



PaNOSC Closing Event

Paving the way towards the PaN FAIR Data Commons

29-30 November 2022

Grenoble - France

PaN Data Commons

Andy Götz – PaNOSC Coordinator

ESRF

29 November 2022



PaNOSC has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 823852



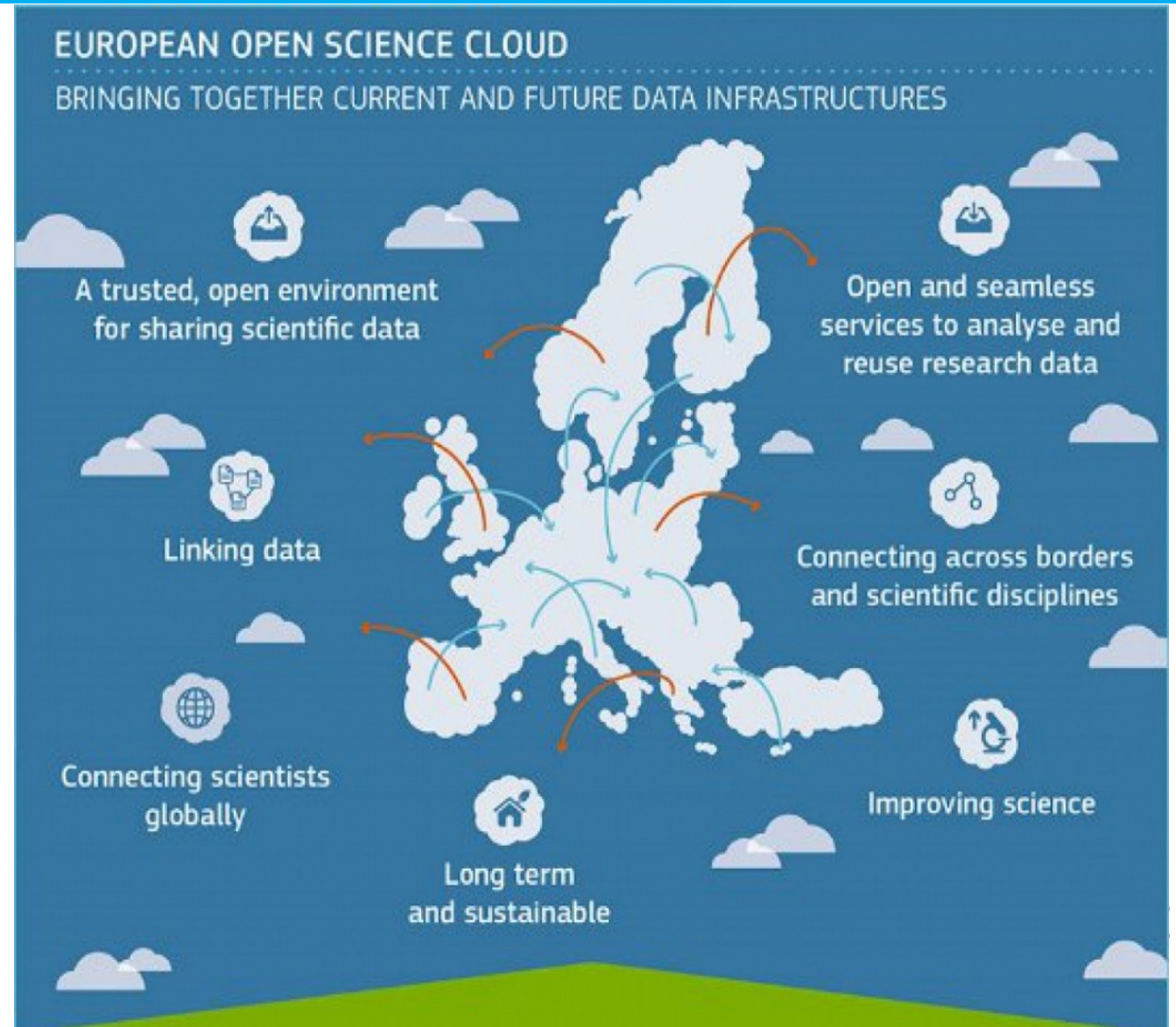
PaNOSC : co-creating the EOSC

Kick-Off meeting PaNOSC
Grenoble, 15 January 2019

Geert Vancraeynest, policy officer
European Commission, Directorate General Research & Innovation (DG RTD)
Unit B4 – Research Infrastructures

The vision

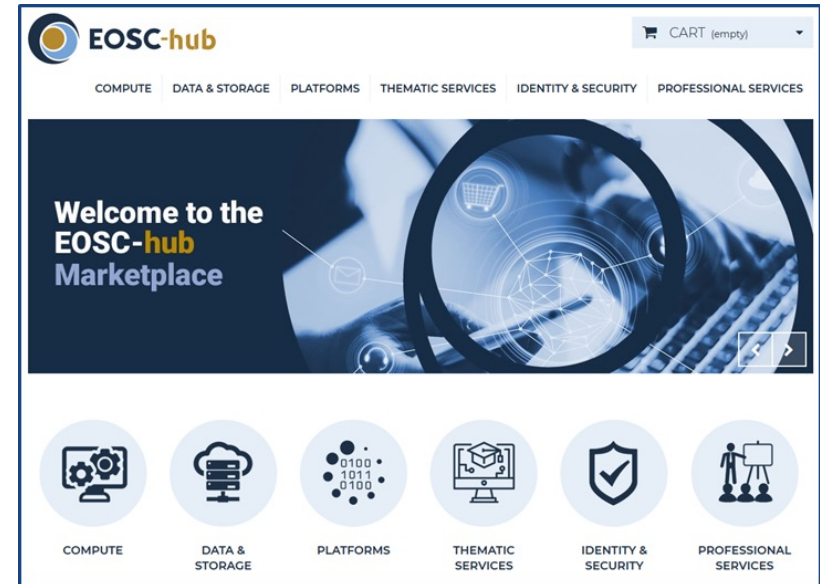
- Bridging today's fragmented and ad-hoc solutions; towards a **federation of data infrastructures**
- **FAIR data and services** for data storage, management, analysis and re-use **across borders and disciplines**
- Added value for **data-driven science**, reproducible science, interdisciplinary research, digital innovation (EU DSM)



Service dimension of the EOSC

The EOSC will provide two million EU researchers with:

- ✓ A catalogue of European research data funded with public money;
- ✓ A catalogue of services to re-use these data;
- ✓ Tools to make their own data open and FAIR;
- ✓ Advanced tools to merge and analyse the data in a secure environment;
- ✓ A simple access gateway to these services (EOSC Portal).



Not a cloud from Brussels, but a research data commons driven by the stakeholders

Your opinion on implementing the EOSC

The survey is closed;
you can view here the results as they stand

Vienna
Declaration
2018

EOSC
declaration
2017

Coalition
of Doers


EOSC SUMMIT

12 June 2017 - Brussels
Charlemagne building Siccó Masholt Room

European Open Science Cloud
New Research & Innovation Opportunities



<http://ec.europa.eu/research/openscience/eosc>

#EOSC

panOSC
photon and neutron
open science cloud

We've never walked alone in the preparation phase ...

We now have one new Common GOAL

Making a PaN Data Commons of FAIR Data from the PaN Community

Andy's wish list post-PaNOSC

- ALL PaN facilities to **implement a FAIR data policy**
- LEAPS+LENS to work actively together on PaN Data Commons + EOSC
- Collaboration with science clusters + national projects e.g. HMC, NFDIDaphne, ...
- Continue development of **tools + services**
- Active development of metadata standard to cover all techniques
- **PaN Data Commons** becomes a reality with FAIR data from ALL PaN RIs



Your wish list post-PaNOSC



Estimated carbon footprint of experiment

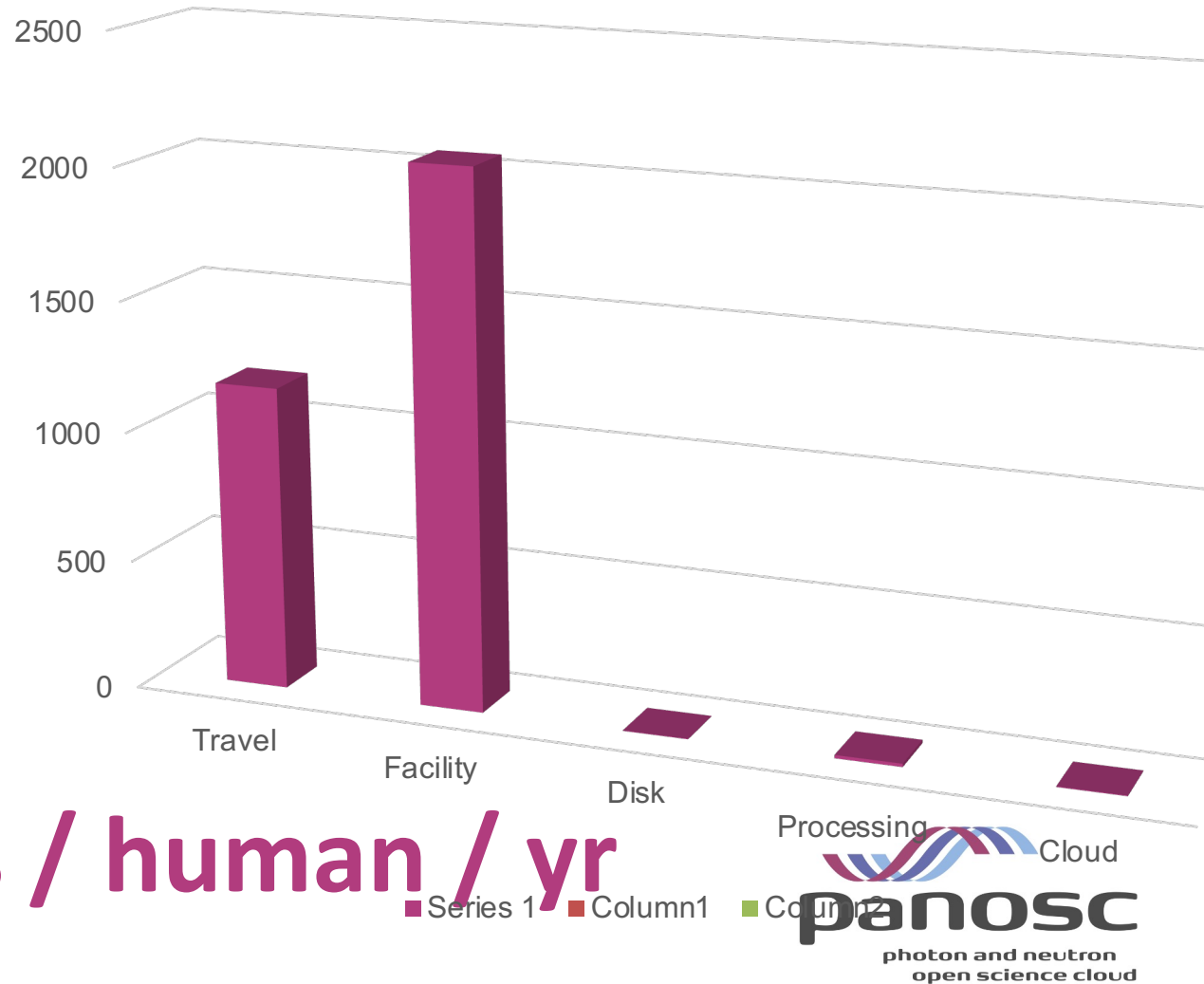
- User Travel = **1170 kg**
- Beamtime energy consumption = **2056 kg**
- Data stored on disk = **1.8 kg**
- Data processing on site = **12.6 kg**
- Cloud transfer = **2.3 kg**

CO₂e per kWh in France = **75 g/kWh**

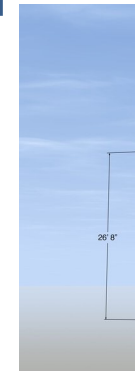
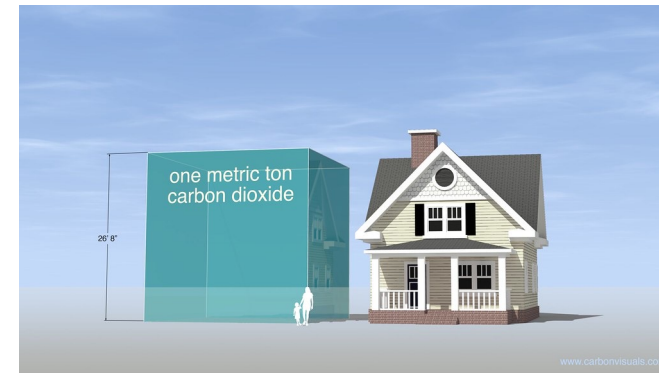
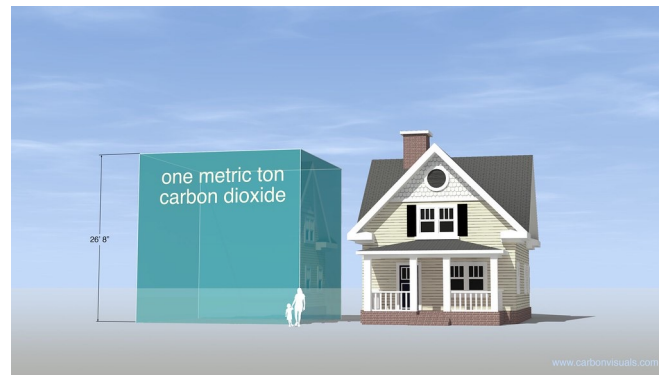
TOTAL = 3.253 tons !

Sustainable Goal = 5 tons / human / yr

Carbon footprint for 1 week experiment @ ESRF



1 week of experiment is equivalent to a cube 30x30x30 metres of CO2



Carbon footprint of archiving data

- Data stored on tape for 10 years $\sim 200 \text{ g} * 35 = 7 \text{ kg}$

CO₂e per kWh in France = 75 g/kWh

ARCHIVING for 10 years $\sim 7 \text{ kgs}$

i.e. 0.2% of the raw data!



Building the PaN Data Commons on the PaNOSC search portal



European Photon and Neutron Open Data Search Portal

Type a query to search for open data from photon and neutron sources:

... or try one of these queries: *diffraction, lung*

The European Photon and Neutron sources are working together in the PaNOSC and ExPaNDS projects financed by the European Commission to build the **European Open Science Cloud**. One of the main objectives of the EOSC is to make **Open Data** from these facilities FAIR. This portal implements the F(indable) part of FAIR via a **federated search engine** from the following facilities:

- European Synchrotron Radiation Facility
- European Spallation Source
- MAX IV
- Paul Scherrer Institut
- Central European Research Infrastructure Consortium

Additional facilities will be included in the federated search as their search engines come online locally. The goal is to include all photon and neutron facilities who provide open data by the end of the two projects PaNOSC and ExPaNDS.

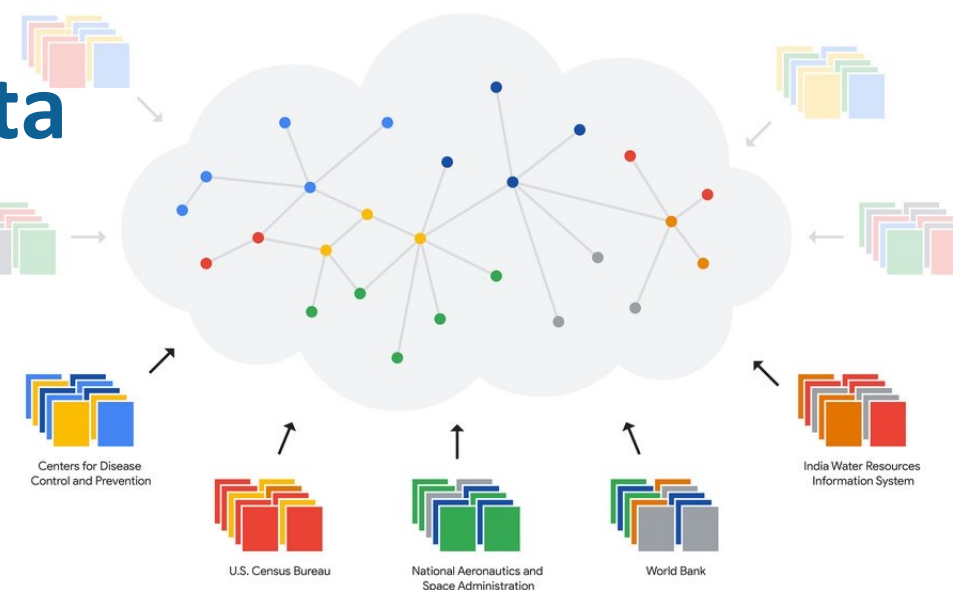
The mission of the PaN data search portal is to contribute to the realization of a data commons for Neutron and Photon science. The search results provide a link to the landing page of the data DOIs through which the other data services provided by PaNOSC and ExPaNDS for data downloading, analysis, notebooks and simulation can be accessed. The aim of the portal is to facilitate using data from photon and neutron sources for the many

What we need from YOU:

1. **Implement an open data repository**
2. **Deploy the PaNOSC Search API + scoring**
3. **Connect your search endpoint to the PaN Search Portal**
4. **Data stewards to curate metadata**
5. **Train your scientists in FAIR data**
6. **Help build a knowledge graph**



Data Commons Knowledge Graph



Conclusion

1. ExPaNDS and PaNOSC have laid the foundations for a PaN Data Commons
2. The outcomes of the two projects will enable a PaN Data Commons of FAIR data
3. A PaN Data Commons will preserve and increase data reuse
4. Finance to sustain a Data Commons will come from facilities + EOSC
5. The PaN community is on the road to becoming part of the FAIR data landscape
6. Saving our data helps fight climate change and supports open science



Useful links

- ExPaNDS - <https://expands.eu/>
- PaNOSC - <https://www.panosc.eu/>
- EOSC Association - <https://eosc.eu/>
- PaNOSC data portal – <https://data.panosc.eu>

Sources used for carbon footprint estimates

- **User Travel** - <https://calculator.carbonfootprint.com/calculator.aspx?tab=3>
- **Beamtime energy consumption** – ESRF electrical monitor + control system
- **Data stored on disk** – <https://www.buildcomputers.net/power-consumption-of-pc-components.html>
- **Data processing on site** – <https://www.buildcomputers.net/power-consumption-of-pc-components.html>
- **Data transfer+storage in cloud** – <https://medium.com/stanford-magazine/carbon-and-the-cloud-d6f481b79dfe>
- **Tape storage** - <https://datastorage-na.fujifilm.com/reducing-carbon-emissions-through-the-data-tape-ecosystem/>
- **CO2 by kWh in France** - <https://www.rte-france.com/eco2mix/les-emissions-de-co2-par-kwh-produit-en-france#>

<https://sciencebusiness.net/news/energy-crisis-starting-hit-europes-big-science-labs>

PaNOSC aim - link all scientific data + output together

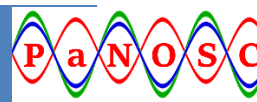
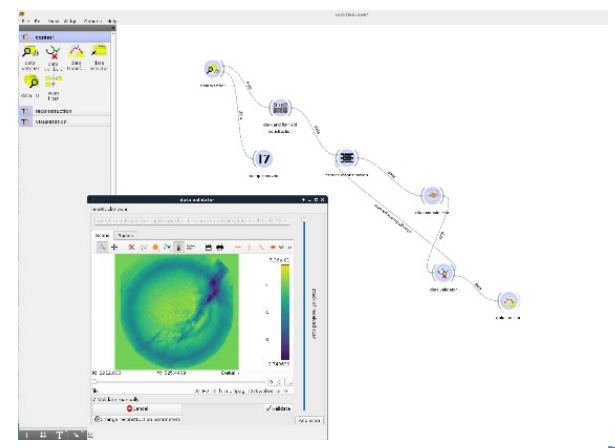


Image Source: <http://michaelnielsen.org/blog/the-future-of-science-2/>



```
File Edit View Run Kernel Tabs Settings Help
In [10]: show_img(img, False, 'none')
```

```
In bash this is done with:
hdh@esr data/cvlib-21-run0131\data\CLS_2013_Mar23_10131_003823_b32b.h5

Same thing with a geometry file:
In [10]: img = reconstruct(img, 'SH128-Lite-2013.geom')
In [11]: show_img(img, False, 'null')
```

CHEMISTRY
An Experimental Protocol for Femtosecond NIR/UV - XUV Pump-Probe Experiments with Free-Electron Lasers
Daniel Rolles¹, Rebecca Boll^{2,3}, Benjamin Erk², Dimitrios Rompotis², Bastian Manschuetz²
¹U. R. Macdonald Laboratory, Department of Physics, Kansas State University, ²Deutsches Elektronen-Synchrotron DESY, ³European XFEL GmbH

Views: 3,065

video

Daniel Rolles
Kansas State University

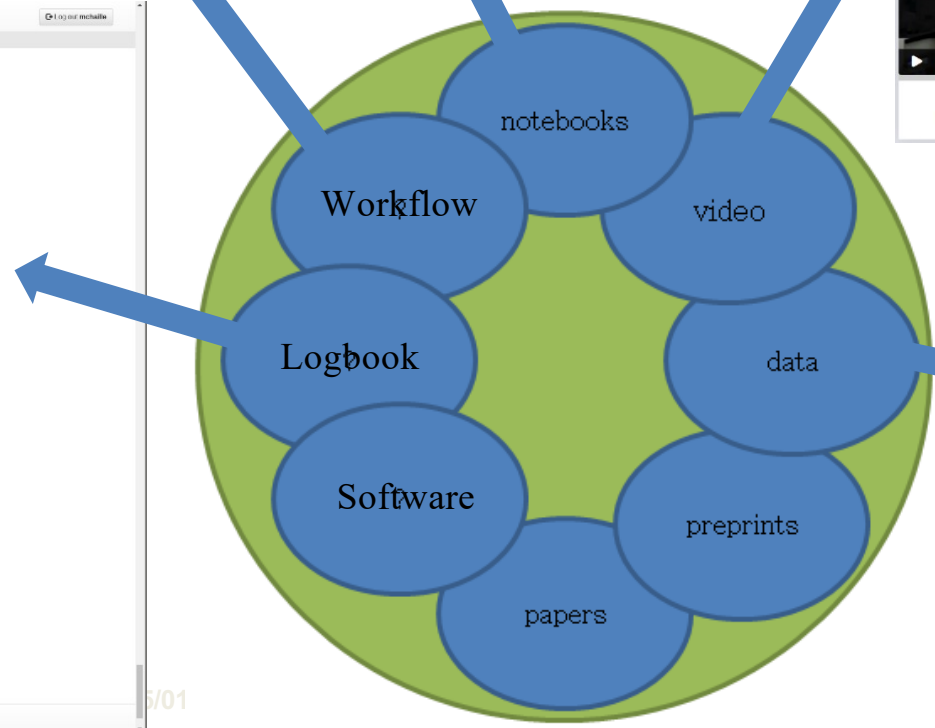
ISSUE 148
DOI: 10.2731/17055
PUBLISHED: 10/23/2016
COMMENTS

ESRF Home My Selection

22:08:32 @ iwick show wcd21d
22:08:20 @ iwick_show wcd21d
22:05:28 @ iwick show wcd21d

22:05:28 @ New dataset: ble_Cd_middles
21:12:52 @ zoomimage samey 7.728 9.24 124 samez 25.156 26.426 106 100 0 (exp: #1, spec: #1)
21:06:26 @ zoomimage ble_Cd1 wheat grain 16um thick CIF coarse
21:05:24 @ New dataset: ble_Cd_coarse
21:06:26 @ New sample: ble_Cd ("wheat grain 16um thick CIF")
21:05:25 @ New spec file: Natas/Vision/ev355cd21Lole Cdble Cd_spec01ble_Cd_spec01.dat

ESRF European Synchrotron Radiation Facility



My Datasets

Name	Project	Time
ble_Cd1	ble_Cd1	2016-10-23 10:13:10
ble_Cd2	ble_Cd2	2016-10-23 10:13:10
ble_Cd3	ble_Cd3	2016-10-23 10:13:10
ble_Cd4	ble_Cd4	2016-10-23 10:13:10



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Thank you

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