UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts XI

Allison A. Barto Fanny Keller H. Philip Stahl Editors

20–22 August 2023 San Diego, California, United States

Sponsored and Published by SPIE

Volume 12676

Proceedings of SPIE 0277-786X, V. 12676

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

UV/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts XI, edited by Allison A. Barto, Fanny Keller, H. Philip Stahl, Proc. of SPIE Vol. 12676, 1267601 · © 2023 SPIE · 0277-786X · doi: 10.1117/12.3012793

Proc. of SPIE Vol. 12676 1267601-1

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/Optical/IR Space Telescopes and Instruments: Innovative Technologies and Concepts XI, edited by Allison A. Barto, Fanny Keller, H. Philip Stahl, Proc. of SPIE 12676, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510665668 ISBN: 9781510665675 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2023 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

vii Conference Committee

HABITABLE WORLDS EXPLORER I: JOINT SESSION WITH CONFERENCES 12676 AND 12677

- 12676 03 UVOIR to far-IR mirror technology development: year 1 status [12676-20]
- 12676 04 ULTRAsim: an integrated modeling environment for large, segmented telescopes with ultra-stable wavefronts [12676-21]

HABITABLE WORLDS EXPLORER II: JOINT SESSION WITH CONFERENCES 12676 AND 12677

- 12676 06 Space interferometer imaging limitations due to GPS uncertainties and parasitic forces in LEO [12676-23]
- 12676 08 Assessment of near-angle scatter on exo-Earth coronagraphy [12676-25]

LARGE MISSIONS AND PROBES: JOINT SESSION WITH CONFERENCES 12676 AND 12677

- 12676 09 **DUET: dual use exoplanet telescope** [12676-26]
- 12676 0A OPA! The Original PolyOculus Array: a status update [12676-27]
- 12676 0B Optical and opto-mechanical design of the PRIMA telescope [12676-28]
- 12676 OC Optical and opto-mechanical design of spectrometers for PRIMA [12676-29]

COATING TECHNOLOGIES

- 12676 OF Electron beam-generated plasmas in NF3 environments for the passivation of UV/O/IR mirrors [12676-14]
 12676 OG Environmental and polarization characterizations of E-beam plasma-based AIF3-passivated
 - aluminum mirrors for astronomical telescopes [12676-15]

- 12676 0H UV to IR high-efficiency antireflective surface modification of freeform and cylindrical lenses for space platform optical instrumentation [12676-17]
- 12676 01 Cryolite overcoated aluminum reflectors for far-ultraviolet spectroscopy [12676-18]

SOLAR AND SPACE WEATHER MISSIONS

12676 ON Development of multi-layer achromatic metasurface Risley prisms for a scanning coronal and heliospheric imager [12676-9]

ROMAN SPACE TELESCOPE

- 12676 00 The Roman Space Telescope optical system: status, test, and verification [12676-1]
- 12676 OP Roman optical telescope integration status and preparation for test [12676-2]
- 12676 0Q Systems engineering integration and test of the wide field opto-mechanical assembly [12676-3]
- 12676 OR Science filter performance summary for the Roman Space Telescope Wide Field Instrument [12676-4]

SMALL-MID MISSION CONCEPTS

- 12676 0S Opto-mechanical design, alignment, and test of the SPHEREx telescope: a cryogenic all-aluminum freeform system for the astrophysics medium explorer mission [12676-5]
- 12676 OT **Europa Imaging System wide angle camera (EIS WAC) optical design, fabrication, and test** [12676-6]
- 12676 0U Optical design and analysis of the ROKITS cameras [12676-7]
- 12676 0V The PICTURE-C exoplanetary imaging balloon mission: a refactored thermal model and framework for an end-to-end model for balloon borne coronagraphs [12676-8]

POSTER SESSION

12676 0WOptimizing design decision-making for remote sensing instrument specification via tolerance
sensitivity analysis of Ritchey-Chrétien telescope [12676-31]12676 0XDesign of a visible and infrared common optical system with the same effective focal length
[12676-32]

- 12676 OY Development of a dual-camera terrain imager for increasing swath width in space exploration [12676-33]
- 12676 0Z Investigating the impact of ghost images on the accuracy of modulation transfer function measurement using knife-edge method [12676-34]
- 12676 10 **Optimizing the alignment of the Korsch telescope with consideration of gravitational effects** [12676-35]
- 12676 11 On-orbit thermal control system design and analysis for space optical telescope ROKITS [12676-36]
- 12676 12 Linear polarizer design for application in the far-ultraviolet spectral range [12676-37]

Conference Committee

Conference Chairs

Allison A. Barto, Ball Aerospace (United States) Fanny Keller, European Space Research and Technology Center (Netherlands)

H. Philip Stahl, NASA Marshall Space Flight Center (United States)

Program Track Chair

Oswald H. Siegmund, Space Sciences Laboratory (United States)

Conference Program Committee

Julien Archer, Airbus Defence and Space (France)
Jonathan W. Arenberg, Northrop Grumman Corporation (United States)
Sean Brennan, L3Harris Technologies, Inc. (United States)
Lee D. Feinberg, NASA Goddard Space Flight Center (United States)
Jeong-Yeol Han, Korea Astronomy and Space Science Institute (Korea, Republic of)
James P. McGuire Jr., Jet Propulsion Laboratory (United States)
Scott Richardson, Lockheed Martin Corporation (United States)
Eric Ruch, Safran Reosc (France)
Jeffrey Scott Smith, NASA Goddard Space Flight Center (United States)