"Sun-Like Stars" PowerPoint Suggested Script

Use with Sun-LikeStars.ppt

PRESENTATION NOTE:

This presentation will take 10 to 15 minutes.

1	**Our Sun is a star.** **Are all the stars in the sky like our Sun?**
2	**Here is our Galaxy with its 200 billion stars.** **What types of stars are in our Galaxy?** **<CLICK>About 90% of all the stars in our Galaxy are healthy, stable stars - stars still in the main part of their lives - still fusing hydrogen at their core. Scientists call these "main sequence" stars. Our Sun is one of these.** **<CLICK>** **About 1% are the giant stars - stars in "retirement" - still fusing at their cores, but no longer fusing primarily hydrogen. These are cooler, swollen stars. They are much larger in size than the healthy, stable main sequence stars.** **<CLICK>** **The remaining 9% are white dwarfs - stars that are at the end of their lives. These are very small and very dim.** **<CLICK>** **So we are interested in the healthy, stable Stars – our Sun is one of those!** **----------** *<u>Additional Information:</u>* **Stars produce energy through nuclear fusion:** the process of forming heavier elements from lighter elements. Some of the mass is converted to energy when the heavier element is made. **Giants:** Sub-giants, giants, and super-giants are grouped together in this presentation. **Main Sequence ("Healthy, stable"):** Stars that are still fusing hydrogen at their cores (main part of their lifetimes) Hottest main sequence stars have spectral types of O, B, and A (bluish) Giants and O, B, A stars are the biggest, brightest stars in the sky. That's why we can see them. Next are spectral types F and G (yellow/white) Coolest stars (red) have spectral types of K, M, L, N The Sun is a main sequence star of spectral type "G". If all the stars were alike, we'd know how far away they are by how bright they are, like knowing at night about how far away a car is by noticing how bright its headlights appear. Refer to "Background Information" in the ToolKit Manual for additional info.

3	**Let's move the giants and white dwarfs aside.** **<CLICK> These are not stars like our Sun.** **So what is a star like our Sun - REALLY?** **Lets look at the 90% of stars that are the healthy, stable stars and break these down.** **<CLICK> Yellow/White Stars like our Sun make up about 7% of all the stars.**
4	**<CLICK> HOT BLUE, massive main sequence Stars comprise about 4% of the stars. These are much brighter than sun-like stars.**
5	**<CLICK> Small, Cool Red main sequence stars comprise about 79% of all the stars. These are very dim stars compared to the yellow/white stars and the bluish stars.**
6	**So here is the population of stars in our Galaxy.** **Which stars do we see with just our eyes?** **What do you think?** **Mostly, we see the biggest and brightest ones:** **<click> The giants** **<click> and the hot, bluish stars** **But which stars are the most numerous? Cool red stars!** **Which stars are the fewest? Giants and hot blue stars!** **Let's take a look at a few constellations.**
7	**Who can tell me which constellation this is?** **<Click> Orion!** **Let's see what kind of stars make up the constellation of Orion.** **< 7 clicks >** **All are giants or massive hot main sequence stars. No stars here like our Sun.**
8	*HIDDEN SLIDE (to un-hide select "Slide Show" and un-check "Hide Slide") This provides you with more information about these stars, including a few star names and, if it is a main sequence star, the spectral type of the star in parentheses.*
9	**Who knows what constellations we're looking at?** **Lyra and Cygnus in the Summer Triangle** **Let's take a look at what kinds of stars these are.** **< 11 clicks> Still no stars like our Sun.**
10	*HIDDEN SLIDE (to un-hide select "Slide Show" and un-check "Hide Slide") This provides you with more information about these stars, including a few star names and, if it is a main sequence star, the spectral type of the star in parentheses.*

11	**Who can name this one?** **<CLICK>** **The Big Dipper asterism and Polaris – the North Star** **Let's take a look at what kinds of stars these are.** **< 8 clicks> And again, no stars like our Sun.**
12	*HIDDEN SLIDE (to un-hide select "Slide Show" and un-check "Hide Slide") This provides you with more information about these stars, including a few star names and, if it is a main sequence star, the spectral type of the star in parentheses.*
13	**Here's Cassiopeia.** **And here are its main stars.** **< 5 clicks >** **Stars like our Sun must be very close to us to be seen without a telescope.** **Which ones are they? Can we actually see any without a telescope?** **In fact, there are only two stars (brighter than 4th magnitude) that we can easily see without a telescope that are like our Sun.** **<CLICK> Here's one! . The star called "Eta" in the constellation of Cassiopeia is one of the VERY few stars in the sky that is much like our Sun <u>that we can see without a telescope</u>. Only 19 light years away.** **The other one …**
14	*HIDDEN SLIDE (to un-hide select "Slide Show" and un-check "Hide Slide") This provides you with more information about these stars. If it is a main sequence star, the spectral type of the star in parentheses.*
15	**The other is Tau Ceti in the constellation of Cetus – but it's only visible for a couple of months during the year. It is just 12 light years away.** ---------- *<u>Additional Information:</u>* Some consider Epsilon Eridani a "sun-like" star, but it is a K star – orange in color, cooler than the Sun. The only other star brighter than 4th magnitude that is almost exactly like our Sun: Alpha Centauri. It is very bright, but only visible from extreme southern continental USA and Hawaii. So it is not included in the "Sun-Like Stars" presentation. No other stars (Northern or Southern Hemisphere) brighter than 4th magnitude are main sequence G stars.
16	*HIDDEN SLIDE (to un-hide select "Slide Show" and un-check "Hide Slide") This provides you with more information about Tau Ceti.*

17	**Stars like our Sun are scattered throughout our Galaxy, but they must be very close to us for us to be able to see them without a telescope. Why? They are small and dim compared to most of the stars we CAN see.** **There are lots more of them, but they are farther away, therefore dimmer – too dim for us to see with just our eyes. Like trying to see a candle10 miles away. The bigger, brighter stars are more like headlights or searchlights or even bigger!** **So Kepler is looking at the Sun-like stars in this field of the Summer Triangle. We can't see them with our eyes, but Kepler is a special kind of telescope that will be out in space. It will be watching 100,000 stars similar to our Sun for a period of four years. Looking for Earth-size planets orbiting in the habitable zone of those stars.** *Optional*: **Let's go out and see if we can find that sun-like star in Cassiopeia!**