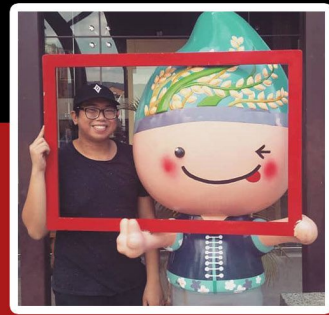




Investigative Study on Preprint Journal Club as an Effective Method of Teaching Latest Knowledge in Astronomy

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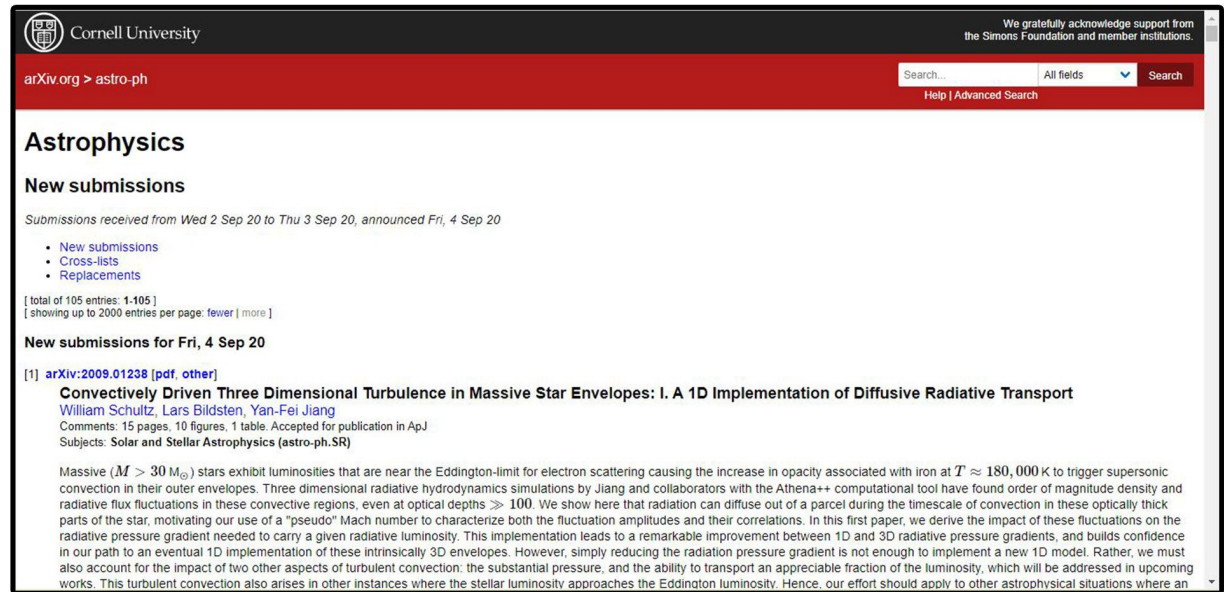


Research Motivation

To keep up with the latest literature, **journal clubs** that aim to discuss articles to keep up with the literature are implemented in various fields (Dwarakanath & Khan, 2000). Discussing **preprint journals**, papers that have been peer-reviewed and accepted by a journal but are still awaiting publication, or papers that are not published (Lim, 1996), can greatly help achieve this objective.

(Preprint) journal clubs in astronomy are usually called as **Astro-Coffee/ Astro-ph (AC)**. The role of AC in astronomy has not been carefully explored and no assessment on its effectiveness has been performed yet. The purpose of this research is to:

- Pinpoint the factors that are crucial for implementing a successful AC
- Evaluate our own university's AC with the identified factors as guide



Screenshot of astrophysics (astro-ph) page of arXiv (arXiv.org)

Astronomy Preprint Servers

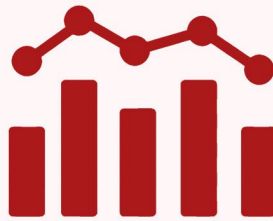
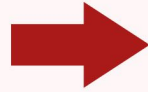
Preprint servers are repositories of preprint journals. One good example is [arXiv \(arXiv.org\)](https://arxiv.org). As the journals here are not peer-reviewed by arXiv, this is usually utilized as a source of preprint journals. Other preprint journal archives also exist, such as [VoxCharta \(voxcarta.org\)](https://voxcarta.org), a server where people can vote for the papers they find interesting, and some websites like [Astrobites \(astrobites.org\)](https://astrobites.org) also offer summaries of journals which are helpful during discussions.

Methodology Flowchart



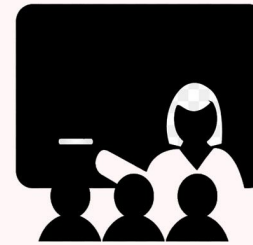
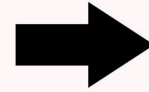
Data Collection

Survey dissemination and interviews to universities around the world



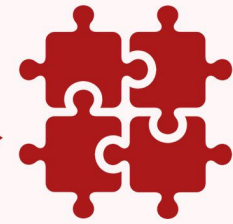
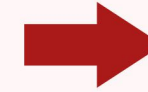
Analysis

What can we infer from the survey and interview responses?



Implementation/Testing

Change and assess NTHU's AC based on the inferred results



Conclusion

What can we conclude from our implementation?

AC Survey and Interviews

An **online survey** was sent to AC organizers from universities and institutions around the world. Respondents are also asked if they are willing to undergo a **follow-up email/video interview** to clarify some of their points. We focus on unveiling the following points which we believe are factors that affect the effectiveness of AC in achieving its goals:

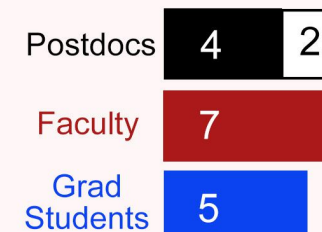
- **Design:** Goals, length, schedule, frequency, content, demographics of AC
- **Format:** How is AC conducted, advantages and disadvantages
- **Environment:** Conduciveness of setting, interaction of participants and organisers
- **Improvements, recommendations, and opinions about their AC**

Survey Respondents

We received **18 survey responses** from **16 universities and institutes** around the world.



Demographics of Respondents



Shaded - with AC
Not shaded - without AC

2 of our respondents (both postdocs) **do not** have AC in their universities.

Some Interesting Points from the Responses

- Most respondents' ACs send emails to disseminate information about their AC (15/16).
- Majority of our respondents (12/16) with AC have **no financial support**.
- 2 of our respondents did not have AC in their institutes because: (1) **no one is committed** enough to start it; and (2) **people do not seem to have a common time slot for AC**.
- Some ACs have **snacks and coffee** (7/16), but majority believe that people will still come even if there are no food included (9/16).

We identified the **4 factors that are crucial for successfully setting up and maintaining AC** which serves as a brief summary of the responses that we received. The diagram below shows how the 4 factors affect each other.

Commitment

Refers to how committed the organiser/s and participants are in attending and participating in AC. Many factors affect commitment (e.g. organiser's position, and relationships in the institute).

Focuses on the **conduciveness on AC for learning**. Schedule, presence of food and drinks, format of presentation, and even the demographics of AC can affect the learning environment of AC.

Environment

Commitment

Environment

Content

Objective

Content

Refers to the **materials used and topics discussed during AC**. Materials include (preprint) journals, videos, recorded talks, news, etc. Topics may be limited to only one field or diverse fields in astronomy.

The most important factor. **What is the goal of your AC?** To learn more about your research field, to help attendees learn how to summarize papers, or to be updated with the latest literature?

Objective

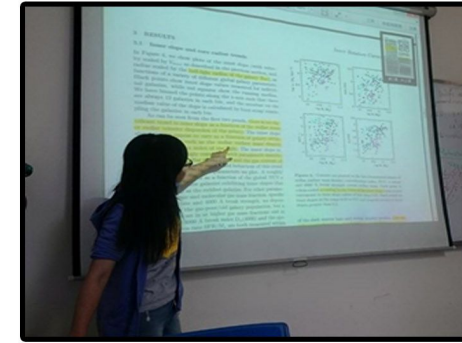
AC Format in NTHU

- Elective class in Spring Semester 2020
- Every TWH, 12:20 pm - 1:00 pm
- Participants can post on our Facebook group or vote on VoxCharta the papers which they want to discuss.
- Each presenter has 10 mins to present the aim and results of the paper. Minimum of 3 papers are discussed per day.



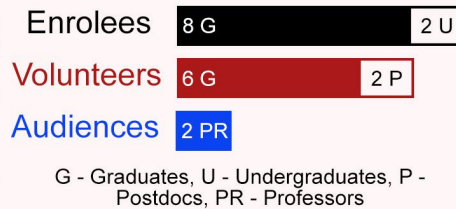
Evaluation of AC in NTHU

- A **5-point Likert scale** questionnaire was utilized to evaluate certain points related to the aforementioned 4 main factors.
- For the sake of the analysis, participants were classified as **enrolees** (those who enrolled and are required to present regularly), **volunteers** (those who are not enrolled but volunteered to present regularly), and **audiences** (those who are not enrolled and did not present).



Evaluation Results

Demographics of our Participants



Commitment

- Enrolees have a higher tendency to attend and participate regularly during discussions, than others.
- Ave. # of papers read per week by participants after attending AC increased from 4.5 to 6.5

Environment

- Enrolees feel more pressured in presenting and reading papers than others.

Content

- Attendees tend stick to their own fields and avoid other fields when discussing/reading papers.

Objective

- All participants gave a high average satisfactory rating (4.8/5) and they feel that the objectives were met (4.6/5).



Conclusion

- There are 4 factors that should be looked at to have a meaningful AC: **objective, commitment, environment, and content.**
- Our **elective AC class in NTHU** was evaluated, and it turns out that different roles during sessions induce different perspectives in AC.



We hope that this research will serve as a benchmark for those who want to start and those who want to improve or assess their own AC in their respective institutes.

Video: Why is AC needed?



Personal website:

