The Astronomer’s Telegram: A Web-based Short-Notice Publication System for the Professional Astronomical Community

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ABSTRACT

The Astronomer’s Telegram (ATEL; http://fire.berkeley.edu:8080/) is a web based short-notice (<4000 characters) publication system for reporting and commenting on new astronomical observations, offering for the first time in astronomy effectively instantaneous distribution of time-critical information for the entire professional community. It is designed to take advantage of the World Wide Web’s simple user interface and the ability of computer programs to provide nearly all the necessary functions. This makes ATEL fast, efficient, and free. In practice, one may post a Telegram, which is instantly (<1 second) available at the Web-site, and is distributed by email within 24 hours through the Daily Email Digest, which is tailored to the subject selections of each reader. In addition, authors reporting new outbursts of transients or coordinates of new objects (for example, gamma-ray bursts or microlensing events) may request distribution by Instant Email Notices, which instantly (∼ minutes) distributes their new Telegram by email to self-identified workers interested in the same topic. This speed in distribution is obtained because no editing or reviewing is performed after posting – the last person to review the text before distribution is the author. Telegrams are enumerated chronologically, permanently archived, and referenceable. While ATEL will be of particular use to observers of transient objects (such as gamma-ray bursts, microlenses, supernovae, novae, or X-ray transients) or in fields which are rapidly evolving observationally, there are no restrictions on subject matter.

1. Introduction

In recent years, use of the World Wide Web (WWW) among astronomers has become commonplace. Most individuals have their own web site, where they maintain a library of their recent preprints and professional information. Data from observatories is often distributed through a web site, as well as observing application forms; many observatories now require submission of these application forms through a web interface. Nearly all major astronomical journals use the web to distribute their refereed articles, often before they are available in paper form. These include The Astrophysical Journal, the main journal, Supplement and Letters (http://www.journals.uchicago.edu/ApJ/journal/); Astronomy & Astrophysics (http://link.springer.de/link/service/journals/00230/index.htm); The Astronomical Journal (http://www.journals.uchicago.edu/AJ/journal/); Publications of the Astronomical Society of the Pacific (http://www.journals.uchicago.edu/PASP/journal/index.html), and Science (http://www.sciencemag.org/); although not (yet) Monthly Notices of the Royal Astronomical Society, or Publications of the Astronomical Society of Japan. The journal Nature (http://www.nature.com/) permits reading of its abstracts, but not text, online simultaneously with the print publication.

A web-based electronic journal of refereed articles - New Astronomy – is distributed by the WWW as well as in paper form, but departs from traditional paper-based journals largely by permitting greater
flexibility in the medium of presentation (color figures, time-evolved video, sound, and other media which can be distributed by the WWW).

There also exists a unique Internet resource which permits the widespread distribution of pre-prints from a single site – known as the e-Print archive (http://xxx.lanl.gov/). This allows astronomers, and practicing scientists in other fields, to distribute their pre-printed articles prior to publication, and often prior to a reading by a referee. This site has become the de facto means of communicating new results to the astronomical community, because those wishing to remain at the forefront of their field require the most up-to-date work as soon as it is available and are competent to evaluate the quality of the presented work themselves.

The main advantage of the WWW and Internet distribution over the more traditional means of article publication has not yet been systematically exploited. This advantage is effectively instantaneous distribution of time-critical information. This advantage is most useful to observational astronomers who study transient objects – such as gamma-ray bursts, microlensing events, galactic X-ray sources, novae, or super-novae – and to fields which are rapidly evolving observationally, such as (presently) brown dwarfs, extra-solar planets, and milli-second pulsars. This advantage is required more for the distribution of short observational reports with a minimal amount theoretical interpretation than for the detailed presentation of results and intricate (and perhaps controversial) interpretation, for which refereed articles in traditional print journals are useful.

1.1. Previous Distribution of Time Critical Information

Time critical information – such as the coordinates of new discoveries, recent intensity measurements in a variety of wave bands, and rapid theoretical interpretation of behavior which has immediate implications for observations – has hitherto been distributed through formal and informal networks.

The most widely used formal network is the electronic International Astronomical Union Circulars (IAUCs; http://cfa-www.harvard.edu/cfa/ps/chat.html). Submitted text is reviewed and edited by the editors, sometimes returned to the author for changes, and distributed electronically between a few hours and a few days after submission. For some types of object (e.g. gamma-ray bursts, microlensing events), a few days delay time is the difference between a well studied object and a missed observational opportunity. The IAUCs also operate as a referenceable repository of information, which makes the author accountable for the presented results, providing motivation for the author to present reliable information.

Most fields of transient objects have developed their own informal networks – sometimes consisting of email exploders, which redistribute messages to a list of interested individuals, or even as informal as a single individual who emails received messages to everyone they know. These networks are typically advertised by “word of mouth”, and are not often widely familiar, limiting the community of workers, and thus the coverage which one can obtain. Also, such informal networks are susceptible to simple breakdowns in communication – due to absences of key distributors, and the difficulty in manually maintaining a relevant email list over the long term. Also, due to the informality of the information distribution, the distributed information is not static, archived, or referenceable; often, one does not know who produced the coordinates at which one is to re-direct one’s telescope for follow-on observations. This limits the reliability of and subsequent confidence in this information, which is essential to other observers evaluating the information for the possibility of further observations.
2. The Astronomer’s Telegram

ATEL is a means to make use of the advantages offered by automation and the WWW for the information distribution needed by astronomers.

It is designed with the problem in mind that the limiting factor in observations of transient objects is the time-scale of distribution of observational information – discoveries, measurements, evolution, availability of finding charts, predictions for future behavior, and rapid pertinent interpretation of the observations which immediately affect observational planning. This time-scale is loosely defined as the elapsed time between when the authors realize when they have information which will be useful to other observers, and when these other observers receive that information.

ATEL eliminates what has hitherto been the determining factor in this time-scale – time spent between the submission of the information and its distribution – by eliminating all people between the author and the means of distribution (the WWW and email).

Thus, the design goals of ATEL are to:

• maximize the reliability and relevance of posted information; this is done by restricting the ability to post to professional astronomers, requiring registration prior to posting of a username and password or PGP public key, with the owner’s identity and professional status verified prior to activation. Either an activated username and passsword or a signature from an activated PGP key is required when a Telegram is posted.
• provide a long-term, stable means of distribution.
• minimize the distribution time and maximize availability of posted Telegrams; this is accomplished by having all functions performed by computer programs, executed through the Web by distant users. The delay time for publication is therefore set by the computational speed of the host computer and the speed of the WWW protocols, and presently is < 1 second.
• provide an easy means of posting, reading and searching Telegrams;
• performing all these functions at zero cost at the point of use to both authors and readers.

2.1. Functions and Use

All interactions with ATEL occur through the WWW (at http://fire.berkeley.edu:8080/) where one may:

• Read posted Telegrams, sortable by subject, date, author, or user-defined keywords.
• Sign up for the Daily Email Digest; by specifying those subjects of interest, ATEL will email to you, each day, those Telegrams received during the previous 24-hour period. No email is sent if no such Telegrams are received.
• Sign up for the Instant Email Notices; information which is extremely time critical, such as the coordinates of a newly discovered object, are emailed at author request to those who have asked to receive these in selected subject areas.
• Post a Telegram for instant reading through the Web and/or Instant Email Notices, and distributed within 24 hours in the Daily Email Digest. Posted Telegrams may make use of HTML formatting, including links to other sites, where supplementary information might be provided. Authors should keep in mind that many readers will see their information in ASCII email, where some HTML formatting (such as TABLE) may not be clear. Several HTML commands – (specifically IMG, META, APPLET, FRAME and HR) are presently not permitted, to insure the static nature of the content, and to keep the Web page layout uniform.

• Submit for registration a username and password or PGP key, with which (once the identity and status of the user is verified) the user may post Telegrams.

Telegrams are posted and instantly available, which is possible only because no review of the material (i.e. editing or refereeing) takes place after submission. The version which the author posts is the version which is available at the web site, and no modifications by anyone may be made after the posting (HTML commands, however, are presently stripped from a Telegram prior to emailing the Daily Email Digest or the Instant Email Notices). Authors who discover errors after posting must post an additional Telegram, delineating the error.

3. Conclusions

The Astronomer’s Telegram offers a publication method which was not previously available to the astronomical community with effectively instantaneous distribution. This is useful, most notably to observers of transient objects and to fields which are rapidly evolving. There are no restrictions on subject matter, and so it may be used by all astronomical professionals.

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