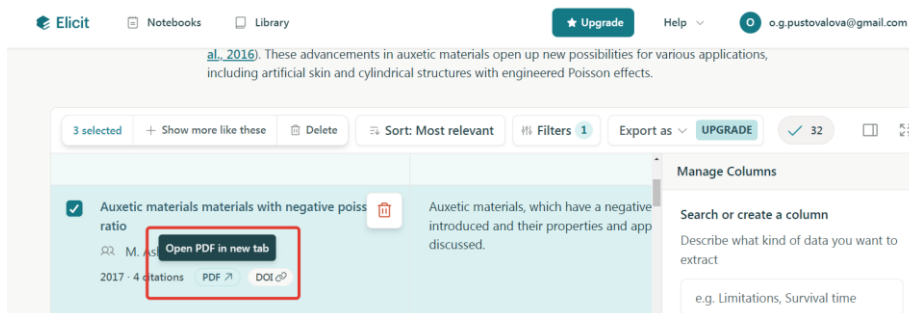


- Расчеты по теории функционала плотности (DFT) с использованием программного пакета VASP с использованием подхода GGA-PBE для корреляции обмена.



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### Auxetic materials materials with negative poisson's ratio

**Abstract**  
Auxetic materials and structures are a novel class of materials which have negative Poisson's ratio. They have improved mechanical properties such as fracture toughness, indentation resistance, etc. They have several potential applications in medical, sports, automobile, defense, etc. Design and modeling of auxetic materials is still in progress. In this article we briefly introduce these materials and their different features and properties.

**Keywords:** auxetic materials, poisson's ratio, mechanical properties

Volume | Issue 2 - 2017

**Mehrdad Ashjari,<sup>1</sup> Sanaz Saadatmand Hashemi,<sup>2</sup> Akbar Rasoulian<sup>1</sup>**  
<sup>1</sup>Faculty of Mechanical Engineering, University of Tabriz, Iran  
<sup>2</sup>Faculty of Mechanical Engineering, Khajeh Nasir-Toosi University of Technology, Iran

**Correspondence:** Mehrdad Ashjari, Faculty of Mechanical Engineering, University of Tabriz, Iran, Email mehرداد\_dts91@ms.tabrizu.ac.ir, mhd\_ashjari@yahoo.com

**Received:** July 22, 2017 | **Published:** September 07, 2017

#### Introduction

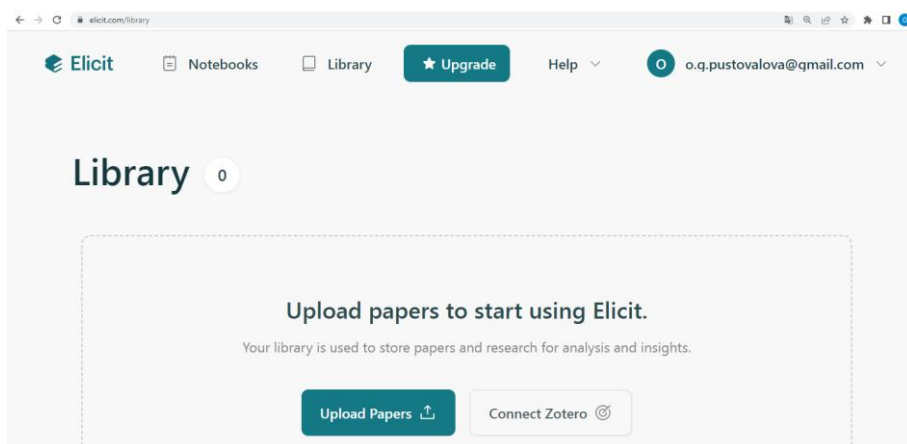
Auxetic materials are those which show counter-intuitive reaction to the applied force meaning, in contrast to the materials which thin transversely under axial tensile force, these materials thicken. Poisson's ratio is a measure of the transverse strain relative to longitudinal strain Fung et al.<sup>1</sup> Claimed that the Poisson's ratio is bounded between -1 and 0.5 for a linear elastic isotropic material. Cork is the material with zero Poisson's ratio. It was shown in the work of Ting<sup>2</sup> that for anisotropic materials, Poisson's ratio can be positive and negative on the condition that the strain energy density function is positive and definite. Then the negative Poisson's ratio can be achieved in the man-made materials. Unlike the conventional materials Auxetic materials get shorter in transverse direction when they compressed in the longitude direction and vice versa. Auxetic materials have different potential applications in different fields such

#### Different types of auxetic structures and models

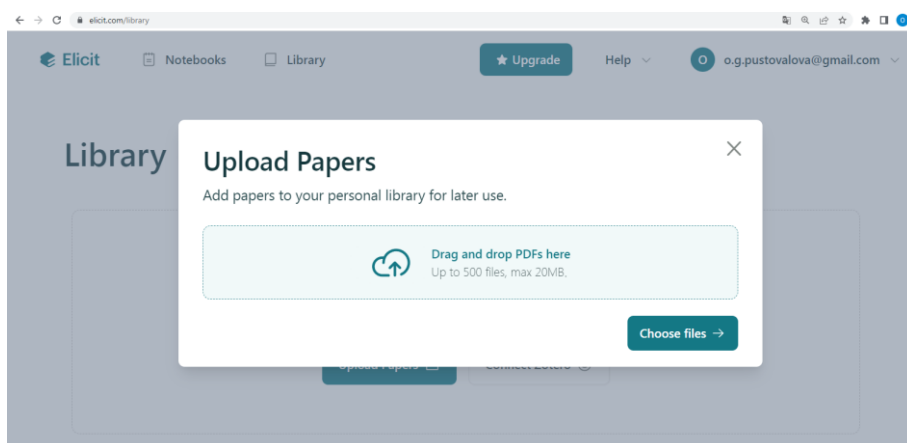
Here in this part we present first Eigen modes of 2D structures with periodic boundary conditions. Taking into account the periodic boundary conditions, Figure 2 shows the first Eigen modes of the hexagonal, quadratic as well as triangular 2D basic cell. There is a direct relationship between the number of nodes and number modes. The number of modes increases with the number of nodes in the basic element. In particular, the number of nodes for the triangular, quadratic and hexagonal basic elements is 3, 4 and 6 respectively which explains the dependence of the number of modes on the unit cell types noted in the Figure 2. For each lattice cell, these Eigen modes were assembled to form a periodic lattice structure. Numerical testing performed by applying a negative strain in the x-y direction.<sup>5</sup>

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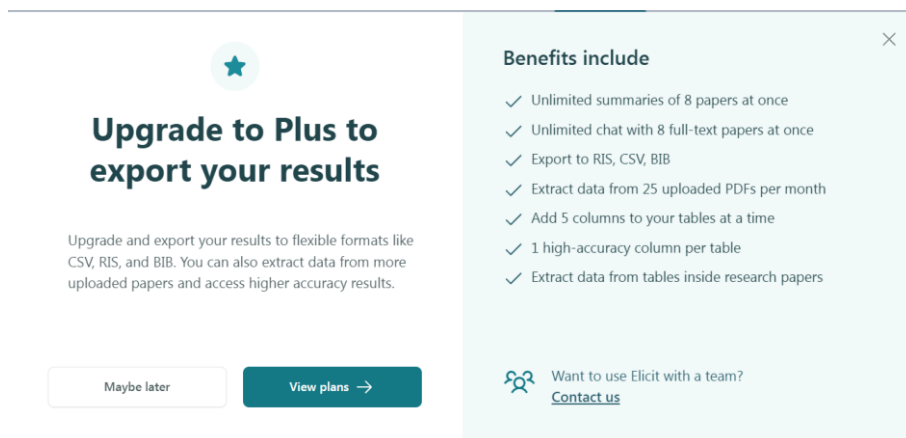
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## Результаты. Summary

В ходе недавних исследований были изучены материалы с отрицательным коэффициентом Пуассона, известные как ауксетические материалы. Черный фосфор, двумерный материал, обладает отрицательным коэффициентом Пуассона из-за своей сморщенной структуры и шарнирного соединения (Du et al., 2016).

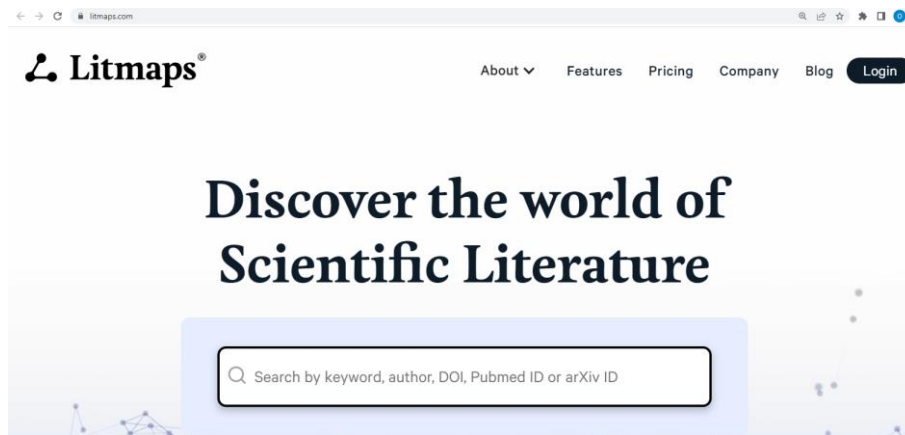
Ауксетические материалы сжимаются в поперечном направлении при сжатии и расширяются при растяжении, в отличие от обычных материалов (Ashjari et al., 2017). Мягкие сетчатые материалы с изотропными отрицательными коэффициентами Пуассона при больших деформациях были разработаны с использованием зигзагообразных микроструктур, что потенциально может найти применение в биомедицинских устройствах и инженерии (Liu & Zhang, 2018).

Эти материалы могут быть подобраны таким образом, чтобы достичь коэффициента Пуассона от -1 до 1 при диапазоне деформаций до 90%. Кроме того, механические метаматериалы, обладающие как отрицательной жесткостью, так и отрицательным коэффициентом Пуассона, были созданы с использованием взаимосвязанных гексагональных субъединиц со встроенными элементами отрицательной жесткости (Hewage et al., 2016).

Эти достижения в области ауксетических материалов открывают новые возможности для различных применений, включая искусственную кожу и цилиндрические конструкции с искусственным эффектом Пуассона.

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