

Atlas and Catalog of Dark Clouds

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We have organized a website to release the database of the atlas and catalog of dark clouds (<http://darkclouds.u-gakugei.ac.jp>). We have also organized some of the data in beautiful images with a general explanation of dark clouds and star formation for the public (in Japanese only), so that they can be used for astronomy and science education at schools.

1. Introduction

Dark clouds are the birthplaces of stars and planets. They consist mainly of gas and dust which block the star light from the regions behind them. Dust in the clouds causes the extinction. Extinction maps are useful not only for researches but also for educators, especially for those who study dark clouds and star formation occurring therein.

We have organized a website of the dark clouds and their extinction maps. The digital data are open to the public. Many researchers download and use the data for their researches. Here, we introduce our website to educators as educational materials that can be used for their teaching at schools.

2. Atlas and Catalog of Dark Clouds

Dobashi et al. (2005) [1] produced an all-sky extinction map from the optical database Digitized Sky Survey (DSS). In addition, Dobashi (2011) [2] and Dobashi et al. (2013) [3] produced an extinction map in the near-infrared (NIR) based on the 2 Micron All Sky Survey Point Source Catalog (2MASS PSC, Skrutskie et al. (2006) [4]). Fig. 1 shows the resulting all-sky extinction map.

Based on these datasets, Dobashi (2011) [2] and Dobashi et al. (2013) [3] have carried out a systematic survey for dark clouds and compiled a new atlas and catalog of dark clouds. As a result, they identify 7614 dark clouds all over the sky. Fig. 2 shows some examples of the identified dark clouds.

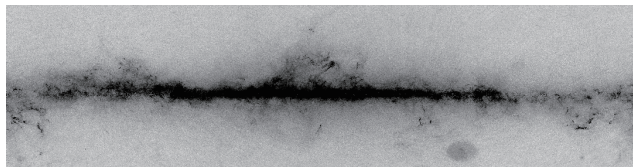


Fig. 1 Extinction map (color excess map of $E(J-H)$) produced from the 2MASS PSC covering all of the sky. The figure is taken from Dobashi (2011) [2].

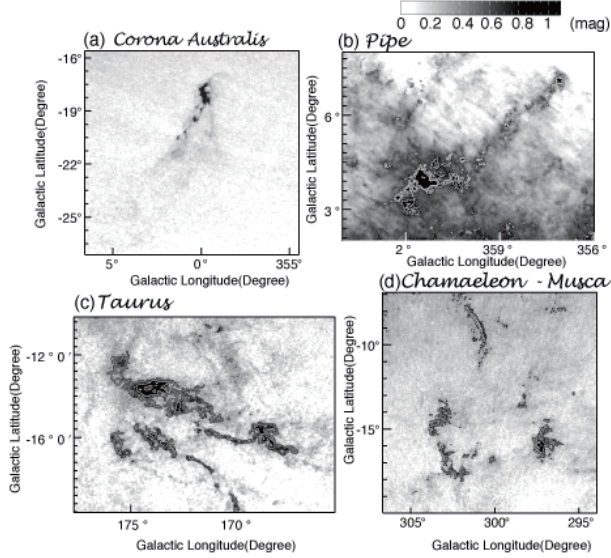


Fig. 2 Examples of the identified dark clouds. (a): Corona Australis region. (b): Pipe region. (c): Taurus region. (d): Chamaeleon and Musca region.

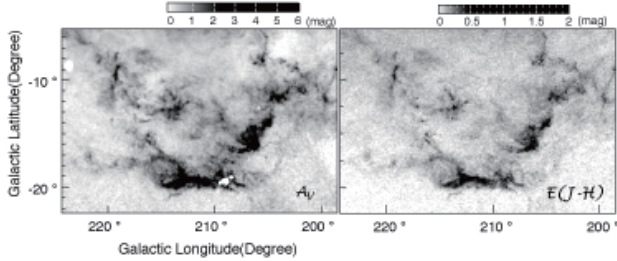


Fig. 3 *Left panel*: Extinction map of the Orion molecular region produced from the DSS [1]. *Right panel*: Extinction map for the same region produced from the 2 MASS PSC [2].

The datasets are useful to picture the structures of dark clouds in various density ranges (see Fig. 3). Infrared light allows us to peer into clouds of gas and dust, and to uncover objects hidden inside. The NIR extinction maps based on the 2MASS PSC [2] mainly trace relatively dense regions in dark clouds revealing a number of dense cloud cores leading to star formation. On the other hand, visual extinction maps based on the DSS [1] are more suited to trace less dense regions and to reveal the global extents of dark clouds.

3. Release of the Data on the Web

We have organized a website to release the database of the atlas and catalog of dark clouds using the 2 datasets. All of the data, i.e., the maps of the extinction as well as the list of the identified dark clouds, are available at our website, <http://>

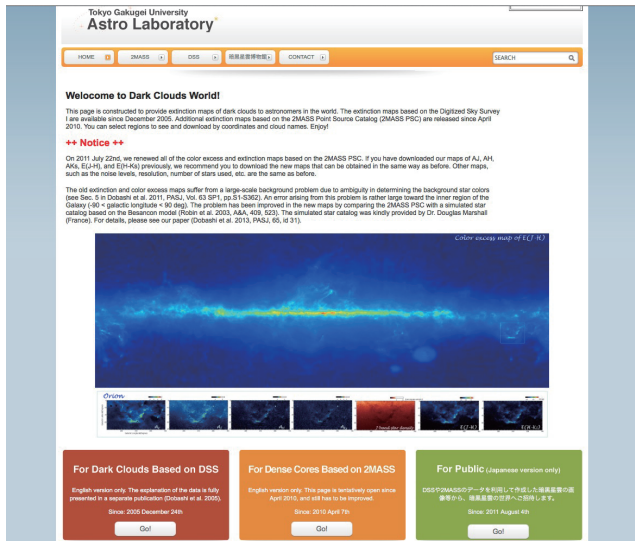


Fig. 4 Top page of our website (<http://darkclouds.u-gakugei.ac.jp>).

darkclouds.u-gakugei.ac.jp.

The website is designed to be simple and user-friendly with CGI, so that the researchers and educators can easily obtain the necessary extinction maps in simple FITS format.

We have also organized some of these data in beautiful images with a general explanation of dark clouds and star formation for the public (in Japanese only), so that they can be used for astronomy and science education at schools.

4. How to Download the Data

The digital data are open to the public in FITS format. One can get them by the following simple steps.

1. Visit our website at <http://darkclouds.u-gakugei.ac.jp> (Fig. 4).
2. Select the type of maps, and set required parameters. Click the [SUBMIT] button to submit the request.
3. You can submit your requests either by coordinates or cloud names.
4. When the data are displayed, click the [Download FITS file] button. You can also get a cloud table (text file) from the same page.

5. Summary

An atlas and a catalog of dark clouds identified using the extinction maps are open to the public at our website, <http://darkclouds.u-gakugei.ac.jp>.

The dark clouds are good educational materials to teach how and where stars and planets (including our solar system) are formed. The data on our website can be used freely for such educational purposes at schools.

References

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