

# Application of TRUST Principles in LISIRD

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## Abstract

The LASP Interactive Solar IRradiance Datacenter (LISIRD), [lasp.colorado.edu/lisird](http://lasp.colorado.edu/lisird), is a website where researchers can discover, visualize, and download solar data from a variety of space missions, instruments, models, and laboratories. LISIRD focuses on making heliophysics research as effortless as possible by making solar data openly available and easy to analyze through an intuitive user interface, detailed metadata, interactive plotting capabilities, and a catalog of over 75 datasets. This poster will discuss how LISIRD currently demonstrates, and aspires to better comply with, the TRUST Principles (Transparency, Responsibility, User Community, Sustainability, and Technology). Topics will include metadata efforts to improve dataset transparency, usability testing to further understand the needs of user communities, and how we designed our current technology stack to make development and maintenance easier and more sustainable.

## Overview

The LASP Interactive Solar IRradiance Datacenter (LISIRD) is a website that provides convenient, standardized access to solar data from a variety of space missions, instruments, models, and laboratories.

The primary objectives of LISIRD include:

- **Discoverability:** Make solar data more openly available.
- **Standardization:** Offer a common interface for otherwise disparate data.
- **Modernization:** Rethink how data can be accessed beyond just static files on a server.
- **Analyzability:** Offer data that is analysis ready by removing preprocessing overhead.

## Transparency and Responsibility

Operating a trustworthy data center requires a high degree of transparency and responsibility. We strive to meet these standards on multiple fronts:

1. **Data Management:** we work with dataset owners to ensure that LISIRD data and metadata are up to date. We also take care to properly acknowledge data sources and provide users with a wealth of resources they can consult for further details about the data.
2. **Documentation:** we provide researchers with thorough documentation for how they can access data from LISIRD. In the near future, we hope to take this a step further with tutorials and code snippets for easily accessing data in Python and IDL code.
3. **Uptime:** we understand that users depend on LISIRD, so we've developed an infrastructure to minimize potential server downtime.

## User Community

In order to keep open communication with the user community, we run monthly usability tests. These "tests" involve having a user complete a list of tasks and answer numerous questions about the website while observers watch, listen, and take notes. Usability testing is great for:

1. Understanding user needs
2. Finding bugs
3. Catching problems early
4. Providing an unbiased examination of the website
5. Allowing users a chance to directly influence the product

Usability testing has provided us with numerous insights and has become an integral part of creating the best possible tool for the community.

## Improvements

The LASP Web Team is upgrading LISIRD with the following improvements:

- Moving from AngularJS to Angular.
- Running LISIRD in the cloud to allow for more dynamic scaling of resources when necessary.
- Developing a more generalized metadata ontology that can be used throughout LASP.
- Creating a library of shared Angular components that can be used across numerous websites developed by the LASP Web Team.

## Contact Us

[lisird@lasp.colorado.edu](mailto:lisird@lasp.colorado.edu)

Feel free to contact us with any questions, feedback, or suggestions for datasets you'd like offered through LISIRD.

## Sustainability and Technology

In order to optimize performance and maintainability, the LASP Web Team makes use of numerous modern technologies across our portfolio of sites.

### Front End



**Angular:** an open-source framework that streamlines the development of web applications. This helps minimize redundant code and allows for easy re-use of UI components both within and across applications.

<https://angular.io>

**Scicharts:** a LASP extension of Highcharts, which is a JavaScript library for creating interactive charts on the web.

<https://highcharts.com/>



### Back End



**LaTiS:** a software framework for data access, processing, and output. The modular architecture supports reusable and custom *Readers* to read a dataset from its native source, *Operations* to manipulate the dataset, and *Writers* to output the dataset in the desired form.

LaTiS 2: <https://github.com/latis-data/latis>  
LaTiS 3: <https://github.com/latis-data/latis3>

**LEMR:** The LASP Extended Metadata Repository is a semantic database of metadata information about the datasets served.



### Infrastructure



**Docker:** a tool that packages up an application with all of its dependencies into an isolated container. This makes for efficient, lightweight, self-contained systems and guarantees that software will always run the same regardless of where it's deployed.

<https://docker.com/>

**Amazon Web Services:** An on-demand cloud services platform that allows for dynamic scaling of computing and storage resources.

<https://aws.amazon.com/>



# lasp.colorado.edu/lisird

