II EU Workshop on Water Cherenkov Experiments for Precision Physics

17—19 September 2025
Kraków (Poland)

(updated: 7 March 2025)

Rationale

The II EU Workshop on Water Cherenkov Experiments for Precision Physics (WCD-2025) aims to showcase and discuss the latest developments in scientific projects utilizing Water Cherenkov Detectors (WCD), primarily for neutrino observations, including those of high-energy cosmic origin, and ground-based WCDs used for studying astrophysical sources of the highest energy gamma rays. It will also review major neutrino experiments involving non-WCD technologies, whether running, under construction, or in early planning phases. The meeting will cover key physics topics in WCD experiments: neutrino oscillations, proton decay, the physics of the Sun, supernovae, and the diffuse neutrino background, etc., as well as astrophysical sources of high-energy radiation and particles.

All oral presentations are by invitation only. Contributed presentations will be displayed as posters, accessible throughout the entire duration of the meeting. A dedicated poster session is scheduled for Wednesday, September 17th, during the Welcome Reception.

This workshop is held within the context of the EU-funded research project H2020-MSCA-RISE-2019-GA872549-SK2HK. SK2HK comprises partners including LLR-CNRS (France), AGH, NCBJ, UJ, UW, WUT (Poland), UAM (Spain), with ICRR-U.Tokyo (Japan) as the main host institute.

Scientific Organizing Committee

Olivier Drapier (Ecole Polytechnique IN2P3-CNRS Laboratoire Leprince-Ringuet Palaiseau France)
Katarzyna Kowalik (National Centre for Nuclear Research, Poland)
Luis Labarga Echeverría (Universidad Autónoma de Madrid, Spain) — **chair**
Magdalena Posiadała-Zezula (University of Warsaw, Poland)
Ewa Rondio (National Centre for Nuclear Research, Poland)
Łukasz Stawarz (Jagiellonian University, Poland)
Marcin Ziembicki (Warsaw University of Technology & Nicolaus Copernicus Astronomical Center PAS, Poland)

Local Committee

Sabrina Casanova (Institute of Nuclear Physics of the Polish Academy of Sciences, Poland)
Kamil Kasprzak (Jagiellonian University, Poland)
Iwona Kotko (Jagiellonian University, Poland)
Oleh Kobzar (Jagiellonian University, Poland)
Patryk Liniewicz (Jagiellonian University, Poland)
Łukasz Stawarz (Jagiellonian University, Poland) — **chair**
Krzysztof Ziętara (Jagiellonian University, Poland)

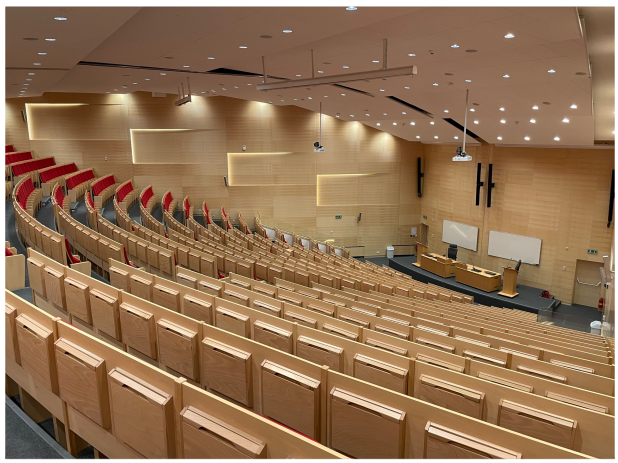
Conference Venue

Didactic Centre of the Faculty of Law and Administration Jagiellonian University
ul. Krupnicza 33A, 31-123 Kraków, Poland

https://maps.app.goo.gl/qZNGqBhpg5TKP5JBA

Located in the center of Kraków's Old Town, this area features many hotels, restaurants, and cafes within walking distance. It is about a 20-minute commute by bus or tram to the main train station and offers convenient connections to the Kraków's airport, approximately 30-minutes by taxi and about 1 hour by city bus, depending on the traffic.

Lectures will take place in the Assembly Hall, with theater-style seating and a capacity of 560 people. Catering and posters will be displayed in the corridor on the ground floor of the building throughout the entire duration of the meeting.



Invited Speakers

Antoine Beauchêne (Department of Physics, University of Oxford, UK)
Zhen Cao (Institute of High Energy Physics, Chinese Academy of Sciences, China)
Mingjun Chen (Institute of High Energy Physics, Chinese Academy of Sciences, China)
Paschal Coyle (Centre national de la recherche scientifique, France)
Marcos Dracos (Institut pluridisciplinaire Hubert Curien, France)
Pablo Fernandez (Donostia International Physics Center, Spain)
Jordan Goodman (University of Maryland, USA)
Francis Halzen (University of Wisconsin-Madison,USA)
Jim Hinton (Max Planck Institute for Nuclear Physics in Heidelberg, Germany)
Yoshitaka Itow (Institute for Cosmic Ray Research, University of Tokyo, Japan)
Takaaki Kajita (University of Tokyo, Japan)
Joanna Kiryluk (Stony Brook University, USA)
Paweł Małecki (Institute of Nuclear Physics of the Polish Academy of Sciences, Poland)
João Pedro Athayde Marcondes de André (Institut pluridisciplinaire Hubert Curien Strasbourg, France)
Teresa Montaruli (University of Geneva, Switzerland)
Yuuki Nakano (University of Toyama, Japan)
Tomas Nosek (Institute of Particle and Nuclear Physics, Charles University, Czech Republic)
Brían Ó Fearraigh (Istituto Nazionale di Fisica Nucleare, Sezione di Genova, Italy)
Benjamin Quilain (ILANCE - CNRS-IN2P3 & University of Tokyo, France)
Federico Sanchez (Université de Genève, Switzerland)
Hiroyuki Sekiya (Institute for Cosmic Ray Research, University of Tokyo, Japan)
Masato Shiozawa (Kamioka Observatory, Institute for Cosmic Ray Research, University of Tokyo, Japan)
Hide-Kazu Tanaka (Kamioka Observatory, Institute for Cosmic Ray Research, University of Tokyo, Japan)
Mark Vagins (Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo, Japan)
Amanda Weinstein (Iowa State University, USA)

……*(to be updated)*……..

Registration & Payment Details

Registration is available only via the Indico account. The deadline for registration is **20 July 2025**

https://indico.oa.uj.edu.pl/e/wcd2025

Should you have any questions regarding the logistics of the meeting, please feel free to contact the Local Organizing Committee chair at the following email address: lukasz.1.stawarz@uj.edu.pl

Registration Fee:

The registration fee for all participants is **120 EUR**. This fee includes all coffee breaks and the Welcome Reception (accompanying persons are welcome at no additional charge). The fee should be paid via bank transfer before **20 July 2025**; bank details are provided below:

Bank name: Bank Polska Kasa Opieki SA
Bank address: Żubra 1, 01-066 Warszawa
IBAN: PL04 1240 2294 1978 0010 7072 2467
BIC SWIFT: PKOPPLPW
Account holder: Jagiellonian University
Account holder address: Golebia 24, 31-007 Krakow, Poland
Purpose: WCD2025: *name of the participant*

An official "Representations on Maintaining a Bank Account" document is available on Indico in the Overview section and also **here**. An invoice will be issued upon confirmation of payment of the registration fee via bank transfer. This invoice will include the billing address and VAT number provided by a participant in the Registration Form.

Timetable

	1st DAY: Wednesday (17.09)	2nd DAY: Thursday (18.09)	3rd DAY: Friday (19.09)
9:00	Session I Main Neutrino WCD Experiments	Session IV Theory & Results	Session VII Astrophysical Context
9:30			
10:00			
10:30	COFFEE BREAK	COFFEE BREAK	
11:00	Session I Main Neutrino WCD Experiments *(cont.)*	Session IV Theory & Results *(cont.)*	COFFEE BREAK
11:30			Session VIII Future Neutrino Experiments & Closing
12:00			
12:30	LUNCH BREAK	LUNCH BREAK	
13:00			
13:30			
14:00	Session II Other Neutrino Experiments	Session V Beyond the Standard Model	
14:30			
15:00			
15:30	COFFEE BREAK	COFFEE BREAK	
16:00	Session III WCD Gamma-ray Experiments	Session VI Reconstruction	
16:30			
17:00			
17:30	WELCOME RECEPTION & POSTER SESSION	SOCIAL EVENT	
18:00			
18:30			
19:00			
19:30			
20:00			

17 September — WEDNESDAY (Day 1)

9:00—10:30 **Session I — Main Neutrino WCD Experiments**
chair: Luis Labarga Echeverría

"Introduction: Water Cherenkov Detectors" (30')
Takaaki Kajita (University of Tokyo, Japan)

"Super-Kamiokande" (30')
Hiroyuki Sekiya (Institute for Cosmic Ray Research, University of Tokyo, Japan)

"Hyper-Kamiokande" (30')
Masato Shiozawa (Institute for Cosmic Ray Research, University of Tokyo, Japan)

10:30—11:00 **COFFEE BREAK**

11:00—12:30 **Session I — Main Neutrino WCD Experiments** *(cont.)*
chair: Olivier Drapier

"IceCube" (30')
Francis Halzen (University of Wisconsin-Madison,USA)

"KM3Net" (30')
Paschal Coyle (Centre national de la recherche scientifique, France)

"Ancillary/test beams: IWCD & WCTE" (15')
TBC

"Ancillary/test beams: ANNIE" (15')
Amanda Weinstein (Iowa State University, USA)

12:30—14:00 **LUNCH BREAK**

14:00—15:30 **Session II — Other Neutrino Experiments**
chair: Magdalena Posiadała-Zezula

"SNO+" (20')
TBC

"JUNO" (20')
João Pedro Athayde Marcondes de André (IPHC Strasbourg/IN2P3/CNRS, France)

"KamLAND" (20')
TBC

"Gd in WC detectors" (30')
Mark Vagins (IPMU, University of Tokyo, Japan)

15:30—16:00 **COFFEE BREAK**

16:00—17:20 **Session III — WCD Gamma-ray Experiments**
chair: Katarzyna Kowalik

"VHE γ-rays: HAWC" (30')
Jordan Goodman (University of Maryland, USA)

"VHE γ-rays: LHAASO" (30')
Zhen Cao (Institute of High Energy Physics, Chinese Academy of Sciences, China)

"VHE γ-rays: SWGO" (20')
Jim Hinton (Max Planck Institute for Nuclear Physics in Heidelberg, Germany)

17:30—20:30 **WELCOME RECEPTION & POSTER SESSION**

18 September — THURSDAY (Day 2)

9:00—10:30 **Session IV — Theory & Results**
chair: Ewa Rondio

"Neutrino Interactions" (30')
Federico Sanchez (Université de Genève, Switzerland)

"Neutrino Generators" (30')
TBC

"Neutrino Oscillation" (30')
Pablo Fernandez (Donostia International Physics Center, Spain)

10:30—11:00 **COFFEE BREAK**

11:00—12:30 **Session IV — Theory & Results** *(cont.)*
chair: Katarzyna Kowalik

"Solar Neutrino Oscillation Results" (30')
Yuuki Nakano (University of Toyama, Japan)

"Atmospheric Neutrino Oscillation Results" (30')
TBC

"Long Baseline Neutrino Oscillation Results" (30')
Tomas Nosek (Institute of Particle and Nuclear Physics, Charles University, Czech Republic)

12:30—14:00 **LUNCH BREAK**

14:00—15:30 **Session V — Beyond the Standard Model**
chair: Magdalena Posiadała-Zezula

"Proton Decay" (30')
Hide-Kazu Tanaka (Kamioka Observatory, Institute for Cosmic Ray Research, University of Tokyo, Japan)

"Dark Matter" (20')
TBC

"Sterile Neutrinos" (20')
TBC

"Lorentz invariance & CPT" (20')
TBC

15:30—16:00 **COFFEE BREAK**

16:00—17:30 **Session VI — Reconstruction**
chair: Marcin Ziembicki

"Reconstruction: SK/HK" (30')
Benjamin Quilain (ILANCE - CNRS-IN2P3 & University of Tokyo, France)

"Reconstruction: IceCube" (30')
TBC

"Reconstruction: KM3Net" (30')
Brían Ó Fearraigh (Istituto Nazionale di Fisica Nucleare, Sezione di Genova, Italy)

17:30—20:30 **SOCIAL EVENT**

19 September — FRIDAY (Day 3)

9:00—11:00 **Session VII — Astrophysical Context**
chair: Łukasz Stawarz

"Solar Physics with Neutrinos" (20')
TBC

"Physics with Atmospheric Neutrinos" (20')
TBC

"Supernova Physics with Neutrinos by very large detectors" (20')
Mark Vagins (IPMU, University of Tokyo, Japan)

"Diffuse Supernova Neutrino Background" (20')
Antoine Beauchêne (Department of Physics, University of Oxford, UK)

"Sources of High Energy Neutrinos" (20')
Joanna Kiryluk (Stony Brook University, USA)

"Multi-messenger Astronomy" (20')
Teresa Montaruli (University of Geneva, Switzerland)

11:00—11:30 **COFFEE BREAK**

11:30—12:45 **Session VIII — Future Neutrino Experiments**
chair: Olivier Drapier

"Future Experiments: ESS-nuSB" (30')
Marcos Dracos (Institut pluridisciplinaire Hubert Curien, France)

"Future Experiments: P-ONE" (15')
Paweł Małecki (Institute of Nuclear Physics of the Polish Academy of Sciences, Poland)

"Future Experiments: TAMBO" (15')
TBC

"Future Experiments: HUNT" (15')
Mingjun Chen (Institute of High Energy Physics, Chinese Academy of Sciences, China)

12:45—13:20 **Closing**
chair: Marcin Ziembicki

"HyperK Instrumentation Highlights" (30')
Yoshitaka Itow (Institute for Cosmic Ray Research, University of Tokyo, Japan)

"About SK2HK; Thanks, and Farewell" (5')
Olivier Drapier (SOC)