PHY 474/374 **Spring 2021**

Class Summary—Week 6, Day 2—Wednesday, May 5

The Main Sequence

Stars spend most of their lifetime fusing hydrogen to helium on the Main Sequence. Today, we will begin learning about the properties of main-sequence stars and the changes that occur as a result of hydrogen fusion.

The Zero Age Main Sequence (ZAMS)

The Zero Age Main Sequence (ZAMS) can be loosely defined as the location of stars that have just settled down to hydrogen fusion. This part is covered with just the right amount of detail in **Section 11.2** (*Dalsgaard*, **pages 141-143**), so I won't write any more here.

In Question 1(a) of today's worksheet, you worked out that the time $t_{\rm MS}$ spent on the Main Sequence can be shown to be

$$t_{\rm MS} \propto M^{-2.5}$$

and obtained values for $t_{\rm MS}$ for a 0.5 $M_\odot$ and 15 $M_\odot$ star *in Question 1(a) of today's worksheet.*

In Questions 2 and 3 of today's worksheet, you worked on some simple calculations and compared to detailed numerical models.

Evolution during core hydrogen fusion

The evolution in the core during hydrogen fusion is covered in **Section 11.2** (*Dalsgaard*, **pages 141-143**), and I have nothing more to add; just go over that section.

In Question 4 on today's worksheet, you discussed the change in L and T from the Zero Age Main Sequence (ZAMS) to the end of the Main Sequence (sometimes known as the Terminal Age Main Sequence).

In Question 5 of today's worksheet, you worked with a numerical modeler.