リサーチコネクト
Re:Dive

-キャルちゃんの論文チェック、その裏側-

キャルちゃん

06/01/2023

自己紹介

- キャルちゃん(とtwitterでは名乗らせていただいております)
- (量子)アニーリング, 組合せ最適化, 量子回路 @ Jij Inc.
- 大学院生時代
  - 磁気流体計算で銀河磁場の研究
  - スパコンで走らせるソフトウェアをC言語で開発
  - アウトリーチ活動
- 結婚を機に🇺🇸ユタ州に移住 (2020年8月~)
-  : https://twitter.com/tweetnakasho
- website: https://github-nakasho.github.io

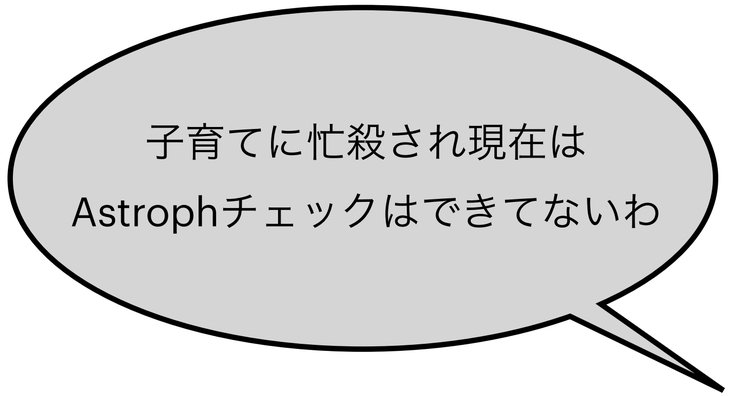
Outline

- キャルちゃんの論文チェック
- ArXivとは
- 論文チェックの仕方
- 例を実演
- 論文を読んだ後は...
- 結言

キャルちゃんの論文チェック

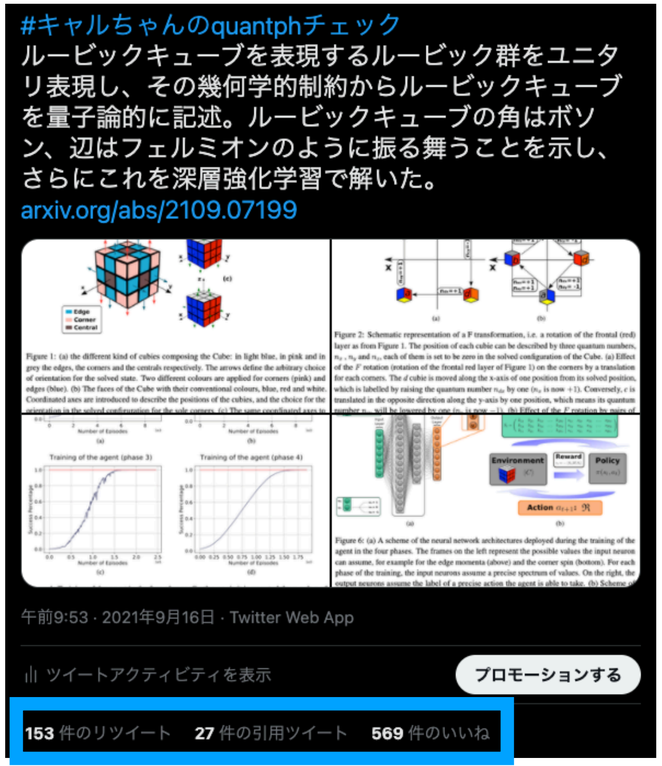
キャルちゃんの論文チェックとは？

- astrophチェック: 宇宙物理系のarXiv新着論文チェック
  ~~毎日夜7時(日本時間では昼10時)ごろTwitter TLに流す~~
- quantphチェック: 量子情報系のarXiv新着論文チェック
  毎日昼過ぎ3時(日本時間では朝6時)ごろTwitter TLに流す



キャルちゃんの論文チェックのメリット

- どんな研究が世界で行われているかのキャッチアップ
- 世の中より先に知識を仕入れることができる
- Twitterでみんなから注目される (たまにプチバズする



勉強のモチベーションは
人それぞれよね

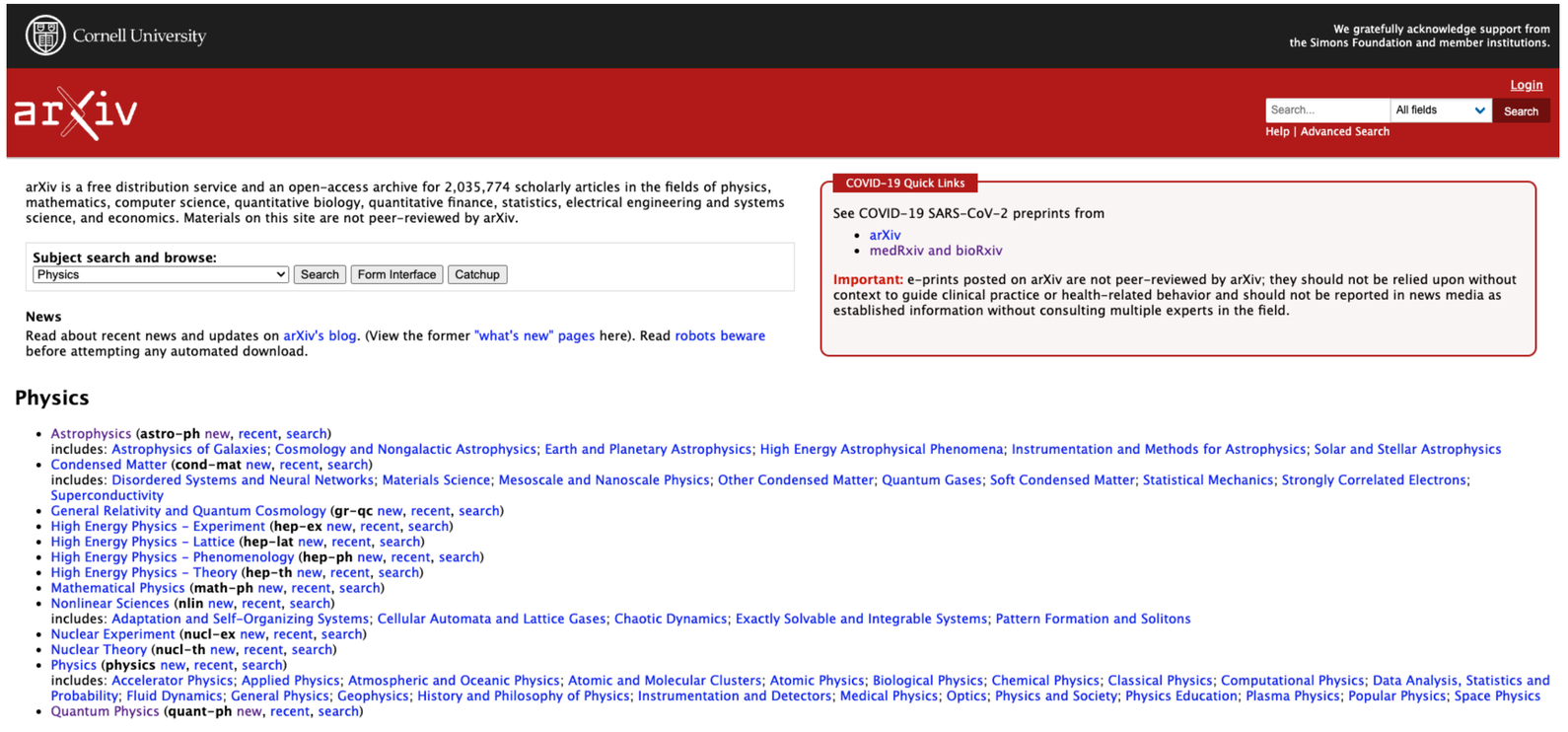
キャルちゃんの論文チェックのデメリット

- 自分の時間が取られる (他にやりたいことがあるのに...
- 正しく要約できているか不安になる (英語力とその分野の理解
- 純粋に日々続けるのが辛かったりする

ArXivとは

チェックしているwebsite

- アーカイブ: https://arxiv.org/
- 世界中の人が査読済み論文や研究ノート・講義ノートを投稿している
- 査読というシステムがないので、信頼性は査読雑誌よりは低い？



ArXivの分類

- Physics
  (Astrophysics, Condensed Matter, General Relativity and Quantum Cosmology, High Energy Physics, Mathematical Physics, Nonlinear Science, Nuclear Physics, Physics, Quantum Physics)
- Mathematics
- Computer Science
- Quantitative Biology
- Statistics
- Electrical Engineering and System Science
- Economics

チェックしている場所

- アーカイブの”new”の部分

Physics

- Astrophysics (**astro-ph** new, recent, search)
  includes: Astrophysics of Galaxies; Cosmology and Nongalactic Astrophysics; Earth and Planetary Astrop
- Condensed Matter (**cond-mat** new, recent, search)
  includes: Disordered Systems and Neural Networks; Materials Science; Mesoscale and Nanoscale Physics; Superconductivity
- General Relativity and Quantum Cosmology (**gr-qc** new, recent, search)
- High Energy Physics - Experiment (**hep-ex** new, recent, search)
- High Energy Physics - Lattice (**hep-lat** new, recent, search)
- High Energy Physics - Phenomenology (**hep-ph** new, recent, search)
- High Energy Physics - Theory (**hep-th** new, recent, search)
- Mathematical Physics (**math-ph** new, recent, search)
- Nonlinear Sciences (**nlin** new, recent, search)
  includes: Adaptation and Self-Organizing Systems; Cellular Automata and Lattice Gases; Chaotic Dynam
- Nuclear Experiment (**nucl-ex** new, recent, search)
- Nuclear Theory (**nucl-th** new, recent, search)
- Physics (**physics** new, recent, search)
  includes: Accelerator Physics; Applied Physics; Atmospheric and Oceanic Physics; Atomic and Molecular (Probability; Fluid Dynamics; General Physics; Geophysics; History and Philosophy of Physics; Instrumenta
- Quantum Physics (**quant-ph** new, recent, search)

Cornell University

arXiv > astro-ph

Astrophysics

New submissions

Submissions received from Tue 15 Mar 22 to Wed 16 Mar 22, announced Thu, 17 Mar 22

- New submissions
- Cross-lists
- Replacements

[total of 101 entries: **1-101**]
[showing up to 2000 entries per page: fewer | more]

New submissions for Thu, 17 Mar 22

[1] arXiv:2203.08151 [pdf, other]

Magnetic Field Reversal around an Active Fast Radio Burst

S. Dai, Y. Feng, Y. P. Yang, Y. K. Zhang, D. Li, C. H. Niu, P. Wang, M. Y. Xue, B. Zhang, S. Burke-Cruces, G. Hobbs, C. C. Miao, J. R. Niu, M. D. Filipovic, S. Q. Zhu

Comments: Submitted
Subjects: **High Energy Astrophysical Phenomena (astro-ph.HE)**; Astrophysics of Galaxies (astro-ph.GA)

The environment of actively repeating fast radio bursts (FRBs) has been shown to be complex and varyin second FRB source associated with a compact, persistent radio source (PRS). The main tracer of the magr and electron density, which does not allow a direct probe of the B-field configuration. Here we report dir changed from ~ 10000 rad m^{-2} to ~ -16000 rad m^{-2} between June 2021 and January 2022. Such extr B-field configuration in or around the FRB could be due to the vicinity of massive black holes, or a magn

[2] arXiv:2203.08152 [pdf, other]

CMB lensing power spectrum with next generation surveys

Louis Legrand, Julien Carron

Comments: Contribution to the 2022 Cosmology session of the 56th Rencontres de Moriond, 2 pages, 2 figures
Subjects: **Cosmology and Nongalactic Astrophysics (astro-ph.CO)**

We introduce a new estimator of the CMB lensing power spectrum, together with its likelihood, based on standard quadratic estimator. Most importantly, it is unbiased towards the assumptions done on the noi compared to the quadratic estimator, while keeping numerical cost under control and being robust to er

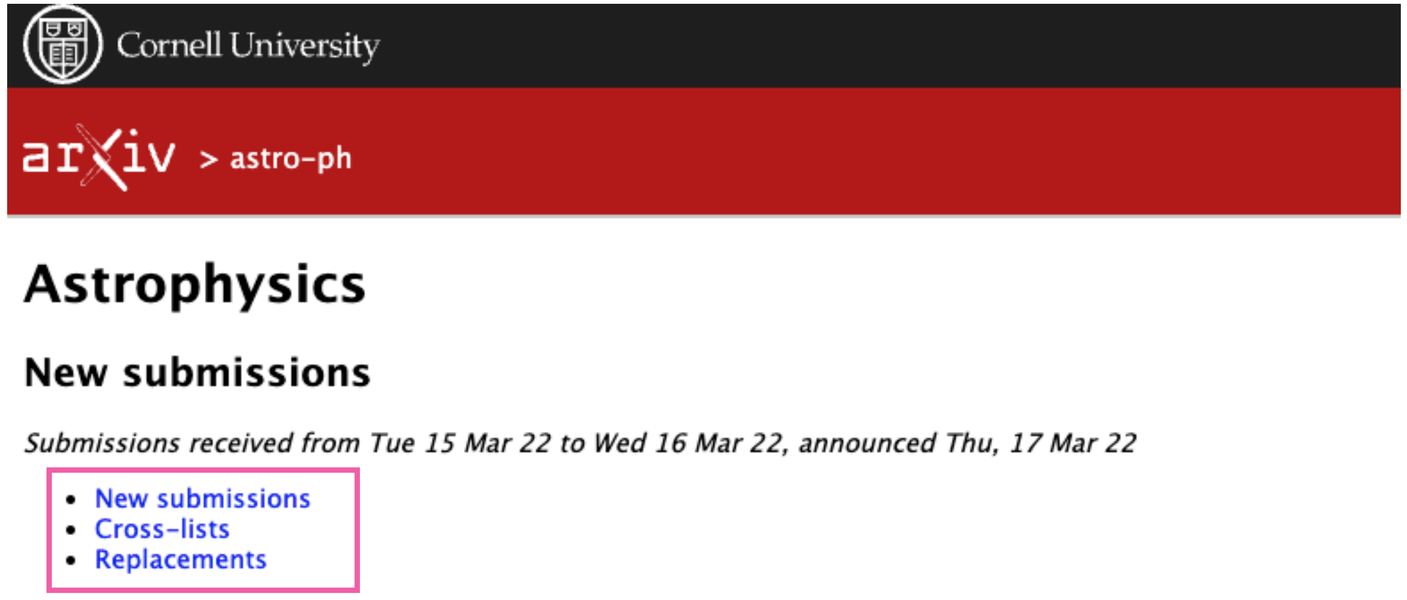
[3] arXiv:2203.08153 [pdf, other]

NGC 1605 is not a binary cluster

Friedrich Anders, Alfred Castro-Ginard, Juan Casado, Carme Jordi, Lola Balaguer-Núñez

チェックしている場所

- New submissions: そのトピックスに沿った投稿論文
- Cross-lists: そのトピックスがメインではないが、サブとして入っている投稿論文
  (例: メインはgr-qcだが、天体物理も絡むのでastro-phも入っているなど)
- Replacements: 以前に投稿されたものの再投稿



ArXivに掲載される本数

- Astroph: 平均50-70本 (多い日で100本越え)

  -> その中から個人的に面白いと思ったものを5-8本くらい抽出

- Quantph: 平均20-40本 (多い日で60本くらい)

  -> 同じく10-20本くらい抽出

論文チェックの仕方

論文チェックの流れ

1. Titleを読む

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Comments: Submitted

Subjects: **High Energy Astrophysical Phenomena (astro-ph.HE)**; Astrophysics of Galaxies (astro-ph.GA)

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Comments: Accepted by RNAAS. 2 pages, 1 figure. Online material here: this https URL

Subjects: **Astrophysics of Galaxies (astro-ph.GA)**; Solar and Stellar Astrophysics (astro-ph.SR)

The open star cluster NGC 1605 has recently been reported to in fact consist of two clusters (one intermediate-aged and one old) that merged via a flyby capture. Here we show that Gaia data do not support this scenario. We also report the serendipitous discovery of a new open cluster, Can Batll\'o 1, with a similar age and distance.

[4] arXiv:2203.08155 [pdf, other]

Weak Mass Loss from the Red Supergiant Progenitor of the Type II SN 2021yja

Griffin Hosseinzadeh, Charles D. Kilpatrick, Yize Dong, David J. Sand, Jennifer E. Andrews, K. Azalee Bostroem, Daryl Janzen, Jacob E. Jencson, Michael Lundquist, Nicolás Meza, Jeniveve Pearson, Stefano Valenti, Samuel Wyatt, Jamison Burke, Daichi Hiramatsu, D. Andrew Howell, Curtis McCully, Megan Newsome, Estefania Padilla Gonzalez, Craig Pellegrino, Giacomo Terreran, Katie Auchettl, Kyle W. Davis, Ryan J. Foley, Hao-

論文チェックの流れ

2. Titleを読んで「面白そう」「自分に必要」と感じたら、abstractを読む

(Titleだけで判断できなければabstractで判断しても良い)

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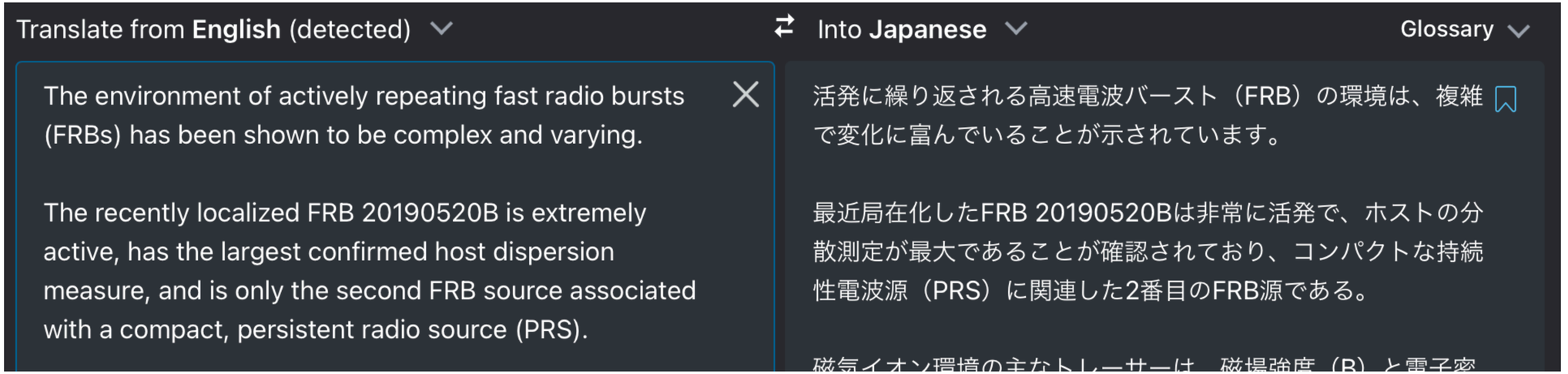
論文チェックの流れ

3. 躊躇なくabstractをDeepLにぶち込む

(専門用語やカンマ区切りの多い文章などは正しく訳せない場合があるので、日本語と英語を照らし合わせながら読む)

(論文のabstractは1000-1500字程度、DeepLは無料で5000字まで翻訳可能)

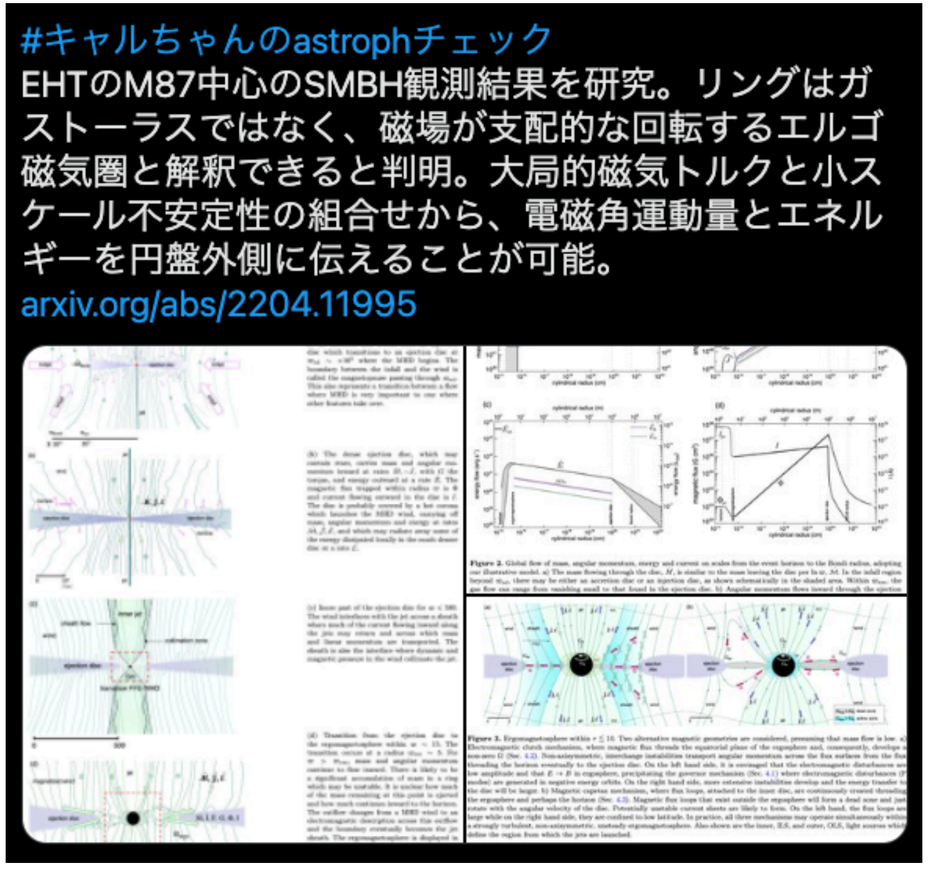
(DeepLの画面で見やすいように改行を入れると良い)



論文チェックの流れ

4. (Twitterなどに要約を掲載する場合)130字程度でその論文の主要な結果を綴る

5. 重要(そう)な図もスクリーンショットに撮り、4つまでを掲載する



論文チェックの流れ

* そもそもどれを読んで良いかわからなければ...

論文が掲載された雑誌・著者などで判断しても良い (非推奨...だが良く使う手)

Nature Astronomy: 14.4

Astrophysical Journal Letters (ApJL): 8.2

Astrophysical Journal (ApJ): 5.9

Astronomy & Astrophysics (A&A): 5.8

Monthly Notices of the Royal Astronomical Society (MNRAS): 5.3

Physical Review D: 5.3

Publications of the Astronomical Society of Japan (PASJ): 5.0

[8] arXiv:2203.08162 [pdf, other]

Using the Hills Mechanism to Generate Repeating Partial Tidal Di

M. Cufari, Eric R. Coughlin, C. J. Nixon

Comments: 6 pages, 1 figure, and 1 table. Resubmitted to ApJL following first referee report

Subjects: **High Energy Astrophysical Phenomena (astro-ph.HE)**

Periodic nuclear transients have been detected with increasing frequency, with one su
source are generated by the repeated partial disruption of a star, but how the star was
integrations to demonstrate that the Hills mechanism, where a binary system is destro
radius of one of the stars within the binary. Thus, Hills capture can produce stars on t
ASASSN-14ko, but for periodic nuclear transients in general. We also show that the ra
indicating that in this system there must be additional effects that contribute to the de
observable period decay rates in future events.

例を実演

例: Magnetic Field Reversal around an Active Fast Radio Burst

The environment of actively repeating fast radio bursts (FRBs) has been shown to be complex and varying.
The recently localized FRB 20190520B is extremely active, has the largest confirmed host dispersion measure, and is only the second FRB source associated with a compact, persistent radio source (PRS).
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一番言いたいのはココ

We report/find/show/propose/provide/demonstrate ... などは特に重要

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The implied short-term change of the B-fie RB could be due to the vicinity of massive black holes, or a magnetized companion star in binary systems, or a young supernova remnant along the line of sight.

ここまでは研究の背景
これまででわかっていること、
これまでの研究の問題や未解決部分など

例: Magnetic Field Reversal around an Active Fast Radio Burst

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今回の発見から示唆されること
将来的な発展性など

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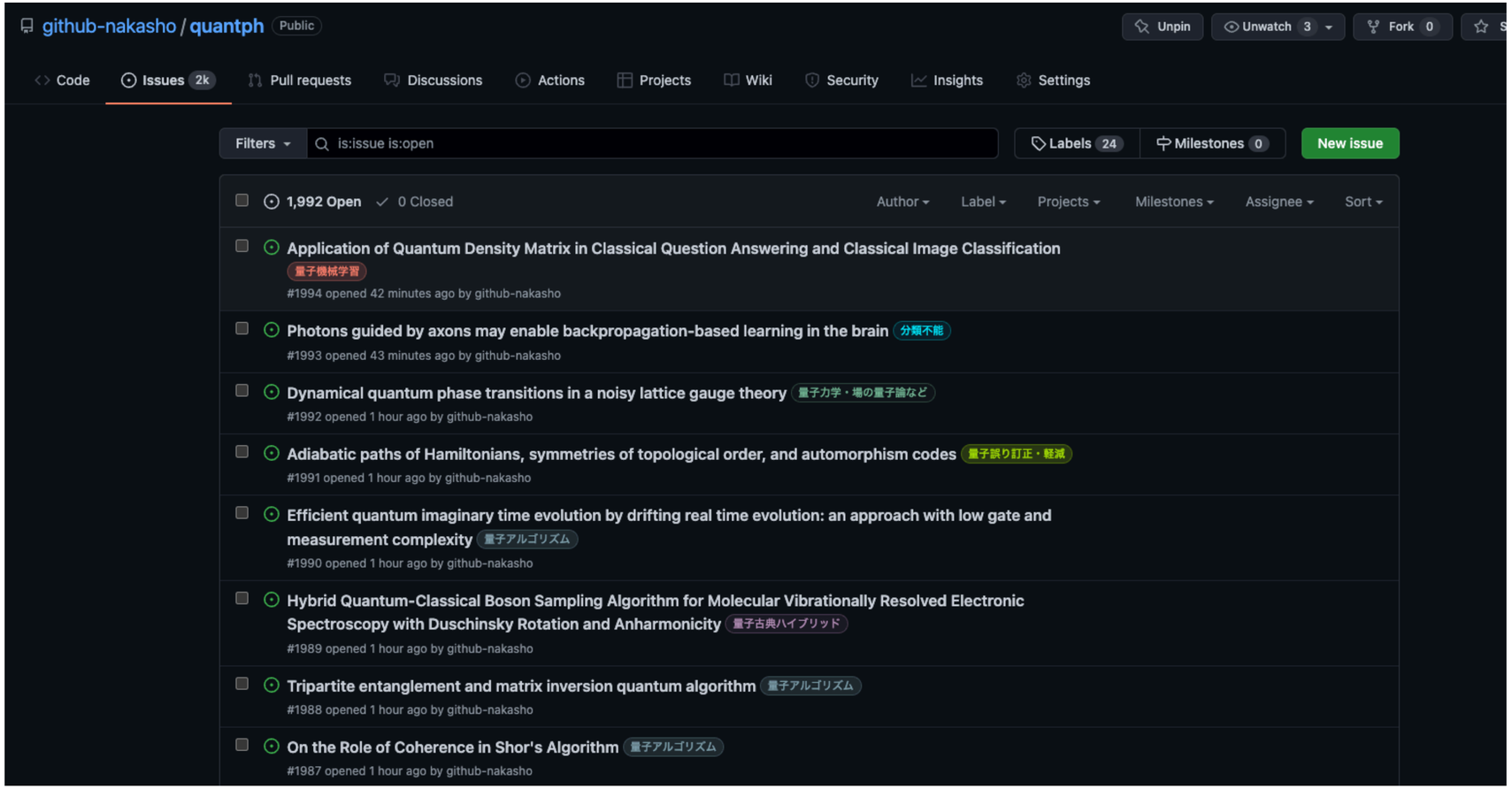
論文を読んだ後は...

GitHubのリポジトリにissue登録

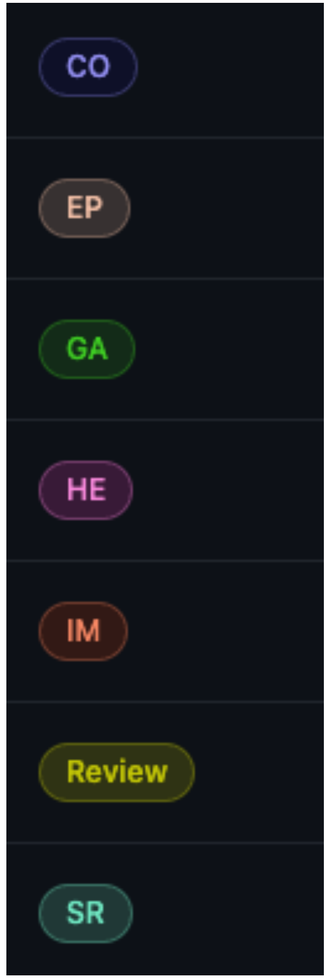
- Issueタイトルに読んだ論文のタイトルをそのままコピペ、内容部分に要約などをコピペするだけ。



GitHubのリポジトリにissue登録

- ラベルをつけて「どのような論文か」を大別することができる

宇宙物理



量子情報

結言

結言

- 論文チェックは、その分野の良い勉強になる
- 英語が読めない -> 和訳や理解を助けるツールをバンバン使おう
- まずは一つ、興味があるものから読んでみると良いかも
- GitHubなどでどんな論文を読んだか管理すると、あとで見返すのがラク

躊躇なくご質問ください！

より細かいことや
みんなの前で聞きづらいことなら
お気軽にDMよ！