



CLUSTER OF RESEARCH INFRASTRUCTURES  
FOR SYNERGIES IN PHYSICS



# CRISP

## An Overview



# Cluster of Research Infrastructures for Synergies in Physics

*“Build up collaborations and create long-term synergies between research infrastructures on the ESFRI roadmap in the field of physics, astronomy and analytical facilities to facilitate their implementation and enhance their efficiency and attractiveness.”*



# Facts And Figures

- 11 research infrastructures
- 16 participating institutions
- Project started: 1 October 2011
- Project duration: 3 years
- 12 M€ funding from EC within FP7



# Infrastructures



- European Synchrotron Radiation Facility (ESRF)
- Facility for Antiproton and Ion Research (FAIR)
- Institut Laue–Langevin (ILL)
- Super Large Hadron Collider (SLHC)
- SPIRAL2
- European Spallation Source (ESS)
- European X-ray Free Electron Laser (XFEL)
- Square Kilometre Array (SKA)
- European Free Electron Lasers (EuroFEL)
- Extreme Light Infrastructure (ELI)
- International Liner Collider (ILC)

## Accelerators



## Instruments & Experiments



**Development and implementation of common solutions**  
**Harmonisation, cost-efficiency and interoperability**

## Detectors & Data Acquisition



## IT & Data Management





# Areas of Activity

	ELI	ESRF	ESS	EuroFEL	FAIR	ILC	ILL	SKA	SLHC	SPIRAL2	XFEL
Accelerators											
Instr & Exp											
Det & DAQ											
IT & DM											



## User Identity



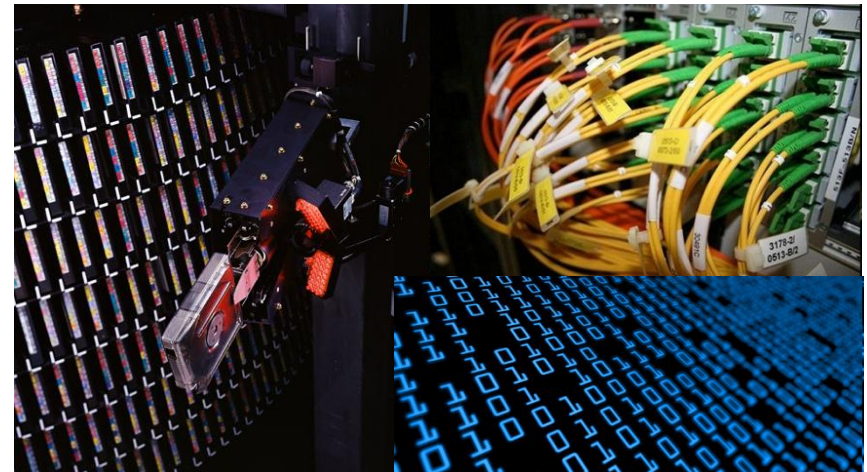
## Metadata and Catalogues



## High-speed Data Recording



## Distributed Data Infrastructure





# Metadata Management and Data Continuum

## *Objectives:*

1. *“Select and deploy metadata management and mining services”*
2. *“Enable a data continuum from raw data to publications”*

*Partners:* ESRF, DESY, CERN, ILL

**Leader:** Jean-François Perrin <perrin@ill.eu>





# Metadata Management

- Enhance and **deploy meta-data catalogues**
  - At the participating RIs
  - **Connect as one seamless resource**
- iCAT (is a candidate)
  - at least for X-Ray and Neutron facilities
  - store/search metadata
  - federates across multiple institutes



# Data Mining

- What are the most studied samples?
- What are the trends?
- What type of Instruments/techniques should be developed further?
- What are the users need and trends?
  - Instrument Setup, Sample Environment, ...
- Is sample  $S$  already analyzed at temperature  $T$  under Pressure  $P$ ?
- Where? Which instrument? Data location?
- Metadata, Users, Publications
  - an invaluable strategic analysis tool



# Typical use case

upgrade the vertical cold source towards diamond coating ?

A diamond coated cold source would be a lot better at long wavelength and slightly worse at short wavelength.

In this context it would naturally be interesting to see how much measuring time we spend at the various wavelengths at an instrument.

This would allow immediately to judge whether a diamond coated cold source would be good or bad for that instrument.



## Data Mining

Use the catalogue to be better aware about the use of our machines so that we can optimize this use for the future.

Beyond simple statistics we would like to establish **correlations** (Is a long wavelength always coupled to low temperatures ? etc ...)



**Data Mining tools integration into the metadata catalogue**



# Data Continuum

- Traceability and transparency for the whole chain for experimental science
- DOI implementation
  - Provides a sustainable standard
    - For the formal identification and retrieval of the datasets
  - Standard already well established in libraries/journals
  - A major initiative has emerged in Europe for science
    - <http://www.datacite.org>
- Help to seal the link between publication and datasets

**T7: Cooperate with the major publishers to ensure that publications, issued from data generated at the facilities, provide reference to the experimental data sets.**



# ICAT Developments

- Data Mining and Report
  - How do we link the existing tools (BIRT WEKA, RapidMiner, ... ) to ICAT ? Direct access to the DB ? DB replication ?
- Data continuum
  - DOI integration (ICAT and TopCat)
  - DB schema + WS for storing publications into ICAT.



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