The Astrobiology Habitable Environments Database (AHED). B. Lafuente[1], N. Stone[2], R. T. Downs[1], D. Blake[3], T. Bristow[3], M. Fonda[3] and A. Pires[1], [1]Geosciences, University of Arizona, Tucson, AZ, USA (barbaralafuente@email.arizona.edu), [2]Open Data Repository, Gray, ME, USA, [3]NASA Ames Research Center, Mountain View, CA, USA.

Introduction: Astrobiology is a multidisciplinary field requiring the integration of disparate sets of data. Moreover, with improved capacity to acquire data resulting from technological advances in instrumentation, and with federal mandates to share and archive data, there is a potential need in the Astrobiology research community for a central database to access, visualize and analyze data on one platform.

The Astrobiology Habitable Environments Database (AHED), funded by NASA, is intended to provide a central, high quality, long-term data repository for mineralogical, textural, morphological, chemical (both inorganic and organic), and isotopic information. The AHED is an outgrowth of an ongoing project funded from NASA's CheMin [1] group, to make planetary analog mineralogical data available to the Mars community for direct comparison with X-ray diffraction data returned from the CheMin instrument on the Mars Science Laboratory rover *Curiosity*.

Objective: The goal of AHED is to offer a user-friendly interface that will allow scientists to design their own individual database for archiving and collaborative sharing of astrobiologically relevant data in order to: (1) understand and interpret planetary geology; (2) identify and characterize habitable environments and pre-biotic/biotic processes; (3) Interpreted returned data from present and past missions; (4) perform detailed planning for future missions; (5) develop spacecraft instrument concepts and evaluate science value; (6) evaluate future mission and instrument concept prior to selection for flight.

Determining the habitability of planetary environments, identifying biosignatures and searching for life beyond Earth are all long-term goals. The aim is then to foster long-term innovative research through supporting integration and analysis of diverse datasets.

Infrastructure: AHED uses the open-source software "The Open Data Repository's Data Publisher" [2] which it is an online platform for managing and publishing research data. AHED will be hosted at the NASA Advanced Supercomputing Division (NAS) at NASA-AMES. The available storage and computing power provided by NAS ensure that the database will not encounter technical limitations to growth and allows the use of the computationally intensive online tools that work with the database. The experience of NAS will assure the system is resilient, with minimal down-time, an essential feature for establishing and maintaining a critical mass of users in any time of online service.

Characteristics: Research teams or individual scientist will design, populate and manage their own database according to the characteristic of their data. The database will have the capability to import and export in a variety of standard formats for each data type and it will be compatible with the Planetary Data System (PDS-4). The communication among databases will be managed by incorporating semantic standards such as OWL 2 (Web Ontology Language). Advanced graphics will be implemented including 3D graphing, multi-axis graphs, error bars, and similar scientific data functions together with advanced online tools for data analysis, e. g. the statistical package, *R*. A permissions system will be put in place so that as data are being actively collected and interpreted, they will remain proprietary. A citation system will allow research data to be used and appropriately referenced by other researchers after the data are made public.

The *CheMin* database: As proof of concept, a database for CheMin measurements and results has been built (see Fig 1).

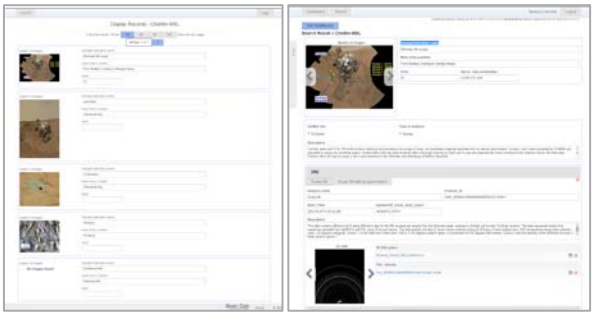

Figure 1. From left to right, examples of a search result and the content of a record in the CheMin database.

References: [1] Blake D. et al. (2012) *Space Sci Rev, 170, 341-399.* [2] Stone N. et al. (2015) *AbSciCon 2015*, submitted.

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