How to Prepare for the 699 Interviews

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What is the purpose of the 699 interviews?

The oral interviews that occur at the end of ASTR 699 projects serve as evaluations of a student’s research performance to date as well as their general astronomical knowledge. It is an opportunity for students to showcase their understanding of their specific research area and body of work to date, as well as their ability to place it within the broader context of astronomy. The interview also provides the GROG an opportunity to evaluate critical thinking skills, communication abilities, and depth of understanding. In particular, the 699-2 interview probes deeper into a student’s research knowledge and also their broader astronomical knowledge. The 699-2 interview is one of the key inputs for the faculty to assess a student’s readiness to proceed to dissertation research. Finally, the format of the 699 interviews has similar elements to types of discussions that students will inevitably encounter as they present their research at conferences and other institutions.

What is the format of the interview?

The 699-1 interview has 3 questions, and the 699-2 interview has 6 questions. Notionally, half of the 699-2 questions are more specific to the student’s research and related fields, while the other half span a broader range of astronomical topics. For the 699-2 interviews, students are provided a list of ~20 questions --- at least one of these will be used as a “broad” question. All the questions are developed by the consensus of the GROG prior to the interviews.

Questions will often have multiple components, and there are likely to be unscripted follow-up inquiries by the GROG in response to your answers. Many questions can be answered solely by speaking, while others may require going to the whiteboard to draw diagrams or write equations.

What kinds of questions will be asked?
Students can expect questions covering a wide range of topics related to their research project and general astronomical knowledge. These may include (but are not limited to) inquiries about:

- the theoretical foundations and open questions of their research topic
- the methodologies employed for their project (and those not employed but used elsewhere in the same field of research)
- the interpretation of their results
- potential shortcomings and improvements in their observations, measurements, analysis, etc.
- the broader implications of their work
- possible future directions for continued research
- recent notable developments in their field and related fields

Questions may vary from conceptual inquiries aimed at assessing understanding, simple quantitative estimation relevant to the research and/or field, and more technical queries probing the depth of knowledge and critical thinking skills. Note that questions are not limited to the graduate courses that the student has taken. Rather, students should be prepared to discuss their research comprehensively (both its specifics and broader context), while demonstrating a strong understanding of key related astronomical principles and developments.

How do I prepare for the 699 interview?

Note that the question is not “how do I study for the interview?” but “how do I prepare for the interview?”. For a class with a final exam (either written or oral), students will typically spend a concentrated block of time (e.g., ~days) studying a well-defined set of knowledge (e.g., class notes, textbook, and homework assignments). While such studying is necessary to prepare for the 699 interviews, it is fundamentally incomplete. Instead, you should think about preparing for these interviews as a continuous process that occurs over the duration of the project. Here are some key things to keep in mind:

- Know Your Research Inside Out: Review all aspects of your research project, including background literature, experimental details, models and their assumptions, results, and implications. Be prepared to discuss your work in depth and address any potential questions or criticisms. Note that “my advisor/collaborator told me to do this” and its variants are considered inadequate answers for the interview (and indeed, generally true going forward in your career). **Remember that any content presented in your paper or talk,**
whether your own work or that of others, is considered fair game for questioning -- be sure you know your stuff.

- **Handy tip:** during the entire course of your project, repeatedly ask yourself “Do I really understand what I am doing, what I am not doing, and why?”

- **Stay Updated on Current Research:** Keep abreast of the latest developments in your research area and related fields. Familiarize yourself with recent publications, conference proceedings, and breakthroughs in astronomy to demonstrate your awareness of the broader scientific landscape.
  - **Handy tip:** regular attendance at astro-ph discussion and research gatherings (e.g., colloquia, research group meetings, and SPLAT for stars+planet folks) is a beneficial way to keep up on the latest developments.

- **Practice Presenting and Defending Your Work:** Rehearse your research presentation multiple times to ensure clarity and coherence. Practice answering potential questions with your peers, advisors, or in mock oral exams to refine your responses and build confidence.
  - **Handy tip:** Be sure to participate in practice sessions with your 699 advisor and those organized by the senior grad students. Also, attending colloquia and the aforementioned meetings help provide exposure to the wide-ranging Q+A that can be similar to what can occur during the interviews.

- **Review Fundamental Concepts:** Refresh your understanding of fundamental astronomical principles, theories, and techniques. Focus on areas relevant to your research project, but also be prepared to discuss general topics in astronomy to demonstrate your breadth of knowledge.
  - **Handy tip:** Recent review articles (e.g. Annual Reviews) can be rather helpful for this. And again, ask yourself “do I really understand what I am doing, what I am not doing, and why?”

- **Imagine Potential Questions:** Try to anticipate the types of questions you might be asked based on your research project and the broader field of astronomy. Consider various scenarios and prepare thoughtful responses to different types of inquiries, ranging from conceptual discussions to technical challenges.
  - **Handy tip:** Review the archive of past 699 questions that is maintained by the students.

Any final words of wisdom?

An important reminder: accurate information regarding the 699 interviews comes from this guide, the corresponding 699 webpage, and communication from the GROG Chair.
While insights from past students can be quite helpful, they should not be considered definitive. Since the GROG membership and procedures have changed over the years, what previous students experienced may not reflect exactly what you will experience, e.g., different faculty inevitably ask different types of questions.

Finally, during your 699 interview, it's important to remember that encountering questions beyond your immediate knowledge is a natural part of the experience. One goal of oral assessments is to establish the depth and breadth of your understanding, which inevitably means finding the limits of your knowledge - i.e., asking you a question that you’re unable to answer. If you encounter this, don't panic and don’t make stuff up. Instead, approach it thoughtfully, acknowledging the boundary of your current understanding. The GROG is definitely not expecting perfection but rather a genuine reflection of your expertise and mindset. Stay calm and focus on articulating your thoughts and reasoning to the best of your ability — embrace the opportunity to learn from these moments, as you will inevitably encounter similar ones in the years ahead.