LASP Time Series Server (LaTiS)
Overcoming Data Access Barriers via a Common Data Model in the Middle Tier

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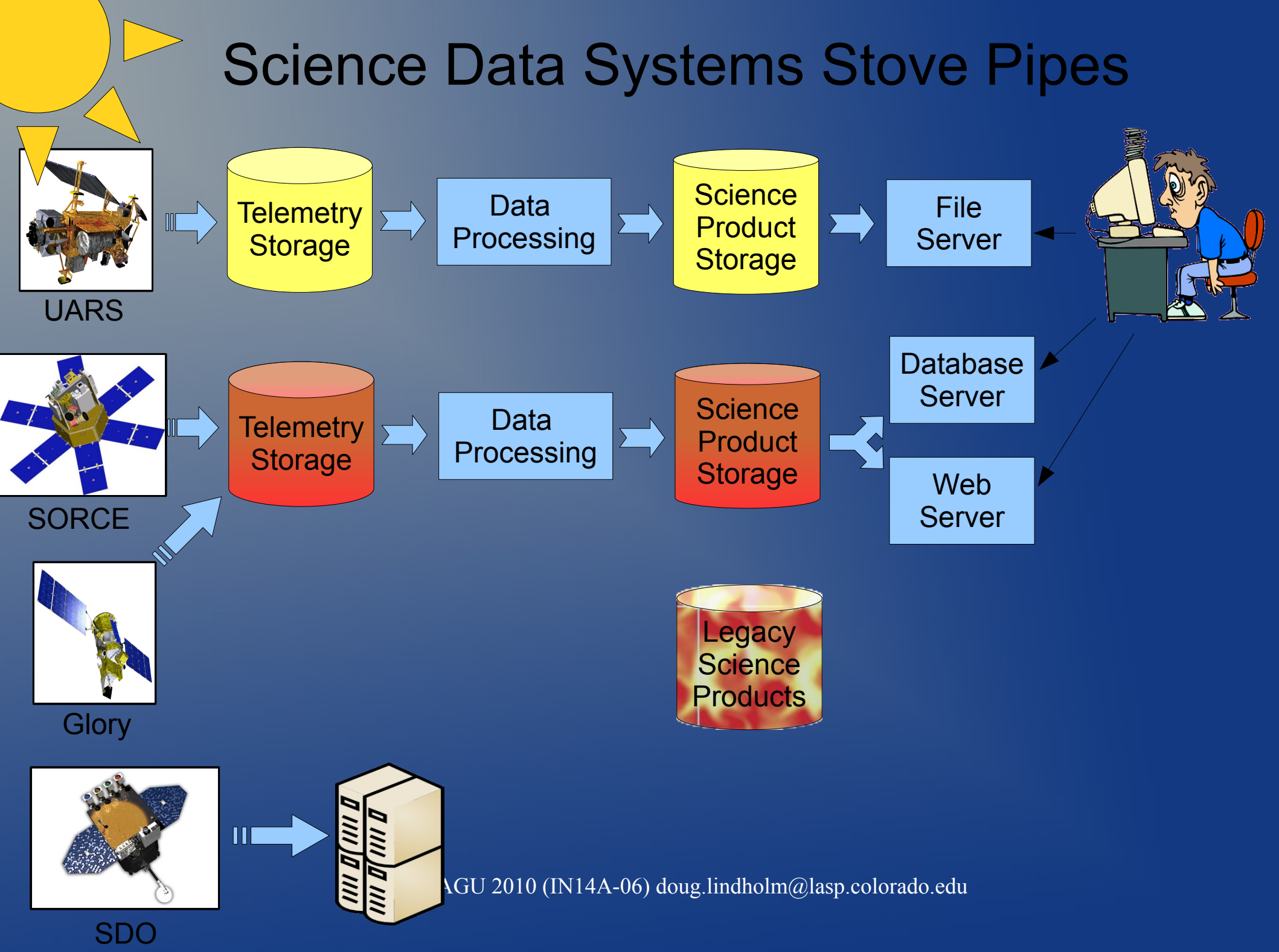
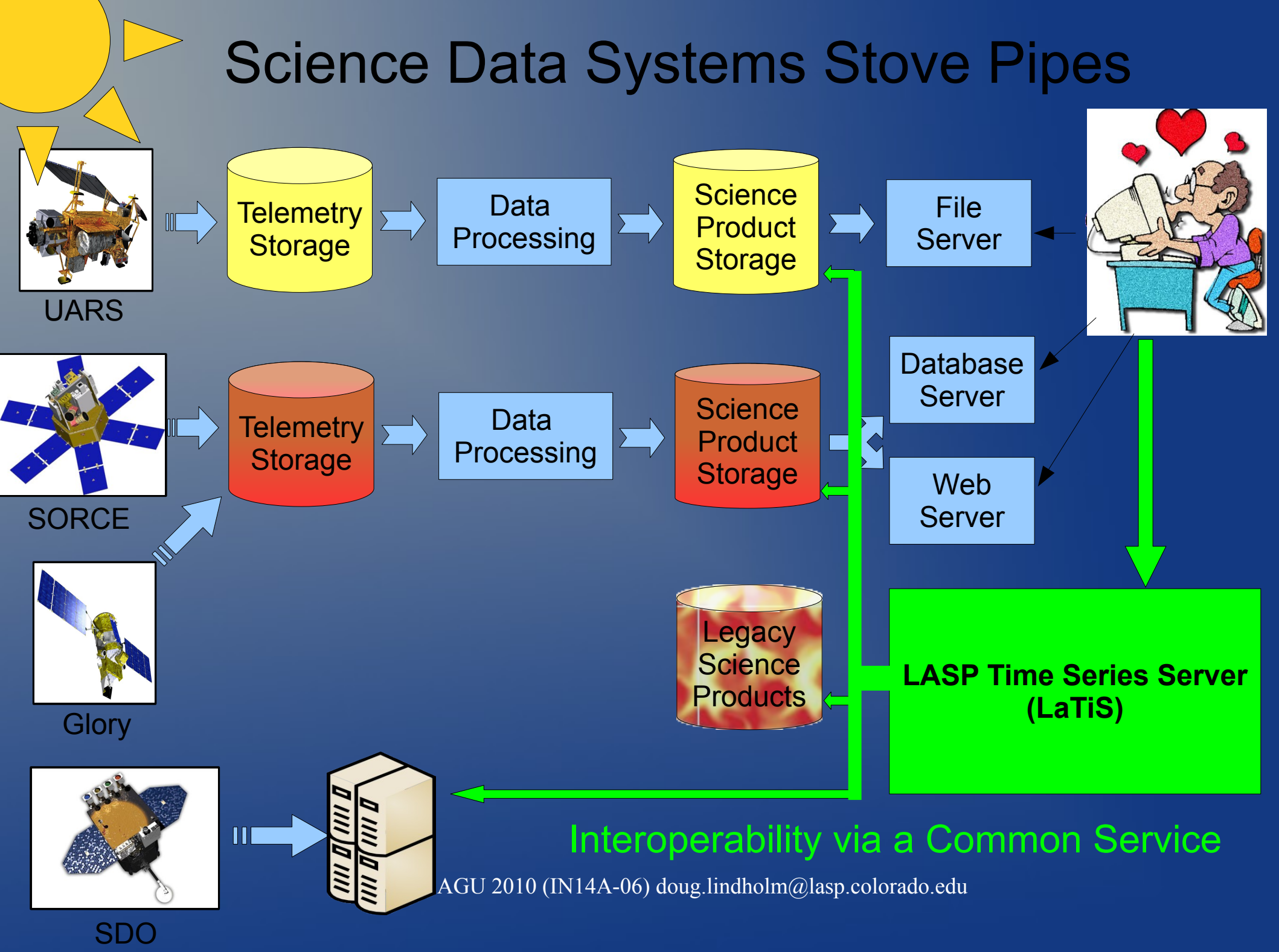
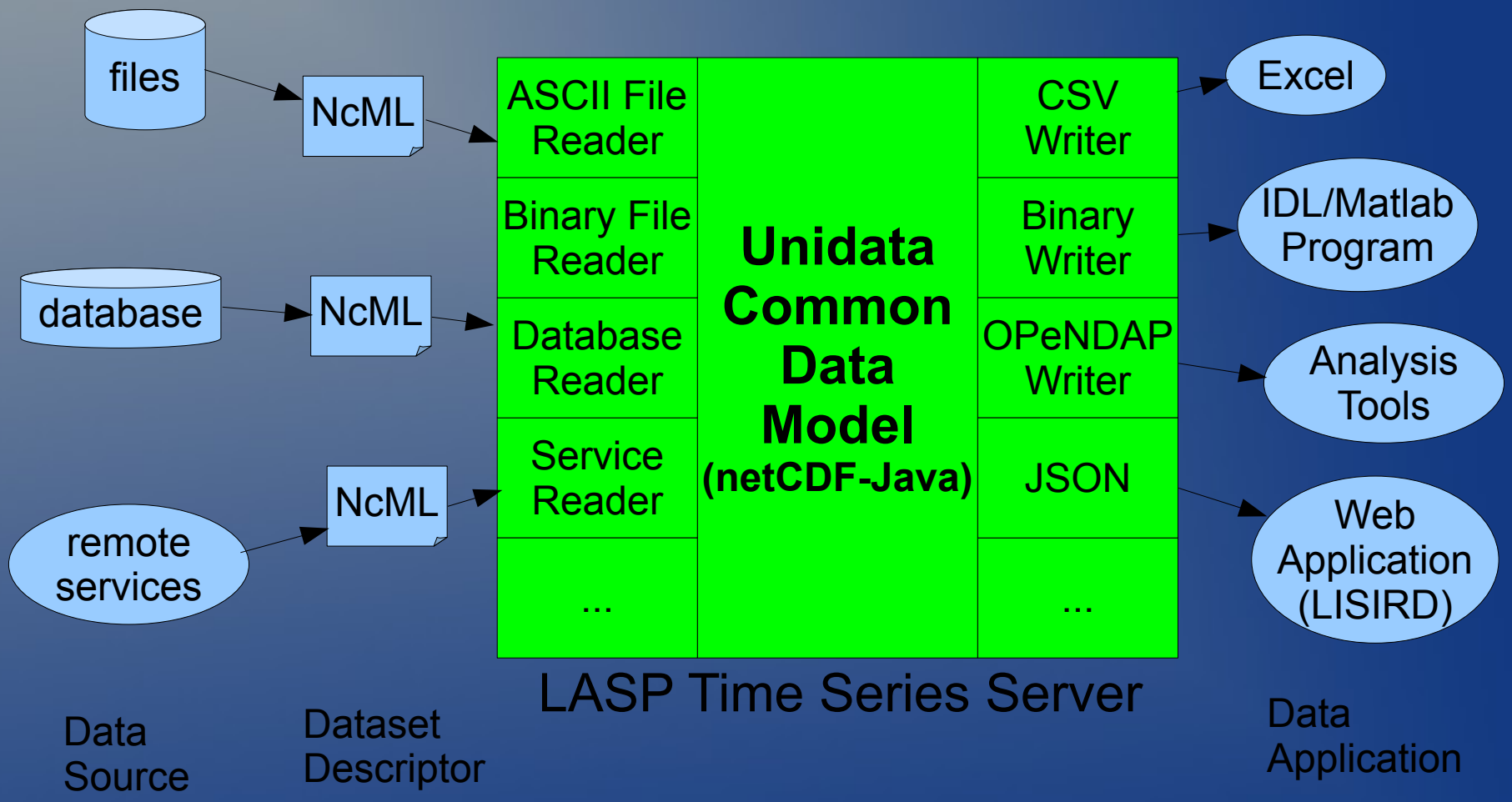
Science Data Systems Stove Pipes



Science Data Systems Stove Pipes



Interoperability via a Common Data Model



Data Abstractions

bits

10110101000001001111001100110011111110

bytes, hex

00105e0 e6b0 343b 9c74 0804 e7bc 0804 e7d5 0804

Int, long, float, double

1, -506376193, 13.52, 0.177483826523, 1.02e-14

arrays

1.2	3.6	2.4	1.7	-3.2

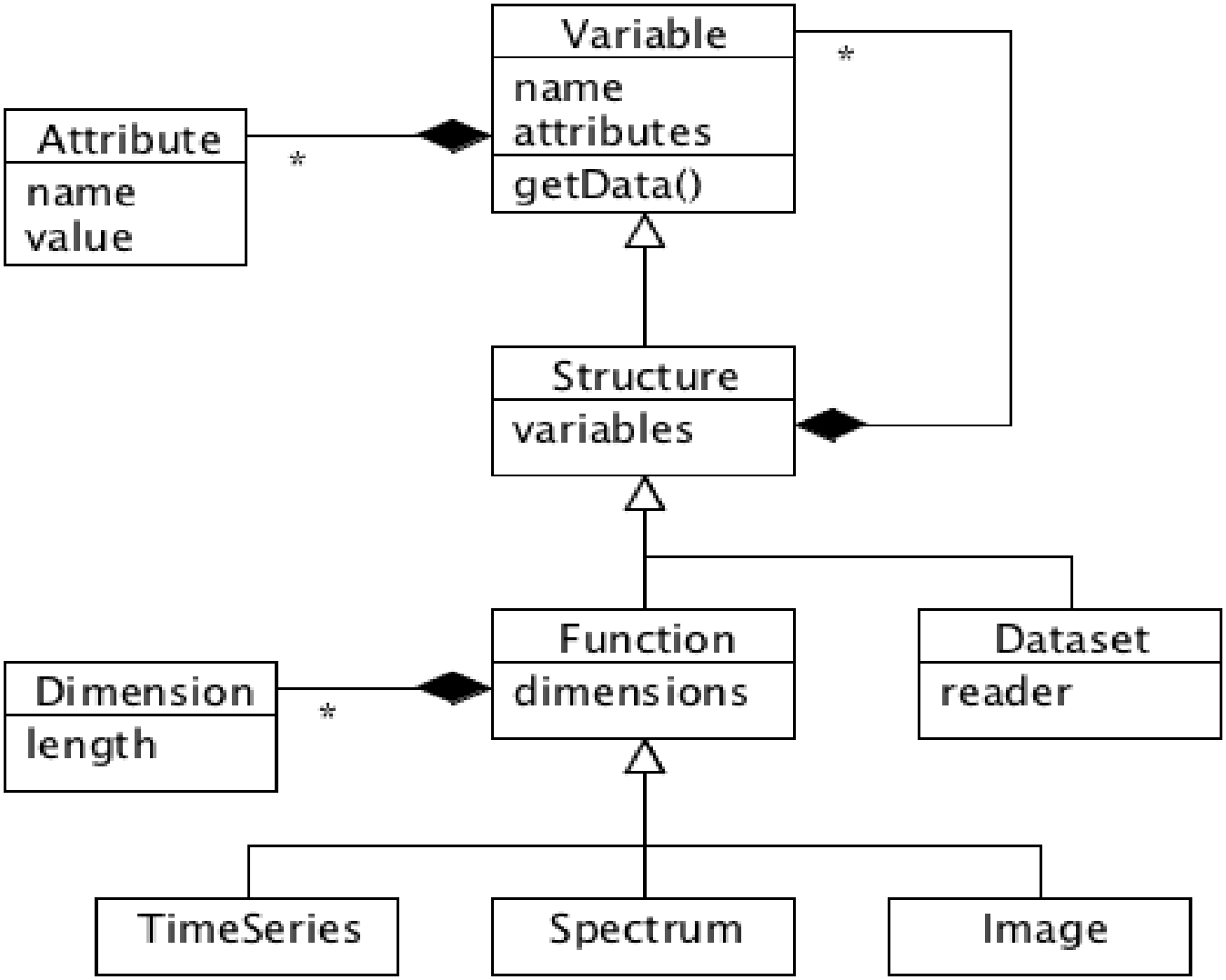
Scientific Datasets:
Functional Relationship

Independent Variable → Dependent Variables

Time Series:
Instead of flux[time]
time → flux

Gridded Time Series:
Instead of flux[time, lat, lon]
time → ((lat, lon) → flux)

LaTiS Data Model



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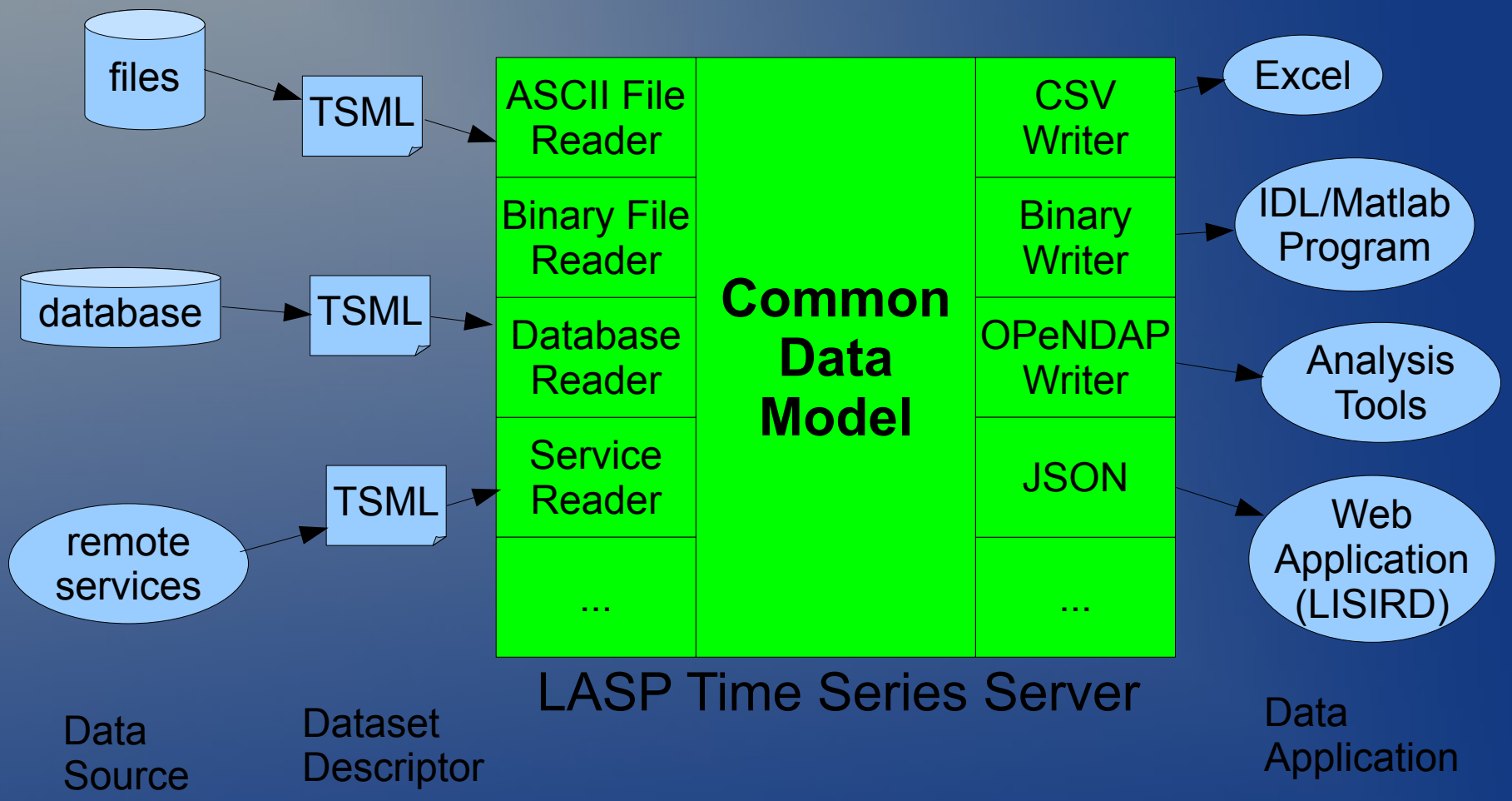


Conclusions

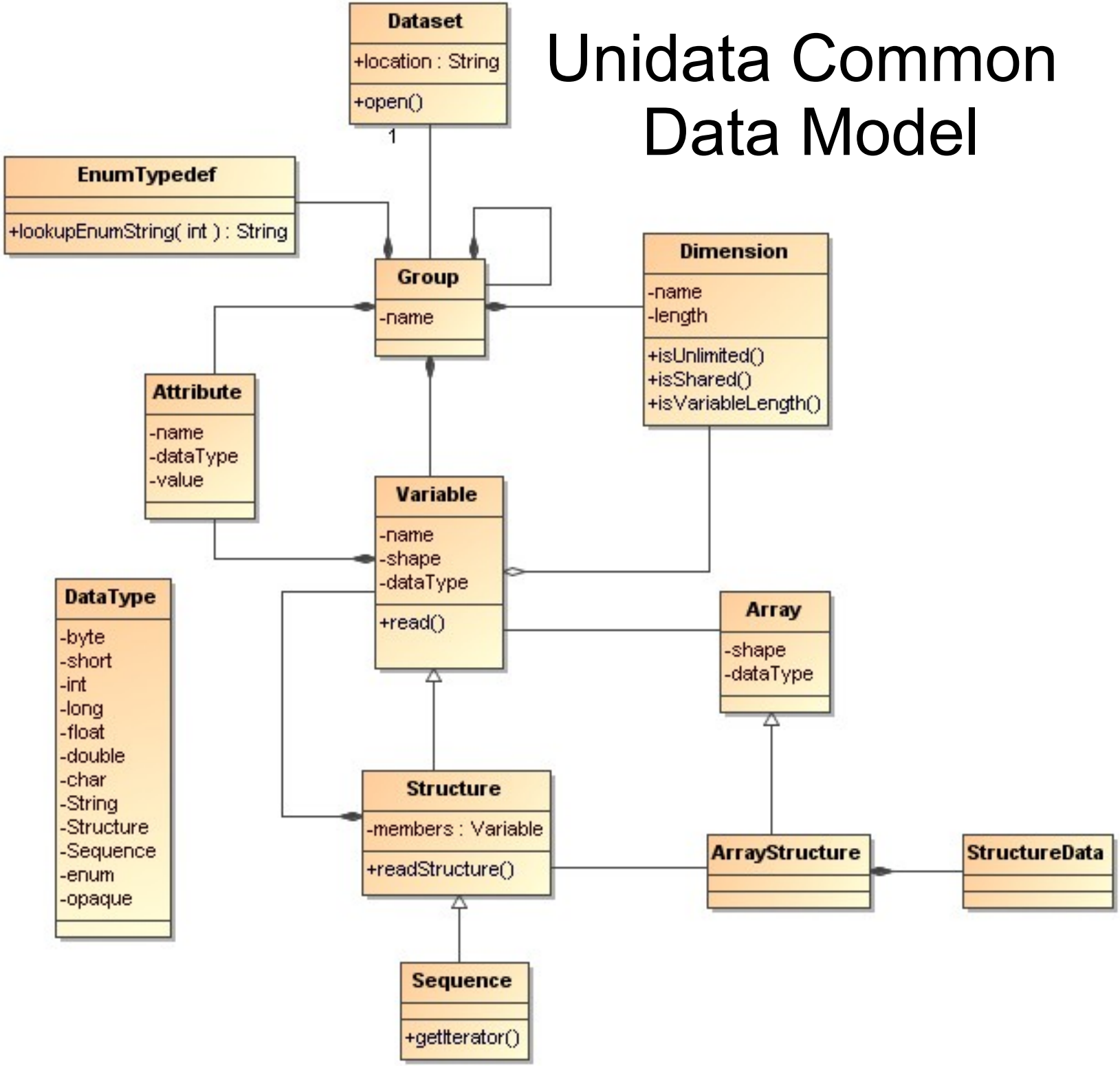
- Good abstractions hide implementation details so data users can focus on **their** problem domain.
- Abstracting beyond arrays of primitive types to *Functions* can better capture the semantics of scientific data.
- Abstracting beyond data granules (e.g. files) to Virtual Datasets improves the usability of data.
- A modular, service oriented software framework built around a common data model and interfaces can enhance data interoperability.

More Conclusions

- A pure Java Interface (with a reference implementation) is more flexible and increases the chance of adoption.
- A modular framework enables (community driven) extensibility without sacrificing clarity and stability in the core API
- There is no one-size-fits-all solution to science data systems. Adapting to existing systems is the key to interoperability.

See Also

- Tuesday Morning Poster (GC21B-0881) "*Solar Irradiance Data Products at the LASP Interactive Solar IRradiance Datacenter (LISIRD)*" Alex Ware DeWolfe, et al.
- Thursday Morning Poster (IN41B-1366) "*Evolving LISIRD and the LASP Time Series Server to Support Data Identification, Citation, and Provenance*" Anne Wilson, et al.
- LISIRD: http://lasp.colorado.edu/lisird/
- Time Series Data Server (TSDS): http://tsds.net

Bonus Slides

Unidata Common Data Model