

Independent Observing Project Description

ASTR:1070 (Stars, Galaxies, and the Universe) Lab



For your observing project, you will document your study of an astronomical object in greater detail than we've done in in lab, taking on the role of an amateur astronomer. In science, we strive to explain how we collected our data and how we analyzed it as clearly as possible. This is so that other scientists can reperform our experiment and (hopefully!) confirm our results. We communicate how we collected the observations, analyzed the data, and arrived at a conclusion as part of a publication in scientific journals. Professional journals are "peer-reviewed", meaning they are vetted by other scientists for clarity and correctness. *A goal throughout your final project is to offer enough details that your work could be peer-reviewed – if a classmate looked at your presentation, they should follow it closely enough to be able to reproduce your work.*

For your project, select an object from the list below. Every group must pick a different object. With the help of the labs performed in class, you will collect observational data of that object with the Telescope Live SPA-1 telescope located in Oria, Spain (using backup data if need be), producing an astronomical data product (a tri-color image). You'll lastly make a physical size calculation based on that data and report your results to the class and your instructor.

Potential Objects to be Studied --

OBJECT TYPE	OBJECT OPTIONS	TELESCOPE	DATA PRODUCT & CALCULATION
NEBULA	<ul style="list-style-type: none">- The Veil Nebula- Sh2-101 (The Tulip Nebula)- NGC 7000 (The North American Nebula)- NGC 6888 (The Crescent Nebula)	SPA-1 (pixel scale = 4.7"/pix)	Tri-color Image & Physical Size (Resources: The Van Allen Observatory and Robotic Observing lab/Image Analysis I lab/Small Angle Formula)

Presentation

Your independent observing project presentation is worth 20 out of your total 280 points for lab this semester, representing ~7% of your total lab grade, or worth 1 regular weekly lab, and is presented by all lab group members in class during your last week of lab.

Your presentation should be 10 minutes in length, and supported with helpful slides.

Your presentation should contain:

- **Background related to your object**
 - Possible topics: historical discovery, when to observe it, what constellation it is in, could you observe it with your eyes, other names for the object, interesting discoveries recently made relating to the object, etc.
 - This portion should include several citations from books or online sources¹ supporting the information you present.
 - *This information should be more than a list of facts – it is your chance to convince your classmates that they should have studied your object instead.*
- **Experimental Plan: Data Analysis & Data Product**
 - Explain how you collected your observations (include filters and exposure times used).
 - Explain the data product you produced and how you produced it.

¹ Online sources must not include Wikipedia. Citations of articles outside Wikipedia are fair game, however. Online articles should meet standards for credibility, but do not have to be academic papers. Examples include: Popular Science, Sky & Telescope, NASA websites, etc.

- *Your audience is your classmates – you want to explain what you’ve done without the full “recipe” in MaxIm (they’ve completed labs to do exercises like these already). This section shouldn’t be any more than 30 – 90 seconds in length.*
- Show your data product and explain what it shows.
- Comparing your data product to other observations of your object is encouraged.
- Connecting your data product to your background information presented is encouraged.
- **Calculation**
 - Calculation explanation should clearly explain each step, define any variables, and explain any relevant formulas.
 - Cite any external information used to complete your calculation.
 - Contextualize your number – is it large or small? How does it compare to that of other similar objects?
 - *Think of this an opportunity to do a problem in front of the class like your instructor: explicitly state any assumptions you’re making and show your work.*

The presentation is performed as a group. **Each group member should take a turn presenting information to the class and speak for at least 2 minutes.**

In addition, you should be prepared for 1 – 2 minutes of questions/answers following your 6 – 8 minute presentation. Polite asking of questions and engagement with your peer’s work is also expected. **Your group should ask a relevant question during 3 other presentations.**

Independent Observing Project Presentation Rubric – 20 Possible Points

Category / Score	0	2.5	5	Notes	Score
Object Background & Observing Plan & Presentation Organization	<ul style="list-style-type: none"> Discusses only one or no suggested background topics Includes one or no citations for supporting information Spelling & grammar mistakes on all slides Use of scientific language is routinely incorrect Presentation is noticeably short Presentation is very difficult to read and has the incorrect amount of text and images to the extreme Presentation is extremely dull and unengaging Did not describe observations 	<ul style="list-style-type: none"> Discusses only two suggested background topics Includes only two citations supporting information Average number of spelling & grammar mistakes on slides Use of scientific language is usually correct but infrequently incorrect, and sometimes clunky/awkward Slides are mostly easy to read with an appropriate amount of text Presentation style is adequate Described observations plan and collection 	<ul style="list-style-type: none"> Discusses at least three suggested background topics Includes three or more citations supporting information No noticeable spelling & grammar mistakes on slides Use of scientific language is appropriate Slides are easy to read with an appropriate amount of text and images Presentation is interesting Described observations plan and collection 		
Experimental Plan (Description of Analysis & Data Product Presentation and Explanation)	<ul style="list-style-type: none"> Description of analysis is incorrect or misleading It is unclear how the resulting data product could be reproduced Data product figure is not included or explained at all 	<ul style="list-style-type: none"> Description of the analysis is mostly clear but occasionally confusing/misleading Another student could produce the data product based on description offered and a little guesswork Data product figure is included and explained 	<ul style="list-style-type: none"> Description of analysis is clear Another student could produce the data product based on description of analysis alone Data product figure is included and explained All suggested identifying information about the observation is included 		
Calculation and Other Analysis and Explanation	<ul style="list-style-type: none"> Calculation is incorrect, or nonexistent It is unclear how the resulting calculation was made based on the narrative 	<ul style="list-style-type: none"> Calculation is correct Another student could repeat the calculation based on the provided description and a little guesswork 	<ul style="list-style-type: none"> Calculation is correct and clearly/cleanly explained Another student could repeat and understand the calculation based on provided description Any external information used to complete the calculation is cited 		
Category / Score	0	1.5	2.5		
Questions	<ul style="list-style-type: none"> Group poses one or no questions 	<ul style="list-style-type: none"> Group poses a relevant question during 2 other presentations 	<ul style="list-style-type: none"> Group poses a relevant question during 3 other presentations 		
Individual Score	<ul style="list-style-type: none"> Did not speak for 2 minutes and/or little to no fluid delivery, appropriate vocal enthusiasm and audience engagement (eye contact, gestures, etc.); student mostly read from the slides 	<ul style="list-style-type: none"> 2 minutes or close to 2 minutes, Some fluid delivery, appropriate vocal enthusiasm and audience engagement (eye contact, gestures, etc.) 	<ul style="list-style-type: none"> 2 minutes, fluid delivery, appropriate vocal enthusiasm and audience engagement (eye contact, gestures, etc.) 		
				Final Score	