

---

# Introduction to Alderbaran Characteristics and Spectrum

---

**AUTHORS**

Zachary Shelton

March 23, 2025

## Contents

<b>1</b>	<b>Abstract</b>	<b>ii</b>
<b>2</b>	<b>Celestial Databases</b>	<b>ii</b>
<b>3</b>	<b>Glossary of Important Terms</b>	<b>ii</b>
<b>4</b>	<b>Learning About Alderbaran</b>	<b>iii</b>

## 1 Abstract

There are billions of stars and celestial bodies that are worthwhile for scientist and astronomers to observe. When focusing on one body, it requires navigating various databases and academic journals to find characteristics of the body. This paper will focus on the star Alderbaran, which is the brightest star in the constellation Taurus. The paper will discuss the characteristics of Alderbaran, including its class, mass, and temperature. It will also outline how to find the same information for other celestial bodies.

## 2 Celestial Databases

There is so much observational data it feels impossible to find a specific piece of data or information. However, there are tools and databases that can help. The first tool is the SIMBAD database, which is a database of astronomical objects. The database provides basic information about celestial bodies, such as their class, mass, and temperature. There is also second tool is the VizieR database, which provides detailed information about similar or same celestial bodies, such as their spectral type, luminosity, and radius. If your interested in exoplanets, there is the Exoplanet Archive, which provides information about observed and theorized exoplanets, such as their mass, radius, and orbital period.

## 3 Glossary of Important Terms

This section will cover a not so comprehensive list of terms used in astronomy and their meanings:

- **Stellar Class** - The class of a star is a letter that represents the temperature of the star. The classes are O, B, A, F, G, K, and M. The O class is the hottest and the M class is the coolest. Astronomers use blackbody radiation and luminosity to determine the temperature of a star.
- **Blackbody Radiation** - Blackbody radiation is the radiation that is emitted by a blackbody(read more at: Blackbody Radiation). By measuring the broad spectrum of wavelengths of stars, scientist to can determine the temperature of the star.
- **Wien's Law** - States the peak wavelength of a blackbody is inversely proportional to the temperature of the blackbody. The law is represented by the equation  $\lambda_{\max} = \frac{b}{T}$ , where  $\lambda_{\max}$  is the peak wavelength,  $b = 2.89 \cdot 10^{-3} m \cdot K$  is Wien's constant, and  $T$  is the temperature of the blackbody.
- **Stellar Mass** - Astronomers and astrophysicist use the spectrum of the star combined with the star's luminosity to determine the mass of the star. The peak wavelength of a star indicates what a star is made of.

- **Stellar Luminosity** - A measure of the total energy a celestial body releases each second, this is also known as absolute brightness. There are many ways to measure this, and there are definite challenges in determining the true brightness of any stellar body far away. (Read More at: [Stellar Luminosity](#))

## 4 Learning About Alderbaran

Heading to SIMBAD, we can search for Alderbaran and find general characteristics of the star. Alderbaran is an identifier, however there are many more celestial bodies to give each a unique name, so the identifier is a combination of numbers and letters. The identifier for Alderbaran is HIP 21421 or Alpha Tauri.

**What is SIMBAD ?**

- basic search
- by identifier
- by coordinates
- by criteria
- reference query
- scripts
- TAP queries
- Output options

**Documentation**

- Object types
- Nomenclature & Dictionary
- Recommendations for Data Publication
- User's guide
- Measurement description
- List of journals
- User annotations documentation
- Query by url
- Acknowledgment

**Information**

- Presentation
- Image thumbnails
- Mobile version
- SimWatch
- Release
- SIMBADn 1.4 - 2023-01
- Release history

**Content**

The SIMBAD astronomical database provides basic data, cross-identifications, bibliography and measurements for astronomical objects outside the solar system. SIMBAD can be queried by object name, coordinates and various criteria. Links to some other on-line services are also provided. Use of SIMBAD service is free without any registration under ODM licence. We request that users cite the original paper reference.

**Basic search**

Alpha Tau

identifier, coordinates (radius=10 arcmin), or b1bcode

[SIMBAD search](#) [close](#) [help](#)

Install the Simbad basic search in your tool bar

**Acknowledgment**

If the Simbad database was helpful for your research work, the following acknowledgment would be appreciated:

*This research has made use of the SIMBAD database, operated at CDS, Strasbourg, France*

2009, A&AS, 143, 9, "The SIMBAD astronomical database", Wenger et al.

**Statistics**

Simbad contains on 2023.02.23

28,311,854	objects
68,438,733	identifiers
446,314	bibliographic references
45,913,929	citations of objects in papers
15,633	acronyms described for Simbad

Figure 1: SIMBAD Database homepage, search for Alderbaran using one of its identifier