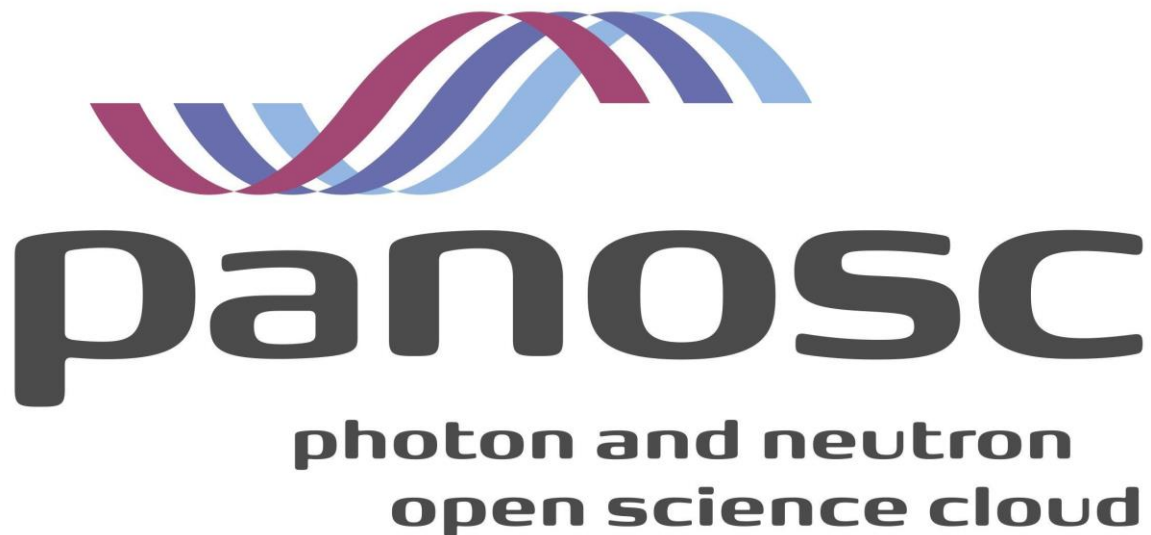


**PaNOSC**  
**Photon and Neutron Open Science Cloud**  
**H2020-INFRAEOSC-04-2018**  
**Grant Agreement Number: 823852**



**Deliverable D8.3: Teaching materials for users of PaNOSC services, FAIR principles, and the PaNOSC facilities accessible in the e-learning platform at [pan-learning.org](https://pan-learning.org)**

## Project Deliverable Information Sheet

Project Reference No.	823852
Project acronym:	PaNOSC
Project full name:	Photon and Neutron Open Science Cloud
H2020 Call:	INFRAEOSC-04-2018
Project Coordinator	Andy Götz (andy.gotz@esrf.fr)
Coordinating Organization:	ESRF
Project Website:	www.panosc.eu
Deliverable No:	D8.3
Deliverable Type:	DEC
Dissemination Level	Public
Contractual Delivery Date:	31/05/2022
Actual Delivery Date:	08/11/2022
EC project Officer:	Flavius Alexandru Pana

### Document Control Sheet

<b>Document</b>	Title: Teaching materials for users of PaNOSC services, FAIR principles, and the PaNOSC facilities accessible in the e-learning platform at <a href="https://pan-learning.org">pan-learning.org</a>
	Version: 1
	Available at: <a href="https://github.com/panosc-eu/panosc">https://github.com/panosc-eu/panosc</a>
	Files: 1
<b>Authorship</b>	Written by: Thomas Holm Rod & Andrew McCluskey
	Contributors: Teodor Ivănoaica
	Reviewed by: Mads Bertelsen, Aljosa Hafner, Mousumi Upadhyay Kahaly & Marius Retegan
	Approved: Andy Götz

### List of participants

Participant No.	Participant organisation name	Country
1	European Synchrotron Radiation Facility (ESRF)	France
2	Institut Laue-Langevin (ILL)	France
3	European XFEL (XFEL.EU)	Germany
4	The European Spallation Source (ESS)	Sweden
5	ELI European Research Infrastructure Consortium (ELI-ERIC)	Belgium
6	Central European Research Infrastructure Consortium (CERIC-ERIC)	Italy
7	EGI Foundation (EGI.eu)	The Netherlands

## Introduction

The e-learning platform contains a wide range of material, ranging from that supplement lectures in neutron scattering at Copenhagen University, to workshops used in teaching at the ISIS Neutron and Muon Facility. This report will focus on the material that was prepared as part of the PaNOSC summer school. This summer school focused on introducing PaNOSC services, FAIR principles and the PaNOSC facilities, in application to materials science topics.

## Summary of prepared training content

E-learning material was developed for the PaNOSC summer school **Material Science at European Large-Scale Infrastructures using Open and FAIR Data** held September 12-16 in Szeged, Hungary. The material is accessible in the e-learning platform: <https://e-learning.pan-training.eu> under the heading:

*PaNOSC Summer School 2022* at <https://e-learning.pan-training.eu/moodle/course/view.php?id=108>

The material covers FAIR data at the types of research infrastructures in PaNOSC, i.e. laser facilities, synchrotron (x-ray) facilities, and neutron sources. The various material is listed in the table below and together encompasses Deliverable D8.3.

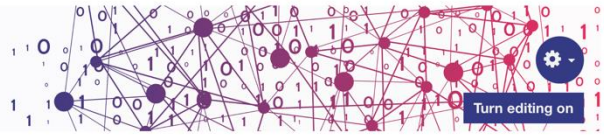
Title	Topic	Functionality used in e-learning platform	Link
FAIR session	FAIR data, open science, EOSC	Moodle	<a href="https://e-learning.pan-training.eu/moodle/course/view.php?id=114">https://e-learning.pan-training.eu/moodle/course/view.php?id=114</a>
Laser focus day	FAIR laser science	Moodle & Jupyter	<a href="https://e-learning.pan-training.eu/moodle/course/view.php?id=111">https://e-learning.pan-training.eu/moodle/course/view.php?id=111</a>
Neutron focus day	FAIR neutron science	Moodle & Jupyter	<a href="https://e-learning.pan-training.eu/moodle/course/view.php?id=109">https://e-learning.pan-training.eu/moodle/course/view.php?id=109</a>
x-ray focus day	FAIR x-ray science	Moodle & Jupyter	<a href="https://e-learning.pan-training.eu/moodle/course/view.php?id=110">https://e-learning.pan-training.eu/moodle/course/view.php?id=110</a>

1. Note that user registration is required to access the training content.

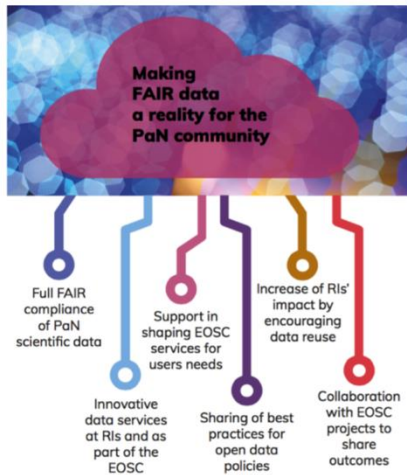
The FAIR data introduction was delivered by Dr Andy Götz (ESRF) representing the PaNOSC project at large and the concepts of FAIR. A screenshot from this material is shown below. This material is student-led including online quizzes, enabling active learning to improve student engagement. The laser focus day was prepared by Dr Mousumi Upadhyay Kahaly (ELI-ALPS) and investigates the analysis and interpretation of simulation methods complementary to ultrafast laser science. The neutron-focus day introduces quasi-elastic neutron scattering and modelling approaches that can be used to analyse these datasets (taking advantage of the hdf5viewer developed in WP4), this was prepared by Dr Andrew McCluskey (ESS). The x-ray focus day material, prepared by Dr Marius Retegan (ESRF), covering x-ray spectroscopy data reduction and analysis (leveraging FAIR data available through the ESRF open data portal). All three focus days take advantage of the ability to include interactive Jupyter Notebooks to improve student engagement and promote an active relationship with the subject of study. Throughout the focus day materials, a particular focus is given to the role of data in the measurements that can be made at the PaNOSC facilities and the PaNOSC services that may be utilised.

## PaNOSC summerschool FAIR session

[e-Learning](#) | [My courses](#) | [PaNOSC summerschool FAIR session](#)



### Making FAIR data a reality



? What are Science, Open Science, EOSC and PaNOSC