

The COBS comet database: Structure and content

Jure Zakrajšek (1), Herman Mikuž (1,2) and Johan Warell (3)

(1) Črni Vrh Observatory, Slovenia (jure.zakrajsek@obsrv.si), (2) Faculty of Mathematics and Physics, University of Ljubljana, Slovenia (3) Swedish Amateur Astronomical Society (SAAF), Sweden (johan.warell@gmail.com)

Abstract

The Comet Observation Database (COBS) [1, 2] is a unique web service that enables comet observers to submit, display and analyse comet data in a single location. The service is currently representing one of the largest databases of comet observations available (containing more than 230.000 observations) and is available to comet observers worldwide.

Introduction

The goal of every serious comet observer should be to publish the observations, so that they become available for scientific research.

COBS has been very successful in its task and has been widely accepted by the comet observing community. It offers a unique and simple way to store the comet observations in ICQ format [3] by using simple web forms to guide the observer in the input of the comet observation.

Website platform and development

The COBS website was introduced to the public in May 2010 at the Meeting on Asteroids and Comets in Europe (MACE) held in Višnjan (Croatia). It is maintained by the Črni Vrh Observatory [4] team.

The foundation of the website is a PostgreSQL database, which holds all the information about the observers and their observations. The front-end of the webpage was written in the Python programming language. It uses the Apache mod-python library to communicate with the Apache http server which is running on a Linux server to generate the dynamic page content.

The current website enables the user to choose between dark or light colour themes. The website layout is presented on Figure 1.

COBS has taken on the task of providing new ICQ-style observer codes and abbreviation keys, as the ICQ has not operated for a number of years. New

observers will be assigned a unique observer code when creating an account. The observer code is required for observation submission.

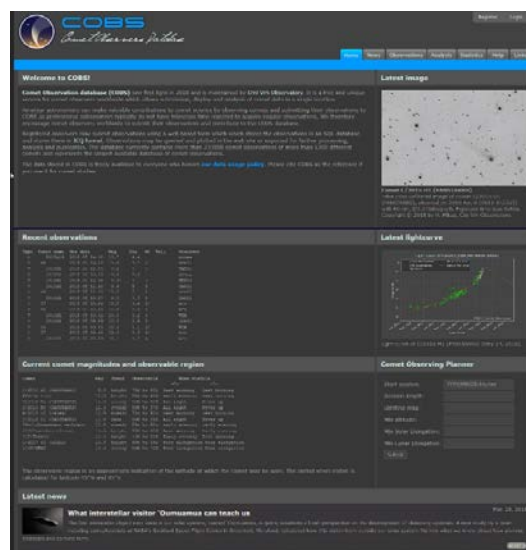


Figure 1: The COBS website layout.

Observers may also request new ICQ abbreviation keys for sensors, cameras, filters passbands, photometric catalogues etc. if they are not present in the available lists.

The website uses simple web forms to guide the observer to input all necessary information about the comet observation. A validation script processes all submitted observations and verifies the adequacy of entries according to the ICQ formatting rules.

Import of archive observations

Many major associations of comet observers have imported their observation archive to the COBS database. The complete archive of SMPH (Czech Republic) was imported in 2011 followed by the import of VdS (Germany), DCV/NKV (Netherlands), SAAF (Sweden), REA (Brazil), BAA (United Kingdom) and ALPO (USA) archives in 2015.

In January 2016, an import of the available ICQ archive was completed. This archive contained the data submitted to ICQ headquarters up to the year 2009 and contained over 160.000 observations, dating back to 1930. The cumulative number of observations stored in the database through the years, with major imports marked, is presented on Figure 2.

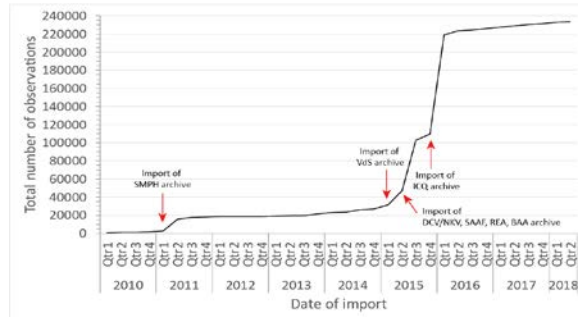


Figure 2: Cumulative number of observations in the COBS database through the years. Major association archive imports are marked.

Database statistics

Currently there are more than 2.500 registered observers in the database, representing 68 different countries all over the world. Almost 90% of these observers have contributed observations to COBS.

The database stores more than 233.000 visual and photometric (mainly CCD) observations (dating back to 1884) of 1.201 different comets. More than 85% of the submitted observations are visual. On average, more than 400 new observations are currently submitted to the database each month.

Table 1: Number of observations for different comet types.

Observed comets: (1201)	Total	Visual	CCD
Short-period comets: (319)	81 303	68 416	12 887
One-apparition Short-period comets: (148)	2 065	1 180	885
Long-period comets: (733)	149 763	133 052	16 711

The best observed comet in the database is C/1995 O1 (Hale-Bopp), with over 15.600 observations. Observations of many short-period comets cover more than just one perihelion passage. Among them 29P/Schwassmann-Wachmann and 1P/Halley have the most observations available in the database.

The number of observations for different comet types is presented in Table 1. The majority of all observations are of long-period comets, followed by short-period comets.

Data usage policy

The COBS Comet Observation Database is the product of the ongoing efforts and expertise of the volunteer observers who contribute the data and the COBS technical staff who prepare and maintain the database.

Data stored in the database are freely available to the community and can be processed with online analysis tools or exported as a CSV file and imported into any other analysis software.

In the publication of results obtained by using COBS, we appeal that users adhere to our data usage policy that can be access on the help tab. Doing so indicates that you support the purpose of COBS and respect the worldwide community of observers who provided the data.

Summary and Conclusions

The Comet Observation Database (COBS) is currently one of the largest databases of comet observations and is open to comet observers worldwide. The service has been widely accepted and is used by major associations of comet observers, as well as individual observers.

Acknowledgements

The authors are grateful for the assistance given by Jakub Černý, for his engagement and suggestions for new features that helped evolve COBS during the past years.

References

- [1] COBS database. Available at: <http://www.cobs.si>.
- [2] Zakrajšek, J. and Mikuž, H.: Comet Observation database (COBS), BAA Journal (accepted for publication)
- [3] International Comet Quarterly. Available at: <http://www.icq.eps.harvard.edu/index.html>
- [4] Črni Vrh Observatory. Available at: <http://www.observatorij.org>