PROCEEDINGS OF SPIE

UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXI

Oswald H. Siegmund Editor

11–13 August 2019 San Diego, California, United States

Sponsored and Published by SPIE

Volume 11118

Proceedings of SPIE 0277-786X, V. 11118

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

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 UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXI, edited by Oswald H. Siegmund, Proceedings of SPIE Vol. 11118 (SPIE, Bellingham, WA, 2019) Sevendigit Article CID Number.

ISSN: 0277-786X ISSN: 1996-756X (electronic)

ISBN: 9781510629295 ISBN: 9781510629301 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445 SPIE.org Copyright © 2019, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 0277-786X/19/\$21.00.

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: Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

∨ii xi	Authors Conference Committee
	UV AND X-RAY SENSORS I
11118 02	Towards megapixel-class germanium charge-coupled devices for broadband x-ray detectors [11118-1]
11118 03	Event-driven detectors for soft x-ray astronomy [11118-2]
11118 06	Monolithic CMOS detectors for use as x-ray imaging spectrometers [11118-5]
	UV MISSIONS AND TECHNOLOGY I
11118 07	The Solar-C_EUVST mission [11118-6]
11118 08	The extreme-ultraviolet stellar characterization for atmospheric physics and evolution (ESCAPE) mission concept [11118-7]
	SUBORBITAL AND CUBESAT EXPERIMENTS I
11118 OB	An introduction to the Rockets for Extended-source X-ray Spectroscopy [11118-11]
11118 OC	The focal plane camera for tREXS [11118-10]
11118 OD	Flight camera package design, calibration, and performance for the Water Recovery X-ray Rocket mission [11118-12]
11118 OE	SEEJ: SmallSat Exosphere Explorer of Hot Jupiters [11118-13]
	UV AND X-RAY SENSORS II
11118 OF	Electrical characterization of prototype DEPFET detectors for Athena's Wide Field Imager [11118-14]

11118 0G Small-pixel x-ray hybrid CMOS detectors: a candidate for the high-definition x-ray imager on Lynx [11118-15]

11118 01 Strontium iodide radiation instrumentation II (SIRI-2) [11118-17]

DECADAL LARGE MISSION CONCEPTS AND TECHNOLOGY I: JOINT SESSION WITH CONFERENCES 11115, 11116, 11117, AND 11118

- 11118 0J The Lynx X-Ray Observatory: Science Drivers [11118-18]
- 11118 0K The Lynx X-ray Observatory: revealing the invisible universe [11118-19]

UV AND X-RAY SENSORS III

- 11118 0L Developments in large-area flat panel photodetectors with ALD glass capillary array microchannel plates [11118-20]
- 11118 0M Recent developments in next-generation microchannel plates for particle identification applications [11118-21]
- 11118 0N UV imaging detectors with high performance microchannel plates [11118-22]
- 11118 00 In-flight performance of a 200mm x 200mm microchannel plate detector [11118-23]
- 11118 0P Life testing of conventional and atomic layer deposition functionalized microchannel plates [11118-24]
- 11118 0Q Bench and thermal vacuum testing of the JUICE-UVS microchannel plate detector system [11118-25]

SUBORBITAL AND CUBESAT EXPERIMENTS II

- 11118 0S The Dual-channel Extreme Ultraviolet Continuum Experiment: Sounding rocket EUV observations of local B stars to determine their potential for supplying intergalactic ionizing radiation [11118-27]
- 11118 0U High-sensitivity far-ultraviolet imaging spectroscopy with the SPRITE Cubesat [11118-29]

X-RAY MISSIONS AND TECHNOLOGY

11118 0V The Imaging X-Ray Polarimetry Explorer (IXPE): technical overview II [11118-30]

- 11118 0W Arcus: the soft x-ray grating explorer [11118-31]
- 11118 0Y Status of the wide field imager instrument for Athena [11118-33]
- 11118 0Z US Contributions to the Athena Wide Field Imager [11118-34]
- 11118 10 SmallSat solar axion and activity x-ray imager (SSAXI) [11118-35]
- 11118 11 Component testing for x-ray spectroscopy and polarimetry [11118-36]

SUBORBITAL AND CUBESAT EXPERIMENTS III

- 11118 12 Ghost-ray reduction and early results from the third FOXSI sounding rocket flight [11118-37]
- 11118 15 The FIREBall-2 UV balloon telescope: 2018 flight and improvements for 2020 [11118-40]

UV MISSIONS AND TECHNOLOGY II

- Advances in aberration-correcting gratings using electron beam fabrication techniques [11118-41]
 High-resolution aperture shape analysis for the JUICE and Europa ultraviolet spectrographs [11118-45]
- 11118 1A Advanced camera-based metrology for spaceborne booms [11118-63]

POSTERS-MONDAY

11118 1C	Design progress on the Lynx soft x-ray critical-angle transmission grating spectrometer [11118-47]
11118 1H	Timepix: Influence of temperature and vacuum on equalisation of x-ray detector and its verification [11118-52]
11118 1J	Crystal Eye: a wide sight on the Universe looking for the electromagnetic counterpart of gravitational waves [11118-54]
11118 1N	Concept study of Solar-C_EUVST optical design [11118-60]
11118 10	Development of Solar-C_EUVST structural design [11118-61]
11118 1P	Thin aluminum/polyimide optical blocking filter study for the Lynx x-ray mission [11118-62]