

NEO Data Exchange and Collaboration Service – NEODECS

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Abstract

We work on a new web service (NEODECS) for collecting and sharing data on Near Earth Objects and facilitating collaboration among observers and researchers. Instead of having to maintain the content ourselves, we will only provide a tool for astronomers to register their databases, broadcast observing plans, seek collaborators as well as offer free telescope time to others. NEODECS can be extended in the future to other Small Solar System Bodies.

1. Introduction

Every day NEO observations are performed in a number of observatories. Raw data collected during those activities are rarely available to the scientific community, and results obtained from their analysis are not always published (or published with significant delay, when a longer observing campaign is completed). Some data are placed in various databases and web sites with either an open access to the whole content or only to a summary of various data products in an archive. Current internet search engines are becoming more and more sophisticated but due to the exponential grow of information finding relevant data is not easy. E-mail is still a basic tool for collaboration among the observers but often requires additional web services to be used, and social media are only a partial solution as they are not optimized for astronomy.

2. Aims

The goal of the NEO Data Exchange and Collaboration Service (NEODECS) is to create an open access central repository of structured meta data on NEOs, as well as a platform for collaboration among NEO researchers, using elements well known in social networking. Such service shall make it easy to locate necessary databases and services on NEOs, broadcast observing plans, seek collaborators as well as offer free telescope time to others. NEODECS can potentially attract observers from other fields of astronomy, who

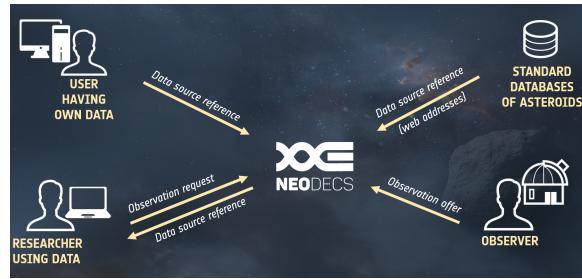


Figure 1: A graph showing how various groups of users would interact with themselves using the NEODECS service.

have free resources but do not know that they can be used for NEO studies. While the information available at the beginning will be gathered by us (to reach a critical mass), the service will then live its own life and its content will be decided by the needs of its users.

NEODECS is developed under a contract to European Space Agency (ESA) and is thought of as an extension of the already existing ESA NEO portal (<http://neo.ssa.esa.int>) which is a central node for all European efforts in NEO studies. Comments on NEODECS received from the astronomical community indicate that it would be useful to open the service to other Small Solar System Bodies (SSSB). This should be easy since most of them share similar observing techniques.

3. Service architecture

NEODECS will offer two modes of use: for registered users, who will use it regularly, and for casual visitors, who will be given open access to most of the content. Registration will be possible after providing basic credentials, affiliation, type of research done (observations, modelling, etc.). Such data will allow our service to automatically create a link to the ADS and Astro-ph databases of publications, which will further characterize the activity of a given scientist.

Fig. 1 shows how researchers will interact with our service. For example, an observer who collects his re-

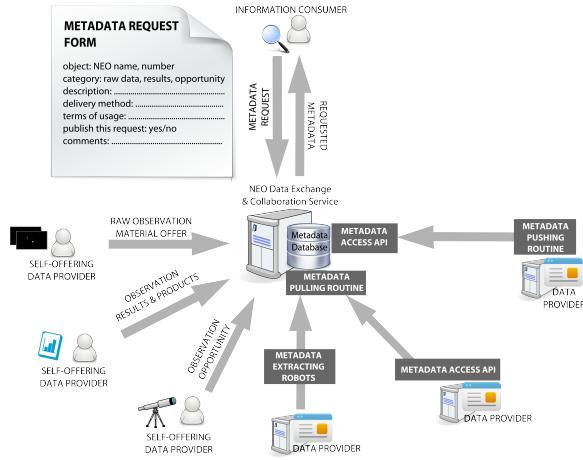


Figure 2: A structure of the NEODECS system

sults in a simple table on own webpage ("User having own data"), so that they are not dispersed in several papers, registers an URL to his data in NEODECS. Doing so he selects keywords (from a predefined list) describing parameters present in his table (like NEO rotation period, taxonomy, diameter, etc.). In case his data are still unpublished, he can register them providing a list of the observed objects and types of determined parameters, but instead of a URL pointing to the data he can request e-mail contact from those interested in using the data.

Such meta-data in NEODECS can then be searched by a "Researcher using data". As a result he will obtain a list of links to resources on the Internet (both published and unpublished). He can also register an "Observation request" asking for data on object he is interested in. Such request should contain basic information on object's visibility. If prolonged monitoring of the object is required, his request can be an invitation to join an observing campaign. In all such cases requests will be registered on the predefined web forms making it easy to enter most of the necessary information.

NEODECS shall also be useful to observers with free telescope time. They will be able to register an "Observation offer" specifying the dates when their instruments would be available, conditions of collaboration (e.g. co-authorship of the paper), etc. A list of telescopes and instruments with a detailed description of their performance shall be created by observers upon registration so that offering them later would require only minimal interaction with the service.

Finally, NEODECS shall be connected to a general

database on NEOs (like the NEODyS) which will be used for verification of some of the entered data (e.g. it will check if the object names are not misspelled).

A more technical presentation of the NEODECS structure is included in Fig. 2.

4. Related projects

Our consortium of Astronomical Observatory of A. Mickiewicz University and ITTI develops several NEO related web services under contracts to ESA. The NEO User Support Toolkit consists of several tools which should help NEO observers in preparation of their observation. It includes, among all, the planning tool (what and when to observe), and the sky chart tool (for producing finding charts), and is in the process of integration with the ESA NEO portal (<http://neo.ssa.esa.int>). Another service called SANORDA (Service for Archival NEO Orbital and Rotational Data Analysis) shall include, among all, web tools for determination of asteroid composite lightcurves and phase curves. It shall also contain an asteroid lightcurve database containing both the historical Asteroid Photometric Catalogue (the latest "Helsinki version") and a newer Asteroid Lightcurve Photometry Database (<http://alcdef.org/>). The former is based on the ATL format, and the later uses the ALCDEF format. It may be interested to readers that the APC catalogue, offered by the Helsinki Observatory together with a web service for data download, upload, and analysis, is no longer available. It has been archived and transferred to our Observatory so that we can use it for SANORDA. As the work on SANORDA shall start not earlier than in September 2017, we offer the archive version of the APC on the NEODECS webpage: <http://neodecs.eu>.

Acknowledgements

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