

# The 17<sup>th</sup> International Workshop on Tau Lepton Physics

University of Louisville  
Louisville, Kentucky, USA

**T** December 4-8  
**2023**

## Scientific program:

Properties of  $\tau$  leptons  
 $\tau$  production at lepton and hadron colliders  
Precision electroweak physics  
CP Violation and flavor mixing  
Neutrino physics

Lepton universality and flavor violation  
Decays involving  $\tau$  leptons  
Hadronic  $\tau$  decays and QCD  
Electric and magnetic dipole moments  
Future opportunities in  $\tau$  physics

**Website: <http://indico.cern.ch/e/TAU2023>**

### Local organizing committee:

Swagato Banerjee (University of Louisville) - Chair  
Emilie Passemar (Indiana University) - Vice-Chair  
Jon Urheim (Indiana University) - Vice-chair  
David N. Brown (Western Kentucky University)  
Chris L. Davis (University of Louisville)

### International advisory committee:

Michel Davier (LAL, Orsay, France)  
Denis A. Epifanov (BINP & Novosibirsk State University, Russia)  
Cristina Galea (Radboud University, The Netherlands)  
Kenji Inami (Nagoya University, Japan)  
Toru Iijima (Nagoya University, Japan)  
Alberto Lusiani (Scuola Normale Superiore & INFN Pisa, Italy)  
Yuri Kudenko (INR, Moscow, Russia)  
William Marciano (BNL, USA)  
Klaus Mönig (DESY, Hamburg & Zeuthen, Germany)  
Vittorio Paolone (University of Pittsburgh, USA)  
Antonio Pich (IFIC, University of Valencia -- CSIC, Spain)  
Lee Roberts (Boston University, USA)  
Michael Roney (University of Victoria, Canada)  
Achim Stahl (RWTH Aachen University, Germany)  
Zbigniew Was (Institute of Nuclear Physics PAN, Krakow & CERN PH-TH)  
Liangliang Wang (IHEP, China)  
Changzheng Yuan (IHEP, China)  
Zhiqing Zhang (LAL, Orsay, France)

UNIVERSITY OF  
**LOUISVILLE**  
Department of Physics & Astronomy

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# Welcome to Tau2023 at University of Louisville



Bus schedule to come from the Galt House in the morning  
<https://indico.cern.ch/event/1303630/page/30190-accommodation>

6 minute walk to W Market @ S 5th	<a href="#">Link to Google Map</a>	<a href="#">Link to Google Map</a>	<a href="#">Link to Google Map</a>
Bus 28 to Floyd Street Garage	8:01	8:16	8:31
Arrival at Student Activity Center [East entrance]	8:20	8:35	8:50

Bus schedule to come from the Hilton Garden Inn in the morning  
<https://indico.cern.ch/event/1303630/page/30190-accommodation>

2-minute walk to Crittenden @ Cracker Barrel	<a href="#">Link to Google Map</a>	<a href="#">Link to Google Map</a>
Bus 2 to Eastern Parkway @ Speed School	7:42	8:17
Arrival at Natural Science Building	7:47	8:22
10-minute walk to Student Activity Center [West entrance]	7:57	8:32

For those coming by bus 2, please follow the yards signs to the SAC West entrances

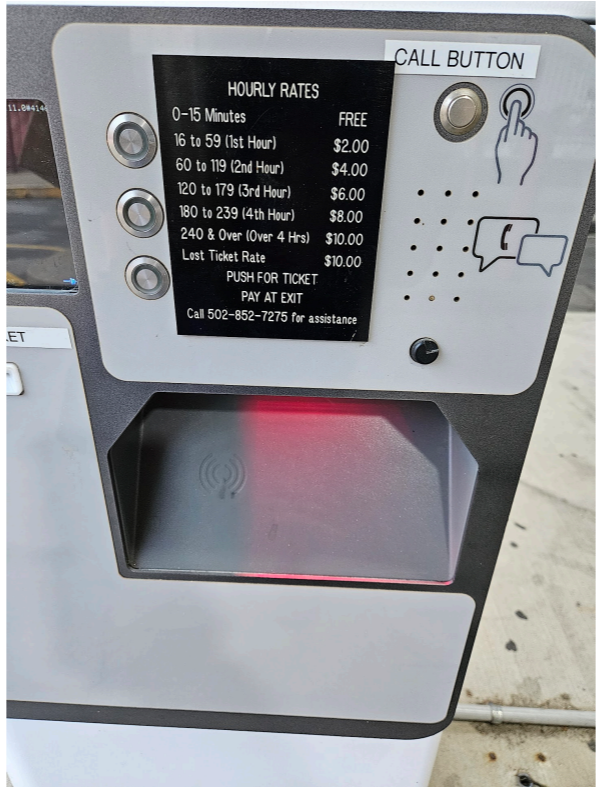


Grass is greener on the Tau2023 side

Entrance from bus 28 is at the East entrance to the SAC, adjacent to the Floyd Street Garage.



Visitor parking at Floyd Street Garage



Plenary presentations are being held in the Floyd Theater



Late registrations are being held in the Floyd Theater [Courtesy: Dr. Sourav Patra]



Lunch and coffee breaks are being held in the Multipurpose Ballroom



For internet connectivity, please see <https://louisville.edu/its/wireless/wireless>



### **Eduroam**

is the preferred UofL wireless network for students, faculty and staff based on the most secure encryption and authentication standards available. Our eduroam wireless service provides secure access for users on campus from other participating institutions that also utilize eduroam. Logging-in to verify your UofL credentials to initially set up the service is required. Use our ITS **on-boarding tool** to begin. See **details** for more information on this wireless network and extending your account for wireless access at other participating universities and institutions. A **configuration guide** for specific devices is also available for assistance.



### **ULvisitor**

allows for open, short-term use. With no sign-in required, this connection is primarily for UofL's visitors and guests who need wireless access. WiFi sessions on ULvisitor are limited to 6 hours on HTTP and HTTPS sites and sessions automatically log out after 30 minutes of inactivity.



Compact view of the timetable is at :  
<https://indico.cern.ch/event/1303630/timetable/?view=nicecompact>

4 Dec 2023	5 Dec 2023	6 Dec 2023	7 Dec 2023	8 Dec 2023
<b>AM</b> 09:00 Welcome - Dayna R. Touron (University of Louisville) (until 09:05) () 09:05 Monday - Swagato Banerjee (University of Louisville) (until 09:15) () 09:05 Announcements - Swagato Banerjee (University of Louisville) () 09:15 Monday morning - Michael Roney (until 09:55) () 09:15 Overview of Tau Physics - Kiyoshi Hayasaka (Niigata University) () 09:55 --- Coffee break --- 10:25 Monday before lunch - Pablo Roig (until 12:30) () 10:25 Monte Carlo for tau lepton Standard Model and New Physics signatures - Zbigniew Andziej Was (Polish Academy of Sciences) () 10:50 Flavor-changing neutral currents in tau decays - Alexey Petrov (University of South Carolina) () 11:15 Charged Lepton Flavor Violation in Heavy Particle Decays - Wolfgang Altmannshofer (UC Santa Cruz) () 11:40 Charged lepton flavor violation at circular e+e- colliders - Pankaj Munshi (University of California Santa Cruz) () 12:05 What if cLFV was only detectable in tau decays? - Dr Innes Bigaran (Fermilab and Northwestern University) ()	09:00 Tuesday (until 09:05) () 09:00 Announcements - Swagato Banerjee (University of Louisville) () 09:05 Tuesday morning - Alberto Lusiani (Scuola Normale Superiore and INFN, sezione di Pisa) (until 10:20) () 09:05 Measurement of the Muon Magnetic anomaly to 0.20 ppm by the Muon g-2 experiment at Fermilab - Lorenzo Gotrozzi () 09:30 Measurement of muon g-2 and EDM at J-PARC - Tsutomu Mibe () 09:55 An alternative evaluation of the leading-order hadronic contribution to the muon g-2 with MUonE - Riccardo Fiato (University of Liverpool) () 10:20 --- Coffee break --- 10:50 Tuesday before lunch - David Hitlin (until 12:30) () 10:50 Data-driven determinations of light-quark-connected and strange-plus-disconnected window contributions to a <sub>mu</sub> - Kim Maltman () 11:15 Tau Data-Based Evaluation of hadronic vacuum polarization contribution to muon g-2 - Pablo Roig Garcia () 11:40 Magnetic and Electric Tau Dipole Moments Revisited - Piotr Gabriel González-Sprinberg (Faculty of Sciences-Uruguay) () 12:05 Status and prospects of measuring Electric Dipole Moment of tau lepton - Kenji Inami ()	09:00 Wednesday (until 09:05) () 09:00 Announcements - Swagato Banerjee (University of Louisville) () 09:05 Wednesday morning - Jon Erik Urheim (Indiana University) (until 10:20) () 09:05 Tracking Down the Origin of Neutrino Mass - Julia Gehrmann () 09:30 Neutrino & Dark Matter Connections - Kevin James Kelly (Texas A&M University) () 09:55 New Physics in Neutrino Oscillations - Adam Jude Aurisano (University of Cincinnati) () 10:20 --- Coffee break --- 10:50 Wednesday before lunch - Zbigniew Andziej Was (Polish Academy of Sciences) (until 12:30) () 10:50 The Euclidean Adler function and its interplay with low-energy data and $\alpha_s$ - Antonio Rodriguez Sanchez () 11:10 New Physics in Hadronic Tau Decays - David Diaz Caldeira () 11:30 Renormalization subtraction in hadronic tau decays - Dr Hiromasa Takaura () 11:50 Update on alpha_s from hadronic tau decays - Maarten Golterman () 12:10 Difference between fixed-order and contour-improved perturbation theory - Santi Pavia ()	09:00 Thursday (until 09:05) () 09:00 Announcements - Swagato Banerjee (University of Louisville) () 09:05 Thursday morning - Jon Erik Urheim (Indiana University) (until 10:20) () 09:05 Accelerator Search for Dark Matter - David Hitlin () 09:30 Neutrino-nuclear interactions, beyond standard-model physics, and accelerator-produced dark matter - Daniel Salvat (Indiana University) () 09:55 Searches for Neutrinoless Double Beta Decay - Walter Pettus (Indiana University) () 10:20 --- Coffee break --- 10:50 Thursday before lunch - Prof. Jianming Bian (University of California Irvine) (until 12:30) () 10:50 The Deep Underground Neutrino Experiment - Martin Tzanov (Louisiana State University) () 11:15 Latest results from the MicroBooNE experiment - Tanaz Mohayari (Indiana University) () 11:40 Status and Prospects of the JUNO Experiment - Mr Matthias Raphael Stock (Technische Universität München) () 12:05 Current Status and Future Prospects of the ICARUS Experiment - Justin Mueller ()	09:00 Friday (until 09:05) () 09:00 Announcements - Swagato Banerjee (University of Louisville) () 09:05 Friday morning - Zbigniew Andziej Was (Polish Academy of Sciences) (until 10:20) () 09:05 Neutrinos in modern astrophysics and cosmology - Alexander Friedland () 09:30 Tau Neutrinos with IceCube - Douglas Cowen () 09:55 Chiral Belle: e- Beam Polarization Upgrade of SuperKEKB - Michael Roney () 10:20 --- Coffee break --- 10:50 Friday before lunch - Pablo Roig (until 12:30) () 10:50 Hadronic vacuum polarization contribution to the muon g-2 from lattice QCD - Simon Kuberski () 11:15 Tau hadronic decay input for Muon g-2 - Taku Izubuchi () 11:40 Global analysis of Lepton Flavor Violating Operators - emanuele mereghetti () 12:05 Status and plans of tau fits for HFLAV/PDG - Alberto Lusiani (Scuola Normale Superiore and INFN, sezione di Pisa) ()
<b>PM</b> 12:30 --- Lunch --- 13:30 Monday after lunch - gianluca inguglia (until 15:30) () 13:30 Electromagnetic corrections in hadronic tau decays - Alejandro Miranda (IFAE) () 13:50 Measurements of Michel parameters and tests of lepton universality in tau-lepton decays at Belle and Belle II - Paul Feichtinger (Austrian Academy of Sciences) () 14:10 Precise measurement of the tau-lepton mass at Belle II - Radek Ziebock (Deutsches Elektronen-Synchrotron) () 14:30 Searching for Heavy Neutral Leptons using tau decays at BABAR - Sophie Middleton (Caltech) () 14:50 Heavy neutral leptons and beyond at the electron-ion collider - Keping Xie (University of Pittsburgh) () 15:10 Searches for lepton flavor violation in meson decays at Belle - Sourav Patra (University of Louisville affiliated to KEK) () 15:30 --- Coffee break --- 16:00 Monday afternoon - Alexey Petrov (University of South Carolina) (until 18:00) () 16:00 Probing $\tau$ flavour change with $\tau \rightarrow e$ observables - Marco Ardu (Univ. Valencia and CNRS, LUPM) () 16:20 The Mu2e Experiment - Sophie Middleton (Caltech) () 16:40 A data-driven method to estimate the antiproton background in Mu2e - Namitha Chithirasemadam (University of Pisa) () 17:00 Mu2e-II Experiment - Mete Yucel (Fermilab) () 17:20 LHCb measurements on semileptonic decays of b-hadrons - Anna Lupato (Università di Padova & INFN) () 17:40 Lepton Flavour Universality tests using semileptonic b-hadron decays - Amaro Brossa Gorzalo (Universidade de Santiago de Compostela) ()	12:30 Photo session (until 12:50) () 12:50 --- Lunch --- 13:50 Tuesday after lunch - David Norvil Brown (Western Kentucky University) (until 15:30) () 13:50 Leptophilic Dark Portals - Bhupal Dev (Washington University in St. Louis) () 14:10 Neutrino Portals to the Dark Sector - Douglas Tucker (TRIUMF and Simon Fraser University) () 14:30 Lepton flavor violation with tau leptons - Julian Heeck () 14:50 Tau-LFUV Tests at Future Lepton Colliders - LINGFENG LI (Brown U.) () 15:10 Status and Prospects of SNO+ Experiment - Ziping Ye () 15:30 --- Coffee break --- 16:00 Tuesday afternoon - Prof. Kiyoshi Hayasaka (Niigata University) (until 18:00) () 16:00 Searches for lepton flavor violation in tau-lepton decays at Belle and Belle II - Alberto Martini (DESY) () 16:20 Charged Lepton Flavor Violation at the EIC - Sonny Mantry (University of North Georgia) () 16:40 Dark sector searches with tau-pair events at Belle and Belle II - Sourav Dey (KEK) () 17:00 Search for Baryogenesis and Dark Matter in B-meson decays at BABAR - David Norvil Brown (Western Kentucky University) () 17:20 Measurement of the tau lepton polarisation in Z boson decays by CMS detector - Abdollah Mohammadi (University of Wisconsin Madison) () 17:40 Measurement of beam polarization at an e+e- B-Factory with a new tau polarimetry technique - Caleb Millor ()	12:30 --- Lunch --- 13:30 Wednesday after lunch - Soeren Andre Prell (Iowa State University) (until 15:30) () 13:30 Searches for New Physics that couple with third generation fermions - Valeria D'Amante (Università & INFN Pisa) () 13:50 Search for LFV with tau leptons in the final state - Luca Guzzi (Università & INFN, Milano-Bicocca) () 14:10 Measurements of Higgs boson properties in decays to two tau leptons and search for lepton-flavor-violating Higgs boson decays into tau leptons using the ATLAS detector - Ogal Oncol (Albert-Ludwigs-Universität Freiburg) () 14:30 Searches for new phenomena in final states with taus using the ATLAS detector - Giuseppe Cavratta (University and INFN, Bologna) () 14:50 Measurement of the tau-lepton pair production from photons and tau g-2 - Quentin Buat (University of Washington) () 15:10 Measurement of the anomalous magnetic moment in ultraperipheral collisions with ALICE at the LHC - Paul Alois Bühler (Stefan Meyer Institute for Subatomic Physics (SMI), Austrian Academy of Sciences) () 15:30 --- Social event and banquet ---	12:30 --- Lunch --- 13:30 Thursday after lunch - Alexander Friedland (until 15:30) () 13:30 Neutrino Mixing Parameters - Shilei Li (UC Irvine) () 13:50 Anomalous Tau Neutrino Appearance from Light Mediators in Short-Baseline Neutrino Experiments - Prof. Bhaskar Dutta () 14:10 Matter effects in the muon to tau neutrino probability ( $P_{\mu\tau}$ ) at long baseline - Srubabati Goswami (Northwestern University) () 14:30 Tau Polarization and Correlated Decays in Neutrino Experiments - Joshua Isaacson () 14:50 Non-standard and secret neutrino interactions at future tau neutrino experiments - Prof. Seodong Shin (Jeonbuk National University) () 15:10 TAMBO: Searching for Tau Neutrinos in the Peruvian Andes - Will Thompson (Harvard University) () 15:30 --- Coffee break --- 16:00 Thursday afternoon - Martin Mihaylov Tzanov (Louisiana State University) (until 18:00) () 16:00 NOvA Status and Prospects - Teresa Lackey (Fermilab) () 16:20 The Hyper-Kamiokande Experiment: Status and Prospect - Dr Umul Kose (ETH-Zurich) () 16:40 The Pacific Ocean Neutrino Experiment (P-ONE) - Andreas Gaetner () 17:00 The sensitivity and discovery potential of nEXO - Prof. Ryan MacLellan (University of Kentucky) () 17:20 The FLARE Experiment for High Energy Neutrino and Dark Matter Searches at LHC - Prof. Jianming Bian (University of California Irvine) () 17:40 3D-Reconstruction of Tau Neutrinos in LArTPC Detectors - Barbara Yaegey Alvarez ()	12:30 --- Lunch --- 13:30 Friday after lunch - Kenji Inami (until 15:30) () 13:30 FASER experiment and first results from LHC Run 3 - Dr Umul Kose (ETH-Zurich) () 13:50 Neutrino Electromagnetic Properties and the Weak Mixing Angle at the LHC Forward Physics Facility - Yu-Dai Tsai (University of California, Irvine) () 14:10 Study of additional radiation in the initial-state-radiation processes $e^+e^- \rightarrow \mu^+\mu^- \gamma$ and $e^+e^- \rightarrow \mu^+\mu^- \gamma \gamma$ in the BABAR experiment - Alberto Lusiani (Scuola Normale Superiore and INFN, sezione di Pisa) () 14:30 Partial wave analysis of $\pi^+ \pi^- \pi^0$ decays at Belle - Andrie Rabusov (Technical University of Munich) () 14:50 Search for charged lepton flavor violation in J/psi decays at BESIII - Xudong Yu (Peking University) () 15:30 --- Coffee break --- 16:00 Friday afternoon - Michael Roney (until 18:00) () 16:00 Wishlist of neutrino results for Tau2025 - Andre De Gouvea () 16:30 Wishlist of G-2 results for Tau2025 - Brendan Kiburg (Fermilab) () 17:00 Wishlist of Tau results for 2025 - Gianluca Inguglia (Austrian Academy of Sciences) () 17:30 Summary of Tau2023 - Soeren Andre Prell (Iowa State University) ()

# Timetable: <https://tinyurl.com/ZoomT23>

< Mon 04/12 Tue 05/12 Wed 06/12 **Thu 07/12** Fri 08/12 All days >

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

Thursday Thursday after lunch Thursday afternoon Thursday before lunch see more...

09:00	<b>Announcements</b>	<i>Swagato Banerjee</i>	09:00 - 09:05
	<b>Accelerator Search for Dark Matter</b>	<i>David Hitlin</i>	09:05 - 09:30
	<b>Neutrino-nuclear interactions, beyond-standard-model physics, and accelerator-produced dark matter</b>	<i>Daniel Salvat</i>	09:30 - 09:55
10:00	<b>Searches for Neutrinoless Double Beta Decay</b>	<i>Walter Pettus</i>	09:55 - 10:20
	<b>Coffee break</b>		10:20 - 10:50
11:00	<b>The Deep Underground Neutrino Experiment</b>	<i>Martin Tzanov</i>	10:50 - 11:15
	<b>Latest results from the MicroBooNE experiment</b>	<i>Tanaz Mohayai</i>	11:15 - 11:40
	<b>Status and Prospects of the JUNO Experiment</b>	<i>Mr Matthias Raphael Stock</i>	11:40 - 12:05
12:00	<b>Current Status and Future Prospects of the ICARUS Experiment</b>	<i>Justin Mueller</i>	12:05 - 12:30
13:00	<b>Lunch</b>		12:30 - 13:30

	<b>Neutrino Mixing Parameters</b>	<i>Shirley Li</i>	13:30 - 13:50
14:00	<b>Anomalous Tau Neutrino Appearance from Light Mediators in Short-Baseline Neutrino Experiments</b>	<i>Prof. Bhaskar Dutta</i>	13:50 - 14:10
	<b>Matter effects in the muon to tau neutrino probability (<math>P_{\mu\tau}</math>) at long baselines</b>	<i>Srubabati Goswami</i>	14:10 - 14:30
	<b>Tau Polarization and Correlated Decays in Neutrino Experiments</b>	<i>Joshua Isaacson</i>	14:30 - 14:50
15:00	<b>Non-standard and secret neutrino interactions at future tau neutrino experiments</b>	<i>Prof. Seodong Shin</i>	14:50 - 15:10
	<b>TAMBO: Searching for Tau Neutrinos in the Peruvian Andes</b>	<i>Will Thompson</i>	15:10 - 15:30
	<b>Coffee break</b>		15:30 - 16:00
16:00	<b>NOvA Status and Prospects</b>	<i>Teresa Lackey</i>	16:00 - 16:20
	<b>The Hyper-Kamiokande Experiment: Status and Prospect</b>	<i>Dr Umut Kose</i>	16:20 - 16:40
	<b>The Pacific Ocean Neutrino Experiment (P-ONE)</b>	<i>Andreas Gaertner</i> 	16:40 - 17:00
17:00	<b>The sensitivity and discovery potential of nEXO</b>	<i>Prof. Ryan MacLellan</i>	17:00 - 17:20
	<b>The FLArE Experiment for High Energy Neutrino and Dark Matter Searches at LHC</b>	<i>Prof. Jianming Bian</i>	17:20 - 17:40
	<b>3D-Reconstruction of Tau Neutrinos in LArTPC Detectors</b>	<i>Barbara Yaeggy Alvarez</i>	17:40 - 18:00
18:00			