
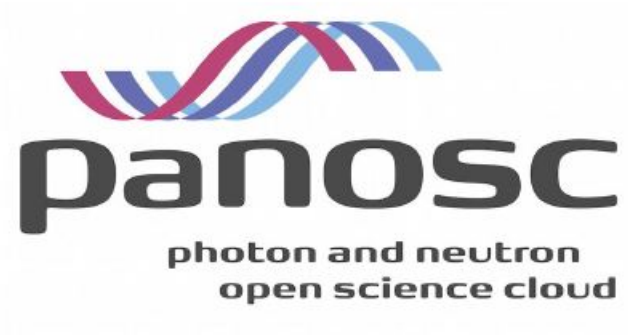


# Photon and Neutron (PaN) Remote Access @ EGI 2020 Conference

*Andy Götz*

*9th of November 2020*

The ExPaNDS project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 857641.
The PaNOSC project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 823852.

# Overview

- Why Remote Access?
- COVID-19 impact for PaNs
- Remote services
- Needs for EGI and EOSC

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# Photon and neutron sources + community

- 10 photon sources
- 7 neutron sources
- Represents ~40 000 users/yr
- PaN is not CERN !


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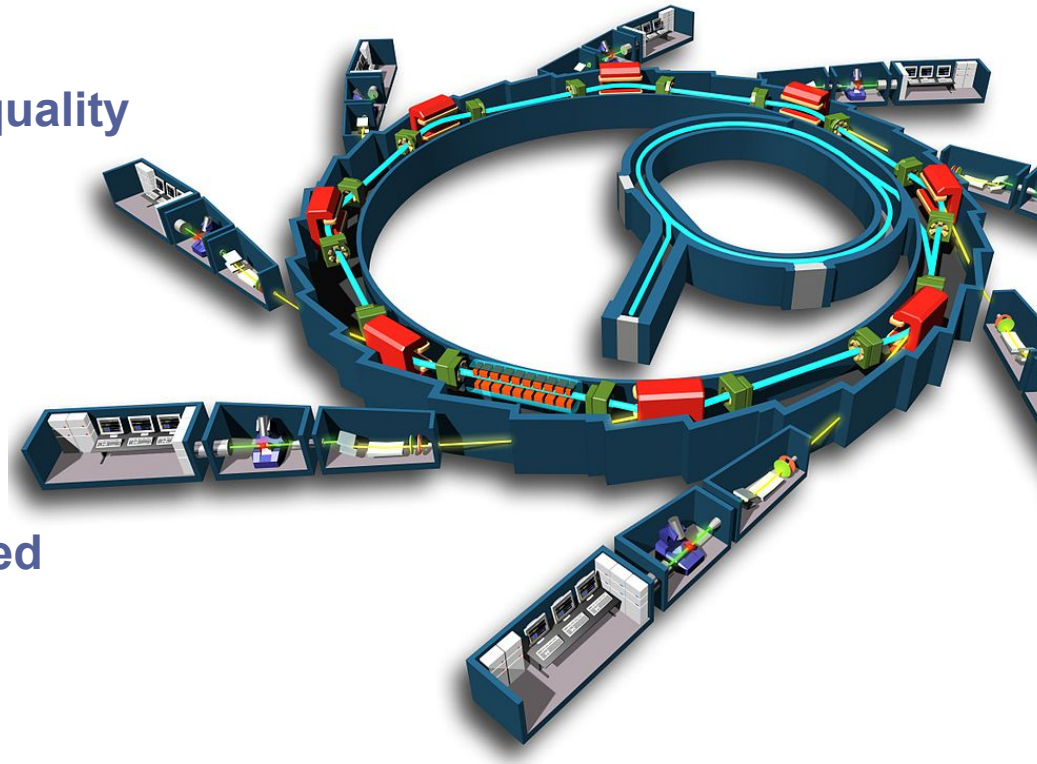
# Photon and Neutron Sources in Europe

The ExPaNDS
The PaNOSC

# How do PaN User Facilities work?

1. User: has an idea / need to study a sample
2. Proposal: User writes a proposal for one of the PaN facilities
3. Review committee: Reviews proposal and rates scientific quality
4. Beamline scientist: Review proposal and checks feasibility
5. Beamtime allocated: User travels to facility / sends sample
6. Experiment: Sample(s) are exposed to beam + data collected
7. Analysis: Data is reduced, analysed + curated (DOI)
8. Publication: User publishes results (DOI) in peer reviewed journal



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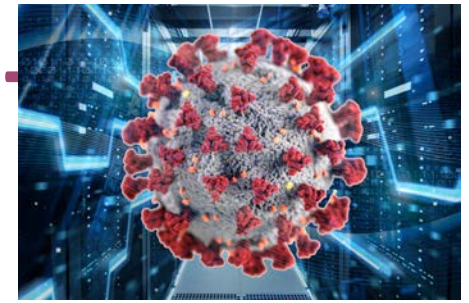
# PaN Users remote access requirements post-



1. User: has an idea / need to study a sample
2. Proposal: User writes a proposal for one of the PaN facilities → Proposal system
3. Review committee: Reviews proposal and rates scientific quality → Remote meeting
4. Beamline scientist: Review proposal and checks feasibility
5. Beamtime allocated: User ~~travels to facility~~ / sends sample → Sample tracking
6. Experiment: Sample(s) are exposed to beam + data collected → Remote control system + monitoring + reduction
7. Analysis: Data is remotely reduced, analysed, downloaded + curated (DOI) → Remote data analysis + Data transfer → Long term archiving
8. Publication: User publishes results (DOI) in peer reviewed journal

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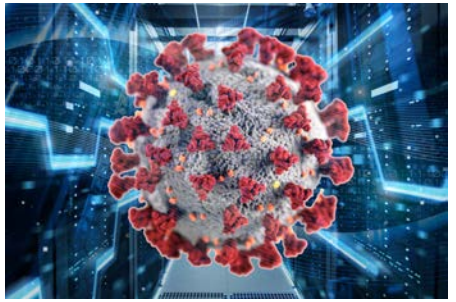
# Post-COVID-19 impact on PaN sources and community



## ALL PaNs are generalising REMOTE EXPERIMENTS (WIP)

1. **USERS** → remote
2. **SAFETY** → security
3. **SAMPLE TRACKING** → by post
4. **DATA ANALYSIS** → remote analysis
5. **DATA TRANSFER** → via internet

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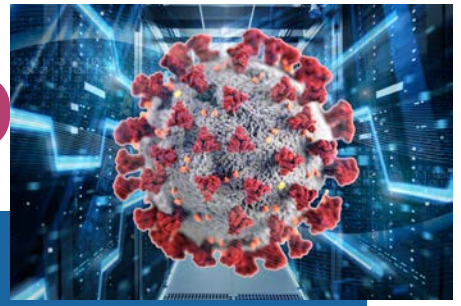
# PaNs workshop on IT solutions for COVID



## LEAPS-IT Working Group 3 Workshop on "IT Solutions to address Operational Challenges during Covid-19"

18 June 2020
Zoom
Europe/Stockholm timezone

- Overview
- Timetable
- Contribution List
- Registration
- Participant List

Darren Spruce, Daniel Salvat
darren.spruce@maxiv.lu...
dsalvat@cells.es

### Timetable

Thu 18/06

Print | PDF | Full screen | Detailed view | Filter
Session legend

Statuses Update | Technical Talks | Wrap up session

13:00 **LEAPS IT Overview: Mark Heron (DLS)** 13:00 - 13:10

**LEAPS Overview: Mirjam van Daalen (PSI)** 13:10 - 13:20

https://indico.maxiv.lu.se/event/1375/timetable/#20200618.detailed

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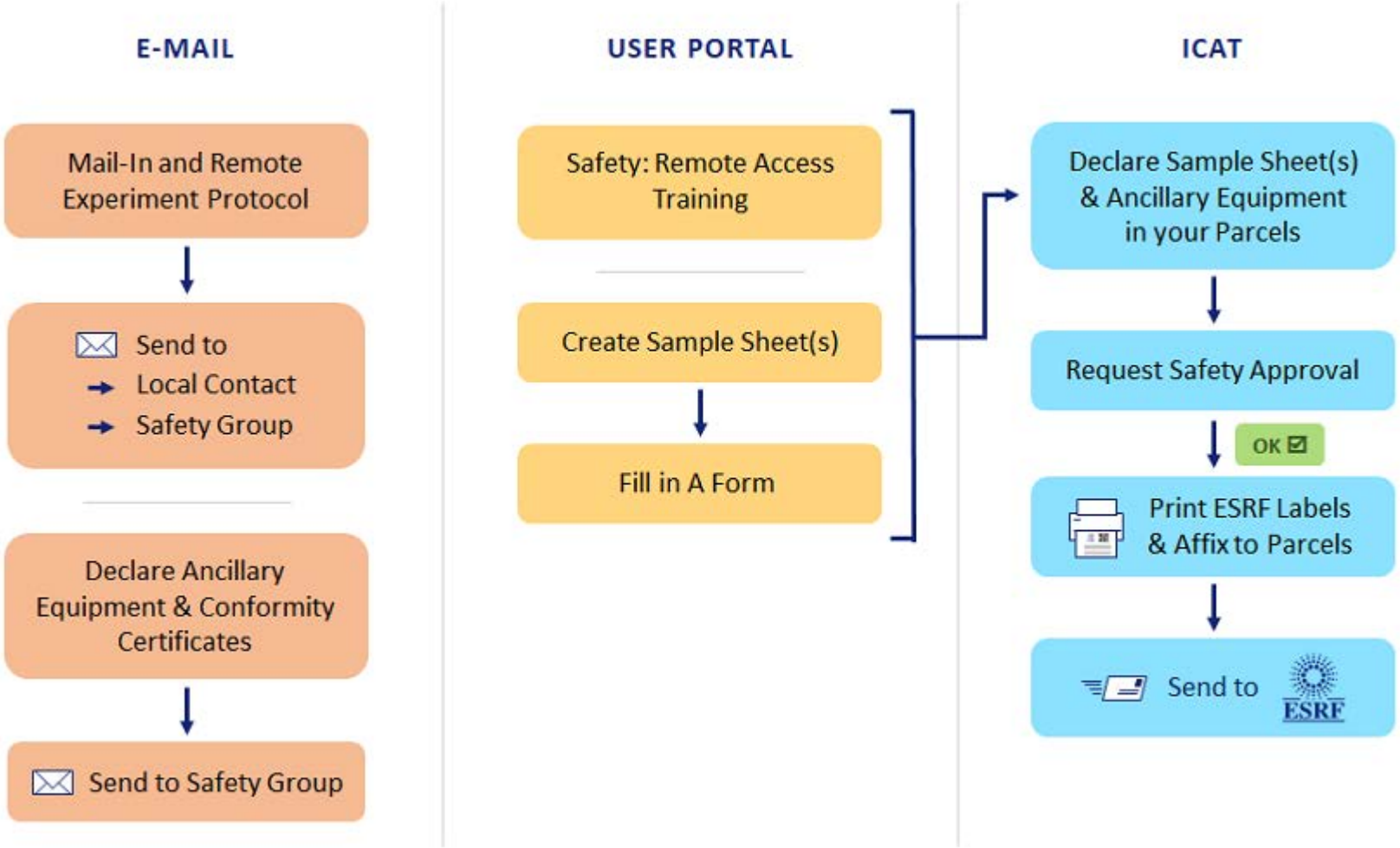
# Remote Experiments @ ESRF

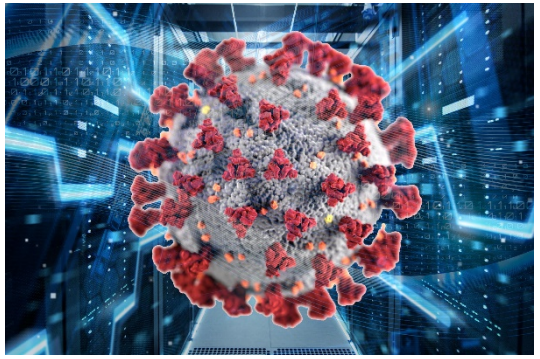
17-07-2020

Remote Experiments on Non Structural Biology Beamlines

Share



# VISA - ILL remote access post-COVID-19



- Provide remote data analysis services with access to
  - Experimental data
  - Analysis software
  - Compute infrastructure
  - Support (IT and Scientific)
- Make access as simple as possible using a web browser
  - Remote desktop as if the user was sitting in front of an ILL data treatment workstation
  - Easy and flexible machine management
- Allow scientific collaborations
  - Sharing desktops
- **Enable remote experiments**
  - Access Nomad (SCI) to perform instrument control
  - This is the current priority for the next reactor cycle (August)

*credits – Jamie Hall (ILL) + Stuart Caunt (ILL)*

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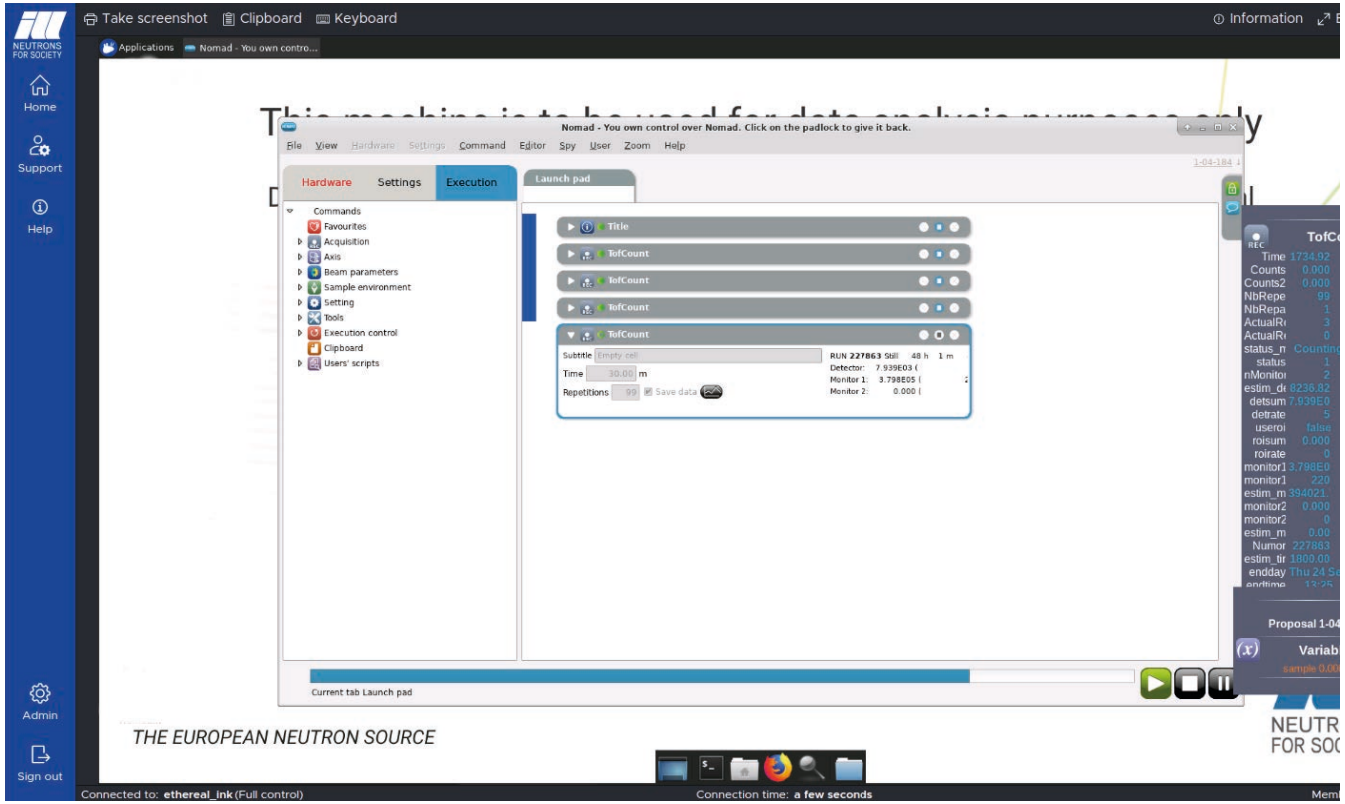
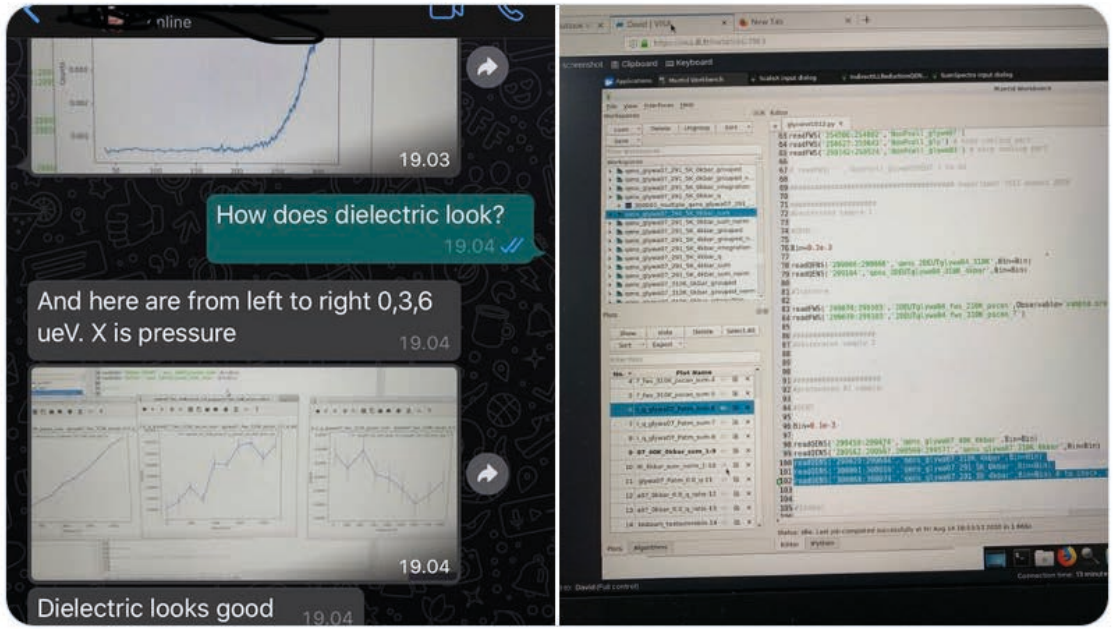
# Remote Experiments @ ILL




Tweet

**Kristine Niss**
@KristineNiss

Combining the @ILLGrenoble remote solution with chat and video conferencing with my onsite PhD student and dedicated local collaborator. Makes me miss the beamtime thrill - but it so much better than nothing. Thx for making it work!




8:36 PM · Aug 14, 2020 from Copenhagen, Denmark · Twitter for iPhone

**1** Retweet and comment **5** Likes

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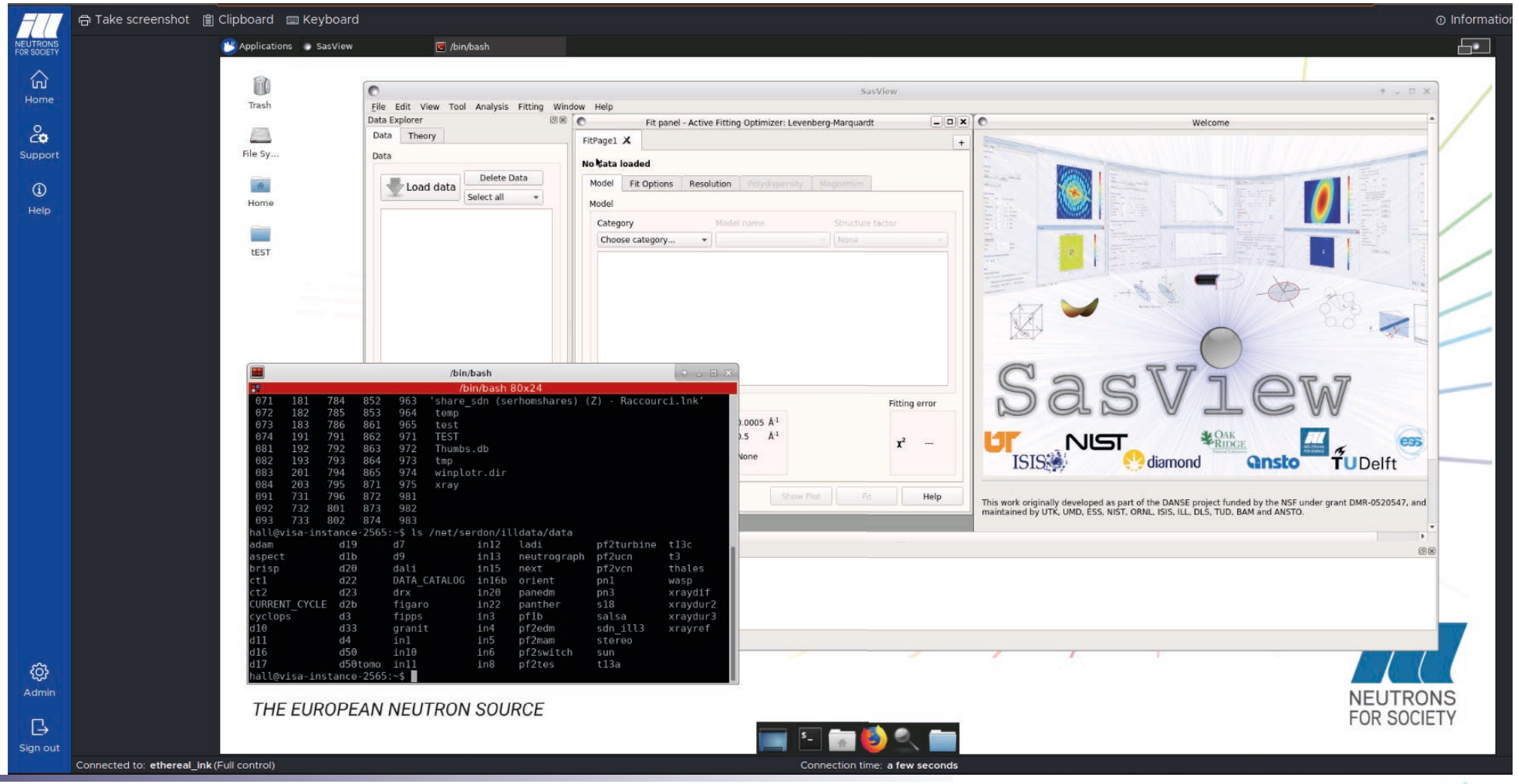
# Remote Experiments @ ILL

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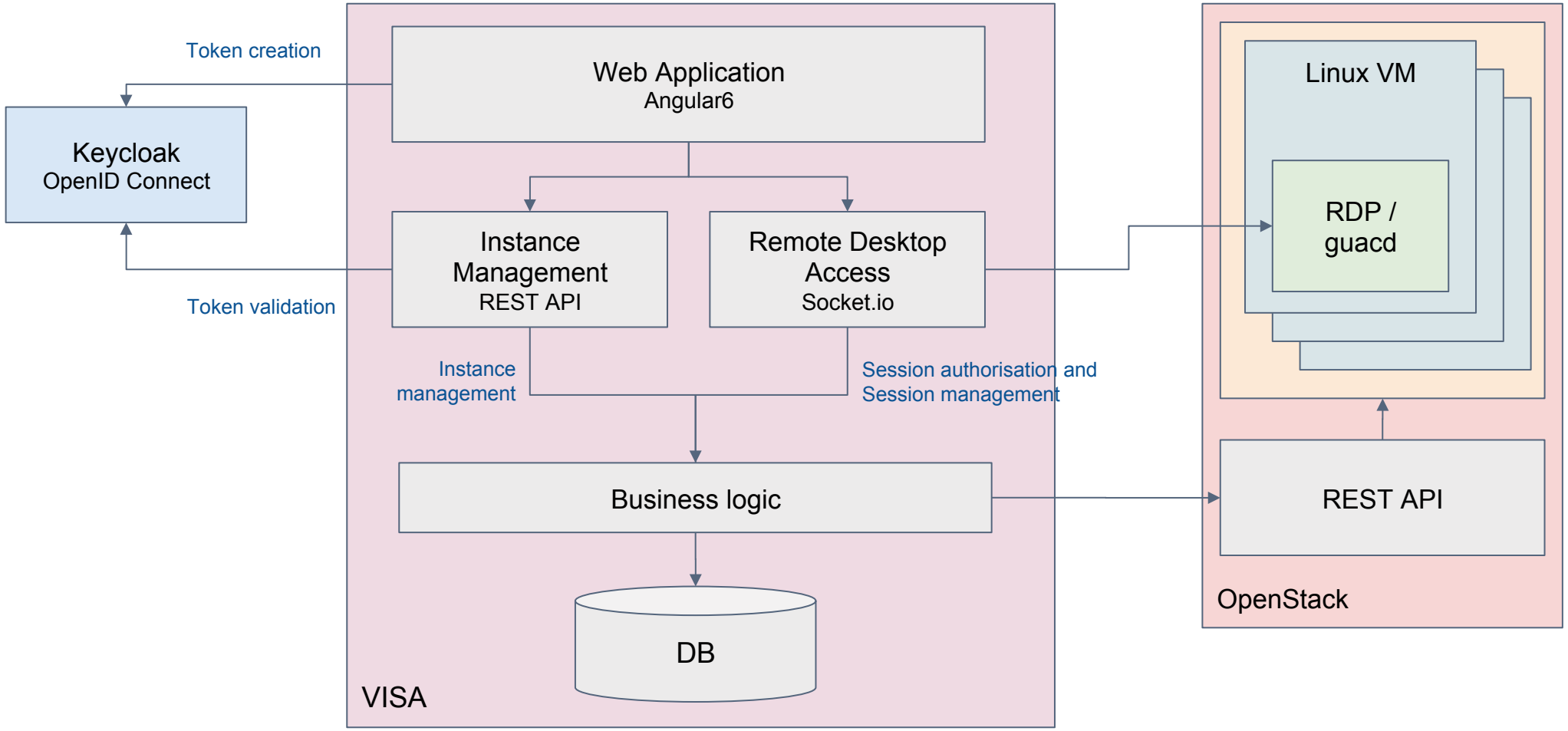
# ILL VISA architecture

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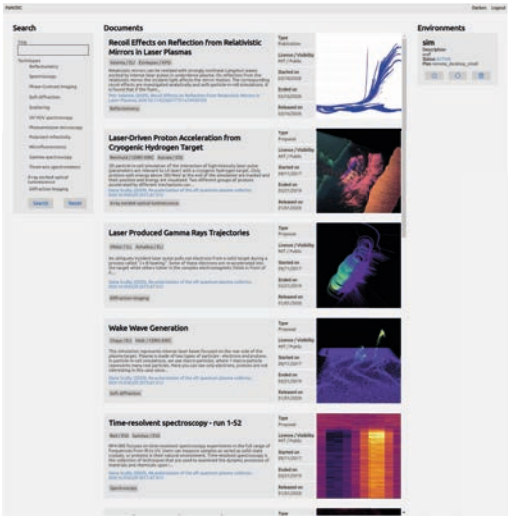
# PaNOSC + ExPaNDS portal architecture



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# PaN Use Cases for Remote Services

**User 1**: How can I download 5 TBs of raw data?

**User 2**: How can I search, view and process data remotely?

**User 3**: How can I access a Jupyter notebook to process my data?

**User 4**: How can I make my data open and get a DOI to cite?

**User 5**: How can I get credentials to login and use these services?

**Beamline scientist**: How can I provide standard notebooks for processing data for my users?

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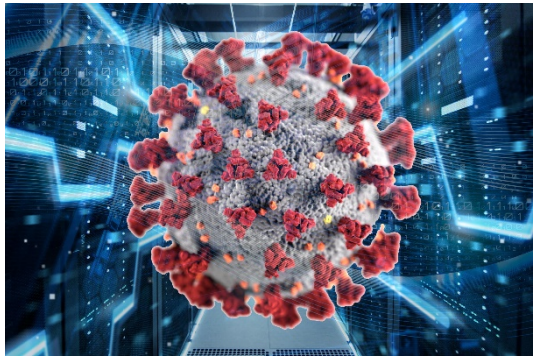
# Post-COVID all PaNs will / should offer

1. Remote experiments
2. Downloadable Metadata & Raw data
3. Software service to browse and analyse raw data
4. Platform as a service to do computations + simulations
5. Common space to share progress and workflows



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# Remote access bottlenecks

1. Remote experiments → internet bandwidth, remote desktop tools
2. Downloading (Terabytes) Data → efficient, ease of use
3. Software service to browse and analyse raw data → compute cluster(s), batch scheduler, VMs, containers
4. Platform to do computations + simulations → HPC cluster
5. Common space to share workflows → workflow tools

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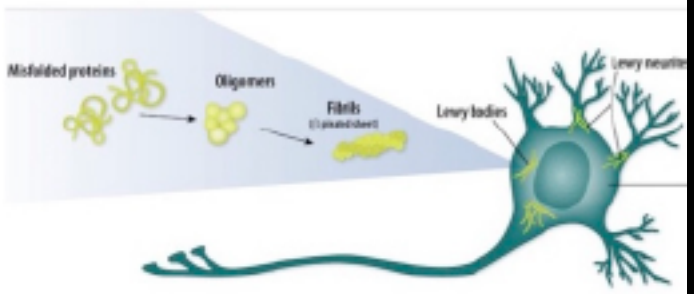
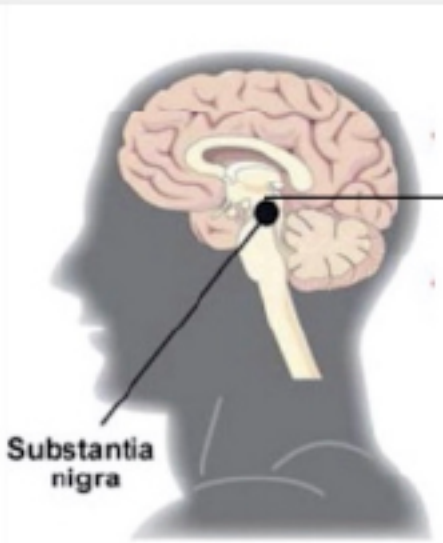
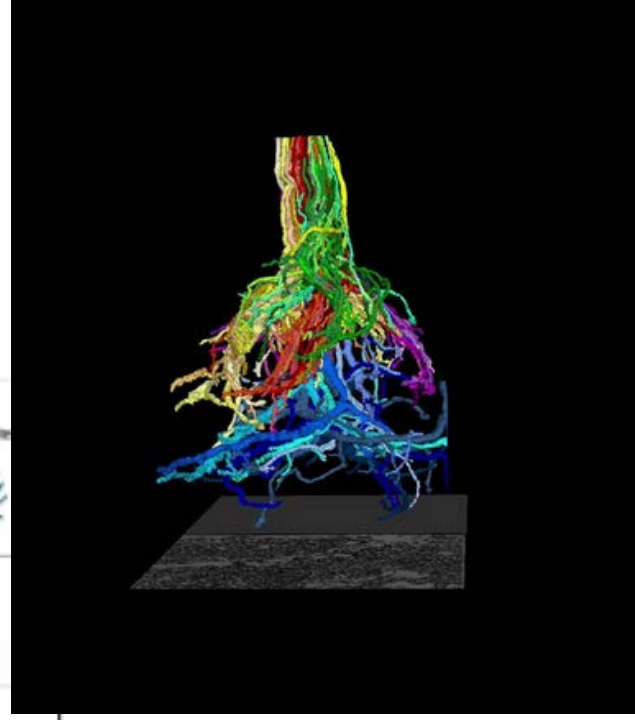
# Use Case

- **Parkinson's disease**
- **Institute: CERIC-ERIC, ESRF**
- **Scientists: L.Casalis et al. + A.Pacureanu et al.**
- **Objective:** mapping of neurons in 2d and 3d
- **Request:** make large data volumes available as Open Data



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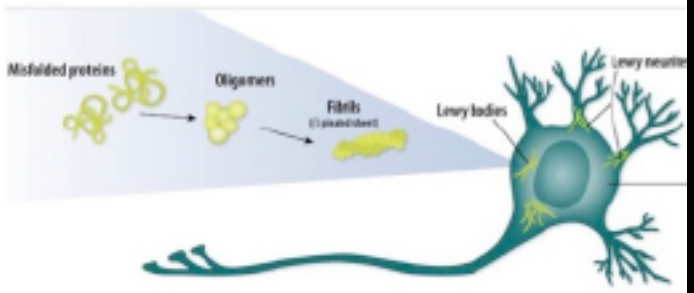
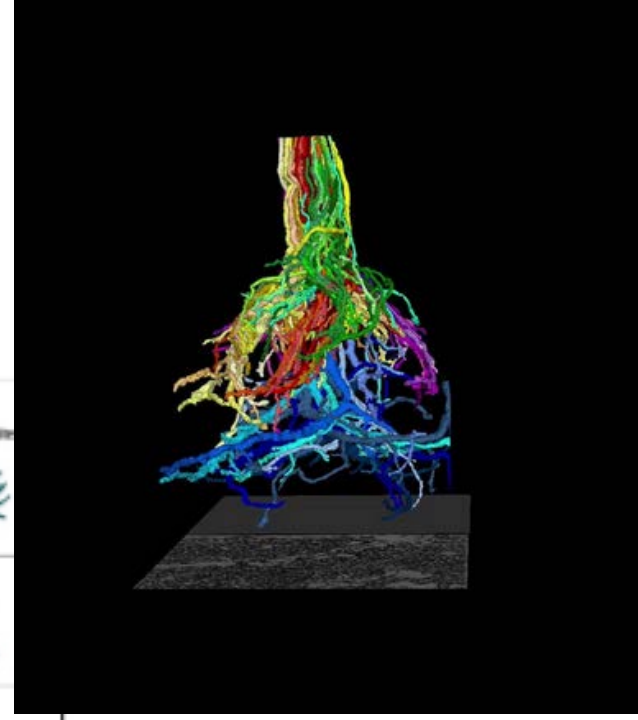
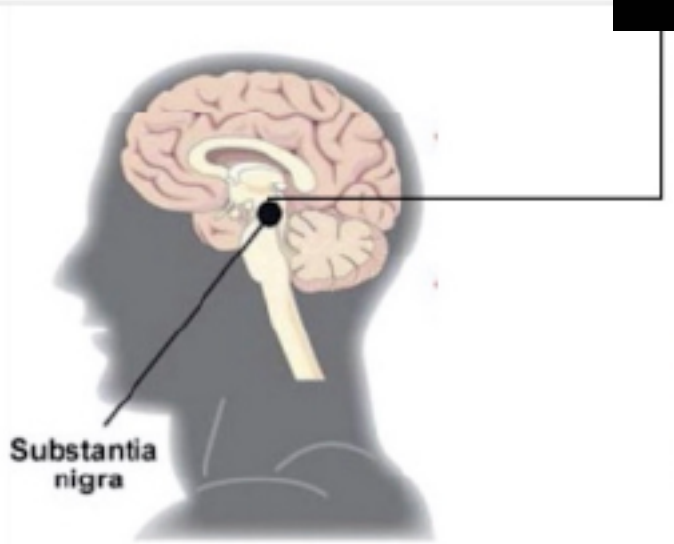
# Use Case

- **Demonstrates:** open data, big data download, data portal, HDF5 data format, search API
- **Work packages:** WP2, WP3, WP4, WP6
- **Linked to:** any user community which needs to publish open data and make it FAIR for their community



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# Where can EGI help?

- Jupyter notebook service
- Binder service for reproducible notebooks
- Compute resources for HTC with GPUs / FPGAs
- High data volume download service
- Common AAI solution

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# Conclusion

- PaNs are generalizing remote access to experiments and data
- Strong need to collaborate on remote access tools
- EGI can help PaNs to provide remote services
- EOSC could help in this area

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# Thank you to all colleagues @ PaNOSC, ExPaNDS + EGI !


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# ILL VISA remote services usage since 11 August 2020

- Number of instances by type of user:
- **Instrument Scientists** **291**
- **External users** **235**

- Session stats:
- User type Count Average duration (m)
- **Instrument responsible** **3614** **121**
- **External user** **3578** **99**

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