Solicitation Title: Classical Cepheids: Determining Evolution Rates and Accurate Parameters
Solicitation Deadline: February 8th, 2022
Solicitation Sponsor: Dr. Scott Engle
Solicitation Funding: External (grants)

Solicitation Summary:

We are seeking a Villanova undergraduate (possibly two, depending on funding) for the summer research opportunity to determine and/or refine the rates of pulsation-period change for select Cepheids. These rates allow the fundamental parameters of the Cepheids to be determined and tested, and satellite astrometric data may also be used to search for co-moving companions to the Cepheids. This will involve gathering and analyzing photometric observations from a number of sources, including the on-campus *George P. McCook Observatory*, the *Robotically Controlled Telescope* at Kitt Peak National Observatory, photometric surveys (e.g. *ASAS-SN* and *Harvard DASCH*), and even space-based missions (e.g. *Gaia* and *TESS*). The candidate will receive training on data gathering/reduction/analysis techniques, including the use of Python codes written specifically for this research program.

Solicitation Requirements:

The research position is open to all Villanova undergraduates that are majoring in astronomy or a closely related field. Applicants need to provide:

- a current CV that highlights commitment to excellence in the applicant's current field of study;
- a 3-page proposal that discusses the scientific background and proposed work timeline;
- a 1-page narrative on expected outcomes and procedures; and
- a 1-page personal statement that conveys the suitability and interest of the applicant.

To apply for this position, interested students need to submit their applications by the deadline in the form of a single pdf document. Only electronic submissions are accepted; email your applications to scott.engle@villanova.edu. Any applications received after the deadline will be returned without review.

Solicitation Documents:

To prepare a strong proposal, the following sources might be useful

- the thesis which describes many aspects of the program
- research papers (1, 2) discussing some more recent results of the program

In addition to these, applicants are encouraged to use their own sources of information.

Solicitation Outcome Announcement:

The review of solicitation material will begin on Feb 8, 2022 and a short-list will be assembled by Feb 15, 2022. The highest-ranking candidate will be informed and offered a position. In the event that the highest-ranking candidate accepts the position, the solicitation will be closed. Otherwise, the position will be offered to the next highest-ranking applicant until the position is filled.