



Monthly Notices of the Everglades Astronomical Society



Naples, FL
September 2017

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President's Message

I have a new muse. His name is Robbie. Robbie is about two feet tall, is black, brown, and white, and sings like a beagle. Last month (I'm writing this on August 10th) I agreed to care for this wonderful dog until his "parents" can get themselves moved down to Southwest Florida. This entails lots of walks at all hours of the day. This morning we started out at about 6:00 AM. It was still dark. For a change, the sky was clear. There in the low eastern sky was Orion lying on his side. The belt stars were vertical. I tried to find Sirius. It was still too low because of the buildings and trees. I decided to wait a minute or two. It didn't take long for it to appear. Like so many of our ancient ancestors, I was watching the heliacal rising of Sirius. It wasn't exactly the first date of the heliacal rising, but close enough for me.

Our August meeting at the Second Cup was great. Several members, new and old were there. I lost count of all the different conversations that were going on. This is proof of just how diverse our membership is.

Now that Saros Cycle 145, Event # 22 is over, I hope that you had good weather and that the thrill of seeing this phenomena will be with you for the remainder of your life. Be sure to attend our January meeting to share your experience with our club. I know there is a lot of talk about the 2024 eclipse, but my sights are set on the 2019 eclipse. Hopefully I'll be able to find something in the South Pacific.

Our September meeting will be very interesting. Rick Piper is giving a presentation on Comets, Asteroids and Meteors. I hope to see everyone there.

Clear skies, Denise Sabatini

Dates for the "Fak"

Usually the best times to go out to the Fakahatchee Strand viewing site are moonless nights. Below is a list of upcoming Saturday nights that you will often find fellow club members out there enjoying the skies with you (weather permitting).

Date	Moonrise	Moonset
Sept. 16	2:33 a.m.	4:11 p.m.
Sept. 23	9:17 a.m.	8:54 p.m.

Sky Events

- September 6 - Full Moon
- September 12 - Last Quarter
- September 19 - New Moon
- September 22 - Autumn Equinox
- September 27 - First Quarter

Next Meeting - CANCELLED

September 12, 2017: Time 7:00 – 9:00 pm
Norris Center, Cambier Park



Ted Wolfe's latest image shot with his Planewave telescope in Chile. Six hours of exposure of a van den Bergh object (VDB123) in Serpens. It is in the Great Rift region of the central Milky Way plane.

Published Articles by EAS Members

Ted Wolfe's article in the Naples News/Collier Citizen on August 29, 2017: Looking Up: Astrophotographers love this star spangled eagle

<http://www.naplesnews.com/story/news/local/communities/collier-citizen/2017/08/29/looking-up-astrophotographers-love-star-spangled-eagle/611734001/>

TO VIEW THE ABOVE ARTICLE, PRESS "CTRL" AND LEFT CLICK BUTTON.

The below link provides previous articles in the Collier Citizen by Ted Wolfe that appeared over past years.

<http://www.naplesnews.com/search/Ted%20Wolfe/>

To view all of Ted Wolfe's photos, visit his website @ www.tedwolfe.com .

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Stellar Cores – Part 2 Temperatures and Pressures

By Dennis C. Albright

The stellar core is where the heaviest nuclei fuse to provide the energy that prevents the star from collapsing into itself due to gravity.

The STARSRAW code calculates the following properties of the stellar core: temperature, T_{core} , total core pressure, p_{ctot} . The results of these calculations are shown in Table 1.

Furthermore, the core temperatures of the giant stars are much higher than those of the main sequence stars. It is these high core temperatures that allow complex nuclei to overcome the electrostatic repulsion and fuse to become larger, more complex, nuclei.

The results of the calculation of the core temperature, T_{core} , for approximately 700 stars are shown in Figure 1. The results of the calculation of the total core pressure, p_{ctot} , are shown in Figure 2.

Table 1 – Core Temperatures and Pressures

Star	Luminosity Class	Type of Star	M_s (suns)	T_{core} ($\times 10^6$ °K)	p_{ctot} ($\times 10^{15}$ Pa)
Sun	V	Main Sequence Dwarf	1.00	15.60	25.50
Thuban	III	Giant	3.85	736.93	377.97
Alphard	II	Bright Giant	3.03	1046.96	234.07
Rigel	Ia	Bright Super Giant	18.00	12019.50	7482.26

Figure 1 – Core Temperature, T_{core} , vs the Stellar Mass, M_s

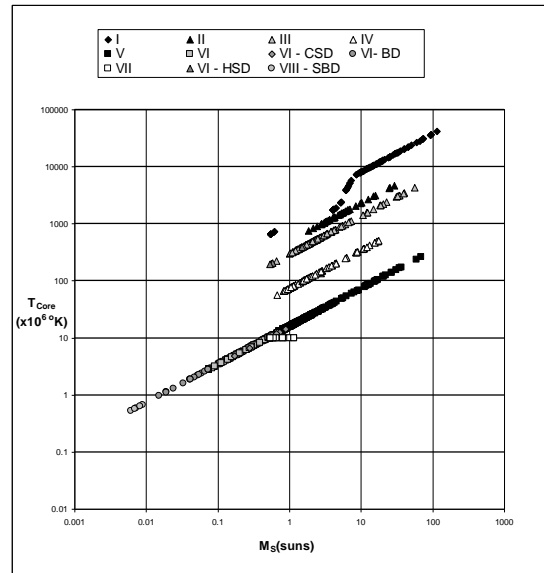
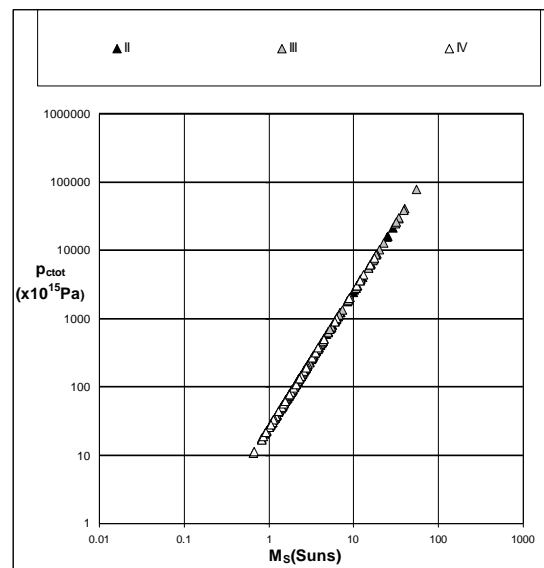


Figure 2 – Total Core Pressure, p_{ctot} , vs the Stellar Mass, M_s



Stellar Cores – Part 3 – Density By Dennis C. Albright

The stellar core is where the heaviest nuclei fuse to provide the energy.

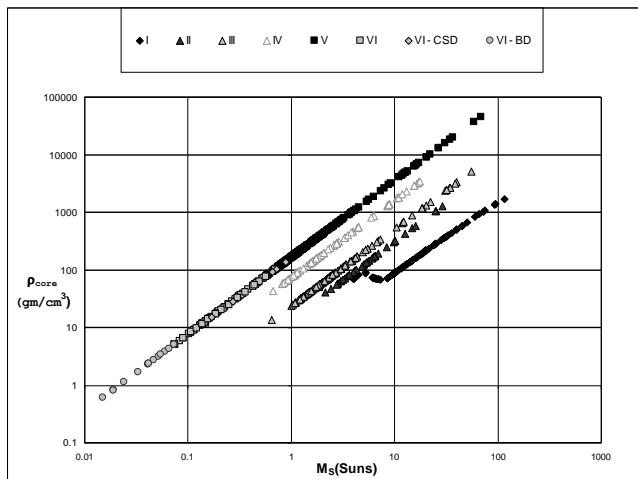
The STARSRAW code also calculates the core density, ρ_{core} . The result of this calculation is also shown in Table 1.

It is important to note here that the density of the sun is roughly 15 times that of lead. This is possible because at these high temperatures, all of the atoms are ionized and, therefore, the nuclei and electrons occupy much less space than un-ionized atoms.

Table 1 – Core Density

Star	Luminosity Class	Type of Star	M_S (suns)	ρ_{core} (gm/cm^3)
Sun	V	Main Sequence Dwarf	1.00	162.20
Thuban	III	Giant	3.85	146.92
Alphard	II	Bright Giant	3.03	64.04
Rigel	Ia	Bright Super Giant	18.00	189.13

Figure 1 – Core Density, ρ_{core} , vs the Stellar Mass, M_S ,



References

1. EAS Newsletter February 2017, STARS-DAW: A Program to Model and Simulate Stars, Dennis Albright
2. EAS Newsletter April 2015, Calculating the Temperatures of Stellar Cores, Dennis Albright

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EAS 2017 DUES

For the bargain price of only \$20.00 per family, all this can be yours this year:

- Meet with your fellow astronomy enthusiasts at least 10 times a year;
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- Many opportunities to view planets, nebulae and other celestial objects (even if you don't have your own telescope); and
- Enjoy the many astronomy programs at our regular monthly meetings.

Don't miss out! Fill out this form (please print clearly) and send it with your \$20 check to the

Everglades Astronomical Society, P. O. Box 1451, Marco Island, Florida, 34146.

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