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COMMUNITY-SUPPORTED STARDUST COMPENDIA. Andrew J. Westphal[1], Bradley De Gregorio[2], Robert Lettieri[1], David R. Frank[3], Michael E. Zolensky[4], [1]*Space Sciences Laboratory, U. C. Berkeley, USA, westphal@ssl.berkeley.edu, +1 510 642 2969,* [2]*Naval Research Laboratory, Washington, DC, USA,* [3]*ESCG, NASA JSC, Houston, TX USA,* [4]*ARES, NASA JSC, Houston, TX USA* .

Challenges of the Stardust collection:

The Stardust cometary and interstellar collections present unprecedented challenges in sample preparation and analysis (e.g., [1, 2]). The ensemble of ∼80 tracks and dozens of foil craters from the cometary collection for which we have analyses exhibits a bewildering complexity and diversity of materials. The interstellar collection is even more challenging, because of the extremely low fluence of interstellar dust, a relatively large background of secondary ejecta from impacts on the spacecraft, and the small size of interstellar dust, approximately three orders of magnitude smaller in mass than typical cometary particles. Unlike with the other returned sample collections, characterization of these samples beyond basic photodocumentation is not generally practical at JSC. Even among the other small-particle collections, currently the cosmic dust and Hayabusa samples, SEM/EDX can provide basic chemistry. This is not possible with Stardust particles without destructive and invasive sample preparation. Furthermore, SEM/EDX requires isolating small grains from adhering aerogel. A reliable technique to carry out this task does not exist. Complete characterization of particles requires coordinated analyses using synchrotron and electron-beam microprobes, which do not exist at any one lab. Thus, it was recognized since the Stardust Preliminary Examination in 2006 that characterization of the samples would rely on the world-wide community of Stardust Investigators.

Here we announce the development of community-editable, wiki-style Stardust compendia that will support this effort. Our intention is that this will facilitate sample requests by providing basic characterization of tracks. We expect that this will also support comprehensive meta-analyses (global syntheses of analyses) of the collections.

Stardust Cometary Compendium:

177 tracks have now been extracted from aerogel tiles in the Stardust Cometary collector, and analyses of more than 80 tracks have been reported in >100 papers in the peer-reviewed literature. No consensus has yet emerged regarding the affinity of comet 81P/Wild2 with any other extraterrestrial collections, and only a few studies (e.g., [3, 4]) have attempted a comprehensive examination of the collection.

Following the example of the lunar and meteorite compendia/citelunarcompendium,meteoritecompendium, we organized the Stardust Cometary Compendium (SCC) by track, with one wiki-style page for each track (Fig. 1). As of the writing of this abstract, each page includes a summary of the track characteristics, and a list of peer-reviewed publication, with a few-sentence summary of the findings for each publication. Summaries of the basic mineralogies of tracks and terminal particles, analyses of foil craters, and inclusion of unrefereed conference proceedings are in progress. Information provided by Stardust Investigators to the Stardust Curator in Sample Information Sheets will not be included, unless permission to do this has been given. Stardust Investigators are encouraged to voluntarily include this information on the SCC.

The URL of the Stardust Cometary Compendium is given in the caption of Fig. 1.

Stardust Interstellar Compendium:

The Stardust Interstellar Preliminary Examination (ISPE) is now complete, and samples are available to the community. 42 samples were analyzed as part of the ISPE, and the analyses from groups that participated in the ISPE were assembled on the ISPE wiki, now renamed the Stardust Interstellar Compendium (SIC). Detailed analyses are presented on the SIC, but over time we anticipate that the format will evolve to the same form as the SCC. Foil craters are not yet included in the SIC.

The URL of the Stardust Interstellar Compendium is http://jake.ssl.berkeley.edu:8000/groups/westphalgroup/

Capabilities:

The SSC and SIC are both searchable by content. For example, it is possible to find all samples in which olivine was reported simply by entering “olivine”, "chondrule" or "Ti-rich" in the search box. When used in combination with the Curation Stardust catalog, this capability may facilitate Stardust Investigators in the identification of suitable samples when writing sample requests.

Community Support:

As with wikipedia, content will be created by the community of Stardust Investigators. The quality of the compendia will directly reflect the level of community support. Past or current Stardust Investigators will be assigned usernames and passwords by the SSC and SIC administrators on request (e-mail: westphal@ssl.berkeley.edu, telephone: +1 510 642 2969). Edit logs will be kept for each user to monitor the compendia for abuse. Stardust Investigators who contribute to the compendia will be publicly recognized on the websites.

References

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[4] Frank D.R, Zolensky M. E., Le L. *et al.* MAPS **A75**, 5396 (2012)
[5] http://curator.jsc.nasa.gov/lunar/compendium.cfm
[6] http://curator.jsc.nasa.gov/antmet/hed/index.cfm

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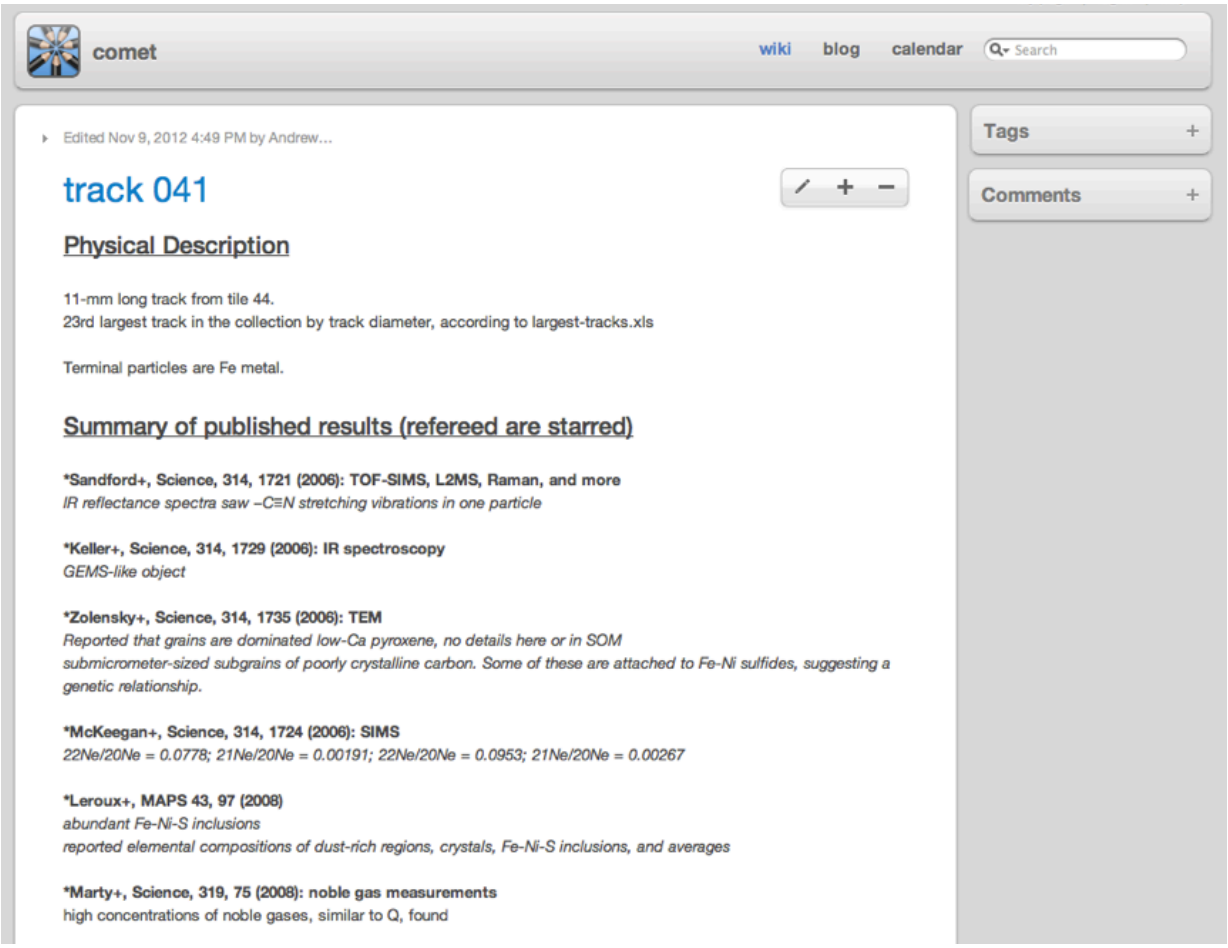

Fig. 1: Screen shot of a portion of the SSC page for track 41. The URL of the SSC is http://jake.ssl.berkeley.edu:8000/groups/comet/search/?sort=title&howMany=1000&sortDirection=forward