

Stellar Proper Motion - Exercise

Student Name: _____

Step 1.

- A. Start Stellarium. It should be in the default configuration you setup in the Using Stellarium exercise. You should set the program to full screen.
- B. Turn of the atmosphere, landscape and compass cardinal points
- C. Use the Date/Time Window to set the date to 1916/12/31 and the time to 00:00:00 and leave the Date/Time Window in the upper right hand corner of the screen. To see more star names, use the Sky & viewing window to
- D. Use the Search Window to locate the star HIP87901 and set the FOV to increase the slider for stars to the left.
between 1° and 1.5° . You should see Barnard's Star labeled in the same FOV.
- E. Now set the year to 1996 and observe the motion of Barnard's star relative to HIP87901. Set the year back to 1916. Change back and forth a few times to observe how over 80 years Barnard's Star moves relative to the background stars.

Step 2.

- F. Return the year to 1916, and click on Barnard's Star and center it.
- G. Record the Year, RA(of date) (hms) and Dec(of date) ($^{\circ}$ ' ") in Table 1.
- H. Advance the year by 10 years.
- I. Repeat steps 2-B and 2-C for a total of 10 data points.
- J. Calculate the decimal equivalents for the RA and Dec. Most scientific calculators can do this function, or you can use the formulas below Table 1.
- K. Plot the data (decimal RA vs. decimal Dec) on the graph provided in Figure 1.

Step 3.

- L. Using your data and your graph, answer the following:

- **Question 1:** Did Barnard's Star move in each decade?

- **Question 2:** Did Barnard's star appear to move in equal increments each decade?

- **Question 3:** Do the data points on your graph suggest a curved line, a straight line or random movement?

Year	h	m	s	°	m	s	RA* (decimal)	Dec** (decimal)

Table 1.

*** - To convert RA(hms) to Decimal RA:**

$$RA(\text{decimal}) = RA(h) + [RA(m)/60] + [Ra(s)/3600]$$

**** - To convert Dec(° ' ") to Decimal Dec:**

$$Dec(\text{decimal}) = Dec(^{\circ}) + [RA(')/60] + [Ra('')/3600]$$

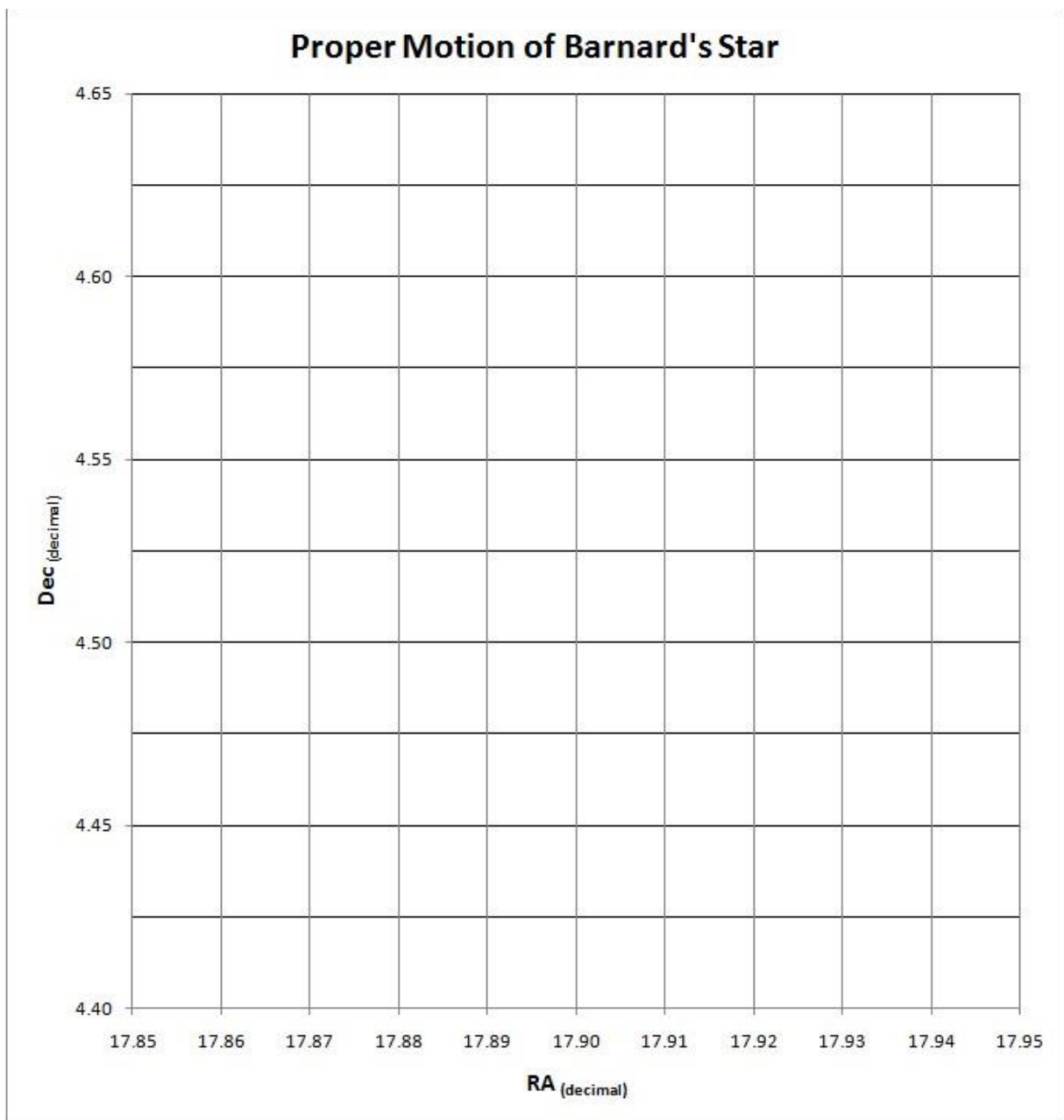


Figure 1.