

Lab 7: The Sun

1 Videos from PBS Nova

We'll watch a series of videos (<http://www.pbs.org/wgbh/nova/labs/videos/#sun>) introducing solar science. For Sections 1 your answers can be brief; a few words or a sentence will do.

1. How long does it take a photon to travel from the core of the sun, where it's produced, to the surface?
2. Describe the 3 forces that are most relevant in the sun.
3. How long does it take the sun to rotate once on its own axis?
4. Name two events that can be caused by a magnetic reconnection.
5. Define what a “solar maximum” is.
6. Why do sunspots look darker than the rest of the sun?
7. What protects the Earth from solar flares?
8. What causes auroras?
9. Why are we humans more vulnerable to exceptionally big solar storms than we were in 1859?
10. Is the following statement true or false? “The longer its wavelength, the more energy light carries.” Explain why.
11. Describe the instruments on the Solar Dynamics Observatory (AIA, HMI).
12. Why is it useful for solar research to have instruments that can look at wavelengths besides the visible that we can see with our eyes?
13. If you want to look at a hotter part of the solar atmosphere, do you want to look at smaller or larger wavelength light?

2 Solar Cycle

Click the Solar Cycle tab on this page and follow the instructions while answering the following questions: <http://www.pbs.org/wgbh/nova/labs/lab/sun/research>

14. Record your estimates of R and the scientific estimates as you go.
15. How do your estimates of R compare to the scientific estimates? If your estimate differed, why do you think that was so?

16. After completing your five estimates, how do your measurements (orange highlighted points) compare to the official solar cycle measurements? Include the figure in your report.

3 Storm Prediction

Click the Storm Prediction tab on this page and follow the instructions while answering the following questions: <http://www.pbs.org/wgbh/nova/labs/lab/sun/research>

17. Record your answers, and how you did compared to the correct answers.
18. Which of these was hardest for you to decide? Easiest?

4 Astrobite

[Astrobites](#) is an astronomy blog site/online literary journal run by grad students from all over the world. Their goal is to make astronomy research more accessible, and they often write summaries of research papers to distill exciting and cutting-edge research into digestible ‘bites’ for people outside of the field.

Choose one of the following astrobites below to read, and answer the questions below about it:

- [The Sun vs. Your Uncle: Chromosphere Edition](#)
- [Vary, Vary, Little Star... Or Don't, If You're The Sun](#)
- [It turns out the Sun is more chill than we previously thought](#)
- [Classifying Holes in the Sun](#)

Tip: You may find yourself encountering a lot of scientific jargon. Do your best with it and feel free to look things up if you need more context!

Questions:

19. What article did you choose?
20. What is the article/paper about? Explain (in a few sentences) the main scientific question, how they went about investigating it, and what they concluded.
21. What is some new terminology that you learned? List them and their definitions.

5 Conclusions

22. What did you like or dislike about this lab?
23. What's something new that you learned about astronomy research?
24. Is anything still unclear?