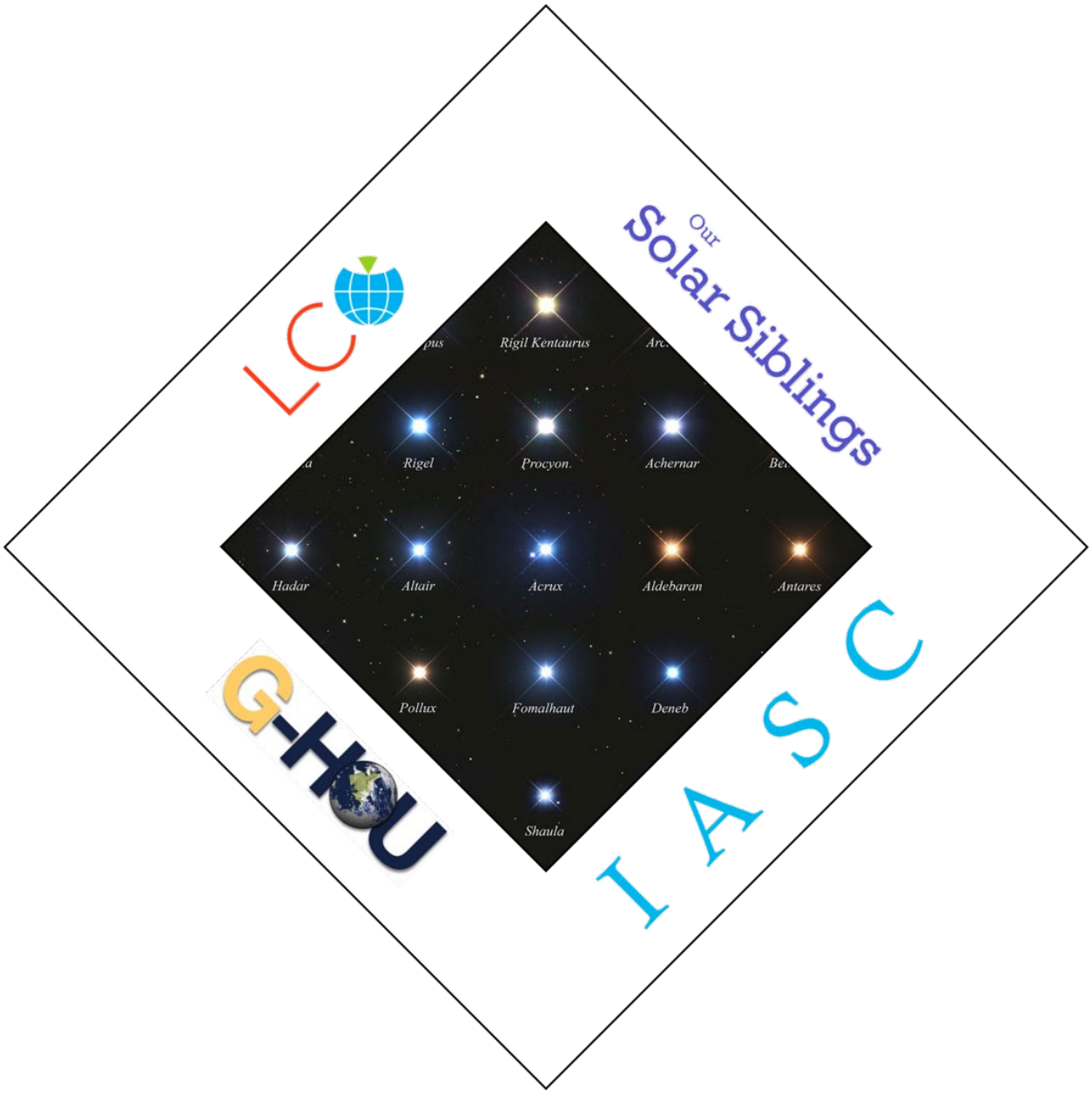
Stars Temperature (Wien's Law)



Bonus Question:

Main sequence stars, as seen in the Hertzsprung–Russell (HR) diagram, include stars that are in their Hydrogen-Burning phase, like our Sun. We can calculate the luminosity, mass, radius and average density of these stars. In addition, we can also calculate how long Hydrogen-Burning stars will take to exhaust their hydrogen fuel before going into their next phase of life (Helium-Burning).

The formulas are:

$$L \cong T^{6.72} \qquad M \cong T^{1.92} \qquad R \cong T^{1.36}$$

$$\rho \cong \frac{1}{T^{2.16}} \qquad \tau \cong \frac{1}{T^{4.80}}$$

where *L* is the *Luminosity*, *M* is the *Mass*, *R* is the *Radius*, ρ is the *Average Density* and τ is the *H-Burning Age in years*.

7 Rigil Kentaurus (α Cen) is a main sequence star belonging to the constellation Centaurus (The Centaur). It is the 3rd brightest star in the night sky overall and located approximately 4.2 light years away from Earth.

Rigil Kentaurus' wavelength is ≈ 5039Å. What is Rigil Kentaurus' luminosity, mass, radius and average density? How long will it take Rigil Kentaurus to burn through its hydrogen fuel?

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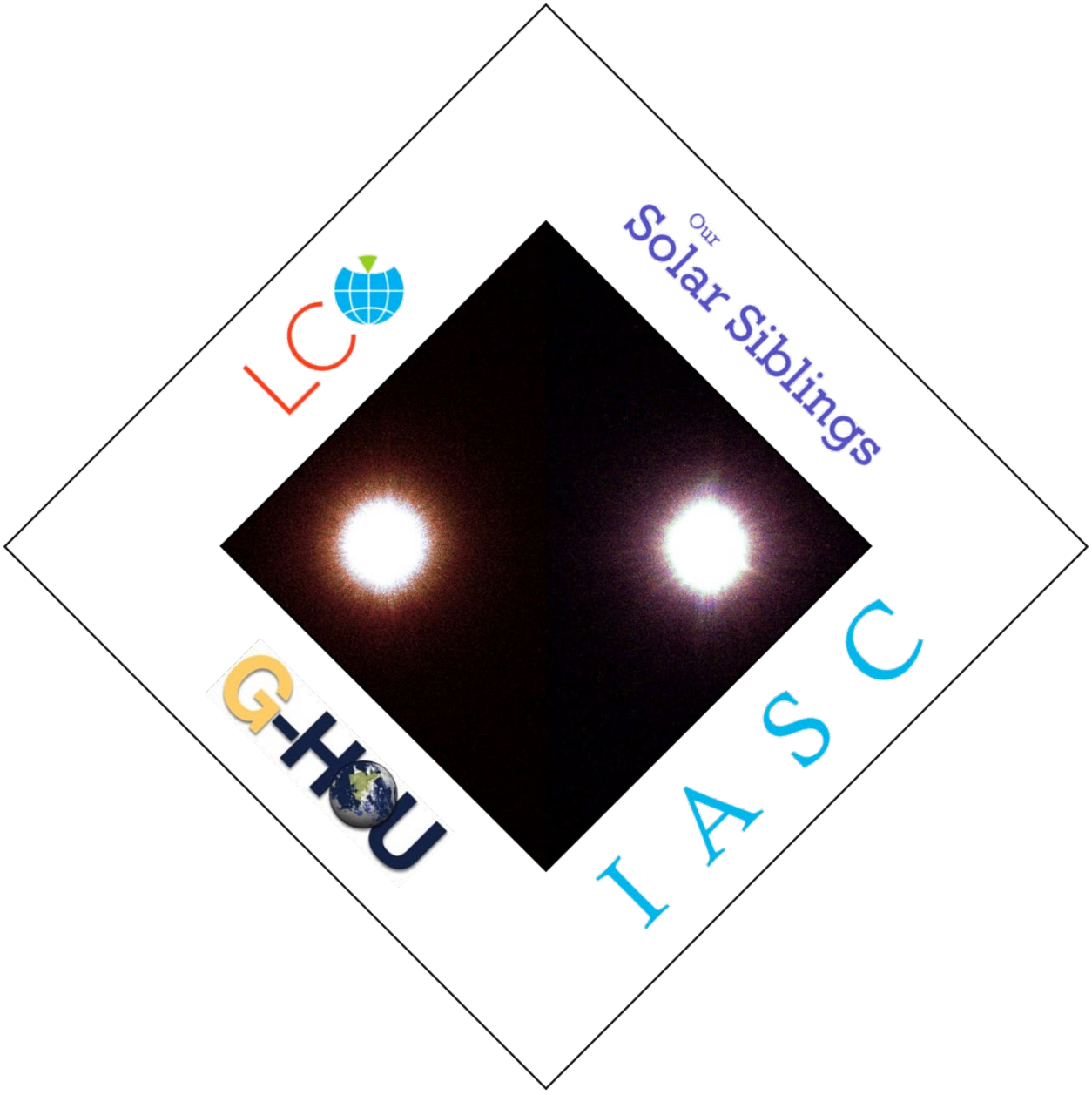

Arcturus (Left), Rigil Kentaurus (Right)
Taken by LCO and colorized using GIMP