Positron Working Group Workshop

March 24th-26th, 2025

Jefferson Lab

D. Higinbotham[1], J. Grames[1], A. Schmidt[2], E. Voutier[3], X. Zheng[4]

and the **Jefferson Lab Positron Working Group**

3rd Edition of the
Annual JLab PWG
« rendez-vous »
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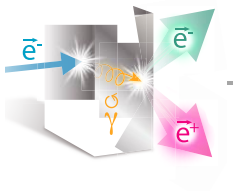
Jefferson Lab GW université PARIS-SACLAY IJCLab Irène Joliot-Curie Laboratoire de Physique des 2 Infinis UNIVERSITY of VIRGINIA

Physics Status



❖ The three pilars of the Positron Experimental Program at JLab have been recognized and approved by the JLab Program Advisory Committee for a total of 412 days.

NUMBER	TITLE	PHYSICS THEME	CONTACT PERSON	HALL	DAYS AWARDED	SCIENTIFIC RATING	PAC DECISION
PR12+23-002	Beam Charge Asymmetries for Deeply Virtual Compton Scattering on the Proton at CLAS12	GPDs	Eric Voutier	B	100	A-	C1
PR12+23-003	Measurement of Deep Inelastic Scattering from Nuclei with Electron and Positron Beams to Constrain the Impact of Coulomb Corrections in DIS	TPE	Dave Gaskell	C	9.3	A-	C1
PR12+23-006	Deeply Virtual Compton Scattering using a positron beam in Hall C	GPDs	Carlos Muñoz Camacho	C	137	A-	C1
PR12+23-008	A Direct Measurement of Hard Two-Photon Exchange with Electrons and Positrons at CLAS12	TPE	Axel Schmidt	B	55	A	C1
PR12+23-012	A measurement of two-photon exchange in unpolarized elastic positron–proton and electron–proton scattering	TPE	Michael Nycz	C	56	A-	C1
PR12+24-005	A dark photon search with a JLab positron beam	BSM	Bogdan Wojtsekhowski	B	55	A-	C1

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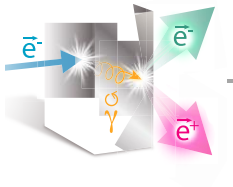

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There is still a lot to explore, quantify, and validate.

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- p-GPs – LOI12+23-001

  Measurement of the generalized polarizabilities of the proton with positron and polarized electron beams

  N. Sparveris

- Axial form factor – LOI12+23-002

  The axial form factor of the nucleon from weak capture of positrons

  D. Dutta

- Dark Bhabha – LOI12+23-005

  A hopefully amplitude-level search for a Dark Photon in Bhabha scattering

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- TPE in polarization transfer – LOI12+23-008

  Polarization transfer in positron-proton elastic scattering

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❖ Dispersive effects in DIS – LOI12+23-015

  Energy dependence of dispersive effects in unpolarized inclusive elastic electron/positron-nucleus scattering the impact of Coulomb correct

  P. Gueye, J. Arrington, P. Giuliani, D. Higinbotham

❖ TPE in neutron elastic scattering – LOI12+24-008

  Measurement of the Two-Photon Exchange contribution to the positron-neutron elastic scattering cross section

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In progress

- Polarized target opportunities
- Tests of the Standard Model
- Experimental program at LERF
- Novel ideas

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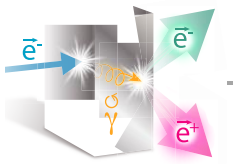

Workshop Charge

- Update on the status of approved proposals
- Update on the status of the positron source R&D
- Update on the status of submitted Letters-of-Intent
- Presentation of the new proposals to PAC53
- Discussion of Novel Ideas with $Ce^{+}BAF$ at 12 GeV
- Continued discussion on a Low-Energy program at LERF
- Discussion on the Positron Technical Design Report

❖ The JLab PWG offers **review** to the new experimental proposals looking for **PWG Endorsement** at PAC53.

Schedule

- Send title and short description by February 28th (last minut request still possible till March 28th)
- Send first draft proposal by April 11th 1pm EDT
- Review due on April 18th 1pm EDT
- Send second draft by April 25th 1pm EDT
- Endorsement decision due on April 30th 1pm EDT

Contact: voutier@ijclab.in2p3.fr

*As today, **3 new proposal requests** are known (E. Fuchey et al. / T. Hague et al. / P. Gueye et al.)*

Low-Energy Physics at LERF

A 4-5 days worshop will be organized in Fall 2025 at Jefferson Lab to specifically discuss the **physics reach** of a **Low-Energy Experimental Program at the LERF**.

Physics @ LERF - Fall 2025

Physics @ **LERF**
at **very low beam energies**

$I_e < 10$ mA $P_e > 80\%$ $T_e < 10$ MeV

Physics @ **LERF**
at **low beam energies**

$I_e < 1$ mA $P_e > 80\%$ $T_e < 150$ MeV

Physics @ **LERF**
at **very low beam energies**

$I_p < 10$ nA $P_p < 60\%$ $T_p < 10$ MeV

Physics @ **LERF**
at **low beam energies**

$I_p > 50$ nA $P_p > 60\%$ $T_p < 123$ MeV
$I_p > 1$ μA $P_p < 10\%$ $T_p < 123$ MeV

Announcements

- Monday lunch is sponsored by Jefferson Lab
- Tuesday lunch is sponsored by the University of Virginia
- Group photo on Tuesday at the lunch break
- Social Event on Tuesday from 6:30-9:00 pm (please subscribe)

Chefs's Market, 11800 Merchants Walk
Newport News