

# Content: Boundaries

*Edwin Henneken and the ADS Team*

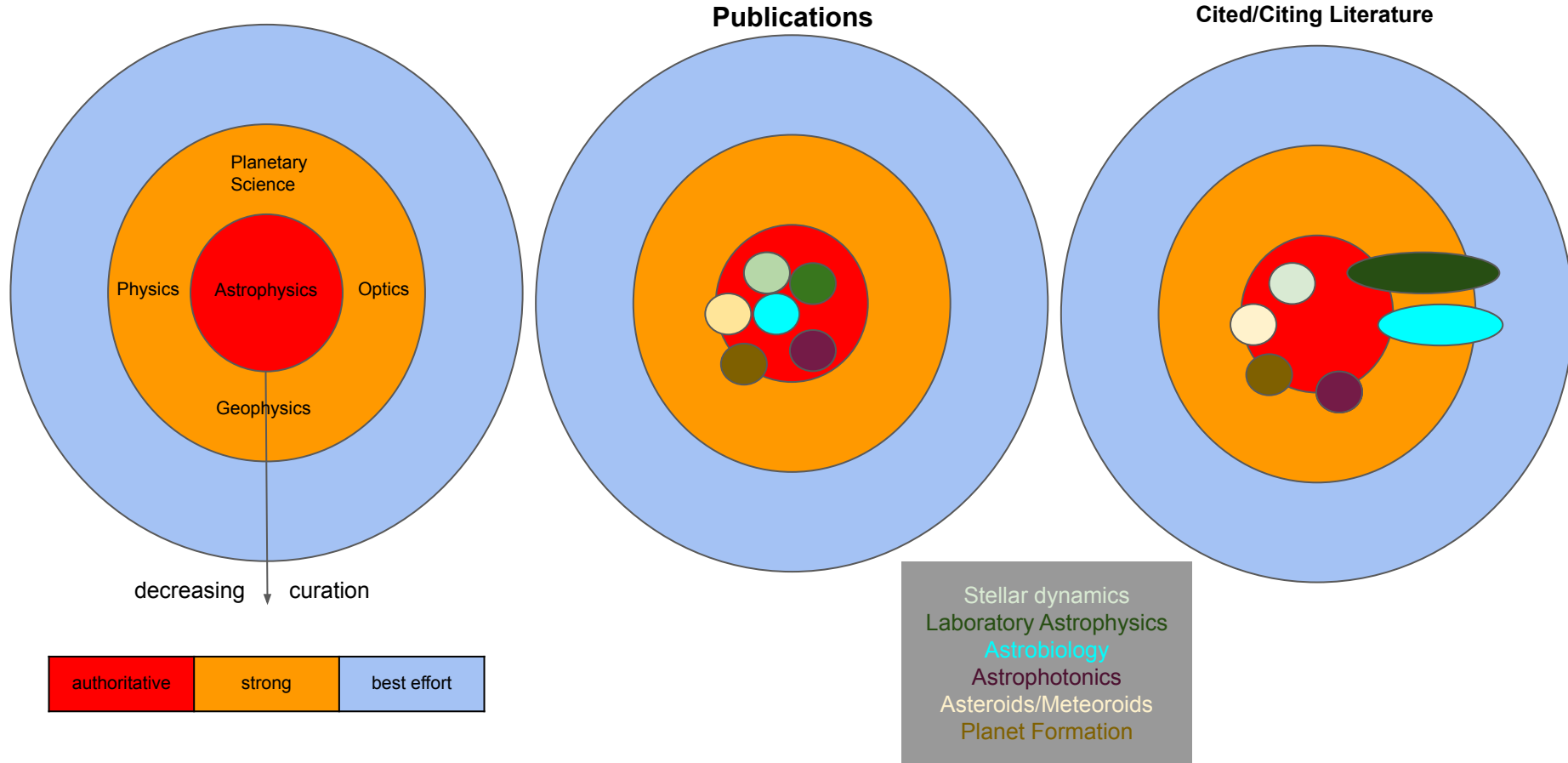
ADS Users Group Meeting, 20-21 Nov. 2019



# Topics

- Opportunities for "core" content coverage/quality
- Inclusion of additional e-print sources?
- Short Planetary Sciences update

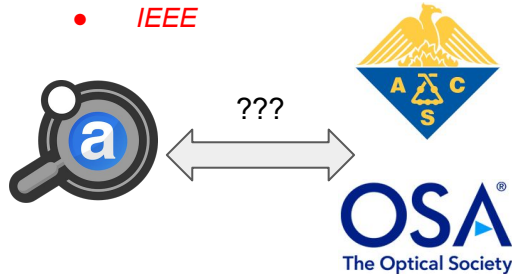
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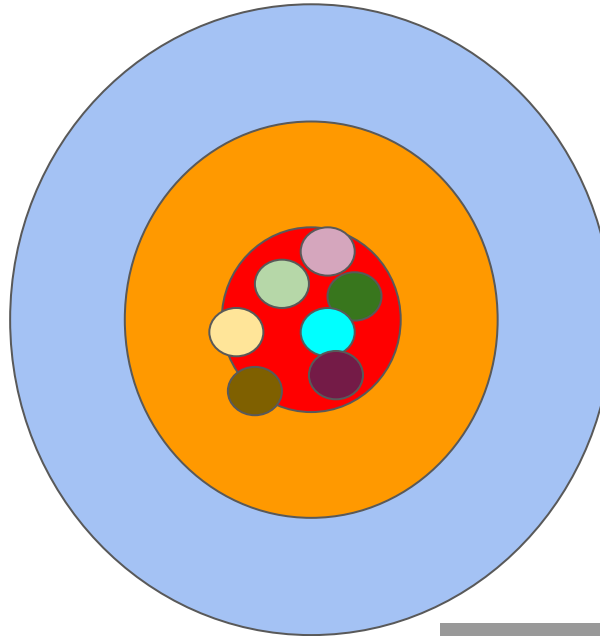
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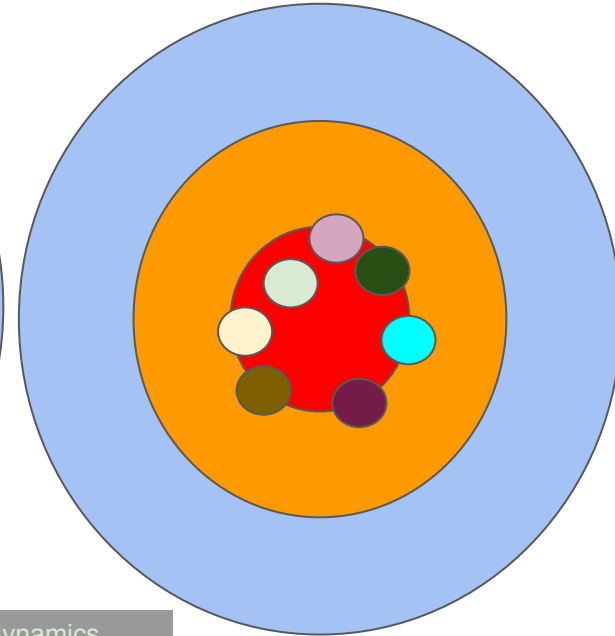


alternative:   
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Publications



Cited/Citing Literature



Stellar dynamics  
Laboratory Astrophysics  
Astrochemistry  
Astrobiology  
Astrophotonics  
Asteroids/Meteoroids  
Planet Formation

# Content: e-prints - no longer just arXiv

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**A Supernova at 50 PC: Effects on the Earth's Atmosphere and Biota**

A.L. Melott, B.C. Thomas, M. Kachelrieß, D.V. Semikoz, A.C. Overholt  
doi: <https://doi.org/10.1101/108936>  
Now published in *The Astrophysical Journal* doi: [10.3847/1538-4357/aa6c57](https://doi.org/10.3847/1538-4357/aa6c57)

Abstract Full Text Info/History Metrics Preview PDF

**ABSTRACT**

Recent  $^{60}\text{Fe}$  results have suggested that the estimated distances of supernovae in the last few million years should be reduced from  $\sim 100$  pc to  $\sim 50$  pc. Two events or series of events are suggested, one about 2.7 million years to 1.7 million years ago, and another may at 6.5 to 8.7 million years ago. We ask what effects such supernovae are expected to have on the terrestrial atmosphere and biota. Assuming that the Local Bubble was formed before the event being considered, and that the supernova and the Earth were both inside a weak, disordered magnetic field at that time, TeV-PeV cosmic rays at Earth will increase by a factor of a few hundred. Tropospheric ionization will increase proportionately, and the overall muon radiation load on terrestrial organisms will increase by a factor of  $\sim 150$ . All return to pre-burst levels within 10 kyr. In the case of an ordered magnetic field, effects depend strongly on the field orientation. The upper bound in this case is with a largely coherent field aligned along the line of sight to the supernova, in which case TeV-PeV cosmic ray flux increases are  $\sim 10^4$ ; in the case of a transverse field they are below current levels. We suggest a substantial increase in the extended effects of supernovae on Earth and in the "lethal distance" estimate; more work is needed. This paper is an explicit followup to Thomas et al. (2016). We also here provide more detail on the computational procedures used in both works.

This is [2017ApJ...840..105M!](#)

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This preprint has been submitted to and is under consideration at *Journal of Geophysical Research - Planets*. ESOAr is a venue for early communication or feedback before peer review. Data may be preliminary. Learn more about preprints.

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**Phase Angle Dependent Ultraviolet to Far-Infrared (0.25-100  $\mu\text{m}$ ) Reflectance Spectroscopy of Mukundpura (CM2) Meteorite: Potential analogue of (162173) Ryugu and (101955) Benu**

Authors

Indhu Varatharajan, Alessandro Maturilli, Bhala Sivaraman, Jorn Helbert, Matthias Grott, J. K. Meka, S Vijayan, Anil Bhardwaj

Published Online: Thu, 31 Oct 2019 | <https://doi.org/10.1002/essoar.10501075.1>

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**Abstract**

Specialized spectral library measured under controlled planetary surface conditions is important to accurately derive the chemical and physical properties from remote observations. It's a general practice to powder the planetary analogues during spectroscopy studies as most surfaces are made up of fine-regolith materials. However, upon arrival at C-type asteroids Ryugu and Benu, Hayabusa2 and OSIRIS-REx revealed these surfaces filled with rocks and boulders. In this study, we built a phase angle dependent ultraviolet (UV) to far-infrared (FIR) spectroscopy (0.2-100  $\mu\text{m}$ ) of a rocky piece of Mukundpura meteorite having five surfaces including fusion crust. Mukundpura meteorite is the freshest carbonaceous chondrite belonging to CM-chondrites in the entire collection which fell in the desert village of India on June 6, 2017. The two sets of varying viewing geometries having incident and reflectance angles includes: a) asymmetric viewing geometry at 13 $^\circ$ :13 $^\circ$ , 13 $^\circ$ :20 $^\circ$ , 20 $^\circ$ :13 $^\circ$ , 20 $^\circ$ :20 $^\circ$ , 13 $^\circ$ :40 $^\circ$ , and 13 $^\circ$ :50 $^\circ$ ; and b) symmetric viewing geometry at 13 $^\circ$ :13 $^\circ$ , 20 $^\circ$ :20 $^\circ$ , 30 $^\circ$ :30 $^\circ$ , 40 $^\circ$ :40 $^\circ$ , and 50 $^\circ$ :50 $^\circ$ . This study found that overall spectral shape, reflectance values, and band depth of diagnostic absorption features are affected by viewing geometry and surface roughness; however, the fundamental band centers are not affected. The comparison of 2.72  $\mu\text{m}$  absorption band of fusion crust and fresh interiors of Mukundpura with published Ryugu and Benu spectra supports that Ryugu surface has experienced extensive heating in its geologic past compared to Benu. Overall study shows that fusion crust and internal surfaces of the Mukundpura meteorite is a potential analogue of Ryugu and Benu both spectrally and morphologically.

Will appear in *Journal of Geophysical Research - Planets*

# Content: Planetary Sciences

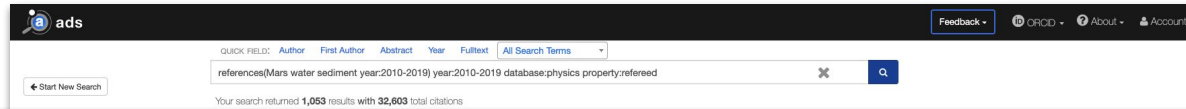


Illustration of the type of content now discoverable in the ADS. In this example we are interested in Martian hydrology found by searching for recent papers mentioning physical/geological processes related to water and sediment. We use the following query

```
references(Mars water sediment year:2010-2019)
year:2010-2019 database:physics property:refereed
```

With this query we generate recent refereed literature in the physics database cited by recent publications on the subject.



# Content: Planetary Sciences

ads

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QUICK FIELD: Author First Author Abstract Year Fulltext All Search Terms

references(Mars water sediment year:2010-2019) year:2010-2019 database:physics property:refereed

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- Ehmann, B. 43
- Grotzinger, J. 41
- Mangold, N. 41
- Ming, D. 38

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- GeoRL 135
- Geo 60
- NatGe 47
- Geomo 44
- ESPL 23
- AmMin 21
- JGRF 21
- ChGeo 18
- Sci 18
- GSLSP 16
- SedG 16
- Sedim 16
- JVGR 15
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- ALMA 2
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1 2013PASP.125.306F 2013/03 cited: 3047  
smoos: **The MCMC Hammer**  
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15 2016PhRL.117y1101I 2016/12 cited: 162

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references(Mars water sedimentology)

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40 2016PhRL.11711011I 2016/12 cited: 162

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**Roger Wiens** is a planetary scientist and Fellow at Los Alamos National Laboratory. He is the project leader for both the ChemCam instrument aboard the Mars Curiosity rover

**Bethany Ehlmann** is a planetary scientist at JPL ( evolution of Mars, chemical weathering and hydrothermal alteration, and the development of planetary science instrumentation)

**John P. Grotzinger** is professor of Geology at Caltech and chair of the Division of Geological and Planetary Sciences. (Sedimentology; stratigraphy; geobiology; ancient surface processes on Earth and Mars. )

**Nicholas Mangold** Laboratoire de Planétologie et Géodynamique, Nantes, France. Planetary geologist. Specialist of Mars geology. (understanding of the climate evolution of Mars, the role and abundance of water and its link with the geological evolution)



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60	<i>Geology</i>
47	<i>Nature Geoscience</i>
44	<i>Geomorphology</i>
23	<i>Earth Surface Processes and Landforms</i>
21	<i>American Mineralogist</i>
21	<i>Journal of Geophysical Research - Earth Surface</i>
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16	<i>Sedimentology</i>
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11	<i>Spectrochimica Acta</i>

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The "geo" content in our database is more than just a set of dangling nodes. We capture a significant amount of citations. A citation network encodes "knowledge" about a subject. This network is used by our Paper Network.

# The ADS Team seeks advice on the following:

- Should we establish a relationship with publishers/societies (like the ACS) or just rely on CrossRef? Establishing relationships needs strategic help.
- Should we start indexing additional e-print sources
  - bioRxiv?
  - ESSOAr?