

# **Space Operations and Support**

Papers Presented at the AIAA SciTech Forum and Exposition  
2021

Online  
11-15 & 19-21 January 2021

ISBN: 978-1-7138-2638-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

The contents of this work are copyrighted and additional reproduction in whole or in part are expressly prohibited without the prior written permission of the Publisher or copyright holder. The resale of the entire proceeding as received from CURRAN is permitted.

For reprint permission, please contact AIAA's Business Manager, Technical Papers. Contact by phone at 703-264-7500; fax at 703-264-7551 or by mail at 34922 Uvptkug'Xcmg{'Ftkxg.'Uwkg'422, Reston, VA 20191, USA.

# TABLE OF CONTENTS

## **SPACE OPERATIONS AND SUPPORT I**

ROBOTIC SMALL SAT SERVICING: A NEXT GENERATION SERVICING ARCHITECTURE INCORPORATING ADVANCED ROBOTICS .....	1
<i>Atif M. Qureshi, John Lymer, Sean Dougherty</i>	

ELECTROMAGNETIC ACTUATION FOR NON-CONTACT, PROPELLANT-FREE, SIX- DEGREE-OF-FREEDOM RELATIVE MOBILITY .....	21
<i>Katherine T. Wilson, Mason A. Peck</i>	

AUTONOMOUS SATELLITE RENDEZVOUS AND PROXIMITY OPERATIONS VIA GEOMETRIC CONTROL METHODS.....	37
<i>Alexander A. Soderlund, Sean Phillips, Anonto Zaman, Christopher D. Petersen</i>	

## **SPACE OPERATIONS AND SUPPORT II**

MANEUVER PLANNING STRATEGY FOR RAPID RESPONSE SOLAR SAIL SATELLITE CONCEPT.....	50
<i>Halis C. Polat, Ozan Tekinalp</i>	

INERTIAL TRANSFER CONCEPT FOR AUTONOMOUS IN-SPACE ASSEMBLY .....	67
<i>Benjamin Hargis, Walter Waltz, Sherif Shazley, William R. Doggett, B. D. Allen</i>	

A CASE STUDY ON AUCTION-BASED TASK ALLOCATION ALGORITHMS IN MULTI- SATELLITE SYSTEMS .....	73
<i>Sean Phillips, Fernando Parra</i>	

## **Author Index**