I P P W - 2 0 2 2

19th International Planetary Probe Workshop

Santa Clara, Silicon Valley
08.29-09.02.2022

AEDL Short Course
08.27-.8.28.2022

NASA

ANALYTICAL MECHANICS ASSOCIATES

www.ippw2022.org

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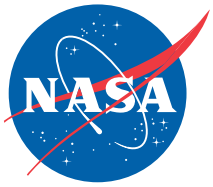
IPPW-2022 is grateful to the following sponsors for their support,
which helped make this Workshop a reality:



Since 1962, AMA has worked with government and commercial organizations solving the toughest engineering, science and business problems. As a customer focused company, we take pride in the relationships we have built during our 60 year history. We are especially proud of our work supporting NASA's missions: past, present and future. We are grateful to our clients for allowing us to be part of their mission, as true partners.

Neerim Corp has provided systems engineering services to government and industry for more than a decade. It is devoted to improving the technology and product development performance of its clients. Our vehicle projects have focused on atmospheric entry at Earth and other planets, with support provided throughout development to protoflight. Recent technology projects have focused on thermal protection materials, and maturing them from concept to flight readiness. In addition to spacecraft projects, Neerim has worked on autonomous aircraft that have achieved commercial success.

CFD Research Corporation specializes in engineering simulations, advanced prototypes, and innovative designs for aerospace, defense, life sciences, materials, energy, and other industries. Using our software and experimental capabilities, we develop new hardware concepts, innovative designs, and superior solutions.

The Georgia Institute of Technology is pleased to help support students who contribute to the missions and science of the International Planetary Probe Workshop (IPPW).

University of Colorado
Boulder

The University of Colorado Boulder has created an environment in which our aerospace engineering and Earth and space sciences faculty, students, and industrial researchers work together to solve complex problems, envisioning and creating the future for space and Earth systems. Home to the Smead Dept. of Aerospace Engineering Science, Laboratory for Atmospheric and Space Physics (LASP), the Cooperative Institute for Research in Environmental Sciences (CIRES), and other 20+ other related units, CU Boulder conducts more than $120M in aerospace-related research annually and is consistently the #1 public university recipient of NASA research funding.

IPPW-2022 Welcome

Welcome to Santa Clara, California and the 19th meeting of the International Planetary Probe Workshop, hosted this year by Analytical Mechanics Associates, Inc. This year's event brings us to the Silicon Valley, a global hub for technology and innovation and also the home of NASA Ames Research Center, located in nearby Mountain View. Each year, IPPW brings together a diverse group of scientists, engineers, technologists, and policy makers from around the world. After holding the workshop as a virtual event the past two years, we are pleased to conduct this year's workshop once again in person.

IPPW-2022 offers a varied program, with keynote addresses and technical presentations, along with many opportunities for networking. Per IPPW tradition, the Workshop was preceded this year by a weekend Short Course, "Introduction to Aerocapture, Entry, Descent, and Landing (AEDL)". Additionally, we solicited and evaluated nominees for the Al Seiff Memorial Award, an annual award recognizing and honoring an individual for their outstanding career contributions to IPPW disciplines and commitment in mentoring the next generation of solar system explorers. We are pleased to present the 2022 Al Seiff Award to Dr. Ethiraj (Raj) Venkatapathy, from NASA Ames Research Center at this year's IPPW. We are also pleased to also present the 2020 Al Seiff Award, in person, to co-awardees Dr. Ralph Lorenz from Johns Hopkins University Applied Physics Laboratory and Ms. Michelle Munk from NASA Langley Research Center this year.

We received a total of 149 excellent abstracts with 84 oral and 56 poster presentations planned for this year's workshop. We encourage you to engage with the presenters throughout the week. The Program Organizing Committee worked hard to develop and coordinate the outstanding technical program over the five days of this year's IPPW. In order to accommodate the number of presenters and posters in a workshop format, we will have shorter oral presentations within each technical session followed by general Q&A for each speaker. All posters will be highlighted with brief, pitch-style short talks by each poster presenter prior to two separate Poster Sessions on Tuesday and Thursday evenings. There are no parallel sessions at IPPW-2022, allowing you to attend all sessions of interest. After a half-day of presentations on Wednesday morning, the afternoon has been set aside to participate in a variety of tours at nearby NASA Ames Research Center (advance sign-up required).

Since IPPW-2022 is indeed a workshop, we invite you to take advantage of the many opportunities during coffee breaks, lunches, and open evenings to build collaborative partnerships with other workshop participants. We would like to thank our generous IPPW-2022 sponsors, as listed in this

program, for supporting our 19th workshop and for providing funding to support both European and US students who are participating in the workshop as they pursue future careers in planetary probes and exploration. This year, we have awarded nearly 20 student scholarships and have scheduled events with a student focus, including the Student Social on Sunday evening and the Student-Professional Development Luncheon on Tuesday.

On Friday afternoon, September 2nd, a presentation will be shared on the plans for 20th workshop (IPPW-2023), to be hosted by the Institut Origines, des planètes à la vie, Aix-Marseille Université in Marseille, France. We encourage you to attend this talk to learn about your next opportunity to join us at IPPW. In this time of exciting missions, planning for future exploration opportunities at space agencies around the world, with the challenges faced and overcome by so many during the past few years, it is all the more valuable for us to reconnect with our colleagues and celebrate our strong planetary probe community. We encourage you to actively participate, expand your knowledge, and enjoy our 19th International Planetary Probe Workshop.

Let's make it a great week! *Ad astra.*

Ashley Korzun
NASA Langley Research Center
US Chair, IPPW International Organizing Committee

Robert Buchwald
ESA
European Chair, IPPW International Organizing Committee

Bernie Bienstock
Caltech / JPL
Emeritus Chair, IPPW International Organizing Committee

David Cornelius
Analytical Mechanics Associates
Co-Chair, Local Organizing Committee

Aga Goodsell
NASA Ames Research Center
Co-Chair, Local Organizing Committee

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General Information

This program contains all of the organization and programming information you'll need for the 2022 International Planetary Probe Workshop (IPPW-2022), held at the Delta Hotels Marriot, Santa Clara/ Silicon Valley, from August 29-September 2, 2022.

You can also find information on the Short Course on Introduction to Aerocapture, Entry, Descent, and Landing (AEDL), which precedes the workshop on August 27-28, 2022.

VENUE

IPPW-2022 will take place in the Delta Hotels Marriott, located in the heart of Silicon Valley which serves as the global center for high technology and innovation.

In addition to the Short Course and Main Workshop taking place at the Delta Hotels Marriott, there is ample lounging areas within the hotel to work, network, and hold informal meetings.

Delta Hotels Marriot, Santa Clara/Silicon Valley
2151 Laurelwood Road, Santa Clara, CA 9505

MEALS

Please note that lunch is included in your registration for each day of the workshop. The **Student Professional Development Luncheon** will take place on **Tuesday, August 30th** and the **Women's Networking Luncheon** will take place on **Thursday, September 1st.**

We'd like to invite all women, and those who identify as gender minorities, to join us for lunch in the Monterey/Carmel room. This will be an opportunity for the women in our community to meet each other and hang out in a casual setting. Please grab your lunch from the buffet and then head over to the Monterey/Carmel room to spend time with the other women at the conference.

REGISTRATION

The Registration Desk is located outside of the main conference room.

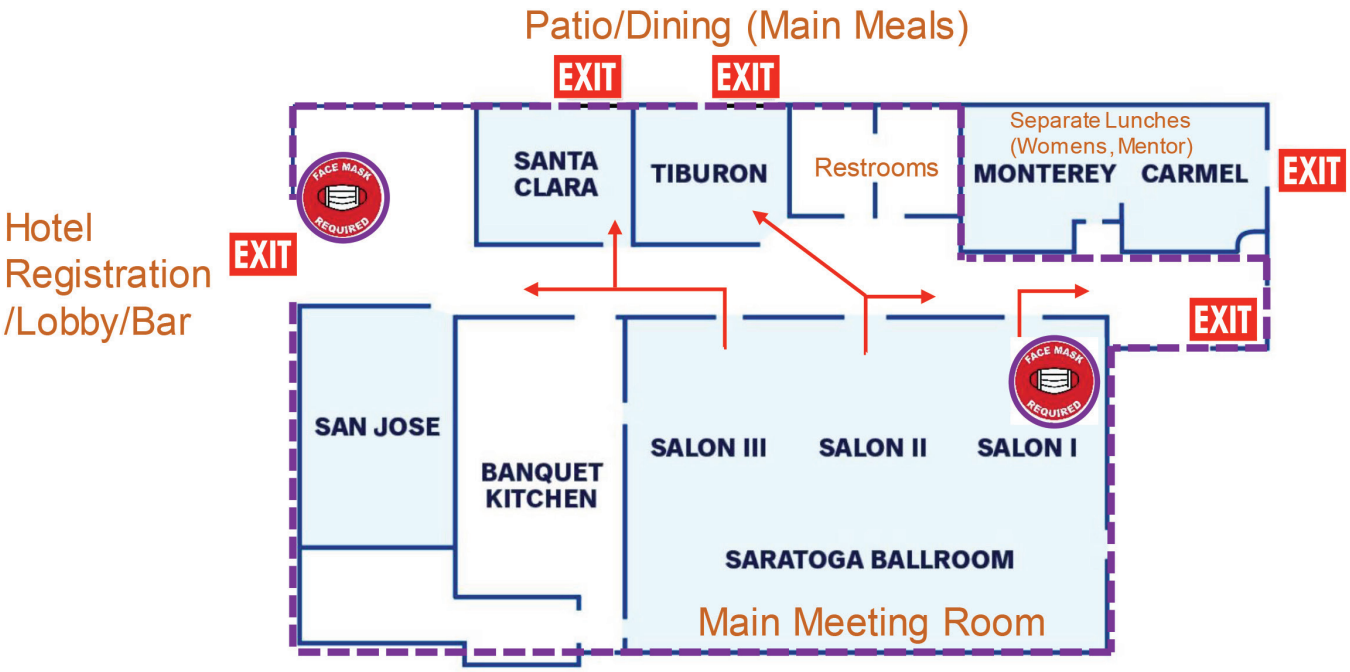
Registration Desk **Operating Hours** are:

Monday, August 29th	**08:00-09:00**
Tuesday, August 30th	**08:00-09:00**
Wednesday, August 31st	**07:30-11:30**
Thursday, September 1st	**08:00-10:00**
Friday, September 2nd	**08:00-10:00**

For registration support outside of these hours or any other questions, please contact LOC POC, **Valerie Escobar, at valerie.a.escobar@nasa.gov**.

DELTA HOTEL MARRIOT

Meeting Space Floor Plan



Short course and Workshop will be held in the Saratoga Ballroom.

Poster sessions will be held in Santa Clara, Tiburon, Monterey, and Carmel rooms.

Welcome to Santa Clara, California

Learn more about Santa Clara and what it has to offer at
https://www.santaclara.org/things-to-do/

Thousands of travelers visit Santa Clara and its many attractions every single year. With everything from fun family attractions and interactive, educational museums to historic sites, a college campus, and the world's most high-tech stadium, Santa Clara covers all the bases.

Whether traveling for business or pleasure or with friends or family, you will be able to enjoy various things to do in Santa Clara. Spend the day riding rollercoasters, watching unique shows, meeting PEANUTS characters, or even floating down a lazy river, in the summer months, at California's Great America.

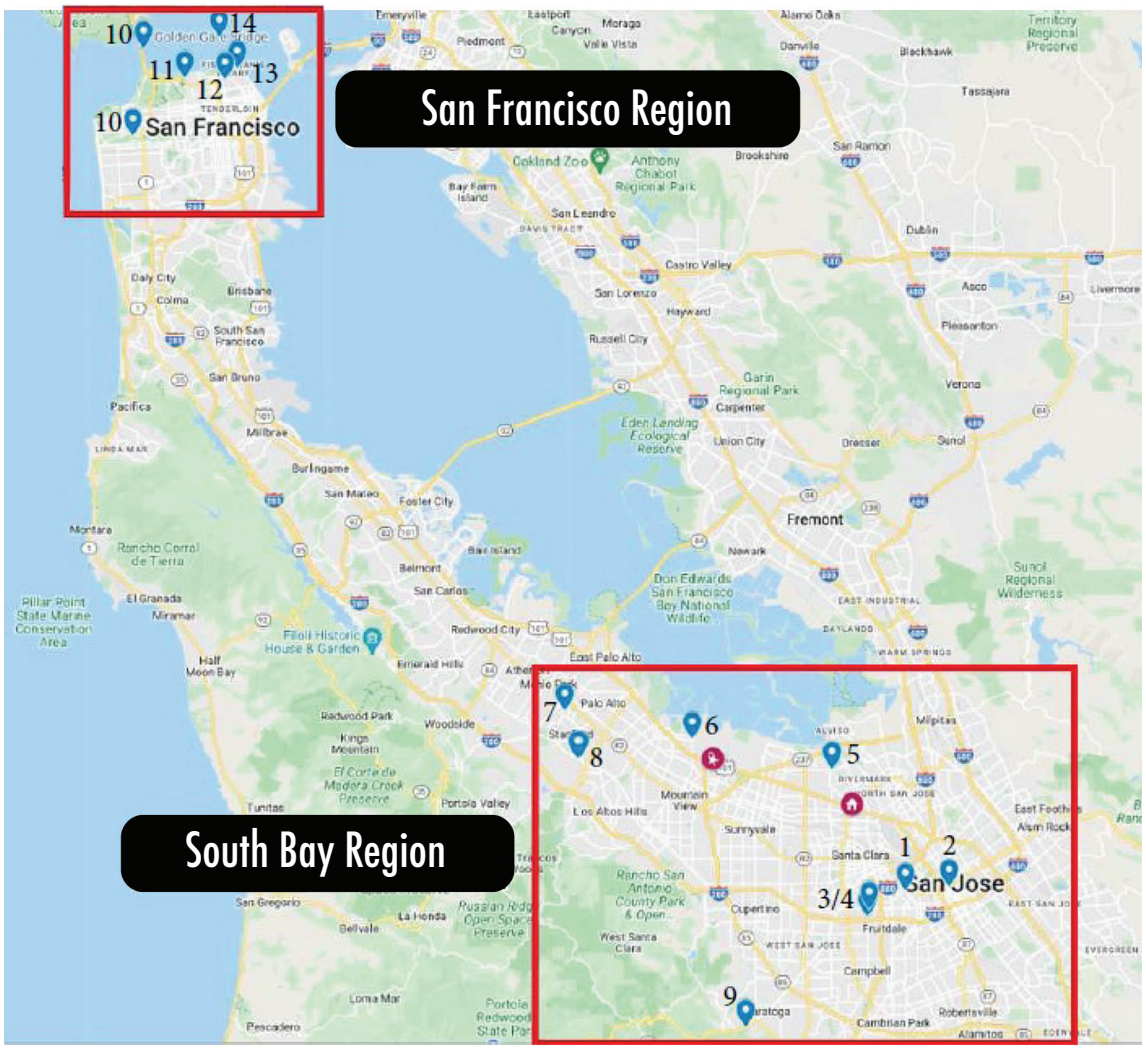
The whole family will enjoy hands-on exhibits at the Intel Museum or see a piece of history at Mission Santa Clara. One of the most popular attractions in Santa Clara is Levi's Stadium. Guests can attend one of the stadium's many exciting events and/or go on a stadium tour.

With so much to see and do, your visit to Santa Clara will be full of fun and memories.

Mission Santa Clara De Asís
500 El Camino Real, Santa Clara, CA

Things To Do Near Santa Clara, California

BAY AREA MAP



1) Rosicrucian Egyptian Museum (14 minutes from hotel)

Rosicrucian Egyptian Museum in San Jose houses the largest collection of Egyptian artifacts on exhibit in western North America. The Rosicrucian Egyptian Museum is home to the largest collection of Egyptian artifacts on exhibit in western North America.

2) The Tech Interactive (Tech Museum) (12 minutes from hotel)

With its splashy, mango-colored exterior, the Tech stands out among everything else in downtown San Jose. Millions have visited since it opened at the original location in 1990, which was around the corner on San Carlos Street. The Tech's founders envisioned a world-class facility wholly devoted to science and technology - exactly what one would expect from Silicon Valley. Today people from across the globe have descended upon San Jose to check out its educational displays.

The Tech is a cosmopolitan museum singularly focused on technology—how it works and the way that it is changing every aspect of the way we work, live, play and learn. Its people-and-technology focus and the integration of advanced technologies into visitor experiences and infrastructure, distinguishes it from other science centers.

The 132,000 square feet of The Tech are shared by four major theme galleries packed full of one-of-a-kind exhibits, the Hackworth IMAX Dome Theater, an educational center for workshops and labs, an upscale cafe, and a retail store featuring books, gifts, and only-in-Silicon Valley items. An estimated 650,000 visitors are expected to trek to The Tech each year, making it one of California's most popular destinations.

3) Santana Row (15 minutes from hotel)

Santana Row is one of the local favorites for premiere shopping and dining. The Row features a vibrant mix of over 50 shops, 30 restaurants, CineArts movie theatre, and the boutique Hotel Valencia. Dining options rang from burgers and Italian to Asian fusion and French. Catch live music and outdoor yoga classes in the outdoor parks and plazas, and enjoy convenient parking all within walking distance.

4) Winchester Mystery House (15 minutes from hotel)

The Winchester Mystery House is an architectural wonder and historic landmark. The house was once the personal residence of Sarah Lockwood Pardee Winchester, the widow of William Wirt Winchester and heiress to a large portion of the Winchester® Repeating Arms fortune. After her husband's death, Mrs. Winchester believed the house was haunted, and to evade spirits, she had to continue to build nonstop. What

remains is the beautiful but bizarre mansion. Construction began in 1884, and didn't stop for 38 years. Tours of the house interior are held daily, and self-guided tours of the garden are open to the public.

5) California's Great America (7 minutes from hotel)

California's Great America is a 112-acre amusement park located in Santa Clara, California. Owned and operated by Cedar Fair, it originally opened in 1976 as one of two parks built by the Marriott Corporation. California's Great America features over 40 rides and attractions, and one of its most notable is Gold Striker, which has been featured as a top-ranked wooden roller coaster in Amusement Today's annual Golden Ticket Awards publication. Other notable rides include RailBlazer, a single-rail coaster from Rocky Mountain Construction, and Flight Deck, an inverted coaster from Bolliger & Mabillard. The park appeared in Beverly Hills Cop III and Getting Even with Dad, two films that were released in 1994.

6) Computer History Museum (10 minutes from hotel)

The Computer History Museum is a museum established in 1996 in Mountain View, California, US. The museum presents stories and artifacts of the information age and explores the computing revolution and its impact on society.

7. Stanford University (20 minutes from hotel)

Stanford University, officially Leland Stanford Junior University,

is a private research university located in the census-designated place of Stanford, California, near the city of Palo Alto. The campus occupies 8,180 acres (3,310 hectares), among the largest in the United States, and enrolls over 17,000 students. Stanford is ranked among the top universities in the world.

8. Stanford Dish Area (Trail) (22 minutes from hotel)

The Dish, also known as the Stanford Dish, is a radio antenna in the Stanford foothills. The 150-foot-diameter (46 m) dish was built in 1961 by the Stanford Research Institute (now SRI International). Located near Stanford and the surrounding communities, the Dish serves many purposes.

Recreation – The Dish is a popular area for hiking and jogging and is open to the public from approximately sunrise to sunset throughout the year. *Academic programs* – The Dish itself is a radio telescope that is still in use. Other research and teaching programs also use the dish area. Univer*sity Support Facilities* – In order to support academic, environment, habitat, and recreational services, support from our facility shops are necessary. Services include maintenance to water storage, pump stations, road maintenance, grounds, and other required facility services. Please yield to service vehicles as they pass. *Environmental Restoration* – Stanford's Conservation Program is directing a program of environmental restoration in the dish area, which includes use of native grasses and other plants. *Habitat Conservation* – Portions of the dish area are devoted to special efforts to enhance habitat for the California tiger salamander, including the development of new breeding ponds.

9) Hakone Gardens (25 minutes from hotel)

Hakone Gardens is an 18-acre traditional Japanese garden in Saratoga, California, United States. A recipient of the Save America's Treasures Award by the National Trust for Historic Preservation, it is recognized as one of the oldest Japanese-style residential gardens in the Western Hemisphere. Notable features include a bamboo garden, a Zen garden, a strolling garden, tea houses, and the Cultural Exchange Center, which is an authentic reproduction of a 19th-century Kyoto tea merchant's house and shop. Parts of the movie, "Memoirs of the Geisha" have been filmed at this location.

10) Golden Gate Park/ Golden Gate Bridge (57 minutes from hotel)

The third most visited park in the United States. While the park is free to visit during the day, popular attractions charge admission, such as deYoung Museum, California Academy of Sciences and Conservatory of Flowers. The park is filled with gardens, museums, art, flowers, trees, lakes, birds and wildlife. There are also plenty of opportunities to participate in sports, clubs and other activities. Browse the site for information on parking, maps,

weddings, hotels, permits, making reservations, transportation, contact numbers, and the history of Golden Gate Park. Be sure to check out the Golden Gate Bridge!

11) Palace of Fine Arts (Near the Golden Gate)
(1 hr 4 minutes from hotel)

The iconic Palace of Fine Arts Exhibition Center provides an astonishing venue for your event that's sure to impress your guests before they even walk in the door. With its Greco-Roman rotunda and colonnades, immaculately planted grounds, lagoon, and super-spacious exhibition center and theater, this San Francisco treasure brings the wow factor to corporate events, private parties, trade shows, conferences, galas, weddings, and more.

12) Lombard Street (1 hr 2 minutes from hotel)

Lombard Street is an east–west street in San Francisco, California that is famous for a steep, one-block section with eight hairpin turns. The famous one-block section, claimed to be "the crookedest street in the world", is located along the eastern segment in the Russian Hill neighborhood. It is a major tourist attraction, receiving around two million visitors per year and up to 17,000 per day on busy summer weekends, as of 2015.

13) Pier 39/ Fisherman's Wharf (1 hr 2 minutes from hotel)

PIER 39 is a 45-acre waterfront complex that is a gathering place for millions of San Francisco locals and visitors. In addition to its 13 full-service restaurants, 90+ shops and popular attractions, PIER 39 is home to a 5-acre waterfront park and a 300-berth marina. PIER 39 is known for its spectacular views of San Francisco Bay including the Golden Gate Bridge, Bay Bridge and Alcatraz, as well as the world-famous California sea lions hauled out on K-Dock.

14) Alcatraz – San Francisco (1 hr 6 minutes from hotel)

Alcatraz reveals stories of American incarceration, justice, and our common humanity. This small island was once a fort, a military prison, and a maximum security federal penitentiary. In 1969, the Indians of All Tribes occupied Alcatraz for 19 months in the name of freedom and Native American civil rights. We invite you to explore Alcatraz's complex history and natural beauty.

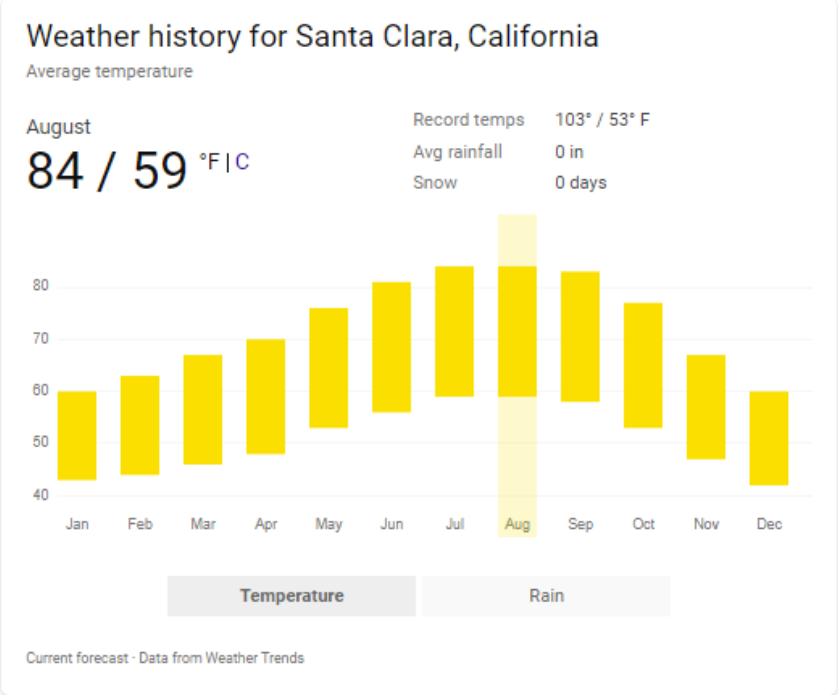
General Locale Information

TIME ZONE

Santa Clara, California is in the US Pacific Time Zone (PDT / UTC-07:00).

CLIMATE AND CLOTHING

In August-September, the average high temperature is 84°F (28.9°C) and the average low is 59°F (15.0°C)— Despite the lack of rain or snow, rain is always a possibility. A light- weight jacket or pull-over are recommended, at the least.



CREDIT CARDS

Credit cards are accepted at most businesses including restaurants, shopping centers (malls) and gift stores, gas stations, grocery stores. Major credit cards include Visa, MasterCard, and American Express. ATMs are also located at many areas across town.

Local Transportation, Including Public Options

From Mineta San Jose International Airport (SJC) to Delta Hotels Marriot, Santa Clara

There are numerous ground transportation options available at SJC. The Ground Transportation Information Counter is located in the central area on Level 5 of Jeppesen Terminal.
Counter hours are 6:30 a.m. to 11:30 p.m. daily.

Rental Cars

All rental car companies at SJC are located directly across from Terminal B. Terminal B passengers can walk across Airport Boulevard at the crosswalks from baggage claim to reach the Rental Car Center. Terminal A passengers may take any Airport blue shuttle bus to or from the Rental Car Center. Individual Rental Car agency hours very; please check the listed hours for your agency. Additional service is provided after hours for delayed arrivals. Should you arrive after hours and find no service please call your rental car company. Please follow the overhead signage for the appropriate pick-up location.

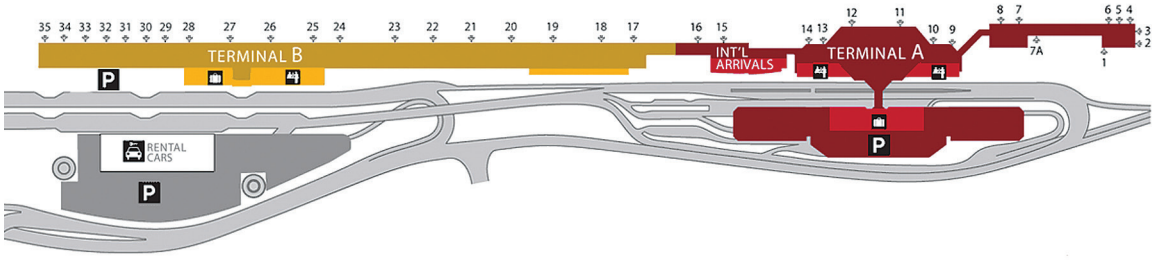
Uber & Lyft

Uber and Lyft are also widely used and drivers are plentiful, both for airport transportation and for getting around. Both services allow for the creation of business travel accounts, and make it easy to split when sharing a ride.

Taxis & Shuttles

Taxis are stationed at the Airport for on-demand service. They are accessible from Terminal A, Stop 2 and Terminal B, Stop 1. Shuttles and Taxis are both available on a pre-arranged basis. Please contact the company of your choice to schedule reservations. Pre-arranged vehicles pick-up at Terminal A, Stop 3, and Terminal B, Stop 11. Taxis provide transportation for passengers with folding wheelchairs at no additional charge. Wheelchair accessible vans are also available at no additional charge, but advance notice is recommended. To arrange this service, please contact the Taxicab provider.

Terminals A & B



Local Printing Shops

If you don't want to put a 4-foot poster in the overhead bin, or transport a heavy stack of papers in an airplane, you can request printing services at the following local providers.

FedEx

FedEx Office Print & Ship Center (2.3 miles from hotel)
3161 Mission College Blvd
Santa Clara, CA 95054
(408) 982-9600

FedEx Office Print & Ship | Kinkos (3.4 miles from hotel)
2125 El Camino Real
Santa Clara, CA 95050
(408) 244-5800

Staples (3.9 miles from hotel)

760 Newhall Dr
San Jose, CA 95110
(408) 271-5061

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LOC-POC: Valerie Escobar, *AMA, Inc*

LOC-POC: Sharon McKee, *NASA ARC*

IPPW-2022
Instructions for Oral and Poster Presenters

1. ORAL presenters — Please note the guidelines below for your presentation:

Presentations and accompanying material (e.g. videos) **must be uploaded to the submission website no later than Monday, August 24th (hard deadline).**

- Go to https://www.openconf.org/ippw2022/author/upload.php and sign in with your personal user credentials (same as used for abstract submission).
- Upload your presentation material into the same "presentation folder" as your abstract. From the drop-down box, select what type of document you are uploading (oral presentation / poster / abstract / 1-slide / other for media files). Note that you may upload multiple files into your presentation folder.
- Please make certain to delete any obsolete file versions.
- Note that the system will automatically rename your files with consistent naming and assign them to the relevant session.
    - One PC laptop, a projector, and a remote pointer will be available during the workshop sessions for oral talk presentations.
    - Ensure that your presentation displays all media files and graphics on a standard Windows laptop equipped with Microsoft Office and PDF reader.
    - Due to the large number of contributions, speaker presentation slots are limited to 15 minutes including questions. The time limit will be strictly enforced.
    - Presentation should therefore be limited to 12 slides in order to adhere to the allocated 15-minute presentation time including questions. You will be warned as you approach the 12-minute presentation time and be asked to end your presentation at 15 minutes elapsed presentation time.
    - You may include additional "backup" slides to briefly address anticipated questions and for archiving purposes. All presentations, with "backup" slides (if submitted), will be archived.
    - In order to facilitate a smooth transition between speakers, we will pre-load all files on the presentation computer. Your contact point for questions will be your session convener. Please preview and verify proper functioning of your files, at the following times on the day of your presentation:
        - **AM Presentations: 8:00 AM**
        - **PM Presentations: 1:30 PM**
        - **During breaks the days before your presentation**

2. POSTER presenters — Please note the guidelines below for your poster:

Poster Setup & Breakdown Times

- **Setup: Monday, August 29, after 11:00am**
- **Breakdown: Friday, September 2, by 12:00pm**

Your poster file (as a PDF) and a one-slide introduction presentation **must be uploaded to the submission website no later than Thursday, June 7th (hard deadline).**

- Go to https://www.openconf.org/ippw2022/author/upload.php and sign in with your personal user credentials (same as used for abstract submission).
- Upload your poster and your one-slide introduction presentation into the same "presentation folder" as your abstract. From the drop-down box, select what type of document you are uploading (oral presentation / poster / abstract / 1-slide / other for media files). Note that you may upload multiple files into your presentation folder.
- Please make certain to delete any obsolete file versions.
- Note that the system will automatically rename your files with consistent naming and assign them to the relevant session.
- Posters must be in portrait orientation, with maximum dimensions of 42" h x 32", preferably A0 (841 x 1188 mm) w. Poster boards will be provided. Pins will be provided to allow you to affix your poster to the board. The authors are responsible to procure the printed version of their poster. *See page 12 for local print shop information.*
- All posters should include:
  - Abstract ID
  - Poster title
  - Author name(s)
  - Author institution(s)
- In addition, include your institutional logo(s) and the abstract number near the top of your poster.
- Dedicated poster introduction sessions are scheduled, please refer to your session convener for further details. Each poster presenter will be allocated 1 minute to provide a very brief overview of their poster. Presenters may use no more than a single slide, either an explanatory brief narrative or the poster itself, to "advertise" their poster during their 1-minute presentation.
- In order to adhere to the allocated time, we will pre-load the 1-slide poster presentations to the workshop computer. Note, that due to the large number of posters, no last-minute updates to the poster presentations can be accommodated.
- Two poster session will be scheduled on Tuesday, 30 August and Thursday, 1 September, as indicated in the detailed program. If additional assistance is needed, please inquire at the registration desk.

Abstracts for Download

Please note that all IPPW-2022 abstracts (for oral presentations and posters) can be accessed through the online program:

https://www.openconf.org/ippw2022/modules/request.php?module=oc_program&action=program.php&p=program

QR code for mobile program:

The Bernie Bienstock Award and Student Oral/Poster Competition

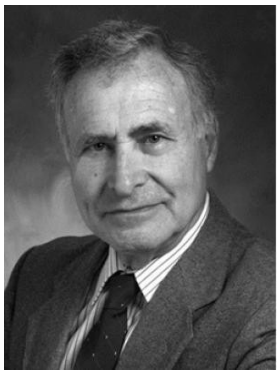
Several awards for posters and oral presentations will be presented at IPPW 2022. The Bernie Bienstock Award will be given to the best oral presentation in the conference. Students and professionals alike are eligible to win the Bernie Bienstock Award. In addition, a student poster and oral presentation competition is also being organized. Both awards will be adjudicated through an online ballot.

Shortly before 08:00 PDT on Monday, August 29, 2022, you will receive an email (in your conference-registered email inbox) from the IPPW SOC (ippwsoc@gmail.com), which contains a link to an electronic ballot. This ballot will be used to record audience scores for all presentations and posters during IPPW 2022.

To access the ballot, click the link/button in the email. To score the participants, choose either the "Paper Competition" or "Poster Competition" option, and press "Next". On either the paper or poster competition pages, select the name of the contestant from the drop-down menu and enter your score using the buttons provided. When you click "Next", your score will be saved, and you will be returned to the option selection page. Each ballot is unique to your email ID, please do not forward this link to anyone. Further, you are allowed to alter your scores until you submit the ballot. You are allowed to skip participants in the ballot, but must go through the "Submit Your Ballot" option on the option selection page in order to have your scores considered.

Please submit your ballot by 13:00:00 PDT on Friday, September 2, 2022.
We thank you for your participation!

Alvin Seiff Memorial Award



The Alvin Seiff Memorial Award, presented annually at the International Planetary Probe Workshop, honors a scientist, engineer, technologist, or mission planner for outstanding career contributions to our field. Each honoree has excelled in aspects of planetary entry probe missions and has served as a mentor for the next generation of solar system explorers. These are the very traits for which Alvin "Al" Seiff was legendary in his pioneering efforts in our field.

Anyone may nominate an exceptional candidate for this award. The nomination process consists of submitting a form, preparing a letter of nomination including details of significant career contributions to the understanding of planetary atmospheres utilizing entry/descent probes, and at least one additional letter of support. Other supporting materials are encouraged but not required, including additional letters of support, bibliography, abstracts of up to three papers by the nominee, and curriculum vitae.

Past Winners:

Dr. Hasso B. Niemann, NASA Goddard (2007)

Professor Jacques Blamont, University of Paris (2008);

Mr. Michael Tauber, Eloret Corporation (2010)

Dr. Martin Tomasko, University of Arizona (2010)

Dr. Jean-Pierre Lebreton, CNRS (2011)

Dr. Bobby Braun, Georgia Tech. (2012)

Prof. Mikhail Marov, Vernadsky Institute of Geochemistry, and Dr. James Arnold, NASA Ames (2013)

Gentry Lee, Jet Propulsion Laboratory (2014)

Boris Ragent (2015)

Rob Manning, Jet Propulsion Laboratory (2016)

Dr. Benton Clark, Lockheed Martin, and Chul Park, NASA Ames Research Center (2017)

Dr. Sushil K. Atreya, University of Michigan(2018),

Athena Coustenis, Paris Observatory, Meudon, France (2019)

Ms. Michelle Munk, NASA Langley Research Center (2020)

Dr. Ralph Lorenz, Johns Hopkins University Applied Physics Laboratory (2020),

Virtual talks given during 2021 with no awards presented (2021)

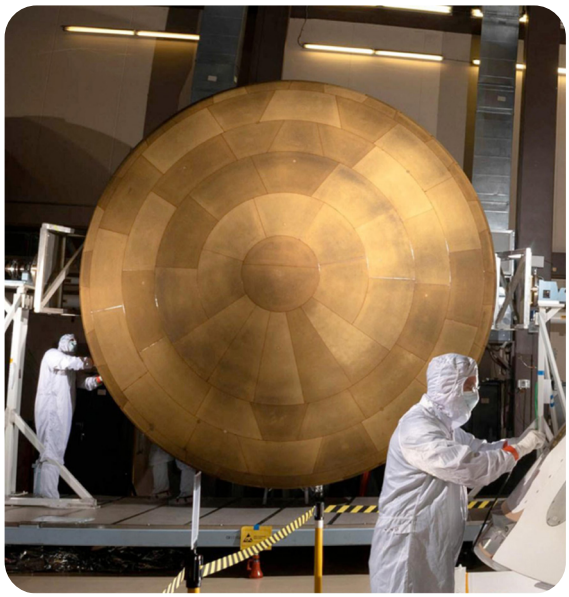
Short Course – AEDL

Short Course Description

Entry, descent, and landing (EDL) originated with the Apollo missions in the 1960s; science missions to Mars, Venus and Jupiter soon followed. The ability to use atmospheric drag to perform maneuvers during entry, followed by descent and a controlled touch down, requires specialized, discipline-oriented understanding of planetary atmospheres, aerodynamics, aerothermodynamics, material response, guidance, navigation and control, and other related fields. These disciplines must operate in a tightly coupled fashion to design EDL missions that safely deliver humans and cargo to planetary bodies of interest in our Solar System. Every decade we see advances across these discipline that has allowed for more and more sophisticated and daring missions.

Looking to the future, in this decade and in those to come, the planetary science missions currently in development are possible due to the depth of expertise, international collaboration, and recent technical advances in the AEDL community. Collecting and returning samples from the surface and Moons of Mars, landing a nuclear-powered octocopter to explore Titan, flying new missions to Venus after a multi-decade hiatus, and potentially conducting the first in-depth exploration of the Ice Giants, are just a few examples of some of the exciting future work in store the AEDL community.

This AEDL short course is intended for students and professionals, with the goal of educating scientists, engineers, mission designers with the various AEDL disciplines and how they are applied to ensure mission success. The talks will be given by an international cohort of subject matter experts involved in numerous past, present, and future AEDL missions.



SHORT COURSE AGENDA

	START	END	TIME ALLOCATION HOURS	TOPIC	SPEAKER(S)
DAY 1 **8/27/22**	8:15	8:25	0:10	Welcome and Introduction	Venkatapathy
	8:25	9:25	1:00	AEDL Overview	Munk
	9:25	10:25	1:00	AEDL Trajectories	Cruz
	10:25	10:35	0:10	- SHORT BREAK -	
	10:35	12:00	1:25	Aerodynamic Modeling	Bibb
	12:00	13:00	1:00	- LUNCH BREAK -	
	13:00	14:30	1:30	Aerothermal Environments	Prabhu (L), Cruden
	14:30	15:30	1:00	GNC for Aerocapture and EDL	Dutta
	15:30	15:40	0:10	- SHORT BREAK -	
	15:40	16:40	1:00	SOA TPS	Stackpoole (L), Yamada, Pichon
DAY 2 **8/28/22**	8:15	9:10	0:55	Material Response Modeling	Stern
	9:10	10:10	1:00	High Enthalpy Testing	Cruden (L), Fretter,
	10:10	10:20	0:10	- SHORT BREAK -	
	10:20	11:50	1:30	Low Enthalpy Testing	Hollis (L), Rohde, Schoenenberger
	11:50	12:50	1:00	- LUNCH BREAK -	
	12:50	13:50	1:00	CFD 101	Thompson (L), Wise
	13:50	14:50	1:00	Entry Systems Modeling	Brandis
	14:50	15:20	0:30	Computational Materials	Abbott
	15:20	15:30	0:10	- SHORT BREAK -	
	15:30	16:30	1:00	Propulsive Descent Technologies	Korzun
	16:30	17:00	0:30	SCIFLI	Inman

IPPW 2022 CONFERENCE AGENDA

Scan QR code for a more detailed itinerary.

Mobile program:
https://www.openconf.org/ippw2022/mobile/

Monday, 29 August 2022

07:30 - 20:30	Registration
08:30 - 10:30	Opening Session I
10:30 - 10:45	- BREAK -
10:45 - 12:30	Opening Session II
12:30 - 14:00	- LUNCH -
14:00 - 15:30	Modeling, Simulation, Testing, & Validation I
15:30 - 16:00	- BREAK -
16:00 - 17:45	Modeling, Simulation, Testing, & Validation II

Tuesday, 30 August 2022

08:30 - 10:15	Venus I
10:15 - 10:45	- BREAK -
10:45 - 12:30	Venus II
12:30 - 14:00	- LUNCH - Lunch and Student Career Development Lunch Event (Monterey/Carmel Room)
14:00 - 15:30	Innovative Concepts for Exploration I
15:30 - 16:00	- BREAK -
16:00 - 17:30	Innovative Concepts for Exploration II
17:30 - 17:45	- BREAK -
17:45 - 20:00	Poster Session I

Wednesday, 31 August 2022

08:30 - 09:45	Ice Giants
09:45 - 10:15	- BREAK -
10:15 - 11:30	Water Worlds and Gas Giants
11:35 - 12:55	Transport Site Visit (Boxed Lunch / Visitor Badging)
13:00 - 17:30	Site Visit

Thursday, 1 September 2022

08:30 - 09:30	Opening Session III
09:30 - 10:15	Aerocapture, Entry, Descent and Landing (AEDL) Technologies I
10:15 - 10:45	- BREAK -
10:45 - 12:30	Aerocapture, Entry, Descent and Landing (AEDL) Technologies II
12:30 - 14:00	- LUNCH - Women's Lunch (Monterey/Carmel room)
14:00 - 15:30	Aerocapture, Entry, Descent and Landing (AEDL) Technologies III
15:30 - 16:00	- BREAK -
16:00 - 17:30	Mars
17:30 - 17:45	Remaining Poster Introductions
17:45 - 18:00	- BREAK -
18:00 - 20:00	Poster Session II

Friday, 2 September 2022

08:30 - 10:15	Science Instrumentation, Experiments, and In-Situ Measurements
10:15 - 10:45	- BREAK -
10:45 - 12:00	Sample Return
12:00 - 12:30	Opening Session IV
12:30 - 14:00	- LUNCH -
14:00 - 16:00	Closing Session

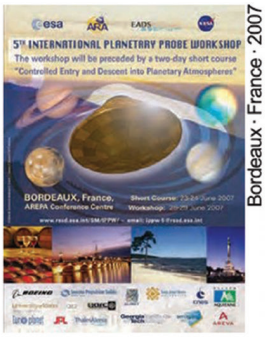
History of the International Planetary Probe Workshop 2003 – 2022

Lisbon · Portugal · 2003

Moffett Field · California · USA · 2004

Anavyssos · Attiki · Greece · 2005

Pasadena · California · USA · 2006



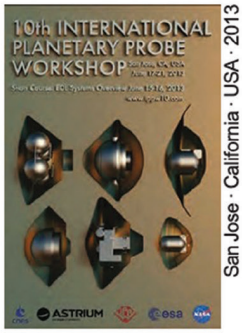
Bordeaux · France · 2007

Atlanta · Georgia · USA · 2008

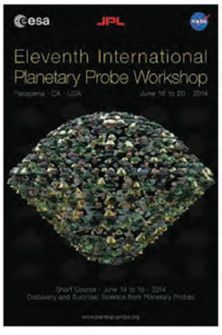
Barcelona · Spain · 2010

Portsmouth · Virginia · USA · 2011

Toulouse · France · 2012



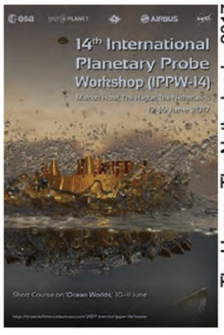
San Jose · California · USA · 2013



Pasadena · California · USA · 2014

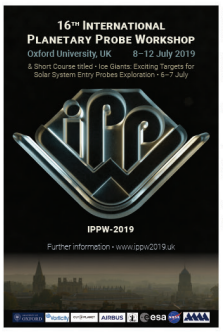
Cologne · Germany · 2015

Laurel · Maryland · USA · 2016



The Hague · The Netherlands · 2017

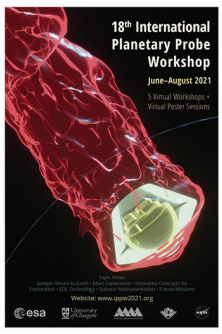
University of Colorado · Boulder · 2018



Oxford University · UK · 2019

Monterey · CA, USA · 2020

COVID — CANCELED



Virtual · 2021

Santa Clara, Silicon Valley, USA · 2022

NOTES

National Aeronautics and Space Administration

Ames Research Center
Moffett Field, CA 94035
www.nasa.gov/ames

www.nasa.gov

SP-2022-08-01-ARC