

## CAN VARIABLE STARS BE INTRODUCED TO CHILDREN?

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### Abstract

In the nature of variable stars lies a key to introducing children to astronomy. This paper proposes a justification for including variable stars in the curriculum of an elementary school, and suggests a number of stars whose observation would be enjoyable and useful.

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### 1. Introduction

Stars are people, too. They are individual; they behave in definite ways. In teaching children about the sky, variable stars are our key to understanding a sky that performs. If we amateur astronomers can aid our understanding of science by observing variable stars, we can make a second important contribution by sharing our love and interest in the stars with someone younger. We are in a unique position to do this; our interest began not through the textbook but through the stars directly. Wherever children gather, in families, classrooms, or in summer camps, we can show them how to discover the variables. Not just high school children can benefit; younger grade school people, age 7 to 12, could also discover astronomy through the magic of variable stars.

The most important thing is not merely to transfer information to the next generation, but to convey one's love of the subject. Emphasize that variable stars don't just shine in the sky, they perform. The young Orion variables enjoy the unpredictability of childhood, the U Gems have temper tantrums, the huge Miras vary with the majesty of senior citizens.

Anthropomorphizing the variables is intended as an aid to inspiration more than to understanding. It is a useful teaching tool as long as the children do not go home believing that stars are really just like us. People are people and stars are stars, and if some apparent behavioral similarities can open a gate to their interest, then we and the children can enjoy them.

### 2. An Observing Program

In observing an active, changing star, a child discovers it, and thinks of questions. What would life be like on a planet orbiting such a star? Was the star always like this? Will our sun someday be like it?

Young children can observe variables if the stars perform regularly and if they and their comparison stars are easy to find. Delta Cephei is my favorite for young people since it satisfies these conditions so well. With a period of 5.37 days, its full cycle can possibly be seen and understood in a typical school week. The two comparison stars form an easily observed triangle with it. The star will show some change with each observing night, so it should keep the level of interest high.

Algol is interesting partly because it is so famous. It is bright, and by simply choosing the next convenient minimum, a child can watch it perform. Since Algol's minima do not often happen early in

the evening, a careful teacher can schedule a special observing party when it does.

Alpha Orionis - Betelgeuse - is a good star. It is bright and red, and part of a major constellation, so finding it should present no problem. Its strange name also seems to attract a child's attention. Although estimating Betelgeuse is fairly difficult, since the star's change is irregular and comparison stars are far across the sky, it is a good representative of its type.

Of all the Mira stars, two seem appropriate for children, Mira itself and Chi Cygni. Planning an observing program in advance is important so that the children do not look for them when they are faint. Mira is quite easy to find when it is brighter than fifth magnitude; and from a dark site, Chi Cygni changes the appearance of the long arm of Cygnus when it is near maximum.

### 3. Some History

Understanding the motivations of people who devoted their lives to this aspect of science is just as important, and as inspiring, as observing their stars. The life of John Goodricke is especially interesting since his story includes rising from the handicap of being unable to hear or speak. His discovery of the variation of Algol was one of the most significant events in the advancement of astronomy, and it happened from a back yard. Unfortunately, the pneumonia which he caught shortly after his discovery of the nature of Delta Cephei killed him at age 21. But through his story, the variable stars and those who study them can come closer to children.

Variable stars teach us the lesson of hope, that the starry sky is a different place from the earthly environment of a child, that it is accessible to young people, that there are stars in the sky that "happen", and that by following them we become a part of them.

#### MARTHA BETZ SHAPLEY: FIRST LADY OF HARVARD COLLEGE OBSERVATORY 1921-1952

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#### Abstract

During the fall of 1985, when family, friends, students and colleagues of Harlow Shapley all assembled to celebrate the centennial of his birth, they often commented on how much his wife, Martha Betz Shapley, supported his career in astronomy as well as her own. Unfortunately, Mrs. Shapley's contributions to science, to her family, and to the extended observatory family were frequently overshadowed by her husband's. Therefore, this paper will examine her mathematical work of calculating elements for eclipsing binary systems and her managerial work of caring for her own and for the observatory family. To date, sources for this paper include a published biographical sketch by Zdenek Kopal, an unpublished manuscript by Jacqueline Kloss, an informal discussion with Mrs. Fletcher Watson, an unpublished typescript by Prof. Charles Whitney of his recent interview with Dr. Luigi Jacchia, and the catalogue and papers that Mrs. Shapley published on eclipsing binary systems.

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