

1st Year Research Exam

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Presenting information compiled by

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Overview

- Research exam: 30 min oral presentation given at the start of your 2nd year of graduate school (Sept)
 - This is mostly to check that you've accomplished some kind of research in your first year at graduate school
 - It is not a qualifying exam so the goal for the committee is not to grill you but to see if you are going in the right direction

<http://www.catcareofvinings.com/blog/cat-thinking/>



Fig. 1: Pensive cat preparing for its research exam

Audience/Panel

- Three assigned faculty members from each general physics area (Astro, CM, HEP)
 - Therefore, should be an accessible talk with less jargon/technical detail!
- Define all terms that are not commonly used outside your research area
- For figures, clearly mention the labels
 - E.g. “This figure shows the specific heat as a function of temperature...”

Presentation Structure

- 15-20 minutes of presentation
- 10-15 minutes for questions
 - Leave room for deliberation

~30 minutes total

- 5-10 minutes for committee feedback



Fig. 2: Graduate student presenting her research exam

Presentation Content

- Focus on **one** project you've worked on in your 1st year
 - (bonus points if it's going to be a paper—try to highlight this at the end of your talk)
- Introduction to your field + motivation behind research
- Explicitly mention what **you** did
 - Try not to have your talk be primarily background/introduction
- Cite your sources
- **Schedule a NPC practice talk with Sanjana and Christina!**

Questioning

- Be prepared to answer general questions about your research, including the next steps you plan to take
- Questions can be asked at any point during the presentation (although most are saved until the end)
- Anything on your slide can (and will) be used against you. Be sure to know how to explain any figure or concept you show!
- Have backup slides with additional plots/figures in case they ask about any specifics (equations, etc.) that wasn't included in the original presentation

Feedback

- Be prepared for harsher critique from certain panelists
 - In our year, a lot of the feedback seemed to be some variation of “be sure to read more literature outside of your immediate research topic”
 - Also, don't take anything they tell you too personally
- Follow-up: We never heard anything back other than what they told us immediately after the questions...
 - Physics students may get a one-on-one meeting with the 1st/2nd year advisor, although the feedback wasn't that different from the committee feedback

Links to some exams from last year:

[Christina's astronomy exam](#)

[Chris' condensed matter exam](#)

[Sanjana's hep-ex exam](#)

[Ruoxi's hep-ex exam](#)

[Annie's astrophysics exam](#)

[Jane's biophysics exam](#)

[Kathleen's astronomy exam](#)

Also, more No-PhD Club events:

Please [sign-up](#):)

Experience shared by Jane Bernadette Denise Garcia

- **soft condensed matter theory/simulations (liquid crystals)**
- transferred from UC Merced to JHU in the middle of their third year. Were required to take the research exam in the fall. At that point, they **were already working on their projects for ~1 year.**
- barely finished talking about **one of their projects.** The committee kept on interrupting their presentation, sometimes to ask for clarification, or just to check if they understand the meaning of the equations.

Experience shared by Jane Bernadette Denise Garcia

- **Committee members:** Brian Camley (the expert), Colin Norman and Petar Maksimovic.
- Brian's questions were mostly focused on the **details of the experiment** that I was modeling (e.g., what type of imaging was used here?), and Colin and Petar's question were mostly on the **math/more theory side of things**.
- Some examples of the questions that I got were:
 - What is the relevant length scale in your simulations? And in the experimental system?
 - Why do you use the Q-tensor? Why does the tensor have to be both symmetric and traceless?
 - What is the difference between the liquid crystals you're modeling?
 - What is a topological defect, are these physical things?

Experience shared by Jane Bernadette Denise Garcia

- The feedback they got was mainly to familiarize themselves more with the physical system they were modeling and the experimental set-up. And also to have a stronger understanding of the physics behind a lot of the equations that they put in (i.e., review more lol). But otherwise, the rest of the feedback was positive.

It's meant to be encouraging and to provide constructive feedback!