D 3.2

2 contributions at scientific conferences

Project acronym: Sylinda

Project full title: Synchrotron Light Industry Applications

Grant agreement no.: 952148

Author(s)	Affiliation
Prof. Josef Hormes	Rheinische Friedrich-Wilhelms-Universitat Bonn

* corresponding Author (e-mail: hormes@physik.uni-bonn.de)

Contributors(s)	Affiliation
Piotr Ciochoń	Uniwersytet Jagielloński
Alexey Maximenko	Uniwersytet Jagielloński
Magdalena Zychowska	Uniwersytet Jagielloński

Due Date of Deliverable: 31.03.2024

Completion Date of Deliverable: 15.03.2024

Lead partner for deliverable: UBO

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 952148.

Project funded by the European Commission within the Horizon 2020 program		
Dissemination Level		
PU	Public	v
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including Commission Services)	
CO	Confidential, only for members of the consortium (including Commission Services)	

Document History

Issue Date	Version	Changes Made / Reason for this Issue	Author
20.06.2023	1.0	Initial draft	Magdalena Zychowska
15.03.2024	1.1	Final version approval	Prof. Josef Hormes

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 952148.

Table of Contents

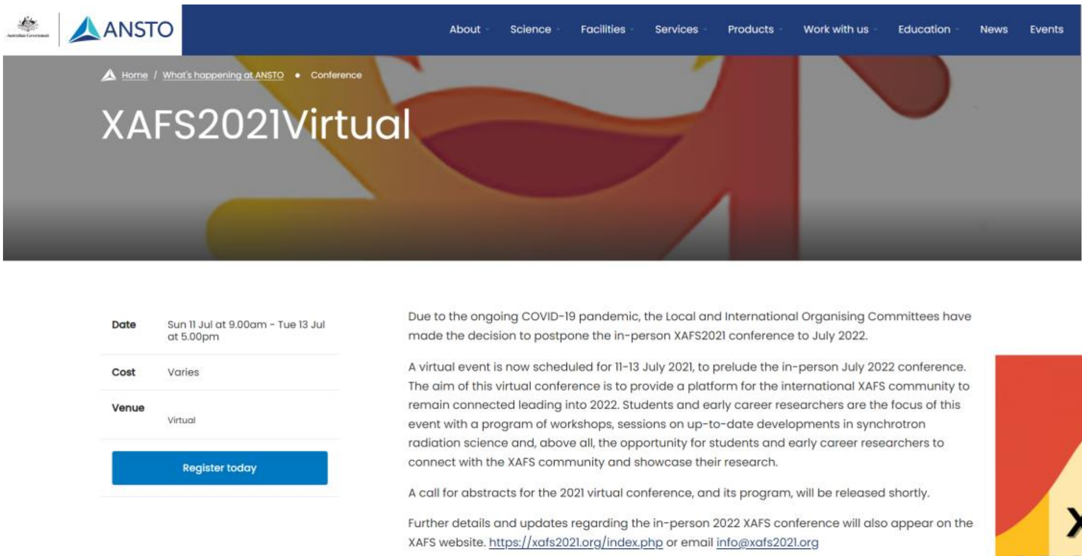
1. Introduction

This report constitutes description of actions which were undertaken to present capabilities of the SOLARIS XAS-beamline (ASTRA beamline) at scientific conferences.

Those conferences were conducted both remotely (at the beginning of the COVID-19 pandemic) and on-site. Selected meetings are highly recognized in the scientific community and draw a large number of participants. Therefore, the capabilities and potential of the XAS beamline improved under the Sylinda project were presented to the wide audience precisely during these events.

2. Description of the scientific conferences

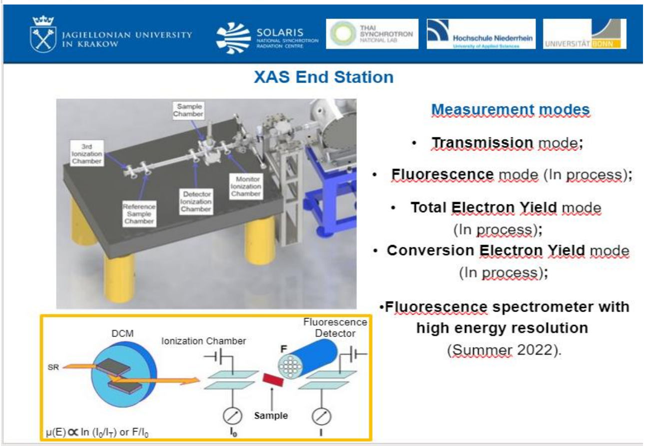
The first conference organized by the **Australian Nuclear Science and Technology Organization** was conducted entirely remotely due to the COVID-19 pandemic.

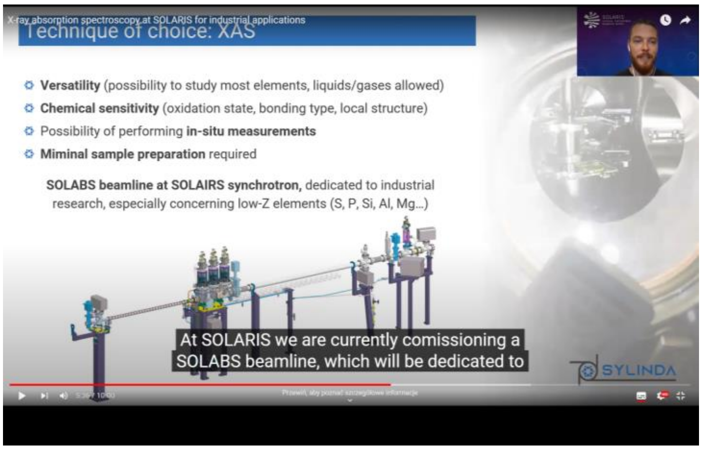


The XAFS2021Virtual conference took place on July 11-13, 2021. In this meeting two lectures showing abilities of SOLARIS XAS-beamline were performed.

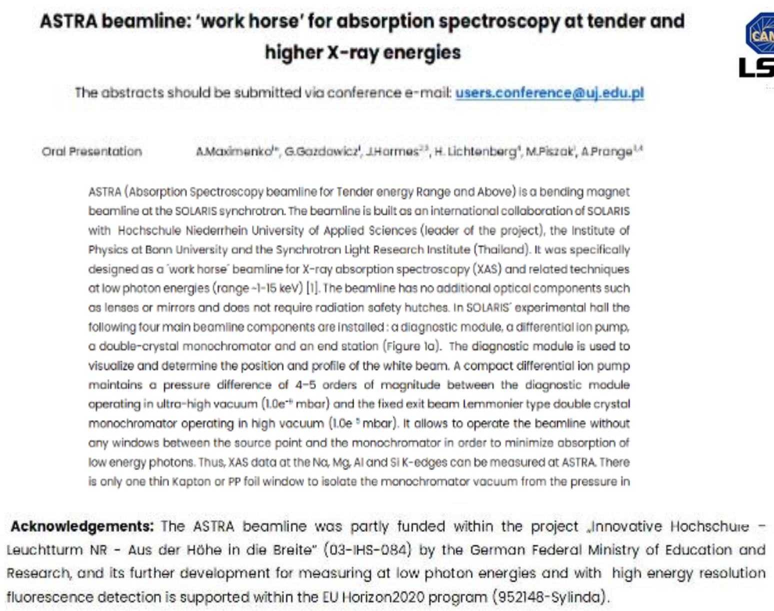
Alexey Maximenko, PhD presented the design and measurement possibilities of the ASTRA beamline, and the second speaker, Piotr Ciochoń, PhD talked about the potential opportunities offered by SOLARIS XAS-beamline in industrial applications (link: https://www.youtube.com/watch?v=xGaB6gep8Bg).

Alexey Maximenko, PhD **Piotr Ciochoń, PhD**





Another conference, the **Joint Meeting of the Polish Synchrotron Radiation Society and SOLARIS Centre Users** was organized in September 2022. During the four-day meeting lecturers had the opportunity to present scientific achievements and experiences in conducting research using synchrotron radiation. Professor Josef Hormes highlighted the capabilities of the SOLARIS XAS-beamline and further prospects for its use. In addition, Alexey Maximenko, PhD presented measurement capabilities on the SOLARIS XAS-beamline in soft, hard and sensitive X-ray energies.



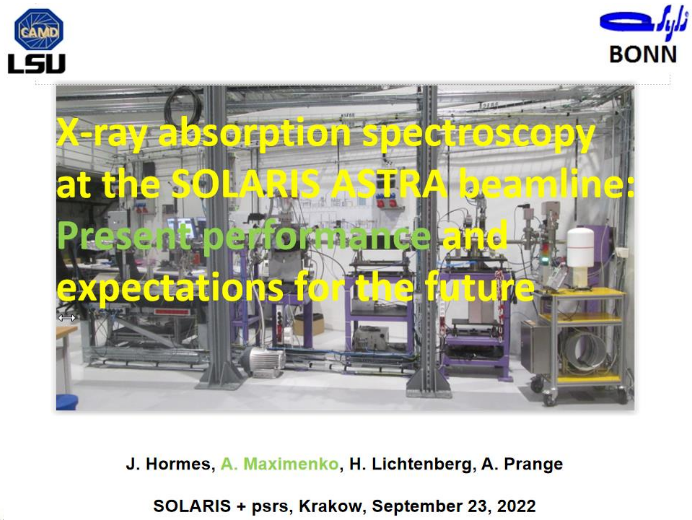
ASTRA beamline: 'work horse' for absorption spectroscopy at tender and higher X-ray energies

The abstracts should be submitted via conference e-mail: users.conference@uj.edu.pl

Oral Presentation A.Maximenko[1*], G.Gazdowicz[1], J.Hormes[2,3], H. Lichtenberg[4], M.Piszak[1], A.Prange[1,4]

ASTRA (Absorption Spectroscopy beamline for Tender energy Range and Above) is a bending magnet beamline at the SOLARIS synchrotron. The beamline is built as an international collaboration of SOLARIS with Hochschule Niederrhein University of Applied Sciences (leader of the project), the Institute of Physics at Bonn University and the Synchrotron Light Research Institute (Thailand). It was specifically designed as a 'work horse' beamline for X-ray absorption spectroscopy (XAS) and related techniques at low photon energies (range ~1-15 keV) [1]. The beamline has no additional optical components such as lenses or mirrors and does not require radiation safety hutches. In SOLARIS' experimental hall the following four main beamline components are installed : a diagnostic module, a differential ion pump, a double-crystal monochromator and an end station (Figure 1a). The diagnostic module is used to visualize and determine the position and profile of the white beam. A compact differential ion pump maintains a pressure difference of 4–5 orders of magnitude between the diagnostic module operating in ultra-high vacuum ($1.0e^{-8}$ mbar) and the fixed exit beam Lemmonier type double crystal monochromator operating in high vacuum ($1.0e^{-5}$ mbar). It allows to operate the beamline without any windows between the source point and the monochromator in order to minimize absorption of low energy photons. Thus, XAS data at the Na, Mg, Al and Si K-edges can be measured at ASTRA. There is only one thin Kapton or PP foil window to isolate the monochromator vacuum from the pressure in

Acknowledgements: The ASTRA beamline was partly funded within the project „Innovative Hochschule – Leuchtturm NR - Aus der Höhe in die Breite" (03-IHS-084) by the German Federal Ministry of Education and Research, and its further development for measuring at low photon energies and with high energy resolution fluorescence detection is supported within the EU Horizon2020 program (952148-Sylinda).



Meeting agenda

Tuesday, 20th		Wednesday, 21st		Thursday, 22nd		Friday, 23rd	
17:30	Registration & Welcome	09:30	Conference opening	09:00	T4_FP1 – SOLARIS today & tomorrow – M. Stankiewicz – SOLARIS National Radiation Synchrotron Centre	09:00	F7_IS1 – Dust Surface Chemistry in the Inner Solar Nebula Simulated in the Lab and Investigated by Near Ambient Pressure X-ray Photoelectron Spectroscopy – P. Rudolf – University of Groningen
		10:00	W1_IS1 – A new setup for Auger Photoelectron Coincidence Spectroscopy (APECS) – N. Mårtensson – Uppsala University	09:20	T4_IS1 – Evolution of the electronic states at the Pb/NbP and Nb/NbP interfaces – an ARPES study – B. Kowalski – Institute of Physics Polish Academy of Sciences	09:30	F7_IS2 – X-ray absorption spectroscopy at the SOLARIS ASTRA beamline: Present performance and expectations for the future – Prof. J. Hormes – Institute of Physics, Rheinische Friedrich-Wilhelms University
		10:30	W1_O1 – Effective Masses of Electrons in a 2D System with Nonparabolic Bands – J. Kołodziej – Faculty of Physics, Astronomy, and Applied Computer Science, Jagiellonian University	09:50	T4_O1 – Interactions of oxygen with MoS2 crystals investigated on the macro- and microscopic lenght scales – R. Szoszkiewicz – Faculty of Chemistry, Biological and Chemical Research Centre, University of Warsaw	10:00	F7_O1 – XPS analysis of Mn valence in phase-separated polycrystalline lanthanum manganite and its effect on magnetic refrigeration – M. Smari – A. Chełkowski Institute of Physics, University of Silesia in Katowice
		10:50	W1_O2 – Unravelling the combination of the electronic structure with magnetism and microstructure for NZFO/f-MWCNTs nanocomposites – A. Bajorek – Institute of Physics, University of Silesia in Katowice	10:10	T4_O2 – Research capacity of the URANOS beamline – N. Olszowska – SOLARIS National Synchrotron Radiation Centre	10:20	F7_FP1 – DUO mini-workshop – A.Górkiewicz – SOLARIS National Synchrotron Radiation Centre
		11:10	W1_O3 – Analytical estimations of size polydispersity from small-angle X-ray scattering data based on unified exponential/power-law approximation – O. V. Tomchuk – The Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences	10:30	T4_O3 – The PIRX beamline performance presented on selected results – M. Zając – SOLARIS National Synchrotron Radiation Centre	10:35	Conference closing & departures
		11:30	Lunch break	10:50	Coffee break	11:00	Transfer to SOLARIS Centre
		13:00	W2_IS1 – Seeing is believing – How we can understand the function of proteins under a cryo-EM microscope – S. Glatt – Malopolska Centre of Biotechnology Jagiellonian University	11:20	T5_IS1 – Millisecond – and micrometer – time and spatial resolutions at the Quick – EXAFS ROCK beamline: Applications in Heterogeneous Catalysis – V. Briois – Synchrotron SOLEIL	11:30	Beamlines "SOLARIS Centre tour"
		13:30	W2_IS2 – Structural characterisation of bacterial Tn7 transposase by cryo-EM – M. Czarnocki-Cieciura – The International Institute of Molecular and Cell Biology	11:50	T5_IS2 – X-ray spectroscopy of magnetic nanoparticles in liquid suspensions – M. Sikora – AGH University of Science and Technology		
		14:00	W2_O1 – Can we manipulate shape and size of virus-like particles on demand? – A. Biela – Malopolska Center of Biotechnology	12:20	T5_O1 – PHELIX – a new tool for spectroscopic measurements – M. Szczepanik – SOLARIS National Synchrotron Radiation Centre		
		14:20	W2_O2 – Chemical Infrared Imaging – capabilities at the nanoscale – M. Roman – SOLARIS National Synchrotron Radiation Centre	12:40	T5_O2 – DEMETER – Dual Electron Microscopy and Spectroscopy Beamline – A. Mandziak – SOLARIS National Synchrotron Radiation Centre		
		14:40	Coffee break	13:00	Lunch break		
		15:00	W3_IS1 – Applications of a high repetition rate XFEL in diffraction and scattering: Exploring more than three dimensions at the SPB/SFX instrument of the European XFEL – J. Bielecki – European XFEL	14:30	T6_O1 – National Cryo-EM Centre at SOLARIS – M. Rawski – SOLARIS National Synchrotron Radiation Centre		
		15:30	W3_IS2 – Soft X-ray femtosecond time-resolved photoelectron spectroscopy opportunities at the European XFEL – M. Izquierdo – European XFEL	14:50	T6_O2 – ASTRA beamline: 'work horse' for absorption spectroscopy at tender and higher X-ray energies – A. Maximenko – SOLARIS National Synchrotron Radiation Centre		
		16:00	W3_IS3 – Time-resolved X-ray crystallography on membrane proteins: watching ions moving in time and space – P. Nogly – ETH Zurich	15:10	T6_O3 – PolyX beamline for microimaging and microspectroscopy at SOLARIS – K. Sowa – SOLARIS National Synchrotron Radiation Centre		
		16:30	W3_O1 – Correlation study of two timing tools at SwissFEL – W. Błachucki – Institute of Nuclear Physics, Polish Academy of Sciences	15:30	T6_O4 – Current status of Chemical Infrared Imaging CIRI (SOLAIR) beamline in Solaris – T. Wróbel – SOLARIS National Synchrotron Radiation Centre		
		16:50	Sponsor's speech – COMEF Sp. z o.o. sp.k. – neaSCOPE for nanoscale optical analysis – technology and applications – Dr. Suman Paul – Sales Application Engineer attocube systems AG	15:50	T6_O5 – SOLCRYS project – MX and SAXS beamline, updated status – M. Kozak – SOLARIS National Synchrotron Radiation Centre		
		17:05	Poster session	16:10	The NAA Laboratory – M. Silarski – Jagiellonian University		
				16:20	Conference Photo		
				18:30	Networking Meeting		

Next conference, **TECHNART 2023**, was organised in Lisbon from May 7-12, 2023.

During the conference, prof. Josef Hormes had the opportunity to present results demonstrating the applicability of the SOLARIS XAS-beamline in two poster sessions according to the Scientific programme: https://technart2023.com/wp-content/uploads/2023/05/programme_-technart23.pdf

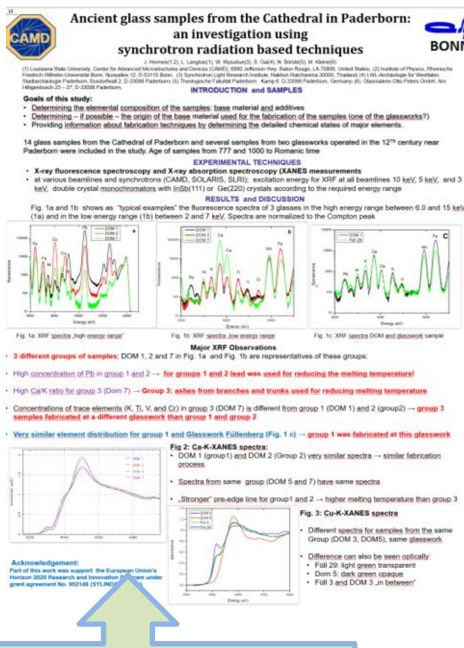
TECHNART 2023 LISBON | 07›12 MAY International conference on analytical techniques in art and cultural heritage

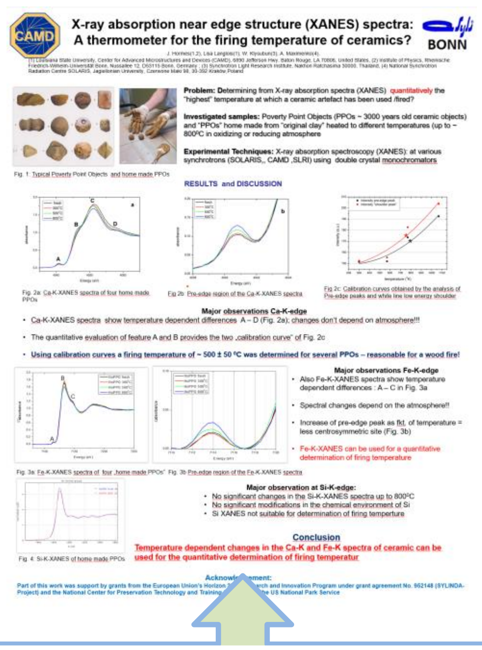
TIMETABLE

	07 May	08 May	09 May	10 May	11 May	12 May
08h30		Registration				
09h00		Opening session	Invited speaker	Invited speaker	Invited speaker	
09h20		Invited speaker	OP	OP	OP	
10h00 10h30		OP				Visit to MNAz
11h00		Coffee break	Coffee break	Coffee break	Coffee break	
11h30 12h30		OP	OP	OP	OP	
13h00 13h30		Lunch break	Lunch break	Lunch break	Lunch break	
14h00	Registration					
14h30		Invited speaker	Invited speaker	Invited speaker	Invited speaker	
15h00 16h00		OP	OP & CS	OP	OP	
16h30		Coffee break	Coffee break	Coffee break	Coffee break	
17h00 18h00	Welcome reception	Poster Session 1	Poster Session 2	Poster Session 3	Poster Session 4	
18h30					Closing session	
20h00				Conference dinner		

OP Oral Presentations
CS Commercial session

The topics and abstracts of both posters presented by prof. Josef Hormes are available in the Abstract Book https://technart2023.com/wp-content/uploads/2023/05/Book-of-abstracts-technart23.pdf (page 155 and 205)

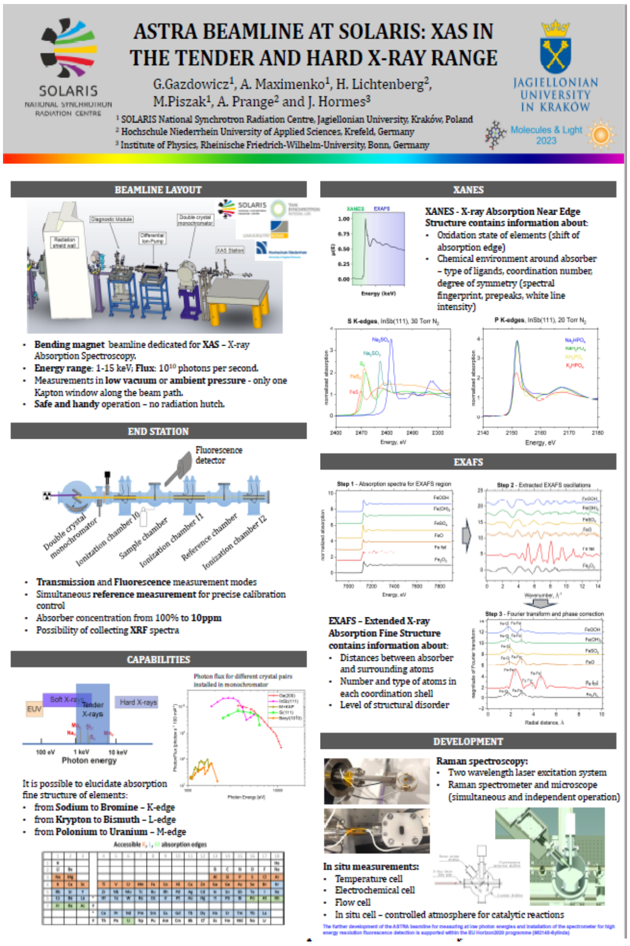




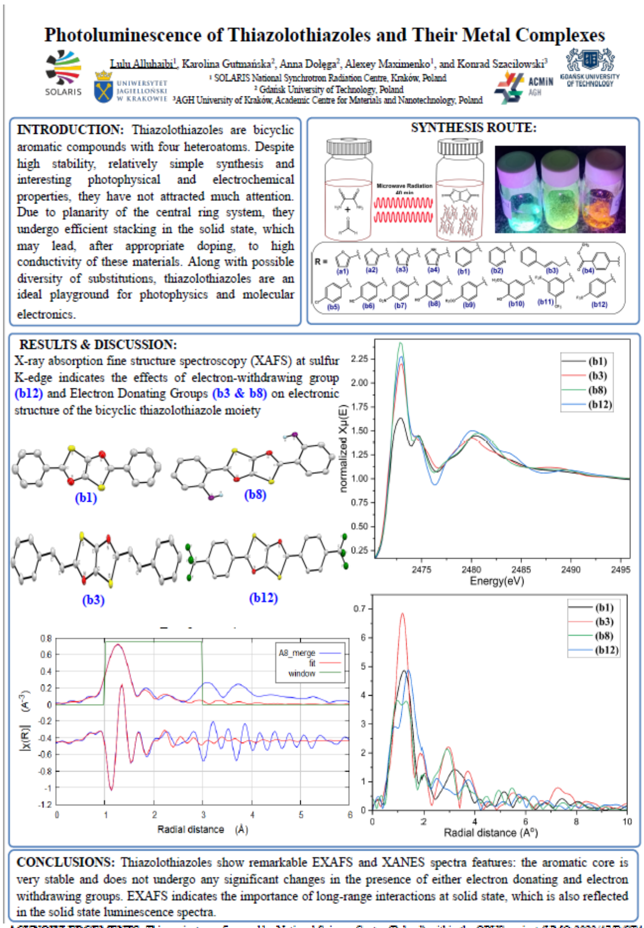
Acknowledgement:
Part of this work was support the European Union's Horizon 2020 Research and Innovation Program under grant agreement No. 952148 (SYLINDA-Project)

Acknowledgement:
Part of this work was support by grants from the European Union's Horizon 2020 Research and Innovation Program under grant agreement No. 952148 (SYLINDA-Project) and the National Center for Preservation Technology and Training (NCPTT) and the US National Park Service

Next conference, the **Molecules & Light, V Autumn Meeting of the Polish Photochemistry Group**, was mainly dedicated to young scientists. This meeting took place in Krakow on September 24-27, 2023 (https://ml2023.org/). During the poster session young researchers from SOLARIS (Lulu Alluhaibi, PhD and Grzegorz Gazdowicz) presented results of their experiments conducted on the SOLARIS XAS-beamline.



The further development of the ASTRA beamline for measuring at low photon energies and installation of the spectrometer for high energy resolution fluorescence detection is supported within the EU Horizon2020 programme (952148-Sylinda)



ACKNOWLEDGEMENTS: This project was financed by National Science Centre (Poland) within the OPUS project (UMO-2022/47/B/ST4/00728).
We acknowledge NSRC SOLARIS for the access (proposal #20227189) to ASTRA beamline, which development is supported within the EU Horizon 2020 program (952148-Sylinda), where the measurements were performed.

3. Summary

Participation in prestigious conferences with a wide audience provided an opportunity to enhance the visualization of the Sylinda project and demonstrate the capabilities of SOLARIS. In addition, participation in the conferences through the Sylinda project has significantly contributed to strengthening the position of the SOLARIS infrastructure in the world-wide large-scale Research Infrastructure community. Moreover, the widely promoted use of the SOLARIS XAS-beamline has increased the number of academic and industrial users interested in using it for their experiments.

Demonstration of SOLARIS XAS-beamline capabilities at international conferences will be consistently performed, to establish SOLARIS position in the research environment.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 952148.