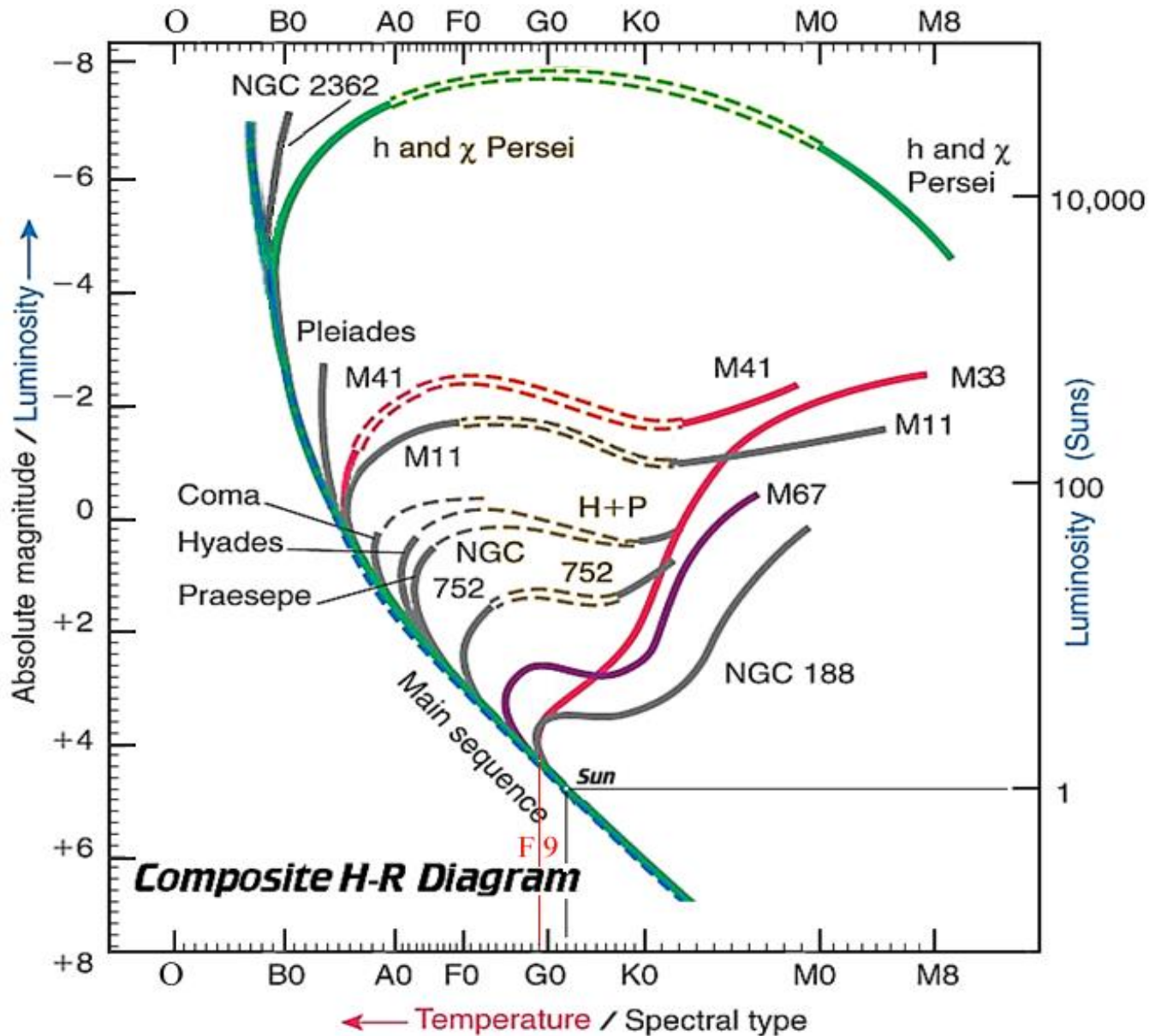


USING THE H-R DIAGRAM TO DETERMINE THE AGE OF STAR CLUSTERS

(10 points)

Instructions: Below can be found a composite H-R diagram which shows numerous clusters of stars represented on the same graph. The Y-axis on the left shows the absolute magnitude of the stars, while the Y-axis on the right depicts the intensity of the stars compared to the sun which equals one. The X-axis represents the spectral classifications or temperatures of the stars. Using the turnoff points of the various clusters along the main sequence, suggest an approximate age of that cluster. As an example, the age of NGC 188 is 7.3 billion years of age according to the graph.

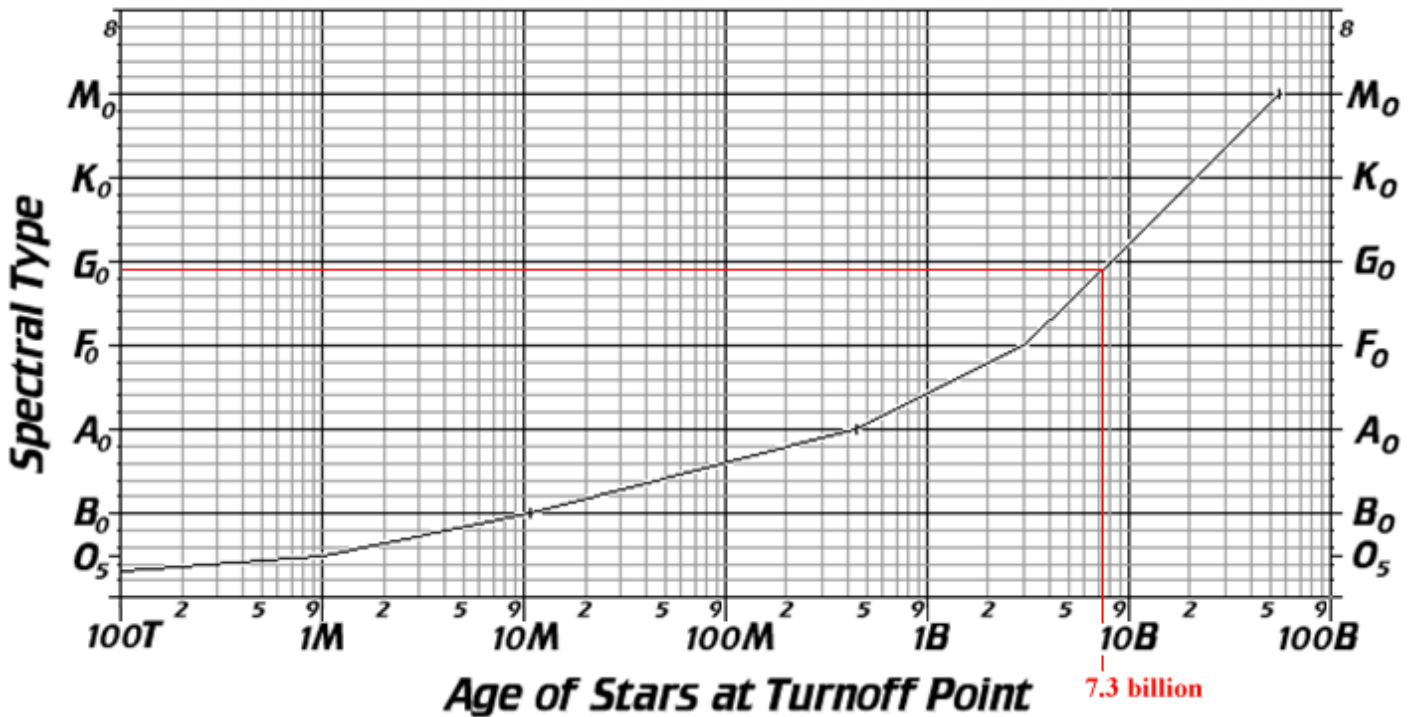


Procedure: Find the ages of the clusters in the H-R diagram by matching the turnoff position of the cluster on the main sequence of the composite H-R diagram with its spectral type. Then match the spectral type with the age of the stars on the graph found on the next page to establish an approximate age for the cluster. The graph on the following page is logarithmic.

Show how you determined the ages of the various clusters using the information contained in this exercise.

1. Show how you determined the turnoff positions found on the first page of the exercise.
2. Show how you used the turnoff positions of the clusters to find their ages using the graph below.
3. Submit both pages of the laboratory exercise.

Spectral Type vs. Time on the Main Sequence



CLUSTER TURNOFF / AGE CLUSTER TURNOFF / AGE

- | | |
|--|--|
| 0. NGC 188 <u> </u> / <u> </u> / 7.3 billion years | |
| 1. NGC 2362: <u> </u> / <u> </u> | 6. Coma Berenices: <u> </u> / <u> </u> |
| 2. h and χ Persei: <u> </u> / <u> </u> | 7. Hyades: <u> </u> / <u> </u> |
| 3. Pleiades: <u> </u> / <u> </u> | 8. Praesepe, M44: <u> </u> / <u> </u> |
| 4. M41: <u> </u> / <u> </u> | 9. NGC 752: <u> </u> / <u> </u> |
| 5. M11: <u> </u> / <u> </u> | 10. M67: <u> </u> / <u> </u> |