Crust, Core and Collision – Unraveling the evolution of differentiated asteroids

A Data Management Plan created using DMPRoadmap

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Project abstract:

The main aim of the proposed project is to improve our understanding of the formation, collisional evolution and cooling history of large differentiated asteroids, which in turn will give new insights into the evolution of the early Solar System. This will be done through studies of mesosiderites, a group of enigmatic stony-iron meteorites. The project is centered around three topics with outstanding questions: Origin – Where do mesosiderites come from? Formation – How and when did the parent body(ies) and subsequently, the meteorites form? Evolution – What role did impacts/collisions play in the history of mesosiderites? To fulfill the aim of the project, a combination of three methods/techniques will be utilized: (1) Petrographic and shock feature investigations; (2) Determination of nucleosynthetic isotope signatures and Hf-W model ages; and (3) Measurements of cosmic-ray exposure ages and cosmogenic radionuclides. The project will run for four years, and will be a unique collaboration between leading experts in the fields of meteoritics, cosmochemistry and shock metamorphism. We will use advanced analytical methods, including neutron and synchrotron radiation-based techniques. This novel multi-disciplinary approach, i.e., applying the different techniques on the same mesosiderite samples, will allow us to provide unique insights into the processes associated with mesosiderite formation, and more generally, into the accretion and early evolution of differentiated asteroids.

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1. Data description

- collecting material or generate/produce data (e.g. interviews, measurement data)
- using existing data (archival data, data from previous project – your own or other researchers')?

Data will be collected through various analytical methods.

Physical material include: Meteorite samples.
Digital material include: text, images and measurement data. These will be saved in .xls, .csv, .pdf, .raw, .jpg, .bitmap and .doc.

- 100 GB – 1 TB

2. Documentation and data quality

We document which data have been collected when and where.
Analytical methods and procedures are described in detail in our published papers.

For each individual dataset, our metadata typically describe:
1. The structure of the dataset, i.e., what each column/row means, units for each data point, headings and so on.
2. Where the reader can find information about how data have been collected and analyzed (i.e. the DOI number of the publication)

For detailed descriptions of research methods, we will refer to the publication in which the data are used.

3. Storage and backup

All data will be stored in folders on a LU pc with the associated integrity and backup procedures from LDC.

There are no data security risks that we have identified.
All data is available for all research group members to use if asked for and when needed.

4. Legal and ethical requirements

- No

The data produced will be owned by me and the students and postdoc in my group that are involved in collecting the data.

Not applicable

- Yes, it does involve external parties.

Before project start, all parties will agree that the data will be stored at LU and that data is not to be published without the consent of all parties involved.

5. Data sharing and long-term preservation

- Yes, both data and metadata

After publication, all data will be made publicly available, using different data repositories.

Raw data will be stored on the LU LDC server and made available upon request. However, in most cases, the data will be downloadable from the journal-specific open data repositories.

No

- My current assessment is that data should be kept.

All digital documentation should be kept as long as it is relevant to the field of research.

6. Responsibilities and resources

Principal investigator is responsible for the data management and assists with the data management during the project.
Who is responsible for data management, keeping of records and long-term preservation, after the project finished is yet to be determined.

Only labor costs associated with the research tasks is expected (i.e. no specific extra costs for data management).