## PROCEEDINGS OF SPIE

## Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXVII

Nerine J. Cherepy Michael Fiederle Ralph B. James Editors

4–6 August 2025 San Diego, California, United States

Sponsored and Published by SPIE

Volume 13621

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in *Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXVII*, edited by Nerine J. Cherepy, Michael Fiederle, Ralph B. James, Proc. of SPIE 13621, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510691506

ISBN: 9781510691513 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org

Copyright © 2025 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



**Paper Numbering:** A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

## Contents

Introduction

Conference Committee

calorimeter concepts [13621-17]

photoelectric x-ray detectors [13621-18]

13621 0A

13621 OB

SEMICONDUCTOR DETECTORS 13621 02 Segmentation and mixed reality representation of cavities in die cast aluminum using 3D x-ray CT [13621-8] 13621 03 Silicon-based microstructured semiconductor neutron detectors (Invited Paper) [13621-9] **APPLICATIONS IN ASTRONOMY AND PHYSICS I** 13621 04 Development of a fission chamber for space applications (Invited Paper) [13621-12] 13621 05 Gamma-ray and neutron spectrometers for lunar science and exploration (Invited Paper) [13621-13] 13621 06 COSI: overview of mission concept, profile, and data operations (Invited Paper) [13621-14] 13621 07 Improved field assessments of chemicals and explosives using high-resolution gamma-ray spectroscopy with a tagged neutron interrogation system (Invited Paper) [13621-15] APPLICATIONS IN ASTRONOMY AND PHYSICS II Prototype development and calibration of the CUbesat Solar Polarimeter (CUSP) [13621-16] 13621 08 13621 09 The beam test facility at Jefferson Lab for the precise energy measurement of future

The legacy of the IXPE instrument and prospects for the next generation of polarimetric

X-POT: x-ray polarimetry with optical time projection chamber [13621-19]

13621 OC Installation and first commissioning results of the JEF lead tungstate calorimeter [13621-20]

	NEUTRON IMAGING
13621 0D	High-energy neutron imaging with a compact accelerator (Invited Paper) [13621-22]
13621 OE	Progress of an optical calibration system for nuclear imaging [13621-25]
	ORGANIC SCINTILLATORS AND DETECTORS
13621 OF	Organic glass scintillators for nuclear physics and homeland security applications [13621-30]
13621 0G	EINSTEIN: enhanced integrated nuclear systems for transmutation and efficient isolation of nuclides (Invited Paper) [13621-31]
	MEV X-RAY IMAGING
13621 OH	Optimization and scale-up of additively manufactured pixelated transparent ceramic scintillator detector arrays for MeV x-ray imaging [13621-34]
13621 01	FLEX: a 2-9 MeV linac for x-ray detector and x-ray inspection development (Invited Paper) [13621-35]
	X-RAY IMAGING
13621 OJ	Whole-scene, one-sided, backscatter, x-ray imaging with coded apertures (Invited Paper) [13621-37]
	GAMMA SPECTROSCOPY AND APPLICATIONS
13621 OL	Integration of data acquisition and real time processing for radiation detection [13621-41]
	SCINTILLATORS FOR GAMMA SPECTROSCOPY

## **POSTER SESSION**

13621 00	Stability of the electrical and spectroscopic parameters of CdTe-based ionizing radiation sensors with different contacts [13621-3]
13621 OP	4H-SiC Schottky barrier diodes at pA level leakage current and performance evaluation up to 600°C [13621-50]
13621 0Q	Effects of argon plasma treatment on passivation of CsPbBr³ perovskite surfaces [13621-51]
13621 OR	Effects of CsPbBr <sub>3-x</sub> Cl <sub>x</sub> (x≤1) alloy composition on the melting-process parameters [13621-52]
13621 OS	Study of the HV power supply modules for the CUbesat Solar Polarimeter (CUSP) [13621-53]
13621 OT	Ionic conduction-based polycrystalline radiation detection [13621-55]
13621 OU	Comparison of fast neutron imaging using a gamma-sensitive scintillator with an iron converter versus polypropylene (PP):ZnS screens [13621-56]
	DIGITAL POSTER SESSION
13621 0V	Polysiloxane scintillators for next-generation nuclear material verification [13621-29]