



VARIABLE STARS

Variable Stars and Collaboration with AAVSO





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Overview

The AAVSO has been around for over 100 years.

Despite its name of American Association of Variable Star Observers, the AAVSO is an international non-profit organization where both amateurs and professionals meet and work together to further our astronomical understanding through variable stars.

This lesson will highlight some of the collaborative aspects and educational aspects available to an association with the AAVSO.



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Why Observe Variable Stars

As variable stars cover the entire spectrum of the HR Diagram, the variations in their luminosity can reveal important information about their internal structures, and in turn, stellar theories.

Variable Star data can be used to determine: Luminosity, temperature, radius, mass, rotational periods, and even distance.

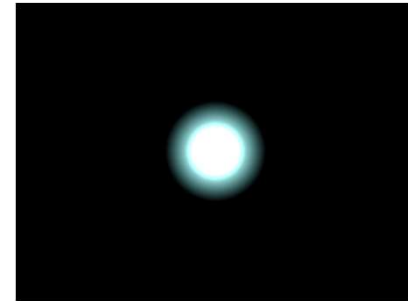
The large observatories, and space telescopes, are hard to come by, and as such, are limited to few areas of measure.

Amateurs, with sound scientific processes, there are thousands of avenues to contribute to astronomical sciences.

The AAVSO has about 10,000+ stars in their databases with an ability to access or create thousands of charts to assist in discovery and stellar monitoring.

Thus the ability to contribute lies in: personal observation programs and support of professional projects.

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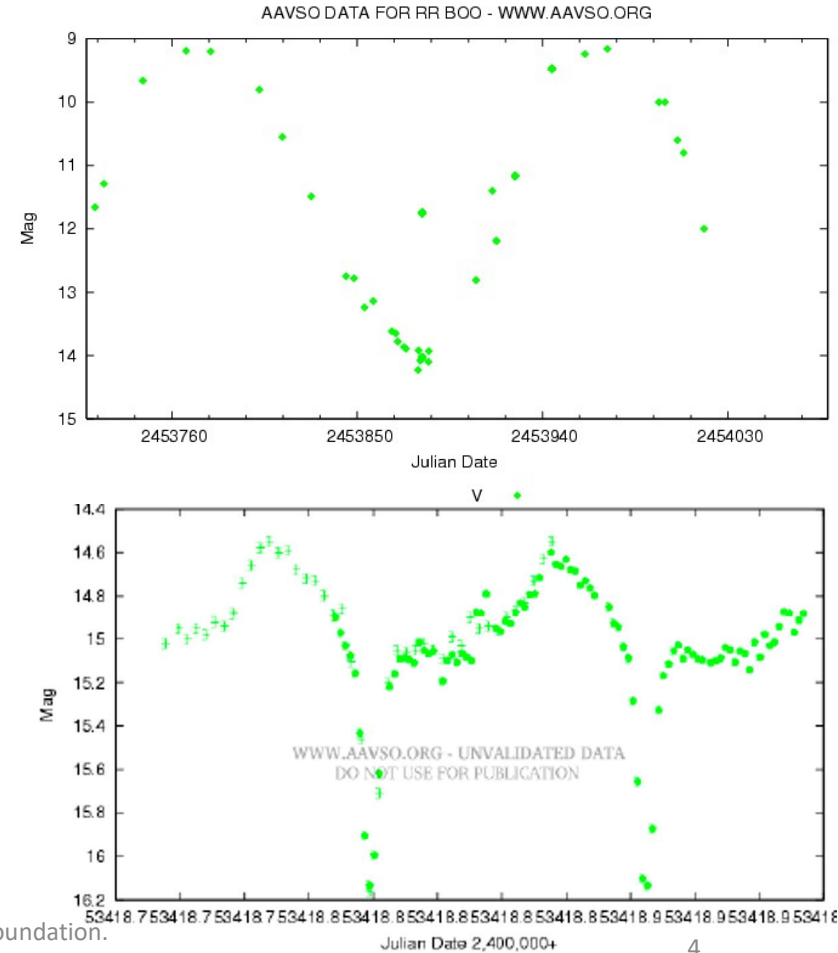


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The Power of Collaboration

Some variable stars have light curves from multiple observers as the periods are so long, and span decades of research. An example to the right is Mira, a pulsating variable.

Other observations can be captured by a single individual in a matter of hours (see the Dwarf Nova to the right). However, the collaboration comes in when comparing the behaviors of this nova to others from past observations. Similarities and differences highlight stellar theories and help refine, or confirm them.



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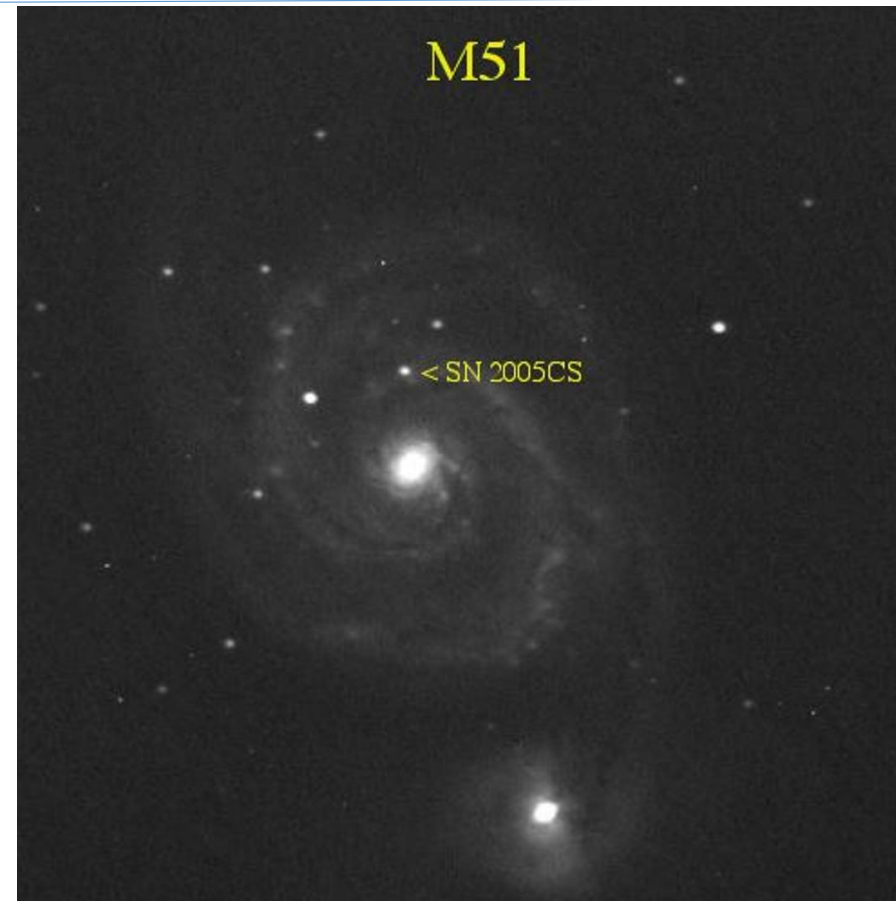


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Collaboration Examples

Some astronomical events occur without any notice and fade rapidly. A supernova in M51 is a prime example.

Such alerts are communicated via the AAVSO's Alert Notice program.





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Assisting Professional Observation Programs

Professional observers, employing land and space based equipment, often request support (i.e. precursor observations, occurrence observations, follow-on observations, etc) of specific targets.

AAVSO Target Tool Print Export CSV API Help Feedback

Observing section: Alerts/Campaigns Exoplanets (EP) Cataclysmic Variables (CV) Eclipsing Variables (EB) Short Period Pulsators (SPP) Long Period Variables (LPV) Young Stellar Objects (YSO) High Energy Targets (HET) Miscellaneous All [Filter observing sections](#)

Observability: To show only targets that are visible tonight at your telescope location, [sign up](#) or [login](#).

Star Name	RA (J2000.0)	Dec (J2000.0)	Constellation	Var. Type	Min Mag	Max Mag	Period (d)	Observing Cadence (d)	Observing Section	Filter/Mode	Last Observed	High Priority	Notes
CH Cyg	19 ^h 24 ^m 33 ^s	+50° 14' 29"	Cyg	ZAND+SR	10.1 V	5.6 V		5.0	Alert/Campaign	B	16 hours ago	⚠	B and V especially needed Alert Notice 639 Alert Notice 454 Special Notice #320
AG Dra	16 ^h 01 ^m 41 ^s	+66° 48' 10"	Dra	ZAND	10.3 V	7.9 V	548.65	3.0	Alert/Campaign	B	1 day ago	⚠	Alert Notice 631 Adopted by John Francis Briol
AG Peg	21 ^h 51 ^m 01 ^s	+12° 37' 32"	Peg	ZAND+R	9.4 V	6.0 V	816.5	1.0	Alert/Campaign	B	1 week ago	⚠	Alert Notice 521
RW Aur	05 ^h 07 ^m 49 ^s	+30° 24' 05"	Aur	CTTS/RO T	13.6 p	9.6 p	2.64	1.0	Alert/Campaign	B	1 day ago	⚠	Alert Notice 514 Special Notice #402
R Aqr	23 ^h 43 ^m 49 ^s	-15° 17' 04"	Aqr	M+ZAND	12.4 V	5.2 V	387.0	10.0	Alert/Campaign	B	5 days ago	⚠	through December 2017 for AN 589 + AN 600 Alert Notice 600 Alert Notice 589 multi-year observing campaign for AN 535

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Education

On the AAVSO website, there are many links to educational materials about variable stars.

These cover the basics, types, relation to stellar development.

Additionally, there are online classes and videos covering a wide variety of topics from how to read variable star plots to exoplanet research.

The screenshot shows the AAVSO website header with the logo and navigation links: Home, Contact Us, FAQ, AAVSO Store, CCD School Videos, CHOICE Courses, and Donate. Below the header, the main content area features a link to 'Home' and a 'Print This Page' option. The 'Variable Stars Main' section is highlighted with a blue underline and contains a list of educational resources:

- What Are They & Why Observe Them?
- The Stories Variables Tell
- Types of Variables
- Variable Star of the Season
- Educational Materials
 - CHOICE Online Institute
 - CCD School Videos
 - Student Projects
 - Two Eyes, 3D
 - Variable Star Astronomy
 - H-R Diagram Plotting Activity
- Reporting Variable Star Discoveries
- Variable Star Index (VSX)
- AAVSO in Print - Publications Using AAVSO Data



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Summary

The study of variable stars goes beyond any single organization.

However, collaboration with the AAVSO can provide vast and valuable resources such as:

- Real-time, up-to-date information on unusual stellar activity
- Assistance in scheduling and executing of variable star observing programs using earth-based large telescopes and instruments aboard satellites
- Correlation of optical data with spectroscopic, photometric, and polarimetric multi-wavelength data
- Collaborative statistical analysis of stellar behavior using long-term data



Questions?