ASTR21200: Homework 1 (HW1)

1. **GitHub:** Create an individual user account on https://github.com/. So that you can be added to the class GitHub page, what is your GitHub username?

2. **Slack:** Create an account on Slack.com. So that you can be added to the class Slack on stoneedgeobservatory.slack.com, what is the email associated with your Slack account?

3. **Astro Software:** For this question, read the wiki pages on Astronomy Software[1] and other Computing Resources

    (a) What is the name of the computer server where you download fits files from Stone Edge Observatory?

    (b) What software will we use to view images in fits format?

    (c) What software can you use to manipulate fits images?

    (d) Where can you find a list of papers written about the Large Magellanic Cloud (LMC)?

4. **Observability:** We need to pick a random Right Ascension (RA) and Declination (Decl.). Take your birthday month and multiply it by two, this will be the hours in RA (e.g., January = 2h, November = 22h, December = 0h). Take the current time of day in hours and multiply it by 3 to get the Decl. (e.g., 1am = 3d, 1pm = 39d, 10pm = 60d).

    (a) With this RA and Decl, look up the sky position and search for all objects within 0.5-degrees in simbad[2] or NED[3]. What is your object's identifier, celestial coordinates, and how many paper references does it have?

    (b) Make a finding chart for this object using AAVSO[4]. Make the chart 15-degrees across, with North up, and the chart oriented such if you were looking at the sky with the naked eye. Include this finding chart plot in your homework submission.

    (c) Use the ING StarAlt tool[5] to determine when your object is best visible from Stone Edge Observatory (SEO, i.e., when its highest elevation in the sky. Note that SEO is not a predefined observatory in StarAlt, so you will need to enter the coordinates manually. For the following questions makes sure to include the relevant figure in your homework submission.

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[1]https://github.com/bradfordbenson/ASTR21200_2023/wiki/Astronomy-Software
[2]https://simbad.cds.unistra.fr/simbad/
[3]https://ned.ipac.caltech.edu
[4]https://www.aavso.org/apps/vsp/
[5]http://catserver.ing.iac.es/staralt/index.php

  i. What is the optimal observing date for your object? Use the "StarMult" mode to determine this.

  ii. In what months is your object higher than 40deg in the middle of the night? Use the "StarObs" mode to see how the observability changes throughout the year. When it culminates, how far away is the Moon? How much is the Moon illuminated then?

  iii. Choose a date 6 weeks later, and make another "StarAlt" plot. What changed? Are both nights good to observe your target, or is one clearly better?

  iv. Tutorial: You can also make a visibility plot using the python module *astropy*. For an example Jupyter notebook that you can modify see footnote [6]

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[6] https://docs.astropy.org/en/stable/generated/examples/coordinates/plot_obs-planning.html