

Systems Contamination: Prediction, Control, and Performance 2018

Monday - Tuesday 20 - 21 August 2018

Conference Sessions At A Glance

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1: Contamination Effects on Spacecraft Systems and Science Instruments
2: Space Mission Flight Measurements and Effects
3: Space Systems Contamination Analysis and Modeling I
4: Contamination Control Methods and Measurements I
5: Space Systems Contamination Control Methods and Measurements: James Webb Space Telescope
6: Laser Systems Contamination and Effects
 Posters-Monday
7: Space Systems Contamination Analysis and Modeling II
8: Contamination Control Methods and Measurements II
9: Contamination Control Methods and Measurements III
 Panel Discussion on Contamination Control: Identifying Areas for High Priority Near-Term Development
 Optomechanical/Instrument Technical Group Event

Important Dates

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Abstract Due:
7 February 2018

Author Notification:
16 April 2018

Manuscript Due Date:
25 July 2018

Conference Committee

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Conference Chairs

[Carlos E. Soares](#), Jet Propulsion Lab. (United States)
[Eve M. Wooldridge](#), NASA Goddard Space Flight Ctr. (United States)
[Bruce A. Matheson](#), Ball Aerospace (United States)

Program Committee continued...

[Joanne Egges](#), Ball Aerospace (United States)
[Alvin Y. Huang](#), The Boeing Co. (United States)
[Matthew Macias](#), Northrop Grumman Aerospace Systems (United States)

Program Committee

Hagop Barsamian, The Aerospace Corp. (United States)
[Nancy Carosso](#), NASA Goddard Space Flight Ctr. (United States)

MONDAY 20 AUGUST

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Welcome and Introduction

Monday 20 August 2018
 8:40 AM - 9:00 AM
 Location: Conv. Ctr. Room 26B

Carlos E. Soares, Jet Propulsion Lab. (USA); **Eve M. Wooldridge**, NASA Goddard Space Flight Ctr. (USA); **Bruce A. Matheson**, Ball Aerospace (USA)


Session 1: Contamination Effects on Spacecraft Systems and Science Instruments

Monday 20 August 2018
 9:00 AM - 10:00 AM
 Location: Conv. Ctr. Room 26B

Session Chair: [Alvin Y. Huang](#), The Boeing Co. (United States)


Photochemistry of common spacecraft outgassing contaminants: a review

Paper 10748-1
 Time: 9:00 AM - 9:20 AM
 Author(s): Abraham Buditama, The Aerospace Corp. (United States)

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Effect of concurrent UV irradiation and contamination on silver-coated teflon radiator surface


Paper 10748-2
 Time: 9:20 AM - 9:40 AM
 Author(s): De-Ling Liu, Jesse D. Fowler, The Aerospace Corp. (United States); Hyun Kim, Aerospace Corp (United States); Diana Alaan, Aura Labatete-Goeppinger, The Aerospace Corp. (United States)

[Add To My Schedule](#) **Experimental findings on the photodeposition of contaminant films outgassed from nylon split loom tubing**

Paper 10748-3

Time: 9:40 AM - 10:00 AM

Author(s): Eleazar Lontoc, Boeing Satellite Systems International, Inc. (United States); Christopher Shaw, The Boeing Co. (United States); Monica Quaresma, Boeing Satellite Systems International, Inc. (United States)

[Add To My Schedule](#) **Coffee Break 10:00 AM - 10:30 AM****Session 2:
Space Mission Flight Measurements and Effects**

Monday 20 August 2018

10:30 AM - 11:50 AM

Location: Conv. Ctr. Room 26B


Session Chair: Jean-Francois Roussel, ONERA (France)

Analysis of observed contamination through SAGE III's first year on orbit

Paper 10748-4

Time: 10:30 AM - 10:50 AM


Author(s): Michael Thompson, Josh E. Bangert, NASA Langley Research Ctr. (United States); Samuel Porter, Science Systems and Applications, Inc. (United States); David E. Flittner, Kaitlin Liles, NASA Langley Research Ctr. (United States); Ryan Stanley, Science Systems and Applications, Inc. (United States); Elaine Seasley, NASA Langley Research Ctr. (United States)

[Add To My Schedule](#) **Natural and induced environment around the International Space Station (ISS) as observed during on-orbit operations of the Robotic External Leak Locator (RELL)**

Paper 10748-5

Time: 10:50 AM - 11:10 AM


Author(s): Katie Fox, Alexandra Deal, Alvin Huang, Michael Heiser, William Hartman, Ronald Mikatarian, The Boeing Co. (United States); Matthew J. Davis, The Boeing Company (United States); Adam Naidis, Timothy Bond, Brien Johnson, NASA Johnson Space Ctr. (United States); Dino Rossetti, Conceptual Analytics, LLC (United States)

[Add To My Schedule](#) **Robotic External Leak Locator (RELL) leak plume field detection on the International Space Station (ISS)**

Paper 10748-6

Time: 11:10 AM - 11:30 AM


Author(s): Alexandra Deal, Katie L. Fox, Alvin Y. Huang, Michael J. Heiser, William A. Hartman, Ronald R. Mikatarian, The Boeing Co. (United States); Dino Rossetti, Conceptual Analytics, LLC (United States); Adam J. Naidis, Brien Johnson, Timothy A. Bond, NASA Johnson Space Ctr. (United States)

[Add To My Schedule](#) **International Space Station environmental control and life support system (ECLSS) vent flow reflection and detection by Robotic External Leak Locator (RELL)**

Paper 10748-7

Time: 11:30 AM - 11:50 AM

Author(s): Alvin Y. Huang, Alexandra M. Deal, Katie L. Fox, Michael J. Heiser, William A. Hartman, Ronald R. Mikatarian, Matthew J. Davis, The Boeing Co. (United States); Adam J. Naidis, Timothy A. Bond, Brien Johnson, NASA Johnson Space Ctr. (United States); Dino J. Rossetti, SGT, Inc. (United States)

[Add To My Schedule](#) **Lunch Break 11:50 AM - 1:00 PM****Session 3:
Space Systems Contamination Analysis and Modeling I**

Monday 20 August 2018

1:00 PM - 2:20 PM

Location: Conv. Ctr. Room 26B


Session Chair: Hagop Barsamian, The Aerospace Corp. (United States)

Progress in a physical approach to contamination in Europe

Paper 10748-8

Time: 1:00 PM - 1:20 PM


Author(s): Jean-Francois Roussel, Emilie Vanhove, Eudes Grosjean, ONERA (France); Delphine Faye, Guillaume Rioland, Ctr. National d'Études Spatiales (France); Riccardo Rampini, Orcun Ergincan, European Space Research and Technology Ctr. (Netherlands)

[Add To My Schedule](#) **Mars 2020 sample cleanliness molecular transport model**

Paper 10748-9

Time: 1:20 PM - 1:40 PM

Author(s): Ira Katz, Jet Propulsion Lab. (United States); Mark S. Anderson, Lauren M. White, Paul A. Boeder, Jet Propulsion Lab. (United States), Caltech (United States); William A. Hoey, Jet Propulsion Lab. (United States)


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Europa Ultraviolet Spectrograph: contamination transport modeling to predict mission performance

Paper 10748-10

Time: 1:40 PM - 2:00 PM

Author(s): Genevieve Devaud, Russell B. Schweickart, Ball Aerospace (United States); Brandon Walther, Michael W. Davis, Ujjwal Raut, G. Randall Gladstone, Kurt Retherford, Southwest Research Institute (United States)


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Determination of desorption activation energies for contaminant species

Paper 10748-11

Time: 2:00 PM - 2:20 PM

Author(s): Addison Everett, Genevieve Devaud, Colton Moore, Mark Crowder, Ball Aerospace (United States)

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Session 4: Contamination Control Methods and Measurements I

Monday 20 August 2018

2:20 PM - 3:20 PM

Location: Conv. Ctr. Room 26B


Session Chair: [Bruce A. Matheson](#), Ball Aerospace (United States)

Implications of new stringent requirements for contamination control

Paper 10748-12

Time: 2:20 PM - 2:40 PM

Author(s): John R. Anderson, Ned Ferraro, NASA Jet Propulsion Laboratory (United States)


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Preliminary testing of NASA's Molecular Adsorber Coating technology for future missions to Mars

Paper 10748-13

Time: 2:40 PM - 3:00 PM

Author(s): Nithin S. Abraham, Doris E. Jallice, NASA Goddard Space Flight Ctr. (United States)


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Using NASA's Molecular Adsorber Coating technology during thermal vacuum testing to protect critical laser flight optics on the ATLAS instrument

Paper 10748-14

Time: 3:00 PM - 3:20 PM

Author(s): Nithin S. Abraham, Doris E. Jallice, NASA Goddard Space Flight Ctr. (United States)

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Coffee Break 3:20 PM - 3:50 PM

Session 5: Space Systems Contamination Control Methods and Measurements: James Webb Space Telescope

Monday 20 August 2018

3:50 PM - 4:50 PM

Location: Conv. Ctr. Room 26B


Session Chair: [Eve M. Wooldridge](#), NASA Goddard Space Flight Ctr. (United States)

Optical cleaning to remove particles for JWST mirror surfaces

Paper 10748-15

Time: 3:50 PM - 4:10 PM

Author(s): Lynette D. Lobmeyer, Larkin Carey, Ball Aerospace (United States)


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The James Webb Space Telescope: contamination control and materials

Paper 10748-16

Time: 4:10 PM - 4:30 PM

Author(s): Elaine Maria Stewart, NASA Goddard Space Flight Ctr. (United States)


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James Webb Space Telescope primary and secondary mirror segment assembly cleaning: a quantitative assessment

Paper 10748-17

Time: 4:30 PM - 4:50 PM

Author(s): Alan C. Abee, SGT, Inc./KBRwyle (United States); Yingrui Huang, Sierra Lobo, Inc. (United States)

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Session 6: Laser Systems Contamination and Effects

Monday 20 August 2018

4:50 PM - 5:50 PM

Location: Conv. Ctr. Room 26B


Session Chair: [Paul A. Boeder](#), Jet Propulsion Lab. (United States)

Contamination-driven laser-induced damage model at the National Ignition Facility

Paper 10748-18

Time: 4:50 PM - 5:10 PM

Author(s): Zhi M. Liao, Rajesh Raman, David Cross, W. Carr, Lawrence Livermore National Lab. (United States)

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Generation and effect of particle contamination and the controlling method in final optics system of high-power laser facility (Canceled)

Paper 10748-19

Time: 5:10 PM - 5:30 PM

Author(s):

Session PMon: Posters-Monday

Monday 20 August 2018

5:30 PM - 7:30 PM

Location: Conv. Ctr. Room 20C


Conference attendees are invited to view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines at <http://spie.org/OPPosterGuidelines>.

Online detection of airborne molecular contamination and its influence on the sol-gel coating

Paper 10748-33

Time: 5:30 PM - 7:30 PM

Author(s): Pang Xiangyang, Sun Mingying, Fan Quantang, Xiong Huai, Wang Congyu, Liu zhigang, Shanghai Institute of Optics and Fine Mechanics (China)


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Effects of vacuum on photocatalytic activity of TiO₂

Paper 10748-34

Time: 5:30 PM - 7:30 PM

Author(s): Naoki Shimosako, Toshiya Egashira, Kosuke Yoshino, Sophia Univ. (Japan); Kazunori Shimazaki, Eiji Miyazaki, Japan Aerospace Exploration Agency (Japan); Hiroshi Sakama, Sophia Univ. (Japan)


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Planetary protection control during the development of IRS/SuperCam instrument for MARS2020

Paper 10748-35

Time: 5:30 PM - 7:30 PM

Author(s): Marion Bonafous, Jérôme Parisot, Observatoire de Paris à Meudon (France), Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Jean-Michel Réess, Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France), Observatoire de Paris (France); Pernelle Bernardi, Observatoire de Paris à Meudon (France), Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France); Didier Zeganadin, Observatoire de Paris (France), Lab. d'Etudes Spatiales et d'Instrumentation en Astrophysique (France)

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TUESDAY 21 AUGUST

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Session 7: Space Systems Contamination Analysis and Modeling II

Tuesday 21 August 2018

9:00 AM - 10:20 AM

Location: Conv. Ctr. Room 26B


Session Chair: Eleazar Lontoc, Boeing Satellite Systems International, Inc. (United States)

Improved chemical identification during materials outgassing tests

Paper 10748-21

Time: 9:00 AM - 9:20 AM

Author(s): Robert M. Moision, The Aerospace Corp. (United States)

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Particulate contamination considerations during launch ascent

(Canceled)

Paper 10748-22

Time: 9:20 AM - 9:40 AM


Author(s):

Modeling maximum pressure differences across honeycomb panel face sheets during launch depressurization

Paper 10748-23

Time: 9:40 AM - 10:00 AM

Author(s): Russell B. Schweickart, Genevieve Devaud, Ball Aerospace (United States)


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Contamination modeling using the OpenFOAM open source software package

Paper 10748-24

Time: 10:00 AM - 10:20 AM

Author(s): Chung M. Wong, Northrop Grumman Corp. (United States)

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Coffee Break 10:20 AM - 10:50 AM

Session 8: Contamination Control Methods and Measurements II

Tuesday 21 August 2018

10:50 AM - 12:10 PM

Location: Conv. Ctr. Room 26B

Session Chair: [Matthew Macias](#), Northrop Grumman Aerospace Systems (United States)

Preliminary results of the far-field contamination plume from a 2-grid RF ion thruster

(Canceled)

Paper 10748-25

Time: 10:50 AM - 11:10 AM

Author(s):

Validation of the effective medium approximation on mixed contaminant films of molybdenum and RTV

(Canceled)

Paper 10748-26

Time: 11:10 AM - 11:30 AM


Author(s):

Analysis of spacecraft contaminants with portable Raman spectroscopy

Paper 10748-27

Time: 11:30 AM - 11:50 AM

Author(s): Elaine Seasley, Gugu Rutherford, NASA Langley Research Ctr. (United States); Walter Wigglesworth, Wyzkyds Consulting, LLC (United States)


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ExoMars 2020 MOMA gas chromatograph mass spectrometer instrument background and its implications

Paper 10748-36

Time: 11:50 AM - 12:10 PM

Author(s): John S. Canham, Northrop Grumman Innovation Systems (United States)

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Lunch/Exhibition Break 12:10 PM - 1:30 PM

Session 9: Contamination Control Methods and Measurements III

Tuesday 21 August 2018

1:30 PM - 3:10 PM

Location: Conv. Ctr. Room 26B


Session Chair: [Nithin S. Abraham](#), NASA Goddard Space Flight Ctr. (United States)

Witness monitoring program with portable Raman spectroscopy for detecting molecular contamination

Paper 10748-28

Time: 1:30 PM - 1:50 PM

Author(s): Gugu Rutherford, Elaine Seasly, Mark Thornblom, NASA Langley Research Ctr. (United States); Bo Xiao, Messaoud Bahoura, Norfolk State Univ. (United States)


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Development and implementation of aseptic operations to meet planetary protection requirements on the MOMA-mass spectrometer

Paper 10748-29

Time: 1:50 PM - 2:10 PM

Author(s): Erin N. Lalime, SGT, Inc. (United States); John S. Canham, Orbital ATK (United States); Radford L. Perry, NASA Goddard Space Flight Ctr. (United States)

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Fall-out predictions are not 100% full proof: variables that affect particle fall-out predictions

(Canceled)

Paper 10748-30

Time: 2:10 PM - 2:30 PM


Author(s):

Considerations of manufacturing tooling aids and materials interactions on system-level contamination

Paper 10748-31

Time: 2:30 PM - 2:50 PM

Author(s): Nancy J. Armstrong, Carlyn A. Smith, Harris Corp. (United States)


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Research on the cleanliness control of the main magnification system without window glasses

Paper 10748-32

Time: 2:50 PM - 3:10 PM

Author(s): Yangshuai Li, Bingyan Wang, Panzheng Zhang, Zhiyuan Ren, Zhigang Liu, Shenlei Zhou, Shanghai Institute of Optics and Fine Mechanics (China); Weixin Ma, Jian Zhu, Shanghai Institute of Laser Plasma (China); Jianqiang Zhu, Shanghai Institute of Optics and Fine Mechanics (China)

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Coffee Break 3:10 PM - 3:40 PM

Panel Discussion on Contamination Control: Identifying Areas for High Priority Near-Term Development

Tuesday 21 August 2018

3:40 PM - 5:30 PM

Location: Conv. Ctr. Room 26B

Moderators:

Carlos E. Soares, Jet Propulsion Lab. (United States)

Eve M. Wooldridge, NASA Goddard Space Flight Ctr. (United States)

Panelists:

Jeffrey W. Garrett, Outgassing Services International (United States)

Elaine Seasly, NASA Langley Research Ctr. (United States)

Jean-Francois Roussel, ONERA (France)

Alvin Y. Huang, The Boeing Co. (United States)

Bruce A. Matheson, Ball Aerospace (United States)

This discussion will be designed to foster communication and collaboration in the Contamination Control Community to intentionally advance the highest priority topics, such as materials outgassing rate testing and modeling and challenges related to materials outgassing characterization for highly sensitive missions, radiation effects on outgassing, as well as plume-induced contamination measurements and engineering model development.

Optomechanical/Instrument Technical Group Event

Tuesday 21 August 2018

8:00 PM - 10:00 PM

Location: Marriott Marquis, Palomar

This is the annual meeting of the premier group of optomechanical engineers that design and analyze the world's optical instruments and systems. The featured speaker will be Kent Weed, Director of Engineering of II-VI Optical Systems. His subject will be the design and testing of a high-performance secondary mirror focus mechanism which is intended for the CAESAR Space Mission which is part of NASA's New Frontiers programs. Following Kent, the floor will be open for other agenda items and a workshop session. Anyone who wishes to put an item on the agenda should contact Al Hatheway at aeh@aeihinc.com.