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Brian D. Warner
Jerry Foote
David A. Kenyon
Dale Mais**

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The Olin Eggen Project

Arne Henden
American Association of Variable Star Observers (AAVSO)
arne@aavso.org

Abstract

Olin Eggen was one of the most prolific professional observers in the Southern Hemisphere. Over a 50-year career, he collected hundreds of thousands of photoelectric observations. This paper describes an ambitious project started by the AAVSO to digitize his observational archive.

1. Introduction

Olin Jeuck Eggen (July 9, 1919 – October 2, 1998) received his Ph.D. in astrophysics from the University of Wisconsin (Madison) in 1948 (only the second one awarded by UW), working with Joel Stebbins and Albert Whitford on the lightcurves of Algol. His seminal paper in 1962 with Lynden-Bell and Sandage (“Evidence from the Motions of Old Stars that the Galaxy Collapsed”, Eggen et al. 1962) is his most cited paper (both Lynden-Bell and Sandage later were awarded the Bruce medal by the ASP, partly based on this paper). Eggen also introduced the concept of moving (or kinematic) groups of stars. A photograph of Eggen, Lynden-Bell and Sandage is given in Figure 1 (from the PASP obituary: Eggen 2001).



Figure 1. Photograph of Olin Eggen, Donald Lynden-Bell, and Alan Sandage (left to right).

Eggen moved to the Southern Hemisphere in 1966, assuming Directorship of Mt. Stromlo Observatory and pursuing the development of the AAT large reflector. He moved to Cerro Tololo Inter-American Observatory (CTIO) in 1977 where he stayed until he passed away 20 years later.

Olin Eggen was a vice-president of the RAS, a life member of the ASP, was awarded the American Astronomical Society Henry Norris Russell Lectureship in 1985 and the Pawsey Memorial Lectureship of the Australian Institute of Physics. The Australian National University has established a scholarship program in his name; the CTIO library is named after Eggen.

He was an extremely prolific researcher, publishing some 400 research articles over his 50-year career, with articles being written up until his death in 1998 from a heart attack. He worked with many of the notable astronomers over the last half of the 20th century, including Sandage, Lynden-Bell, Greenstein, Herbig and others. He was well known as a careful researcher, never observing unless it was perfectly clear, and always substantiating any claim he made in a paper. However, Eggen was not without controversy, having a gruff personality, always willing to voice his opinion on a topic, even resigning his membership in the IAU around 1970. We will leave his most famous episode, “the Neptune file,” for other historians to comment about!

2. Eggen's Legacy

Eggen was well known as a proponent of small-telescope science. However, what the AAVSO is most interested in is that Eggen published only a small part of the enormous amount of data he collected over his lifetime. He initially developed a photometric system called (P,V) (for photographic and visual), roughly comparable to B and V, and published many papers of photometry on this system.

Astronomers migrated to the Johnson U,B,V system and Eggen's P,V system fell into disuse. However, the P,V system is nearly identical to Johnson B and V (see Moro and Munari, 2000: the Asiago Database on Photometric Systems), and can be easily transformed into the Johnson system. Later in life, Eggen worked mostly in the Stromgren narrow-band system. All of these observations were handwritten onto index cards that he kept in his office. Often, when a visitor would ask a question about a star, he would look up the coordinates, go to his card file, and retrieve observations that he had made of that target.

3. The Eggen Observation Card File

In early 2007, we made contact with CTIO to find out what had happened to that card catalog, mainly because we were interested in some observations that Eggen had made but never published. CTIO had taken the cards out of Eggen's office upon his passing, and had placed them in storage at La Serena. Since they were not serving any useful purpose in storage, the Director of CTIO, Alistair Walker, gave the AAVSO permission to study these cards, sending them to us on long-term loan.

The box containing the index cards is shown in Figure 2. This large box contains an estimated 100,000 3x5 index cards, each of which refers to a single star and the observations of that star. The majority of these stars are in the southern hemisphere;

all observations are photoelectric and of high quality. Our intent is to make these observations available to the astronomical community.



Figure 2. Large cardboard box containing Eggen's cards.

The first phase will be a general examination of the cards, moving them out of the miscellaneous cardboard boxes into more organized storage, and placing them into a logical sequence (Right Ascension is the obvious one, as this is how Eggen originally filed the cards). We will take some test scans of the cards, to see what resolution, file type and compression ratio can be tolerated. An example of such a scan is given in Figure 3, where 6 cards are shown to

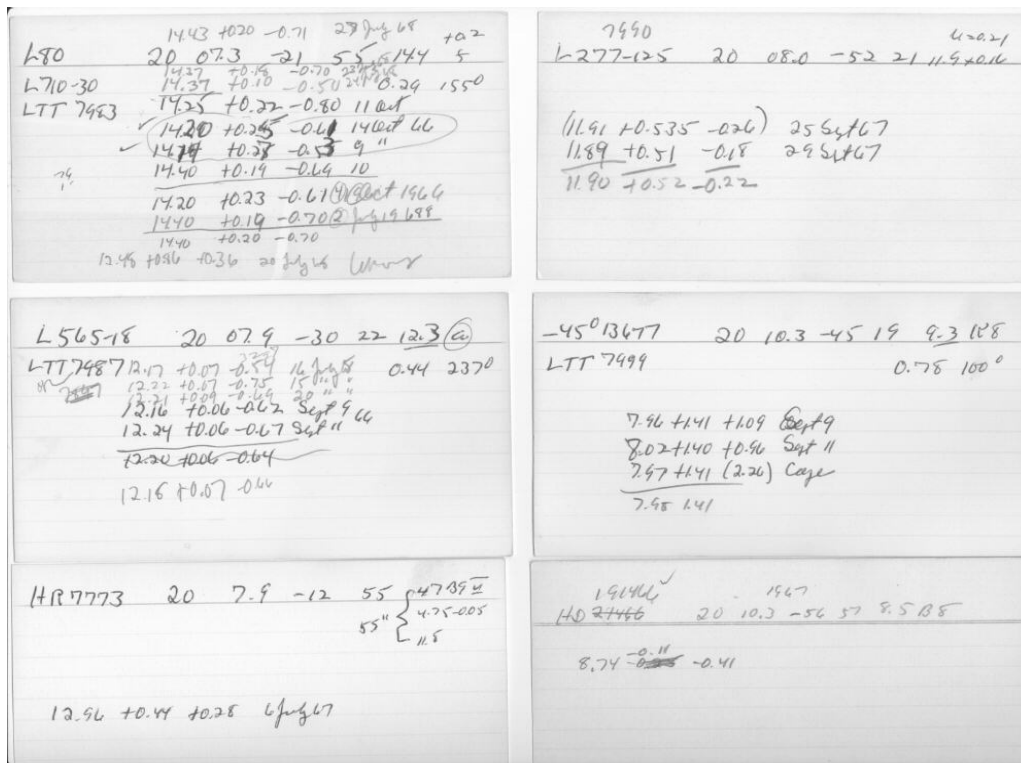


Figure 3. Scan of 6 Eggen index cards.

demonstrate the quality of a typical scan and the information content of the cards.

The next phase will be to scan all of the cards. We hope to hire a summer student to perform the mundane task of scanning, with funding from the AAS and perhaps a grant of a high-speed scanner from a commercial company. We expect the entire catalog to fit on a single DVD for off-line, permanent archival.

The third phase will be to place the scans on-line at the AAVSO website. The scans will be logically named, with a lookup table to find an appropriate star in the sequence. A Graphical User Interface (GUI) will be developed so that an outside researcher can request copies of any scan.

The final phase is where we need the most help. Our intent is to digitize the observations themselves, and place them in a separate MySQL database for ready access. Since the observations are handwritten, OCR techniques are nearly useless, and we need volunteers to “check out” scanned cards and enter the measurements from those cards into a computer file that we can read and upload into the database. Since there are 100K cards, this is the most labor-intensive part of the exercise and will require dedication by a large number of people to accomplish the task.

4. Summary

Our ultimate goal is to make the photoelectric observations that Eggen made over his career available in a convenient, machine-readable and easily queried format to researchers worldwide. They are a treasure-trove of information, both on infrequently studied southern stars, as well as measurements of variables over decades of time. The initial phases can be accomplished quite quickly, so at least individual stars can be found and measurements extracted; the final phases may take years to accomplish. Eggen was a great observer – we should make use of his efforts.

5. References

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