Results of LEAPS survey and the PaN Data Commons

PaNOSC+ExPaNDS Symposium- 26/10/2021

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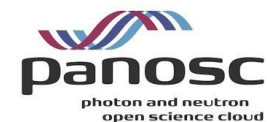
LEAPS partners

PaNOSC + ExPaNDS members

We have One Common **GOAL**

→ Open Data Commons for PaNs

Federated PaN Search

Publisher

Open Science

Citizen Science

Human Organ Atlas

Open Data Portal

Open Data Portal

Open Data Portal

PaN Open Data Repository (EOSC)

PaN Search API

Example of open data publishing:

Human Organ Atlas

Reference: **"Multiscale three-dimensional imaging of intact human organs down to the cellular scale using hierarchical phase-contrast tomography"** by Walsh, C.L., Tafforeau, P., Wagner, W.L., Jafree, D.J., Bellier, A., Werlein, C., Kühnel ,M.P., Boller, E., Walker-Samuel, S., Robertus, J-L., Long, D.A., Jacob, J., Marussi, S., Brown, E., Holroyd, N., Jonigk, D.D., Ackermann, M., Lee, P.D**. Nat Methods (2021)** Accepted

refer to PaNOSC Use Case 23 for more info

Human Organ Atlas   EXPLORE   SEARCH

Welcome to the Human Organ Atlas

The Human Organ Atlas uses **Hierarchical Phase-Contrast Tomography** (HiP-CT) to span a previously poorly explored scale in our understanding of human anatomy, the micron to whole intact organ scale. Histology using optical and electron microscopy images cells and other structures with sub-micron accuracy but only on small biopsies of tissue from an organ, while clinical CT and MRI scans can image whole organs, but with a resolution only down to just below a millimetre. HiP-CT bridges these scales in 3D, imaging intact organs with ca. 20 micron voxels, and locally down to microns. We hope this open access Atlas, enabled by the ESRF-EBS, will act as a reference to provide new insights into our biological makeup in health and disease.

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- The **Royal Academy of Engineering**, UK
- The **UK Medical Research Council**
- The **Wellcome Trust**

DEMO

Collaborators

- <u>UCL</u>, London, England: **Peter D Lee, Claire Walsh, Simon Walker-Samuel, Rebecca Shipley, Sebastian Marussi, Joseph Jacob, David Long, Daniyal Jafree, Ryo Torii, Charlotte Hagen**
- <u>ESRF</u>, Grenoble, France: **Paul Tafforeau, Elodie Boller**
- Medizinische Hochschule Hannover, Germany: **Danny D Jonigk, Christopher Werlein, Mark Kuehnel**
- Universitätsmedizin der Johannes Gutenberg-Universität Mainz, Germany: **M Ackermann**
- University Hospital of Heidelberg, Germany: **Willi Wagner**
- Grenoble Alpes University, Department of Anatomy, French National Center for Scientific Research: **A Bellier**
- <u>Diamond Light Source</u>, Harwell, UK: **Andy Bodey, Robert C Atwood**
- Imperial College London, UK: **JL Robertus**

Aknowledgements

The development of this portal has been done as part of the <u>PaNOSC project</u>. PaNOSC has received funding from the European Union's <u>Horizon 2020</u> research and innovation programme under grant agreement No. 823852. The following people were involved in the development: Paul Tafforeau, Alejandro De Maria Antolinos, Axel Bocciarelli, Marjolaine Bodin and Andrew Götz from the ESRF, Jiří Majer from ELI, as well as the broader PaNOSC and ICAT communities.
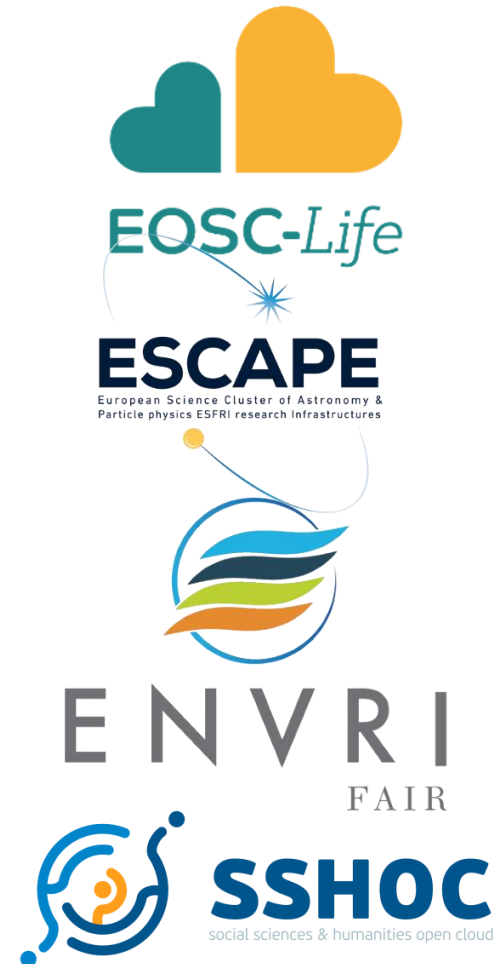
https://human-organ-atlas.esrf.eu
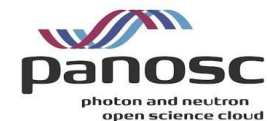
PaN Open Science Commons - Concept

- **Vision** – **create a common space** for PaNOSC and ExPaNDS facilities where petabytes of **PaN FAIR data, analysis software, notebooks, workflows, and training material** can be **F**ound, **A**ccessed (downloaded and/or executed), **R**e-Used + **I**mproved i.e. **FAIR**

- **Remote access** – the **PaN commons** will be **accessible remotely** while being executed locally (close to the data) or via the EOSC (data needs to be moved)

- **Remote users** – the **PaN commons** will enable and encourage **remote users** and experiments (urgently required in the post-COVID-19 phase)

Examples from other clusters in EOSC

- **EOSC-Life**
  - EU COVID-19 portal
- **ESCAPE**
  - High Energy Physics – CERN Open Data
  - Virtual Observatory
- **ENVRI-FAIR**
  - ICOS, DISSCO, …
- **SSHOC**
  - CLARIN, DARIAH, …
- **PaNOSC+ExPaNDS**
  - ISIS, ILL, ESRF, PSI, …

Questionnaire sent to LEAPS partners

1. How many of the PaNOSC + ExPaNDS outcomes will your facility adopt?

1. Do you share the vision of a PaN Open Science Commons?

1. Should we publish a LEAPS strategy paper on Data + Open Science Strategy?

Q1: LEAPS facilities uptake of PaNOSC+EXPaNDS outcomes

Legend:
- Yes, already adopted (Y)
- Not Planning to be adopted (N)
- In progress of being adopted (WIP)
- Planned to be adopted (P)
- Under evaluation (U)

FACILITY	FAIR data policy	DMPs	DOIs	Nexus HDF5	Search API	Open Data Portal	AAI	JupyterLab	VISA	SIMEX	Pan-learning/ training
ALBA	P	P	WIP	WIP	P	P	U	P	U	U	U
DESY	WIP	P	P	Y	WIP	P	WIP	Y	U	N	WIP
DIAMOND											
ELETTRA	Y	WIP	Y	Y	WIP	WIP	Y	Y	WIP	Y	WIP
ESRF	Y	WIP	Y	Y	WIP	WIP	Y	Y	WIP	Y	WIP
EuXFEL	WIP	WIP	Y	WIP	WIP	WIP	WIP	Y	WIP		WIP
FELIX	Y	P	WIP	U	U	WIP	U	U	N	N	U
HZB	Y, N, P [1]	P	WIP [2]	Y	P	Y	P	U	U	U	U
HZDR	WIP	WIP	Y	N	N	WIP	WIP	WIP	P	N	Y
INFN	U	U	U	U	U	U	U	U	U	U	U
ISA*	U	U	U	U	U	U	U	U	U	U	
MAX IV											
PSI	WIP	WIP	Y	WIP	Y	Y	WIP	WIP	N	N	N
PTB	Y	WIP	Y	WIP	N	Y	N	N	N	N	N
SOLARIS #											
SOLEIL	U	P	WIP	Y	P	P	WIP	U	WIP	U	Y
ILL (LENS)	WIP	WIP	Y	Y	Y	Y	WIP	Y	Y	N	WIP

panosc
photon and neutron
open science cloud

ExPaNDS
European Open Science Cloud Photon
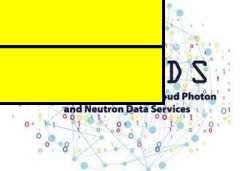and Neutron Data Services

Q1: LEAPS facilities uptake of PaNOSC+EXPaNDS outcomes in the future

FACILITY	FAIR data policy	DMPs	DOIs	Nexus HDF5	Search API	Open Data Portal	AAI	JupyterLab	VISA	SIMEX	Pan-learning/ training
ALBA	Y	Y	Y	Y	Y	Y	U	Y	U	U	U
DESY	Y	Y	Y	Y	Y	Y	Y	Y	U	N	Y
ELETTRA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ESRF	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EuXFEL	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
FELIX	Y	Y	Y	U	U	Y	U	U	N	N	U
HZB	y	Y	Y	Y	Y	Y	Y	U	U	U	U
HZDR	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y
PSI	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
PTB	Y	Y	Y	Y	N	Y	N	N	N	N	N
SOLEIL	U	Y	Y	Y	Y	Y	Y	U	Y	U	Y
ILL (LENS)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	WIP
INFN	U	U	U	U	U	U	U	U	U	U	U
ISA*	U	U	U	U	U	U	U	U	U	U	
DIAMOND	* Will fill-in after Oct 25										
MAX IV											
SOLARIS #											

Answers – Q2 + Q3

- **Q2: Does your facility share the view of a PaN Data Commons?**
  Answer = 12 Yes + 4 No

- **Q2b: Which scenario do you prefer for a PaN Data Commons?**
  Answer = 7 Scenario 1 + 5 Scenario 3

- **Q3: Do you see a need for a common Open Science and Open Data strategy paper for LEAPS**
  Answer = 9 Yes + 1 No + 6 Undecided

	Q2	Q2b	Q3
ALBA	Y	3	Y
DESY	Y	1	Y
DIAMOND			
ELETTRA	Y	1	Y
ESRF	Y	3	Y
EuXFEL	Y	1	Y
FELIX	Y	3	Y
HZB	Y	1	Y
HZDR	Y	1	Y
INFN	Y	3	N
ISA	Y	3	N/A
MAX IV			
PSI	Y	1	N/A
PTB			N/A
SOLARIS			
SOLEIL	Y	1	Y

Sustaining the PaN Open Science Commons

- Option 1 - **Local implementation (€€€)** – **all sites** implement a local data repository and the PaNOSC API which supports federated searching of Open Data

- Option 2 - **Centralised implementation (€)** - all sites contribute data (and money) to **one site** which implements a PaN data repository for Open Data + Open Science

- Option 3 - **Hybrid implementation (€€)** - **some sites** implement a local data repository and make Open Data available via the PaNOSC search API, sites without a data repository contribute Open Data (and money) to **a centralised site**

Actions for PaN Open Data Commons

1. EU / National Project funding – **Not for Operation**
   → **Action – apply for funding in EOSC calls**

2. Collaboration Contracts between Ris – **Operation**
   → **Action – LEAPS+LENS to commit to finance**
   Data Managers + common portal

3. Collaborate with national funding agencies
   → **Action – collaborate with DAPHNE, Science Ouverte, ...**

Keeping the momentum going

1. We need to keep the PaNOSC + ExPaNDS communities collaborating together on issues around **Data Management**

2. **Proposal**: create a PaN Data Management Working Group to continue working together

3. Enabling **Open Science** through the **PaN Common Data Portal** via EOSC

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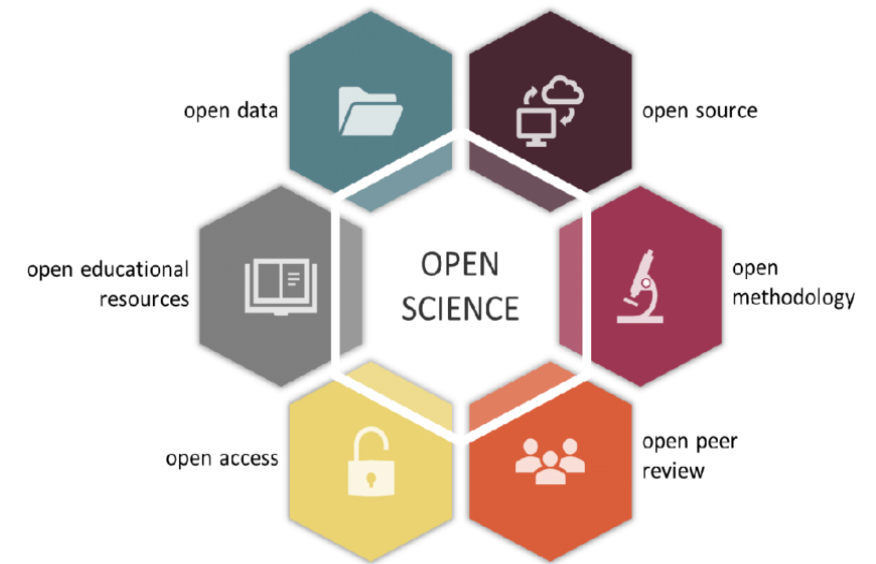
Conclusion

1. **LEAPS facilities will make FAIR data reality**

2. **LEAPS facilities share the vision of a PaN Data Commons**

3. **Sustainability to be addressed with internal funding + EOSC**

4. **LEAPS (+ LENS) need to collectively commit to PaN Data Commons after PaNOSC+ExPaNDS …**

Thank you to all PaNOSC + ExPaNDS contributors!