

# PROCEEDINGS OF SPIE

## ***Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray***

**Jan-Willem A. den Herder  
Shouleh Nikzad  
Kazuhiro Nakazawa  
Editors**

**17–22 July 2022  
Montréal, Québec, Canada**

Sponsored and Published by  
**SPIE**

**Volume 12181**

Part One of Two Parts

Proceedings of SPIE 0277-786X, V. 12181

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

Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray, edited by Jan-Willem A. den Herder,  
Shouleh Nikzad, Kazuhiro Nakazawa, Proc. of SPIE Vol. 12181, 1218101 · © 2022 SPIE ·  
0277-786X · doi: 10.1117/12.2656411

Proc. of SPIE Vol. 12181 1218101-1

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](http://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 *Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray*, edited by Jan-Willem A. den Herder, Jan-Willem A. den Herder, Shouleh Nikzad, Shouleh Nikzad, Kazuhiro Nakazawa, Kazuhiro Nakazawa, Proc. of SPIE 12181, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510653436

ISBN: 9781510653443 (electronic)

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 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](http://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.

**SPIE. DIGITAL  
LIBRARY**

[SPIEDigitalLibrary.org](http://SPIEDigitalLibrary.org)

---

**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

xv Conference Committee

## Part One

### UV I

---

- 12181 04 **The UV-SCOPE mission: ultraviolet spectroscopic characterization of planets and their environments** [12181-1]
- 12181 05 **The scientific payload of the Ultraviolet Transient Astronomy Satellite (ULTRASAT)** [12181-3]
- 12181 06 **The Polstar high resolution spectropolarimetry MIDEX mission** [12181-4]
- 12181 07 **The Lyman-UV imaging spectrograph: a SMEX mission concept** [12181-5]

### UV II

---

- 12181 0B **Quick Ultra-Violet Kilonova surveyor (QUVIK)** [12181-10]
- 12181 0C **Design drivers for the Polstar spectropolarimeter: an FUV/NUV design achieving high spectral resolving power with precise 4-Stokes measurements** [12181-11]
- 12181 0D **OUL: an ultraviolet wide field imager for the Luna 26 mission** [12181-12]
- 12181 0E **The ultraviolet researcher to investigate the emergence of life: a mission proposal to ESA's F-call** [12181-13]
- 12181 0G **Optimizing silicon UV detector response with antireflection coatings, solar-blind bandpass filters, and linear variable filters** [12181-15]
- 12181 0H **A photon counting imaging detector for UV space missions** [12181-16]

### SOLAR

---

- 12181 0J **CUSP: a two CubeSats constellation for space weather and solar flares x-ray polarimetry** [12181-18]
- 12181 0K **Exploring the application of image slicers for the EUV for the next generation of solar space missions** [12181-19]

---

## **ATHENA I**

---

- 12181 0M    **Design of the detection chain for Athena X-IFU** [12181-22]  
12181 0O    **Aperture cylinder on Athena X-IFU: development status** [12181-24]

---

## **ATHENA II**

---

- 12181 0S    **Mitigation of bandwidth limitation induced crosstalk on Athena's WFI** [12181-28]

---

## **ATHENA OPTICS**

---

- 12181 0T    **ATHENA optics technology development** [12181-29]  
12181 0U    **The development of the mirror for the Athena x-ray mission** [12181-30]  
12181 0V    **Alignment and integration of the SPO mirror modules onto the ATHENA Telescope** [12181-31]  
12181 0W    **X-ray tests of the ATHENA mirror modules in BEaTriX: from design to reality** [12181-32]  
12181 0Y    **X-ray testing ATHENA optics at PANTER** [12181-34]  
12181 0Z    **Characterisation of iridium and low-density bilayer coatings for the Athena optics** [12181-35]

---

## **OPTICS I**

---

- 12181 11    **Fabrication of lightweight silicon x-ray mirrors** [12181-37]  
12181 12    **Progress on the realisation of high-resolution thin monolithic shells** [12181-38]  
12181 13    **VOXI: Versatile Optics for X-ray Imaging** [12181-40]

---

## **OPTICS II**

---

- 12181 16    **Flight-like critical-angle transmission grating x-ray performance for Arcus** [12181-43]

12181 17 **Dopamine dip-liquid overcoatings for soft x-ray reflectivity enhancement** [12181-44]

---

#### SPECTRUM-RONTGEN-GAMMA AND IXPE

---

12181 1A **SRG/eROSITA status and operations during the first four all-sky surveys** [12181-47]

12181 1C **In-orbit monitoring of the imaging x-ray polarimeters on-board IXPE** [12181-49]

12181 1D **A possibility to extend the IXPE energy band** [12181-50]

---

#### TRANSIENT AND SMALL SATELLITES I

---

12181 1G **Design, integration, and test of the scientific payloads on-board the HERMES constellation and the SPIRIT mission** [12181-53]

---

#### TRANSIENT AND SMALL SATELLITES II

---

12181 1K **Early results from GRBAlpha and VZLUSAT-2** [12181-57]

12181 1L **Towards the CAMELOT fleet of GRB detecting nano-satellites: the design concept of the 3U members based on the GRBAlpha and VZLUSAT-2 heritage** [12181-58]

12181 1O **Characterization of Glowbug: a gamma-ray telescope for bursts and other transients** [12181-61]

---

#### EINSTEIN AND SVOM

---

12181 1P **Calibration of the flight model lobster eye optic for SVOM** [12181-63]

12181 1Q **Results of the development of the MXT x-ray telescope for the SVOM mission** [12181-64]

12181 1R **Follow-up X-ray Telescope (FXT) mirror module for the Einstein probe mission** [12181-65]

---

#### XRISM

---

12181 1S **Status of resolve instrument onboard X-Ray Imaging and Spectroscopy Mission (XRISM)** [12181-66]

12181 1T **Xtend, the soft x-ray imaging telescope for the X-Ray Imaging and Spectroscopy Mission (XRISM)** [12181-67]

- 12181 1U **Ground calibration of the x-ray mirror assembly for the x-ray imaging and spectroscopy mission (XRISM) I-measurement setup and effective area** [12181-68]
- 12181 1V **Ground calibration of the x-ray mirror assembly for the X-Ray Imaging and Spectroscopy Mission (XRISM) II: imaging performance and stray light** [12181-69]

---

#### EXTP

---

- 12181 1W **Enhanced X-ray Timing and Polarimetry mission: eXTP: an update on its scientific cases, mission profile and development status** [12181-70]
- 12181 1X **The large area detector onboard the eXTP mission** [12181-71]
- 12181 1Y **The wide field monitor onboard the Chinese-European x-ray mission eXTP** [12181-72]

---

#### MISSIONS UNDER DEVELOPMENT/PROPOSED

---

- 12181 21 **Arcus: exploring the formation and evolution of clusters, galaxies, and stars** [12181-75]
- 12181 22 **A broadband x-ray imaging spectroscopy in the 2030s: the FORCE mission** [12181-76]
- 12181 23 **Super DIOS for exploring dark baryon** [12181-77]
- 12181 24 **GEO-X (GEOspace X-ray imager)** [12181-78]
- 12181 25 **SOlar Neutron and Gamma-ray Spectroscopy mission (SONGS)** [12181-79]
- 12181 26 **The X/Gamma-ray Imaging Spectrometer (XGIS) for THESEUS and other mission opportunities** [12181-81]
- 12181 29 **Sub-arcsecond x-ray imaging with Multi-Image X-ray Interferometer Module (MIXIM): introduction of a periodic coded-aperture mask** [12181-84]

---

#### DETECTORS AND MISCELLANEOUS

---

- 12181 2A **Performance of high frame-rate x-ray CCDs for future strategic missions** [12181-85]
- 12181 2B **Performance of the SRON Ti/Au transition edge sensor x-ray calorimeters** [12181-86]
- 12181 2C **Development of the focal-plane CMOS detector for the GEO-X mission** [12181-87]

- 12181 2D **Position-sensitive transition edge sensor with sub-micrometer accuracy developed for future x-ray interferometry mission** [12181-88]
- 12181 2E **Towards precision particle background estimation for future x-ray missions: correlated variability between Chandra ACIS and AMS** [12181-89]

---

#### GAMMA-RAY AND POLARIZATION

---

- 12181 2G **Development of the ComPair gamma-ray telescope prototype** [12181-92]
- 12181 2H **ASTENA: an innovative mission concept for broadband high-energy astrophysics** [12181-93]
- 12181 2I **Using single-crystal diamond detectors as a scattering medium in Compton telescopes** [12181-94]
- 12181 2J **Development of the balloon-borne Galactic Explorer Coded Aperture Mask and Compton Telescope (GECCO) prototype** [12181-95]
- 12181 2K **The TRILL project: increasing the technological readiness of Laue lenses** [12181-96]
- 12181 2L **The Mini Astrophysical MeV Background Observatory (MAMBO) CubeSat mission for gamma-ray astronomy** [12181-97]
- 12181 2N **Development of a prototype detector for the Gamma-RAy Polarimeter Experiment (GRAPE)** [12181-99]
- 12181 2O **Development of Bragg reflection-type x-ray polarimeter based on a bent silicon crystal using hot plastic deformation** [12181-100]

---

#### POSTER SESSION: ULTRA VIOLET

---

- 12181 2P **Aberration corrected echelle spectrographs for the far ultraviolet** [12181-101]
- 12181 2Q **Determining ideal grating parameters for UV blazed gratings** [12181-102]
- 12181 2R **Optical design of LUVIS for a SMEX mission** [12181-103]
- 12181 2S **World Space Observatory-ultraviolet mission: status 2022** [12181-104]
- 12181 2V **The concept of lunar-based astrophysical telescope for International Lunar Research Station (ILRS)** [12181-107]
- 12181 2W **LUVIS: an ultraviolet SMEX mission optimized for the Lyman UV** [12181-108]
- 12181 2X **The design of a UV CMOS sensor for the ULTRASAT Space Telescope** [12181-109]

- 12181 30 **TINI: a mission for FUV spectroscopy of extended objects** [12181-112]
- 12181 31 **A concept for a deployable normal incidence EUV mirror based on shape memory alloy sheets** [12181-113]
- 12181 32 **Small laboratory emulator of the far UV imager on board WSO-UV to test the optical performance of the field camera unit FUV channel** [12181-114]
- 12181 33 **An ultraviolet stellar catalog for occultation measurements, planetary illumination modeling, and spectral sky map analyses** [12181-115]
- 12181 36 **Optical modeling of new lifetime positions for the Cosmic Origins Spectrograph (COS)** [12181-118]
- 12181 38 **Europa clipper ultraviolet spectrograph: ground calibration results** [12181-120]
- 12181 39 **Calibration approach for the Polstar spectropolarimeter** [12181-121]
- 12181 3A **Evidence that evaporated Al/AlF<sub>3</sub> bilayer thin films stored in a 327 K oven for over 2500 hours have not degraded** [12181-122]
- 12181 3B **UV photocathodes for space detectors** [12181-123]
- 12181 3C **Plasma based production of AlF<sub>3</sub>-passivated aluminum mirrors for UVOIR astronomy** [12181-124]
- 12181 3G **Spectroscopic observation of planetary and Moon exospheres in the ultraviolet** [12181-128]
- 12181 3H **Updated data processing and analysis methods for the AstroSat UltraViolet Imaging Telescope (UVIT)** [12181-129]
- 12181 3I **New views in the ultraviolet of the Andromeda galaxy enabled by the AstroSAT/UVIT Telescope** [12181-130]
- 12181 3J **Narrowband mirrors tuned at the desired far UV spectral lines** [12181-131]
- 12181 3K **Star-Planet Activity Research CubeSat (SPARCS): science payload assembly, integration, and testing plan** [12181-241]
- 12181 3L **Star-Planet Activity Research CubeSat (SPARCS): instrument thermal vacuum testing setup** [12181-242]

## Part Two

---

### POSTER SESSION: SOLAR

---

- 12181 3M **Geant4 modeling of a cerium bromide scintillator detector for the IMPRESS CubeSat mission** [12181-170]

- 12181 3O     **The thermal filter for the Solar Ultraviolet Imaging Telescope (SUIT) on-board Aditya-L1** [12181-172]
- 12181 3R     **Solar Transition Region Ultraviolet Explorer (STRUVE) requirements flow down to design** [12181-175]
- 12181 3S     **Solar Transition Region Ultraviolet Explorer (STRUVE) pointing performance modeling** [12181-176]

---

#### **POSTER SESSION: ATHENA**

---

- 12181 3T     **Hardware development of Athena WFI frame processing module** [12181-177]
- 12181 3U     **Time distribution on the Athena WFI** [12181-178]
- 12181 3V     **Drain current characteristics of Athena WFI flight-like DEPFETs** [12181-179]
- 12181 3W     **Spectroscopic performance of flight-like DEPFET sensors for Athena's WFI** [12181-181]
- 12181 3X     **Development status of the instrument control unit for the X-IFU instrument of the Athena mission** [12181-182]
- 12181 3Y     **Demonstrator model of the warm front-end electronics for the ATHENA mission's X-IFU instrument** [12181-183]
- 12181 3Z     **Monolithic amplifier and current biasing for SQUID readout-AwaXe\_v4** [12181-184]
- 12181 40     **Geant4 simulation of the residual background in the ATHENA wide field imager from protons deflected by the charged particle diverter** [12181-185]
- 12181 41     **Study on the trigger logic for the X-IFU Athena anticoincidence system** [12181-186]
- 12181 42     **Total ionizing dose test with DEPFET sensors for Athena's WFI** [12181-187]
- 12181 43     **Athena charged particle diverter simulations: effects of micro-roughness on proton scattering using Geant4** [12181-188]
- 12181 44     **A 50 mK test bench for demonstration of the readout chain of Athena/X-IFU** [12181-190]
- 12181 45     **When less is more: the truncation of the optimal filter to reconstruct events in X-IFU/Athena-like TES detectors** [12181-191]
- 12181 49     **Optical on-board metrology in the Athena x-ray mission** [12181-195]

---

#### **POSTER SESSION: ATHENA OPTICS**

---

- 12181 4D **The expanded, parallel, and monochromatic x-ray beam of BEaTriX: alignment and characterization** [12181-200]
- 12181 4E **Simulations of the ATHENA performance verification testing at XRCF** [12181-202]
- 12181 4F **Coating process parameter influence on thin films for the ATHENA x-ray optics** [12181-203]
- 12181 4H **Carbon nanotubes thin filters for x-ray detectors in space** [12181-205]
- 12181 4I **The effect of mirror curvature and wedging on the angular resolution of Athena** [12181-206]

---

#### **POSTER SESSION: OPTICS**

---

- 12181 4J **Modelling diffractive effects in silicon pore optics for the ATHENA X-ray Telescope** [12181-207]
- 12181 4K **Optimization of multilayer coatings for future high-energy focusing telescopes** [12181-208]
- 12181 4N **X-ray micropore optic array preliminary calibration results for the lunar environment heliospheric x-ray imager** [12181-211]
- 12181 4O **Design, analysis, and testing of x-ray mirror modules** [12181-212]
- 12181 4P **Coating of thin, lightweight x-ray mirrors without distortion** [12181-213]
- 12181 4R **Current status of development of lightweight x-ray mirror with carbon fiber reinforced plastic (CFRP)** [12181-215]
- 12181 4S **Upgrade of a laboratory x-ray diffractometer to extend its operating range towards soft energies** [12181-216]
- 12181 4X **Axial shift mapping metrology for x-ray telescope mirrors** [12181-223]
- 12181 4Y **Adjustable height glass spacers for bonding and aligning x-ray mirror stacks** [12181-225]
- 12181 53 **Blazed reflection gratings with electron-beam lithography and ion-beam etching** [12181-230]

---

#### **POSTER SESSION: ONGOING MISSIONS**

---

- 12181 54   **Simulation studies of the eROSITA particle-induced background using a highly detailed mass model** [12181-231]
- 12181 56   **A pixel-by-pixel equalization method for the x-ray imaging polarimeter on board the IXPE mission** [12181-233]
- 12181 57   **Validation of neural network software by using IXPE ground calibration data** [12181-234]

---

#### **POSTER SESSION: SMALL SATELLITES**

---

- 12181 58   **Mechanical and thermal design of the BlackCAT CubeSat** [12181-235]
- 12181 59   **Estimating the background of the BlackCAT CubeSat and its impact on science observations** [12181-236]
- 12181 5A   **Performance analysis of embedded firmware for the detection of gamma-ray bursts on a 2U CubeSat** [12181-237]
- 12181 5B   **Mission pointing optimisation of twin satellite system for all-sky burst monitoring** [12181-238]
- 12181 5D   **Development of the grade selection of x-ray events using machine learning for a CubeSat application** [12181-240]
- 12181 5G   **Ultra-lightweight x-ray telescope fabricated with multiple MEMS technologies for GEO-X mission** [12181-245]
- 12181 5J   **Development of a method for aligning lobster eye optics onboard HiZ-GUNDAM with visible light and shape measurements** [12181-248]
- 12181 5K   **Calibration of the first detector flight models for the HERMES constellation and the SpIReT mission** [12181-249]
- 12181 5M   **The power supply unit onboard the HERMES nano-satellite constellation** [12181-251]

---

#### **POSTER SESSION: MISSIONS IN DEVELOPMENT**

---

- 12181 5O   **On-ground calibration highlights for the SVOM/ECLAIRs camera** [12181-253]
- 12181 5R   **Scenario design and preliminary verification of SVOM operational test** [12181-256]
- 12181 5S   **Strategy of visible telescope on-board data processing during GRB localization in SVOM mission** [12181-257]

- 12181 5V **The space weather x-ray spectrometer for the Helianthus sub-L1 mission with solar photonic propulsion** [12181-271]

---

**POSTER SESSION: XRISM**

---

- 12181 5W **Ground test results of the electromagnetic interference in the x-ray microcalorimeter onboard XRISM** [12181-261]
- 12181 5X **XSLIDE (X-ray Spectral Line Identifier and Explorer): a quick-look tool for XRISM** [12181-262]
- 12181 5Y **Ground calibration of the x-ray mirror assembly for the X-Ray Imaging and Spectroscopy Mission (XRISM) III-performance variation across the aperture** [12181-263]
- 12181 5Z **High count rate effects in event processing for XRISM/Resolve x-ray microcalorimeter** [12181-264]
- 12181 60 **The XRISM pipeline software system: connecting continents, processes, testing, and scientists** [12181-265]
- 12181 61 **Xappl: software framework for the XRISM pre-pipeline** [12181-266]
- 12181 62 **Relative timing calibration of the Resolve x-ray microcalorimeter onboard XRISM using the modulated x-ray source** [12181-267]
- 12181 63 **Ground test results of the micro-vibration interference for the x-ray microcalorimeter onboard XRISM** [12181-268]
- 12181 64 **Pulse parameters optimization of the modulated x-ray sources for the resolve microcalorimeter spectrometer on XRISM** [12181-269]

---

**POSTER SESSION: eXTP**

---

- 12181 65 **The mechanical design and implementation of the WFM cameras for eXTP** [12181-132]
- 12181 66 **The instrument control unit processing hardware and software of the wide field monitor on eXTP** [12181-133]
- 12181 67 **The detector/readout-electronics assembly of the eXTP wide field monitor** [12181-134]
- 12181 6C **Design and testing of the structure of the eXTP optics** [12181-139]
- 12181 6F **The digital data processing concepts of the large area detector and the wide field monitor onboard eXTP** [12181-142]
- 12181 6H **Filters design and characterization for LAD instrument onboard eXTP** [12181-144]

|          |  |
|----------|--|
| 12181 6I | <b>Development of sensor SQUID and Zappe interferometer switch for HUBS</b> [12181-145]                      |
| 12181 6M | <b>A 4 K pulse tube cryocooler for the HUBS mission</b> [12181-149]  |
| 12181 6N | <b>An 800 mK helium sorption cooler for the HUBS mission</b> [12181-150]                                     |
| 12181 6O | <b>Collimator of the ultra-lightweight x-ray telescope for the GEO-X mission</b> [12181-152]                 |
| 12181 6P | <b>An AOCS concept for the x-ray interferometer mission</b> [12181-153]                                      |
| 12181 6Q | <b>The thermo-mechanical design of the module of the LAD instrument onboard the eXTP mission</b> [12181-270] |

---

#### POSTER SESSION: DETECTORS/OTHERS

---

|          |  |
|----------|--|
| 12181 6R | <b>Understanding the effects of charge diffusion in next-generation soft x-ray imagers</b> [12181-154]   |
| 12181 6S | <b>Reducing the background in x-ray imaging detectors via machine learning</b> [12181-155]   |
| 12181 6W | <b>Source detection algorithm for lobster eye telescopes with machine learning algorithms</b> [12181-159]  |
| 12181 6X | <b>The evolution of the ACIS contamination layer on the Chandra X-ray Observatory through 2022</b> [12181-160]   |
| 12181 6Y | <b>AstroPix: novel monolithic active pixel silicon sensors for future gamma-ray telescopes</b> [12181-161]   |
| 12181 70 | <b>Optimization and experimental measurements of high impedance niobium-silicon (NbSi) transition edge sensors (TES) for high spectral and spatial resolution x-ray space-borne telescopes</b> [12181-163] |

---

#### POSTER SESSION: GAMMA-RAY AND POLARIZATION

---

|          |  |
|----------|--|
| 12181 71 | <b>Optical performance of the x-ray telescope for the XL-Calibur experiment</b> [12181-164]            |
| 12181 72 | <b>Balloon-borne narrow field of view semiconductor Compton telescope concept: miniSGD</b> [12181-165] |
| 12181 76 | <b>A compact gamma-ray spectrometer for nuclear astrophysics and planetary science</b> [12181-169]     |

## **POSTER SESSION**

---

- 12181 77    **FORECASTOR: an exposure time calculator for the CASTOR space mission simulating UVMOS spectroscopy [12181-272]**

# Conference Committee

## Symposium Chairs

**René Doyon**, University de Montréal (Canada)  
**Shouleh Nikzad**, Jet Propulsion Laboratory (United States)

## Symposium Co-chairs

**Sarah Kendrew**, European Space Agency (United States)

**Satoshi Miyazaki**, National Astronomical Observatory of Japan  
(Japan)

## Conference Chairs

**Jan-Willem A. den Herder**, SRON Netherlands Institute for Space Research (Netherlands)

**Shouleh Nikzad**, Jet Propulsion Laboratory (United States)  
**Kazuhiro Nakazawa**, Nagoya University (Japan)

## Conference Program Committee

**Hisamitsu Awaki**, Ehime University (Japan)

**Didier Barret**, Institut de Recherche en Astrophysique et Planétologie (France)

**Marshall Bautz**, Massachusetts Institute of Technology (United States)

**Marcos Bavdaz**, European Space Research and Technology Center (Netherlands)

**Enrico Bozzo**, ISDC Data Center for Astrophysics (Switzerland)

**Maria Teresa Ceballos**, Universidad de Cantabria (Spain)

**Roland H. den Hartog**, SRON Netherlands Institute for Space Research (Netherlands)

**Megan E. Eckart**, Lawrence Livermore National Laboratory (United States)

**Marco Feroci**, INAF - Istituto di Fisica dello Spazio Interplanetario (Italy)

**Desiree Della Monica Ferreira**, DTU Space (Denmark)

**Luigi Gallo**, Saint Mary's University (Canada)

**Luigi Gallo**, Saint Mary's University (Canada)

**Varoujan Gorjian**, Jet Propulsion Laboratory (United States)

**James C. Green**, University of Colorado at Boulder (United States)

**Jessica A. Gaskin**, NASA Marshall Space Flight Center (United States)

**Varoujan Gorjian**, Jet Propulsion Laboratory (United States)

**Walter M. Harris**, The University of Arizona (United States)

**Fiona Harrison**, California Institute of Technology (United States)  
**Walter M. Harris**, The University of Arizona (United States)  
**Gillian Kyne**, NASA Jet Propulsion Laboratory (United States)  
**Olivier Limousin**, CEA-Centre de SACLAY (France)  
**Alexander Lutovinov**, Space Research Institute of the RAS  
(Russian Federation)  
**Hironori Matsumoto**, Nagoya University (Japan)  
**Hironori Matsumoto**, Nagoya University (Japan)  
**Mark L. McConnell**, The University of New Hampshire (United States)  
**Kyriaki Minoglou**, European Space Research and Technology Center  
(Netherlands)  
**Mark L. McConnell**, The University of New Hampshire (United States)  
**Kirpal Nandra**, Max-Planck-Institut für extraterrestrische Physik  
(Germany)  
**Kyriaki Minoglou**, European Space Research and Technology Center  
(Netherlands)  
**Anna M. Moore**, The Australian National University (Australia)  
**Takaya Ohashi**, Tokyo Metropolitan University (Japan)  
**Giovanni Pareschi**, INAF - Osservatorio Astronomico di Brera (Italy)  
**Kirpal Nandra**, Max-Planck-Institut für extraterrestrische Physik  
(Germany)  
**Biswajit Paul**, Raman Research Institute (India)  
**Giovanni Pareschi**, INAF - Osservatorio Astronomico di Brera (Italy)  
**Biswajit Paul**, Raman Research Institute (India)  
**Mikhail N. Pavlinsky**, Space Research Institute (Russian Federation)  
**Paul S. Ray**, U.S. Naval Research Laboratory (United States)  
**Taro Sakao**, Institute of Space and Astronautical Science (Japan)  
**Andrea Santangelo**, Eberhard Karls Universität Tübingen (Germany)  
**Taro Sakao**, Institute of Space and Astronautical Science (Japan)  
**Andrea Santangelo**, Eberhard Karls Universität Tübingen (Germany)  
**Hiroyasu Tajima**, Nagoya University (Japan)  
**Hiroyasu Tajima**, Nagoya University (Japan)  
**Tadayuki Takahashi**, Japan Aerospace Exploration Agency (Japan)  
**Tadayuki Takahashi**, Japan Aerospace Exploration Agency (Japan)  
**Vincent Tatischeff**, Institut National de Physique Nucléaire et de  
Physique des Particules (France)  
**Hiroshi Tsunemi**, Osaka University (Japan)  
**Vincent Tatischeff**, Institut National de Physique Nucléaire et de  
Physique des Particules (France)  
**Hiroshi Tsunemi**, Osaka University (Japan)  
**Sarah E. Tuttle**, University of Washington (United States)  
**Cui Wei**, Tsinghua University (China)  
**Sarah E. Tuttle**, University of Washington (United States)  
**Cui Wei**, Tsinghua University (China)  
**Richard Willingale**, University of Leicester (United Kingdom)  
**Jörn Wilms**, Friedrich-Alexander-Universität Erlangen-Nürnberg  
(Germany)

**Richard Willingale**, University of Leicester (United Kingdom)  
**Jörn Wilms**, Friedrich-Alexander-Universität Erlangen-Nürnberg  
(Germany)  
**Yoichi Yatsu**, Tokyo Institute of Technology (Japan)  
**Shuangnan Zhang**, Institute of High Energy Physics (China)  
**Yoichi Yatsu**, Tokyo Institute of Technology (Japan)  
**Shuangnan Zhang**, Institute of High Energy Physics (China)  
**William W. Zhang**, NASA Goddard Space Flight Center (United States)  
**William W. Zhang**, NASA Goddard Space Flight Center (United States)

