# Stars and Stellar Evolution (WS11-12)
# Computer Practicum with WTTS

## Exercise 3 (02/12/11)

**NOTE**: Please save your plots (using the PNG plotting option, "Save As") in your **BaMa home directory** (`scp /<location>/<filename> <username>@cipserv1:<location>`), answer the exercises using them and **send your answers to sutirtha@astro.uni-bonn.de**. Mention your folder name (e.g. `SSE_WTTS#`) in the subject (discuss and work with your group mate(s)).

**6.** Using **the Kippenhahn tab** for the$1\,\mathrm{M}_\odot$ and $15\,\mathrm{M}_\odot (Z = 0.02)$ models from last class (Question 4 & 5), answer the following (comparing the plots for the two masses) :

1. Plot age on $x$-axis, mass on $y$-axis and $H$ (hydrogen) as the $z$-axis. Explain what you see.
2. Plot Age, M and E_nuc (the last in Log). This shows the nuclear burning regions.
   a) What happens to the burning region when the core runs out of hydrogen?
   b) What happens to the magnitude of the burning? (Hint: try setting the $y$ range maximum to (say) $0.3$ to focus on the central region.)
3. Change Age to Model Number. **Replot**.
   a) Why is it easier to see the details of the transition from core to shell burning when plotting against Model Number?
   b) Why is the Model Number not simply linearly proportional to time?
4. Change back to Age for the $x$-axis and try $L$ on the $z$-axis (linear).
   a) Can you explain what you see?
   b) Compare the maximum luminosities with the values in the HRD(Exercise 1). Is there an error somewhere?
   c) What do you think has happened?