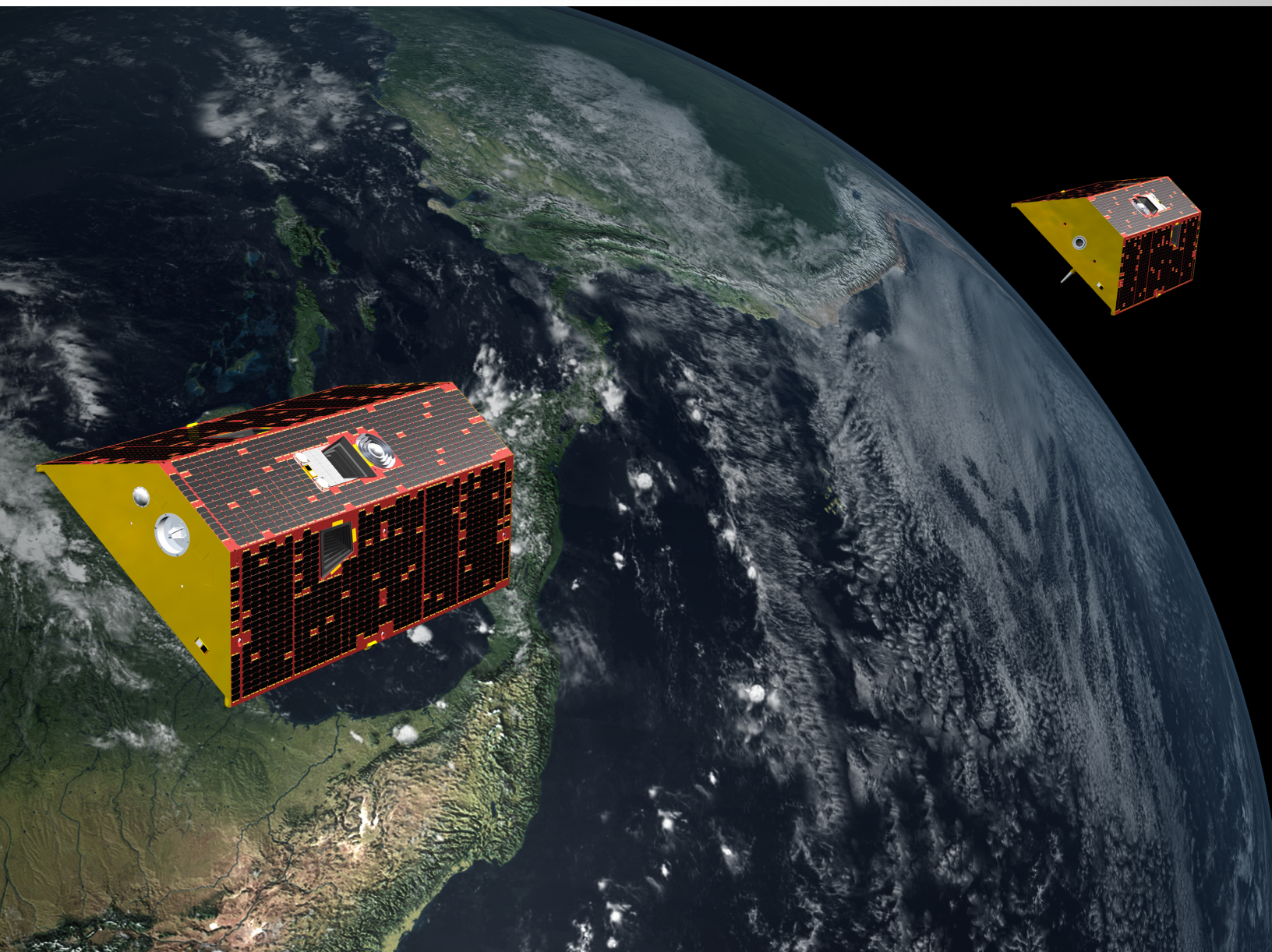


2018 AAS/AIAA Astrodynamics Specialist Conference

August 19-23
Snowbird, UT



AAS General Chair
Dr. Belinda Marchand
Progalaxia, LLC

AAS Technical Chair
Dr. Puneet Singla
The Pennsylvania State University

AIAA General Chair
Dr. Brandon A. Jones
The University of Texas at Austin

AIAA Technical Chair
Dr. Ryan Weisman
Air Force Research Laboratory

07/17/2018

2018 AAS/AIAA ASTRODYNAMICS SPECIALIST CONFERENCE

CONFERENCE INFORMATION

GENERAL INFORMATION

Welcome to the 2018 Astrodynamics Specialist Conference, hosted by the American Astronautical Society (AAS) and co-hosted by the American Institute of Aeronautics and Astronautics (AIAA), August 19 – 23, 2018. This meeting is organized by the AAS Space Flight Mechanics Committee and the AIAA Astrodynamics Technical Committee, and held at The Cliff Lodge, 9320 Cliff Lodge Dr., Snowbird, UT 84092, (801)-933-2222, <https://www.snowbird.com/lodging/the-cliff-lodge/>.

REGISTRATION

Registration Site (<https://www.xcdsystem.com/aas/attendee/index.cfm?ID=cOgRz2U>)

In order to encourage early registration, we have implemented the following conference registration rate structure: **Register by June 30, 2018 and save \$70!**

Category	Early Registration (through Jun 30, 2018)	Registration (beginning Jul 1, 2018)	Walk-up Registration (beginning Jul 26, 2018)
Full - AAS or AIAA Member	\$590	\$660	\$760
Full - Non-member	\$690	\$695	\$795
Retired (Member) or Student*	\$200	\$270	\$370
Retired - Non-member	\$300	\$370	\$470

**does not include proceedings CD*

Refunds will be issued in full until July 24, 2018. A 10% fee will be assessed for all refunds issued after that date and until 8:00 am PST August 18, 2018. No refunds will be issued after 8:00 am PST August 18, 2018.

One ticket to The Summit at Snowbird on Tuesday evening is included with every registration. This includes dinner at the top of the mountain and the tram. Guest tickets for the event may be purchased for \$70 per person. More information about the offsite event is included below.

All registrants and guests are invited to the welcome reception on Sunday evening for food and drinks.

A conference registration and check-in table will be located in the Front Desk Lobby of the Cliff Lodge and will be staffed according to the following schedule:

- Sunday August 19: 3pm – 6pm
- Monday August 20: 7:30am – 2pm
- Tuesday August 21: 8am – 2pm
- Wednesday August 22: 8am – 2pm
- Thursday August 23: 8am – 10 am

We will accept registration and payment on-site for those who have not pre-registered online, but we strongly recommend online registration before the conference in order to avoid delays (see URL above). Pre-registration also gives you free access to pre-print technical papers. On-site payment by credit card will be only through the AAS website using a computer at the registration table. Any checks should be made payable to the “**American Astronautical Society.**”

Cover image of the GRACE Follow-On mission is courtesy of NASA.

SCHEDULE OF EVENTS

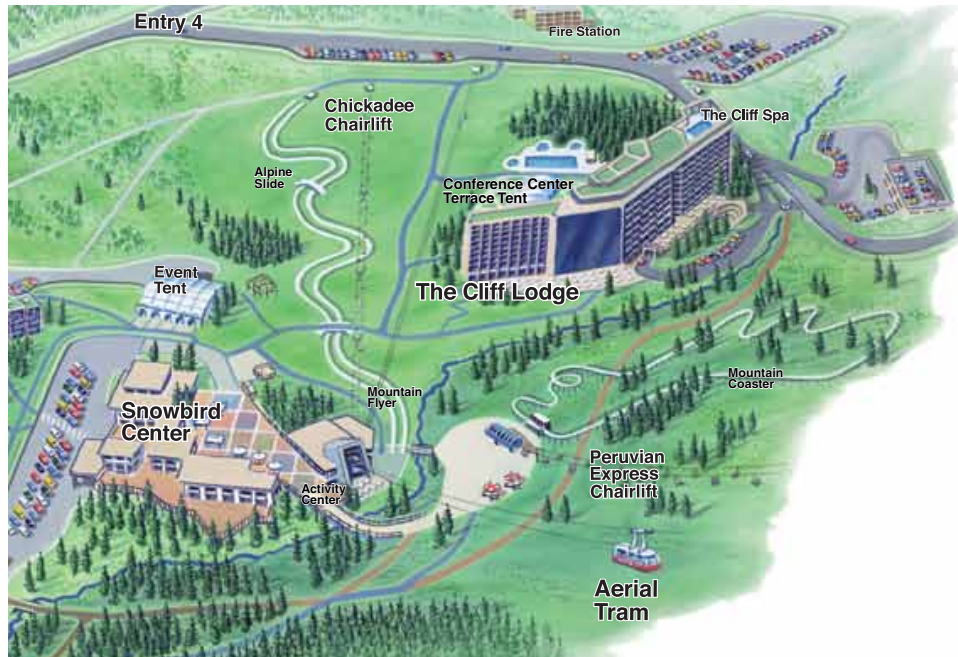
Technical sessions begin on Monday, 20 August, at 8 am. The last technical sessions end at 12:20 pm on Thursday, 23 August. Presentations are limited to 15 minutes with an additional 5 minutes for questions and answers. Each session has a 20-minute morning or afternoon break. Authors are required to be in their session room 30 minutes prior to the start of their sessions. No speakers' breakfast will be served.

Day	Start	End	Function	Room
<i>Sunday 19 August</i>	3pm	6pm	Registration	Front Desk Lobby
	6pm	9pm	Early Bird Reception (Food and Hosted Bar)	Conference Center Terrace
<i>Monday 20 August</i>	7:30am	2pm	Registration	Front Desk Lobby
	8am	12pm	Session 1: Astrodynamics I	Superior A
	8am	12pm	Session 2: Prox. Missions and Formation Flying I	Superior B
	8am	12pm	Session 3: Trajectory Design and Opt. I	Maybird
	8am	12pm	Session 4: Space Situational Awareness I	Cirque
	10am	10:20am	Morning Break	Atrium Patio
	Noon	1:30pm	Joint Technical Committee Lunch	Aerie Private Dining Room
	1:30pm	5:30pm	Session 5: Attitude Dynamics & Control I	Superior B
	1:30pm	5:30pm	Session 6: Spacecraft GNC I	Superior A
	1:30pm	5:30pm	Session 7: Asteroid & Non-Earth Orb. Missions I	Maybird
	1:30pm	5:30pm	Session 8: Orbital Debris	Cirque
	3:10pm	3:30pm	Afternoon Break	Atrium Patio
	5:30pm	6:30pm	Cocktail Reception	Conference Center Terrace
	6:30pm	8:30pm	Dirk Brouwer Award Plenary and Breakwell Student Travel Award Presentation	Ballroom 1

Day	Start	End	Function	Room
Tuesday <i>21 August</i>	8am	2pm	Registration	Lobby
	8am	12pm	Session 9: Astrodynamics II	Superior A
	8am	12pm	Session 10: Trajectory Design and Optimization II	Maybird
	8am	12pm	Session 11: Attitude Dynamics & Control II	Superior B
	8am	12pm	Session 12: Space Situational Awareness II	Cirque
	10am	10:20am	Morning Break	Atrium Patio
	Noon	1:30pm	AIAA Technical Committee Lunch	Aerie Private Dining Room
	1:30pm	5:30pm	Session 13: Prox. Missions and Formation Flying II	Superior B
	1:30pm	5:30pm	Session 14: Orbit Determination	Superior A
	1:30pm	5:30pm	Session 15: Trajectory Design and Optimization III	Maybird
	1:30pm	5:30pm	Session 16: Spacecraft GNC II	Cirque
	3:10pm	3:30pm	Afternoon Break	Atrium Patio
	6pm	9pm	Offsite Event: The Summit (tram to mountain top)	Summit
	8am	2pm	Registration	Front Desk Lobby
Wednesday <i>22 August</i>	8am	12pm	Session 17: Astrodynamics III	Superior A
	8am	12pm	Session 18: Asteroid & Non-Earth Orb. Missions II	Cirque
	8am	12pm	Session 19: Trajectory Design and Optimization IV	Maybird
	8am	12pm	Session 20: Spacecraft GNC III	Superior B
	10am	10:20am	Morning Break	Atrium Patio
	Noon	1:30pm	AAS Technical Committee Lunch	Aerie Private Dining Room
	1:30pm	4:30pm	Session 21: Space Situational Awareness III	Cirque

Day	Start	End	Function	Room
<i>Wednesday 22 August</i>	1:30pm	4:30pm	Session 22: Attitude Dynamics & Control III	Superior B
	1:30pm	4:30pm	Session 23: Special Session – Mission Design for Spacecraft in Near Rectilinear Halo Orbits	Maybird
	3:30pm	3:50pm	Afternoon Break	Atrium Patio
	4:30pm	6:30pm	Town Hall Meeting: Astrodynamics Research Funding	Superior A
	6:00pm	7:00pm	Conference Administration Subcommittee	Cirque
	6:00pm	7:00pm	Technical Administration Subcommittee	Maybird
	6:00pm	7:00pm	Website Administration Subcommittee	Superior B
<i>Thursday 23 August</i>	8am	12noon	Registration	Front Desk Lobby
	8am	12:00pm	Session 24: Trajectory Design and Optimization V	Maybird
	8am	12:00pm	Session 25: Space Situational Awareness IV	Cirque
	8am	12:00pm	Session 26: Astrodynamics IV	Superior A
	10am	10:20am	Morning Break	Atrium Patio

A map of the Cliff Lodge and the relevant meeting rooms appears on the next page.



The Cliff Lodge: Lobby Level

AAS Meeting Rooms:

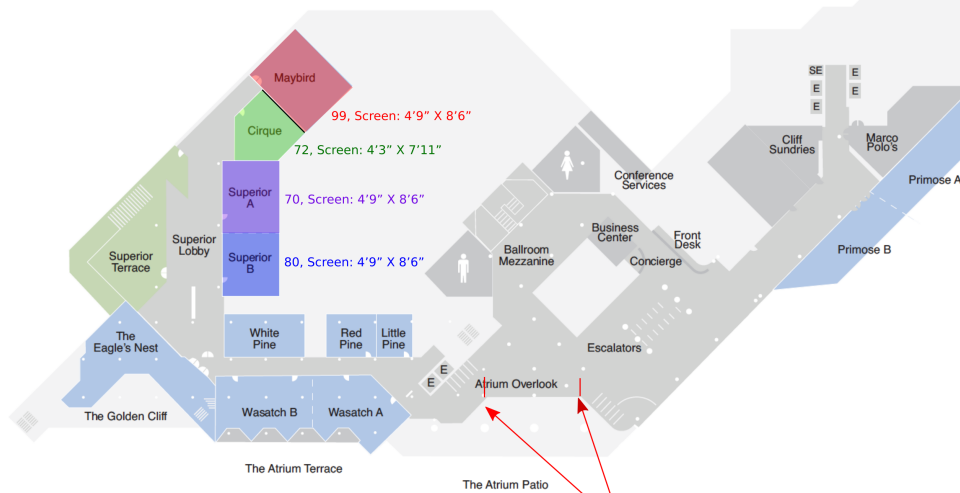
Maybird

Cirque

Superior A

Superior B

} Theater style seating



Registration area

SPECIAL EVENTS

EARLY BIRD RECEPTION

Sunday, 19 August 6:00 – 9:00 pm

Location: Conference Center Terrace

Buffet Menu

TBD

DIRK BROUWER AWARD PLENARY AND BREAKWELL TRAVEL AWARD PRESENTATION:

Monday, 20 August 5:30 – 6:30 pm (Awards Reception)
6:30 – 8:30 pm (Ceremony and Lecture)

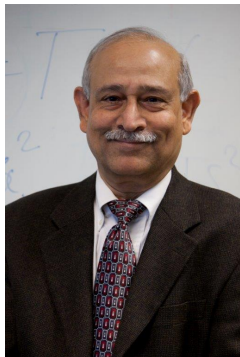
Location: Conference Center Terrace (Awards Reception)
Ballroom 1 (Ceremony and Lecture)

There will also be a presentation for new AAS Fellow, Dr. Bobby Braun.

Fifty Years of Tethered Space Systems

The feasibility of using tethered systems in space was first demonstrated in September 1966 when Gemini XI was connected by a tether to the Agena Target Vehicle. Since then many tethered space systems have flown with various mission objectives. Tethered satellites have been proposed for scores of applications such as upper atmospheric studies, electrodynamic propulsion, creation of artificial gravity, formation flying, debris removal, etc. These proposals have led to many interesting problems in astrodynamics. Some of these problems will be discussed in the talk. Some of the recent tethered satellite missions as well as the ones to be launched in the near-term will be described.

Dirk Brouwer Award Honoree



Dr. Arun K. Misra is the Thomas Workman Professor in the Department of Mechanical Engineering at McGill University in Montreal, Canada. His research interests lie in the areas of dynamics and control of tethered satellites, large space structures, formation flight and space robotics. Dr. Misra is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA) as well as of the American Astronautical Society (AAS). He has been elected to the International Academy of Astronautics and to the Canadian Academy of Engineering.

THE SUMMIT AT SNOWBIRD

Tuesday, 16 August 7:00 – 9:00 pm (Plated Dinner)

Location The Summit at Snowbird



The Summit is Snowbird's newest year-round guest facility located atop Hidden Peak at 11,000 feet. Just a few steps from the Aerial Tram, The Summit is accessible for any tram passenger whether on foot, skis, bikes or boards.

All conference registrations will receive an event ticket, which a tram ride to and from the top of the mountain. Tram service will begin at 6pm. Dinner will be served at TBD.

Guest tickets are available for \$70 each on the conference registration site and include the tram ride and dinner.

Conference attendees and guests are required to specify their selected dinner at the time of registration. Options include:

- Herb roasted pork loin, pan juices, warm apple chutney, butternut squash, seasonal vegetables
- Breast of chicken saltimbocca), prosciutto, sage-caper sauce, orecchiette with broccoli and asiago
- Grilled vegetable kebabs, lemon tahini sauce, braised lentil, and pine nut pilaf

CONFERENCE LOCATION

THE CLIFF LODGE

9320 Cliff Lodge Dr.

Snowbird, UT, 84092

<https://reservations.snowbird.com/>

(801) 933-2222 (voice)

1-800-232-9542 (toll-free)

1-800-453-3000 or 1801-947-8220 (Central reservation office, US callers)

00 800 4400 5511 (Reservations, international)



The Cliff Lodge at Snowbird is one of North America's most iconic ski lodges. The majesty of Little Cottonwood Canyon can be explored from the views each room provides whether facing Snowbird's ski slopes or peering down the glacially carved canyons spilling into the Salt Lake City valley below.

Within walking distance to Snowbird's pedestrian village, The Cliff Lodge offers comfortable lodging for the whole family or group. Other amenities include an exercise room, resort-wide internet service, room service, concierge and a state-licensed daycare facility. Among Snowbird's excellent selection of dining opportunities, The Aerie Restaurant and Lounge and The Atrium are open year-round and provide diverse menus for every palate.

After a day on the mountain, relax at the outdoor pool or The Cliff Spa. Open year-round, a heated swimming pool and three hot tubs are located outdoors on Level 3. Located on the 9th and 10th floors, The Cliff Spa features over 30 treatment and salon services, yoga studio, fitness center, rooftop pool and hot tub.

A room block with the Government Per Diem Rate (\$117/night, \$10 per additional person per night, \$10 per room resort fee) will be held through **July 18, 2018**. Reservations requested after this date will be accepted

based upon availability and subject to the hotel's prevailing rate. We encourage all conference attendees to make your hotel reservation early!

Attendees may register at the personal group web page listed below or they may call the hotel (see voice number above). Please be sure to mention the group code AAS or the group name "American Astronautical Society" when making reservations in order to receive the group rate. Attendees may book rooms at the group rate either on-line or over the phone. Online bookings should use the "Group Code" **2C81OG**. When booking on-line, full payment is required at time of booking. When calling in, a one-night deposit is required at the time of booking. Either method has a 72-hour prior cancellation policy to avoid a one-night fee. Group arrival is August 18, 2018 and Group Departure is August 23, 2018.

Group Reservation Page:

<https://reservations.snowbird.com/>

Cancellations must be made 72 hours in advance of intended arrival.

The required resort fee includes self-parking and internet access.

ARRIVAL INFORMATION

Check-In and Checkout

- Check-in: 4:00 PM
- Check-out: 11:00 AM

Parking

Self-parking is included in the resort fee when staying at the conference hotel.

HOTEL SERVICES AND AMENITIES

- 24-hour Front Desk
- Concierge Service (located at the front desk)
- Room Service
- Wireless high-speed Internet access in all guest suites and public areas
- Fitness center and yoga studio
- In-room coffee
- USA Today
- Business center with first 15 minutes free
- Heated swimming pool
- Hot tub
- Cliff Spa
- Luggage Storage

TRANSPORTATION INFO

The greater Salt Lake City, UT area is served by the Salt Lake City International Airport (SLC). The Snowbird Resort is located roughly 31.9 miles southeast of the Salt Lake City International Airport, approximately 41-minutes one-way. The hotel does not offer a free shuttle to/from the hotel. However, for those not traveling via rental vehicle, there are several at-cost transportation options available. The table below shows a cost comparison across some of those options, though the actual pricing should be verified directly with the appropriate vendor on the dates of travel.

OVERVIEW

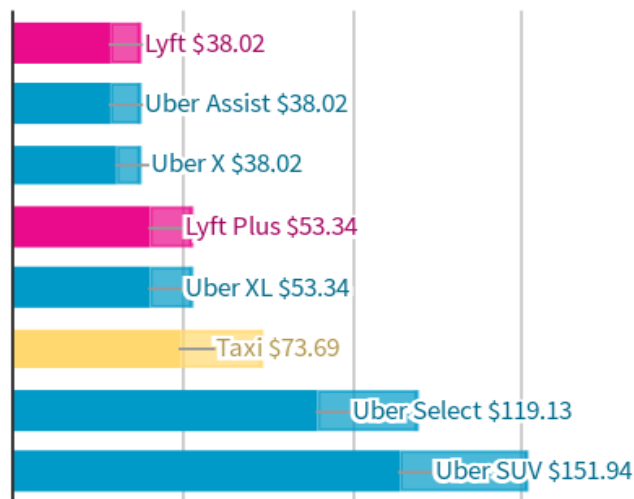


Image Source: <https://ride.guru/>.

A mid-range alternative, in terms of cost, is available through Canyon Transportation, as noted below. This is less expensive than a Taxi but more expensive than Uber or Lyft.

DIRECTIONS FROM AIRPORT

FROM SLC to Snowbird, UT

Take I-80 east to I-215 south. Take Exit 6 (6200 South) and go east on 6200 South, toward the mountains. This road will lead you straight to UT-210 and up Little Cottonwood Canyon to Snowbird.

UBER/LYFT

Uber and Lyft operate between Salt Lake City Airport and The Snowbird Resort. The costs range from the high \$20's to the mid \$30's for UberX and UberXL (see <https://www.uber.com/fare-estimate/>) or \$43 to \$60 with Lyft and Lyft Plus, (see <https://www.lyft.com/fare-estimate/>).

CANYON TRANSPORTATION

Phone: (801) 255-1841

Website: <http://canyontransport.com/>

Canyon transportation, which holds an exclusive contract with Snowbird, offers a reasonably priced shared ride service to/from the resort. Private SUV's and vans are also available. The rates, at the time of this publication, are posted below. A shared ride arrangement costs around \$82 for a round trip, or \$45 one-way. Reservations are **highly recommended**, but you can also visit their desk at the airport and they will do their best to get you to the resort in a timely fashion.

	One Way	Round Trip
Shared Ride		
Adult	\$45	\$82
Children – Under 12	\$28	\$55
Private SUV (1-4 passengers)	\$180	\$360
Private Van (1-5 passengers)	\$225	\$450
Private Van (6 passengers)	\$230	\$460
Private Van (7-8 passengers)	\$255	\$510
Private Mini Coach (1-14 passengers)	\$320	\$640

TAXI

Taxi service between SLC and Snowbird is available. The estimated one-way fare (at the time of publication) is \$75.

AREA ATTRACTIONS

The Cliff Lodge is located at the mountain based in Snowbird, UT. In the summer, the resort offers a variety of activities for families (aerial tram, mountain coaster, ropes course, etc.) and more adventurous adults (vertical drop, mountain biking). Details on these activities and more, including how to make reservations where required, may be found at <http://www.snowbird.com>.

SNOWBIRD OKTOBERFEST

Snowbird is holding its annual Oktoberfest Aug. 18-Oct. 21. This event is held Sat.-Sun., 12noon-6:30pm every weekend during that time, and admission is free. Early arrivals may sample a variety of beers from American pale ales to stouts made with a wide variety of hops and brew methods. This annual festival was voted one of America's 10 Best Oktoberfests by Men's Journal Magazine. More details on the event may be found at <https://www.snowbird.com/oktoberfest/>.

SNOWBIRD CENTER

The Snowbird Center, which is within walking distance of The Cliff Lodge, offers a variety of dining, nightlife, and shopping venues. A map of the center may be found at:

https://www.snowbird.com/uploaded/meetings-pdfs/snowbird_villagemap.pdf

ADDITIONAL INFORMATION

SPEAKER ORIENTATION

Authors should have submitted a brief (approximately 50 words or 3 sentences) speaker's bio with their abstract submission. Author presentations (preferably in PDF format) will be submitted through a web-based system and are due by **Friday August 17th, 2018, 23:59:59 Eastern Time**. Authors are required to maintain close correspondence with your Session chair regarding the presentations of your manuscript. Please be in the session room 30 minutes prior to the start of their sessions. No speakers' breakfast will be served.

Authors are reminded that the deadline to upload pre-prints to the <https://www.xcdsystem.com/aas/> website is before **August 10, 2018, 23:59:59 Eastern Time**.

VOLUNTEERS

Volunteers that would like to staff the registration table may sign up at the registration table.

PRESENTATIONS

Each presentation is limited to 15 minutes. An additional five minutes is allotted between presentations for audience participation and transition. Session chairs shall maintain the posted schedule to allow attendees the option of joining a parallel session. Each room is equipped with a laser pointer, an electrical outlet, and a video projector that can be driven by a computer. Presenters shall coordinate with their Session Chairs regarding the computing equipment, software, and media requirements for the session; however, *each presenter is ultimately responsible for having the necessary computer and software available to drive the presentation*. Microsoft PowerPoint and PDF are the most common formats.

"NO-PAPER, NO-PODIUM" POLICY

Completed manuscripts shall be electronically uploaded to the submission site before the conference, limited to 20 pages in length, and conform to the AAS conference paper format. If the completed manuscript is not contributed on time, it will not be presented at the conference. If there is no conference presentation by an author, the contributed manuscript shall be withdrawn.

Each author also acknowledges that he or she is releasing technical information to the general public and that respective papers and presentations have been cleared for public release. If any author of a paper is a US person (citizen or permanent resident), he or she acknowledges that the release of these data and content of the paper and presentation conforms to ITAR and are not on the USML. The information contained in these documents is neither classified, SBU, FOUO, nor proprietary to any sponsoring organization.

PRE-PRINTED MANUSCRIPTS

Physical copies of preprinted manuscripts are no longer available or required for the Space Flight Mechanics Meetings or the Astrodynamics Specialist Conferences. Electronic preprints are available for download at least 72 hours before the conference at <https://www.xcdsystem.com/aas/> for registrants who use the online registration system. The hotel provides conference guests with complimentary wireless internet access in guest rooms and the conference meeting space. Registrants without an internet-capable portable computer, or those desiring traditional paper copies should download and print preprint manuscripts before arriving at the conference.

CONFERENCE PROCEEDINGS

All full registrants will receive a CD of the proceedings mailed to them after the conference (extra copies are available for \$60 during the conference). However, the hardbound volume of *Advances in the Astronautical Sciences* covering this conference will be available to attendees at a reduced pre-publication cost, if ordered at the registration desk. After the conference, the hardbound proceedings will more than double in price, although authors will still receive a special 50% discount off the post-conference rate even if they delay their order until after the conference. Cost of Proceedings:

- Conference Rate \$290 domestic (\$380 international)
- Post-Conference Rate \$600 (approx.)
- Authors (post-conference) \$300 (approx.)

Although the availability of hardcopy proceedings enhances the longevity of your work and elevates the importance of your conference contribution, please note that conference proceedings are not considered an archival publication. Authors are encouraged to submit their manuscripts after the meeting to one of the relevant journals, such as:

Journal of the Astronautical Sciences
Editor-in-Chief: Kathleen C. Howell
School of Aeronautics and Astronautics
3233 Armstrong Hall
Purdue University
West Lafayette, IN 47907
(765) 494-5786
howell@purdue.edu

Journal of Guidance, Control and Dynamics
Editor-in-Chief: Dr. Ping Lu, Iowa State University
Manuscripts can be submitted via: <https://mc.manuscriptcentral.com/aiaa>

Journal of Spacecraft and Rockets
Editor-in-Chief: Dr. Robert D. Braun, Georgia Institute of Technology
Manuscripts can be submitted via: <https://mc.manuscriptcentral.com/aiaa>

SATISFACTION SURVEY

Registrants are highly encouraged to record their level of satisfaction and conference preferences in an anonymous survey taken throughout the time of the conference. Please return the survey form given to you when you check in at the registration table to the registration table before departing from the conference.

COMMITTEE MEETINGS

Committee seating is limited to committee members and invited guests. Committee and subcommittee meetings will be held according to the schedule at the beginning of the program.

DRAFT