MyNewsFlash: A System for Near Real-Time Variable Star Monitoring and Alerts

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Abstract *MyNewsFlash* is an automated and customizable system for distributing timely variable star data. It supplies near real-time reports to the user of the latest activity of a variable star or class of stars. The stars it monitors, the frequency of report delivery, the delivery format, and more features are all completely customizable so the reader receives only reports of information he or she wants and nothing more or less. In addition, manually-generated alerts called *Special MyNewsFlashes* are occasionally sent out with additional information on special or abnormal behavior of a variable star. *MyNewsFlash* evolved from the AAVSO *News Flash*, an electronic publication dedicated to outbursts of popular cataclysmic variable stars.

1. Background

The AAVSO *News Flash* was an electronic publication prepared at AAVSO Headquarters (Figure 1). From February 26, 1996, through August 11, 2003, 1,214 *News Flashes* were published. The vast majority of the *News Flashes* were prepared by Rebecca Turner, who was responsible for the publication. Occasionally she was helped by fellow staff members Kerriann Malatesta, Gamze Menali, Elizabeth Waagen, Sara Beck, or Aaron Price. Director Janet Mattei oversaw operations and supplied input when needed.

The content of the *News Flash* was dominated by the outburst behavior of popular cataclysmic variables (CVs). Occasionally *News Flashes* were issued on the special behavior of non-CV stars and/or to announce an observing campaign. It was published via e-mail and on the AAVSO web site.

The *News Flash* was very popular among observers. A community of active CV observers formed around it and even though they also published their CV data elsewhere, having observations published in an AAVSO *News Flash* was considered the "gold standard" (Simonsen 2000). Friendly competition even sprang up to be credited with a "loner," which is a CV outburst detected by only a single person. On average, 2.2 *News Flashes* were issued per week, although in the last couple of years that average was closer to 3 per week as CV observing increased in popularity.

The *News Flash* was largely prepared by an editor using computer programs developed by Michael Saladyga of the AAVSO staff, and tools and scripts developed by Price to help in the lengthy process. This caused a problem in that it could only be issued during regular working hours. In addition, it covered mostly cataclysmic variables.

Demand was growing for the *News Flash* to be expanded to include non-CV stars after the discontinuation of the *AAVSO Circular* in December 2002 after 30 years of publication. The *Circular* was edited by John Bortle and included a sampling of observations of CVs, Miras, novae, and other variable stars. The loss of the *Circular* created a vacuum for rapid publication of non-CV observations.

In May of 2003 a survey of *News Flash* subscribers was conducted to look for outstanding needs and desires. Among them the desire for continuous coverage and coverage of more stars were the strongest. These and other feature requests were used as the basic design kernel that evolved into *MyNewsFlash*. The system went on-line in public-test mode in June 2003, and was officially launched two months later upon the final publication of the original *News Flash*.

2. *MyNewsFlash*

The *MyNewsFlash* system was made possible by the creation of an automated data pipeline in 2000 that processes observations from observers as soon as they are sent to Headquarters. An estimated 75% of observations sent to the AAVSO are now processed through this pipeline without any human intervention. Of the remaining 25%, 6% are sent on paper reports via postal mail and are not included in the *MyNewsFlash* reports.

Every ten minutes the *MyNewsFlash* system polls the database created by the incoming pipeline. It compares that database with a database of *MyNewsFlash* subscribers (currently about 1,200) and prepares individualized reports for each subscriber. The subscriber can customize the reports using the following criteria:

Star name(s) This can be any number of stars by their name in the *General Catalogue of Variable Stars* (GCVS; Kholopov *et al.* 1985).

Star type(s) This can be any number of stars by their GCVS type.

Brightness of observation This allows subscribers to filter out stars too faint for their observing system.

Activity If the observer used the "Y" Comment Code to denote "Activity" in their observation, then it can be included in the report regardless of whether it passes other filters. This allows observers to provide some level of manual input into *MyNewsFlash*. Observers often know better than anyone else if a star's behavior is abnormal.

Age of observation Observations older than a certain number of days can be ignored.

Delivery Schedule Reports can be delivered every ten minutes, hourly, daily, weekly or monthly.

Delivery Format Most reports are delivered in a standard format (Figure 3), however a condensed format for wireless devices is also available (Figure 4).

In addition, there exist a few predefined lists exist of stars with common similarities. These predefined lists make it easy for subscribers to monitor entire classes of stars and is in fact the most popular monitoring choice. The lists are:

Cataclysmic variables This is a list of over 250 of the most popular cataclysmic variables among our observers. It includes the stars monitored for the original *News Flash* and has been expanded to cover fainter and newly discovered CVs. K. Malatesta visually examined the AAVSO light curves of each star and set an outburst threshold. If an observation comes in brighter than that threshold, it is included in the *MyNewsFlash* report. Price and Simonsen have added to the list and adjusted some of the outburst thresholds, which are always being tweaked for better performance of the system.

SNOBs The "Significant" or "Noteworthy OutBurstS" list is a collection of around 100 stars which have rare or noteworthy outbursts. The stars for the list were chosen by Simonsen and the outburst thresholds determined by Price.

GTN This is a list of 54 blazars and magnetic variables (polars) being observed by the AAVSO International High Energy Network in support of the GLAST Telescope Network (GTN) (Spear 2004). This list includes all data submitted and does not have outburst thresholds set. In the future, a GTN-outburst list is planned once enough data has been collected to set quiescence levels for these optically chaotic objects.

More lists will likely be designed and implemented in the future.

3. How to use *MyNewsFlash*

MyNewsFlash is a free public service. To sign up, the interested party visits http://www.aavso.org/publications/newsflash/myflash.shtml . Their subscription will begin as soon as the form is filled out. The form includes "What's This?" and other links that open pop-up windows of helpful information and explanations.

Multiple subscriptions can be used. For example, one may sign up to receive updates on SNOBs activity every ten minutes and also sign up to receive a report on regular CVs once a day.

Modifying a subscription can be done on-line by logging into a WebObs account. WebObs is an on-line toolbox for AAVSO observers. In WebObs they can input observations, upload CCD time series data, search for past observations and more.

WebObs is also freely available to the public. If the subscriber does not have a WebObs account and does not want to create one then they can modify the subscription by sending an e-mail to aavso@aavso.org.

The reports arrive in the subscriber's e-mail box from a consistent e-mail address (aavso@aavso.org) and with a consistent format to the Subject: line ("AAVSO *MyNewsFlash* Report For" followed by the calendar date then the JD). This makes it convenient to set up an automatic foldering system in an e-mail client.

Two examples of the success of the system can be found in publications of data on UV Per (Price *et al.* 2003) and BZ UMa (Price *et al.* 2004). Both are CVs whose outburst was originally reported to the public via the *MyNewsFlash* system SNOBs list. These quick notifications alerted observers and allowed AAVSO Headquarters to begin coordinated monitoring campaigns. The results of those campaigns were the source of the two publications. It was especially crucial in the case of BZ UMa, which has a very short outburst length of only 3–4 days. A single day's delay would have meant the loss of one-third of the data acquired.

An astronomically-themed quotation appears at the bottom of each report. These are randomly generated from a list of about 35 quotations gleaned from various sources. The most frequent source is the "Out of Focus" column in the old issues of *The Sky* (one of *Sky & Telescope*'s predecessors). One of the other sources is reader feedback so please feel free to submit quotations to be used in the list.

4. Limitations

The observations reported in the *MyNewsFlash* system are exactly as they are submitted to the AAVSO. They have not been checked, processed, or put through any quality control procedures. As one may expect, this means that sometimes erroneous data makes it into the system. Most of the time these user errors involve an incorrect Julian Date so can be easily picked out in the report. AAVSO Headquarters staff corrects these errors when they are reported to us, but if the report was sent out before the change was made then there error will be included. As such, we refer to these data as raw, "unvalidated" data. (At the end of each month, all data received are processed, added to the AAVSO International Database, and ultimately validated for automatic download.)

5. Proper usage and citation of data

Because the data in the reports are unvalidated they should not be used for display or publication. If needed for such a purpose, the subscriber should contact AAVSO Headquarters to have the data validated. Special *MyNewsFlashes* are numbered and archived on-line at http://www.aavso.org/publications/newsflash. Because of their customized nature, individual *MyNewsFlashes* are not archived on-line.

References to a *MyNewsFlash* or *Special MyNewsFlash* report should cite this paper as its source.

6. The future of *MyNewsFlash*

The *MyNewsFlash* system has been a success. Upon launching, it immediately saw a subscriber increase of over 30% from the original *News Flash* list. However, it is still in a relatively crude form. There are plans to make it more useful with sophisticated outburst detection routines and routines to look for abnormal behavior in non-outbursting stars. Small features such as the adding of comparison star charts and CCD error data are planned as well. Feedback is always appreciated from its users. An HTML version (optional) with embedded light curves and links to charts is also under consideration. Finally, real-time monitoring not limited to 10-minute windows is also being investigated.

7. Conclusion

The original AAVSO *News Flash* was a popular electronic publication. Its offspring, the AAVSO *MyNewsFlash* system, is a natural evolution which takes advantage of current technology to make it more useful and timely. It is a new way to monitor the activity of your favorite variable stars. It is quite customizable and provides a unique resource in astronomy in that everyone has access to the same data at the same time. The future plans for the system include very basic forms of data analysis and additional format features.

References

Simonsen, M. 2004, private communication.
Kholopov, P. N., *et al.* 1985, *General Catalog of Variable Stars*, 4th ed., Moscow.
Spear, G., *et al.* 2004, American Astronomical Society Meeting 204, No. 35.13.
Price, A. 2003, *Inf. Bull. Var. Stars*, No. 5488.
Price, A. 2004, *Inf. Bull. Var. Stars*, No. 5526.

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* * * AAVSO NEWS FLASH * * *

Subject: GK Persei No. 1
February 26, 1996

MINOR OUTBURST OF GK PERSEI

The old nova GK Per (Nova Per 1901) has gone into a minor outburst, for the first time since July 1992, as indicated by the following observations:

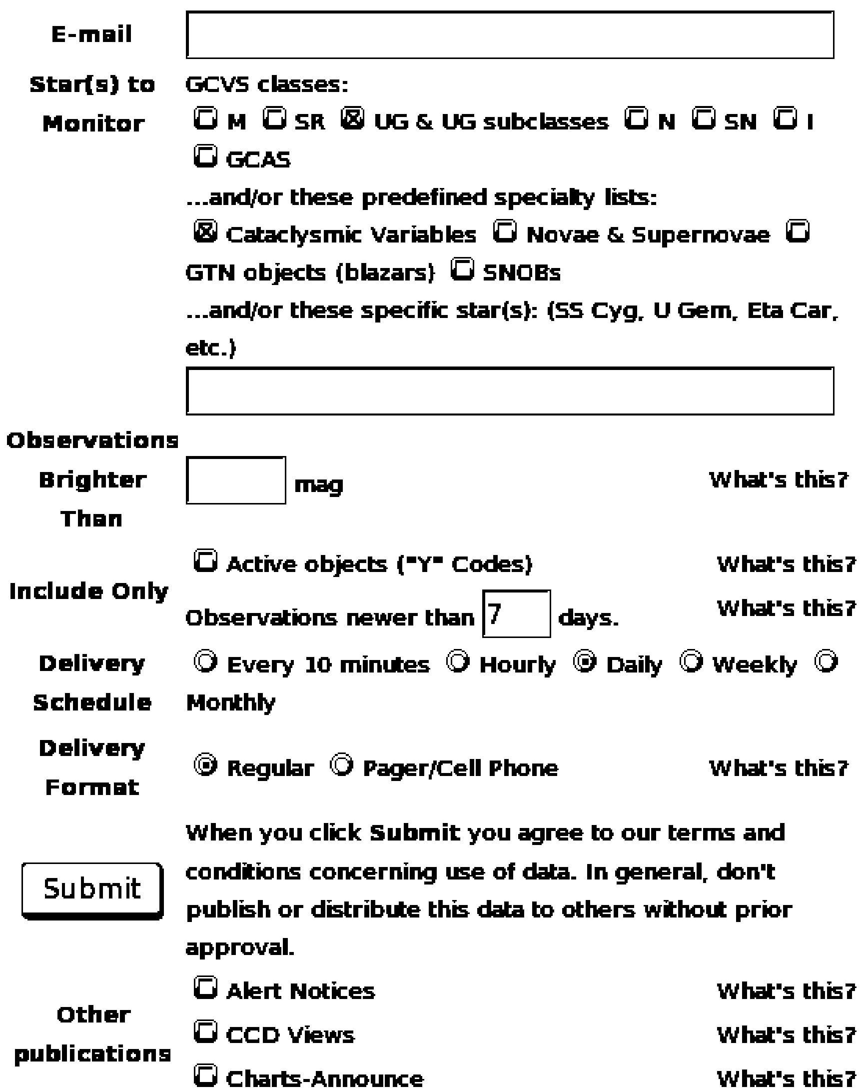
UT	JD	Mag.	Observer
FEB 19.0257	2450132.5257	12.8	(J. Bortle, USA)
FEB 19.0993	2450132.5993	13.0	(J. McKenna, USA)
FEB 20.0896	2450133.5896	12.9	(W. Dillon, USA)
FEB 23.1333	2450136.6333	13.0	(R. Royer, USA)
FEB 23.828	2450137.328	12.9	(P. Schmeer, Germany)
FEB 25.0507	2450138.5507	12.7	(M. A. Komorous, Canada)
FEB 25.819	2450139.319	12.7	(Schmeer)
FEB 25.873	2450139.373	12.6	(J. R. Osorio, Spain)
FEB 26.0542	2450139.5542	12.4	(McKenna)
FEB 26.0549	2450139.5549	12.5	(Bortle)
FEB 26.781	2450140.281	12.4	(Schmeer)
FEB 26.809	2450140.309	12.4	(Schmeer)

The X-ray Timing Explorer (XTE) satellite has been scheduled to observe GK Per on Feb. 27, 1996, at 10 UT.

Please monitor GK Per closely and phone-in, fax, or e-mail your observations to AAVSO.

Good observing!
Janet A. Mattei

Figure 1. The first *AAVSO News Flash*.



E-mail

Star(s) to Monitor

GCVS classes:

M SR UG & UG subclasses N SN I

GCAS

...and/or these predefined specialty lists:

Cataclysmic Variables Novae & Supernovae GTN objects (blazars) SNOBs

...and/or these specific star(s): (SS Cyg, U Gem, Eta Car, etc.)

Observations Brighter Than mag What's this?

Include Only

Active objects ("Y" Codes) What's this?

Observations newer than 7 days. What's this?

Delivery Schedule

Every 10 minutes Hourly Daily Weekly Monthly

Delivery Format

Regular Pager/Cell Phone What's this?

Submit

When you click **Submit** you agree to our terms and conditions concerning use of data. In general, don't publish or distribute this data to others without prior approval.

Other publications

Alert Notices What's this?

CCD Views What's this?

Charts-Announce What's this?

Figure 2. *MyNewsFlash* sign-up form.

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The following star(s) have observations in this report:
  3C 66A AN    MARK 421   AN UMA

The following observation(s) have been received by the AAVSO:

  0216+42  3C 66A AN (BLAZAR):
    FEB 25.1281  2453060.6281   14.3   JM   CCDV

  1058+38  MARK 421  (BLAZAR):
    FEB 24.9479  2453060.4479   12.5   GCO
    FEB 25.3167  2453060.8167   12.6   SXN  Y
    FEB 25.3599  2453060.8599   12.5   JM   CCDV

  1058+45  AN UMA (AM):
    FEB 24.1687  2453059.6687   16.45  MDW   CCDV

 The preceding observation(s) were contributed to the AAVSO International
 Database by:
 JM      JAMES, ROBERT A.            LAS CRUCES, NM USA
 GCO     GUALDONI, CARLO             COMO, ITALY
 SXN     SIMONSEN, MICHAEL A.        IMLAY CITY, MI USA
 MDW     MACDONALD II, WALTER J.     WINCHESTER, ONTARIO KC K, CANADA

 For more information visit these URLs
  Light Curves: http://www.aavso.org/data/lcg/
  Raw Quick Look Data: http://www.aavso.org/data/ql/
  Charts: http://www.aavso.org/observing/charts/
  ---
  ###
  Byron:
  Ye stars, that are the poetry of heaven!
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Figure 3. Sample *MyNewsFlash*.