

THCA Student Seminar

Syllabus for Fall 2017

Organizer: Xuening Bai (IASTU & THCA)

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Office: THCA — Mong Man Wai Building (蒙民伟科技楼) S-617

IASTU — Science Hall (科学馆) 312

Instructors: Xuening Bai and other THCA faculty members

Time: Fridays, 3:00-4:30 pm

Location: Mong Man-wai Building (蒙民伟科技楼) S-727

Office Hours: Walk-in or by appointment.

Website: <http://astro.tsinghua.edu.cn/~xbai/teaching/studentseminar.html>

General Rationale

This seminar is offered to THCA graduate students as well as interested undergraduate students. While we have organized THCA graduate student seminars in the past, this semester represents a major reform towards a more matured system. The overall format we adopt is very similar to the astrophysics graduate student seminar at Princeton University, which has been a standard part of the course curriculum there for decades. Many other astronomy departments in major universities have a similar system.

The goals of this seminar are three-fold:

- Learn astrophysical topics beyond your own area of research.
- Improve your English, especially reading and speaking English.
- Develop and improve your skills for scientific presentation.

Through this seminar series, we hope to expose students to a wide range of topics to develop both breadth and depth in astrophysical knowledge. Moreover, it trains students in aspects that are not normally covered by standard courses and research works, but the corresponding skills are crucial for your future careers, regardless of whether you stay in academia or not.

Format

The organizer (a THCA faculty member) will decide on the general theme for each semester's seminar series, and divide the theme into a list of

topics. For each topic, a few papers are suggested as the starting point based on which the students will construct their seminar talks, and there will be a faculty contact (if not the organizer) to help with the preparation.

During the 1st week of the semester, the organizer gives a broad overview and provides the list of topics to students. Students select a few topics of their interest, but we stress that **the topics should be different from the students' current areas of research**. Afterwards, the organizer will assign individual students with a topic and a date considering the overall preferences. **We expect 2 to 3 student talks per week** in general.

Students are expected to read the papers provided in the list for their assigned topics, and are encouraged to explore other relevant literature as needed. **A good practice is to start preparing the talk at least two weeks ahead of time**. During the preparation, students should feel free to consult with the faculty contact and/or other faculty members. **At least two days before the seminar, the student must get ready for the presentation and discuss with the faculty contact for approval**. If approved (see "Evaluation" section for details), the faculty contact will further comment and help improve the presentation, and the student should further practice and polish the talk before the seminar. **If not approved, the talk will unfortunately be cancelled**. For graduate students, this not only means that you lose the opportunity to improve your presentation skills, but also, you will no longer be eligible for THCA scholarships.

Each presentation is expected to be 25 minutes for the talk, plus 5 minutes for questions. The talk is expected to cover standard ingredients such as motivation/background, methodology, main results, and implications. We require every presenter to give the talk in English. English is also strongly encouraged during the question session, but it is OK to switch to Chinese if necessary.

Participation Policy

We require all THCA graduate students to participate in the seminar, and plan to eventually incorporate it into the standard course curriculum. To enforce this, we ask students to sign up at every seminar.

Undergraduate students are strongly encouraged to participate and give presentations (sign up needed at first class), but we welcome anyone interested to attend the talks.

The seminar will be advertised to all members of THCA, and we anticipate a good fraction of faculty and post doc to attend as well. They will also offer feedback to the presenters.

Evaluation

Given that the seminar is open to broad audiences in THCA, we need quality control so that the audience do not waste their time. The faculty contact will judge the overall quality of the talk based on the level of understandings the student possesses on the topic, and how well the talk is prepared. The bottom line is that an audience with no background on the topic should be able to learn something useful from talk. Some guiding principles include:

- 1). The content of the talk is reasonably well organized and joined in a logical way, and should at least contain introduction, method, results, and summary sections.
- 2). Key results are highlighted and well explained.
- 3). Be able to answer basic questions about this topic.

For approved talks, everyone in the audience will be provided an evaluation sheet prior to the presentation. Students in the audience should carefully evaluate the overall quality of the talk by answering the questions provided in the sheet. The sheets are anonymous (but you are welcome to put your name as well) and will be collected at the end of the seminar. The presenter, upon receiving the evaluation, should talk to the faculty contact to discuss his/her performance.

Theme of the Semester: Astronomy's Greatest Hits

We start off in this semester with a theme of "astronomy's greatest hits", aka, the most cited papers in astronomy. While citation is not necessarily a good measure on the quality of a paper, it signifies the impact ("usefulness") of the paper in the field, and the most cited papers are among the ones that have profoundly changed the history of astronomy. The papers we choose typically have more than 2000 citations. They cover a wide range of areas, and offer a broad overview in the development of astronomy over the course of about half a century. Besides the fact that you should know most of these papers as a professional astrophysicist, reading and construing these papers will also substantially beneficial for you in many aspects of your research.

We caution that the definition "most cited papers" can be ambiguous and subjective. No matter how we make a cut, we have to miss many excellent and equally important papers. Many method/data release papers tend to reach very high citations, which we have purposefully omitted. Moreover, comparing citations among different fields is generally not fair. For instance, cosmology papers are on average more highly cited than papers in other fields of astronomy simply because many more people work in this field. Because of this bias, we have adjusted the list of papers to achieve some balance among various fields.

Since most of the papers are relatively old, in your presentation, we expect you to provide some historical background, and also discuss the impact of these papers to the present-day astronomy in your talk. While preparing your presentation, you should also think about why these papers became so well received and highly cited, and how you can write papers of similar quality some day!

Schedule

Week 0 (Thursday Sep. 14, 4:45pm):

Introduction to this semester's seminar and exemplary talk. (**X. Bai**). Rescheduled to Thursday due to time conflicts.

Week 1-3 (Sep. 22-Oct. 6):

No student seminar: first seminar speakers busy preparing their talks! Time slots occupied for other purposes + national holiday.

Weeks 4-16 (Fridays, 3:00pm):

About 2-3 student talks per week.