



*Society for the
Advancement of
Material and Process
Engineering*

SAMPE

Los Angeles Chapter

News and Information



**September
2021**

ADVANCED COMPOSITE MATERIALS IN THE MARS 2020 MISSION

By Dr. Juan M. Mejia-Ariza, JPL, NASA
September 28, 2021 (Tuesday) at 6:00 PM



Date:

9-28-21 (Tuesday)

Time:

6:00 PM PDT

Reservations:

Register for the
Zoom presentation.

Registration link at:

You are invited to a Zoom meeting.
When: Sept 28, 2021 06:00 PM Pacific Time (US and Canada)

Register in advance for this meeting:

<https://us02web.zoom.us/join/tZclCQghqj8iHtFFDL-L8pKTLIV9-cTfWQ4d>

After registering, you will receive a confirmation email containing
information about joining the meeting.

Meet Dr. Juan M. Mejia-Ariza

Juan Mejia-Ariza has a PhD in Macromolecular Science and Engineering from Virginia Tech. His PhD was funded by the National Science Foundation to study large space deployable structures. As a graduate researcher at AFRL Juan performed research in large space deployable structures, for which, he won a special service award from the Space Vehicles Directorate, Kirtland AFB, NM. In his previous job as a Program Manager/Principal Investigator, he won several Small Business Innovation Research projects for NASA and AFRL in the areas of deployable sunshades for telescopes and high strain composites for origami materials.



As a Materials and Processes

Engineer in the Materials Development, Testing, and Failure Investigations Group, Juan is currently leading all composite development and fabrication activities in JPL's Materials Test Laboratory, developing flight hardware for space missions such as Mars 2020, NISAR, SWOT, and Europa Clipper. He is also supporting the Structural Bonding, Surface Treatment and Heat Treatment Labs at JPL. Juan has won several JPL internal research and development proposals and a couple of JPL awards related to the implementation of composite hardware in space missions and continues to investigate novel approaches to composites design, fabrication, and implementation with the collaboration of Caltech's researches.

NASA's Jet Propulsion Laboratory

Nestled at the base of the San Gabriel Mountains in Southern California, NASA's Jet Propulsion Laboratory – JPL for short – is a federally funded research and development center managed by Caltech. Amid a sprawling and picturesque campus-like setting, where deer and other critters are a common sight, there are limitless possibilities for high-tech innovation.

JPL's main activities involve robotic space and Earth science missions – for example, we've visited every planet in our solar system and landed five rovers on Mars. Life at JPL includes a dedicated and diverse population of scientists, engineers, technologists, developers, communicators, designers, safety experts, business administrators, and more. They think big and dream big.

Our robust [internship program](#) trains the next generation of explorers, and JPL collaborates with many countries to develop future space missions.

JPL benefits from its direct connections to Caltech, a world-renowned university, and NASA, the federal agency that is the gold standard of space exploration, inspiring people across the globe.



Advanced Composite Materials in the Mars 2020 Mission Presentation

This presentation will focus on a brief description of the advanced composite materials used in the Mars 2020 mission by the JPL composites team in the Materials Test Laboratory and many other collaborators. The presentation covers aspects of the Perseverance Rover, Ingenuity helicopter, and other major systems of the Mars 2020 spacecraft like the cruise stage, aeroshell (backshell and heatshield), and descent stage. Specifically, we will review and visualize the materials used for the parachute, heat exchangers, solar panels, antennas, radomes, and helicopter blades/legs. These materials include polymer resins with carbon/glass fiber reinforced composites, structural foam cores, thermal protection layers/coats, primers, film/paste adhesives and Kevlar/Nylon fibers. These advanced composites were essential to the success of the mission throughout its life cycle: from the journey to Mars, to current research operations; including the survival Perseverance and Ingenuity.



Special Announcement –

Dr Clem Heil Wins the 2021 George Lubin Memorial Award

Dr. Clement (Clem) Hiel Wins the 2021 George Lubin Memorial Award. The Award is awarded to Dr. Heil on behalf of the SAMPE Global George Lubin Memorial Award Committee. The Lubin award is named after George Lubin who was instrumental in utilizing advanced composites in various structures. The Lubin Award recognizes Dr. Hiel for his significant contributions to the composites industry.

Dr. Hiel is President of CSSI (Composite Support & Solutions, Inc.) in San Pedro, CA. His company focuses on the commercialization of innovations related to pultrusion technology, and to fire- and ballistic-protection of high value assets. Dr. Hiel joined SAMPE in 1992 and has served as a board member with the Northern California as well as with the Los Angeles SAMPE chapter.

Prof. Hiel is a big believer in education! This has motivated him, during the past 30 years, to share his knowledge by teaching courses on composite materials design and manufacturing, and on design innovation at both the University of Brussels and at UCLA. Additionally, he has won worldwide distinguished design awards and is a pioneer in structural assembly by means of snap-fit technology. He is also a “Commander in the Order of the Crown,” of Belgium and a Fellow of SAMPE.



Schedule of Upcoming Events

Event	Presented From	Date
Advanced Composite Materials In The Mars 2020 Mission	NASA's Jet Propulsion Laboratory	September 28, 2021
Space Tech Expo	Long Beach, CA	October 6 – 8, 2021
Anaheim Electronics & Manufacturing Show	Anaheim, CA	October 13 -14, 2021
Measurment Science Symposium	Anaheim, CA	November 15 – 18, 2021
Westec and AeroDef	Long Beach, CA	November 16 – 18, 2021
Materials Innovaton & Advanced Technical Leadership Form	Huntington Beach, CA	January 26 – 27, 2022
Del Mar Electronics & Manufacturing Show	Del Mar, CA	May 4- 5, 2022 (New Date)
CAMX	Anaheim, CA	October 10 -13, 2022



Irene Epstein Scholarship

The Irene Epstein Memorial Scholarship Awards were initiated in 1996 shortly after the death of Irene Epstein, to honor her volunteer efforts on behalf of the Society for the Advancement of Material and Process Engineering (SAMPE), and to recognize her strong desire to assist financially-needy, academically-deserving students at Fairfax High School (Los Angeles) to attend college to study engineering, science, mathematics, or medicine.

The Irene Epstein Memorial Scholarship Awards program was initially funded by contributions from The Aerospace Corporation and SAMPE. It is also supported by the Air Force Space Systems Manufacturing Problem Prevention Program (MP3).

The program is administered by Dr. Howard A. Katzman, Senior Scientist at The Aerospace Corporation, and Education Chairman of the Los Angeles Chapter of SAMPE.

Many individuals and companies have generously contributed to help the fund grow so the amount of the scholarship awards has increased five-fold since it started. In addition, a special Book Awards was introduced three years ago to help selected students in the purchase of their college textbooks. If you would like to make a donation or learn more about the scholarship, please contact Dr. Howard A. Katzman at 310-336-5860 or e-mail him at Howard.A.Katzman@aero.org.

Thank you all for your sponsorship and support of SAMPE – LA!!!

Our list of sponsors is growing!!! Sponsors get monthly exposure in our mailing to over 500 members and associates of the local chapters of SAMPE. Sponsors also get a link to their corporate webpage via the SAMPE Los Angeles Chapter website.

For information on being a sponsor, please contact:

Howard A. Katzman

(310)336-5860

SAMPE-Los Angeles Sponsors

<u>Company</u>	<u>Contact</u>	<u>Phone</u>	<u>E-Mail</u>
Advanced Technology International	Nick Melillo	843-760-3228	nick.melillo@ati.org
Airtech International	Jeff Dahlgren	714 899-8100	jldahlgren@airtechintl.com
Aligned Vision	Scott Blake	978 244-1166	Sb@assemblyguide.com
CMS North America	Todd Hammer	714-403-3755	thammer@cmsna.com
Element Materials Technology	John Moylan	818 247 4106	John.Moylan@element.com
Hitco Carbon Composites	Les Cohen	310 970-5409	lescohen@aol.com
Laser Technology, Inc.	John Newman	610 631-5043 x14	Jwnewman50@aol.com
Plataine Inc.	Avner BenBassat Avital Dotan	626 486-2629	Avner.BenBassat@plataine.com Avital.Dotan@plataine.com
PMIC	Darrell Oakes	541 753-0607	darrelloakes@pmiclab.com
Revchem Composites	Randy Arrowsmith	909-316-6613 909-600-8296 (Cell)	RArrowsmith@revchem.com
SAMPE Los Angeles Chapter	Clem Hiel	310 650-6938	Hiel.Clement@gmail.com
Shimadzu	Chris Macy	800 477-1227 x1859	cjmacey@SHIMADZU.com
SME	Dave Morton	313 425-3142	dmorton@sme.org
Thermal Wave Imaging	Steve Shepard Alan Nusbaum	248 414-3730	Sshepard@thermalwave.com alannusbaum@thermalwave.com
Toray Advanced Composites USA	Eric Howard	831 601-3851	e.howard@toraytac-usa.com

Thank you all for your sponsorship and support of SAMPE-LA!!!

ALL NEW!

Materials Innovation & Advanced Technology Leadership Forum

Towards Industrialization of Composites Manufacturing

JANUARY 26-27, 2022

**HUNTINGTON BEACH,
CALIFORNIA**

PLAN NOW TO ATTEND

**SPONSORSHIPS
AVAILABLE!**

Contact
[materialsforum@
sampe.org](mailto:materialsforum@sampe.org)

WEDNESDAY, JANUARY 26, 2022

TIME	SESSION		
9:00am - 12:00pm	GrayMatter Robotics Tour - Limited to 50 registrants		
1:00 - 2:30pm	Track 1	Short Course	Advances and Challenges in Automated Fiber Placement (AFP), by Ramy Harik, University of South Carolina and Sayata Ghose, The Boeing Company
2:30 - 4:00pm			Pultrusion Technology, Commercialization and Industrialization, by Clement Hiel, Composites Support & Solutions, Inc.
1:00 - 2:30pm	Track 2	Short Course	Non-Destructive Evaluation (NDE) Integration Into Modern Aerospace Manufacturing, by David Forsyth, TRI Austin
2:30 - 4:00pm			Thermoplastic Composites: Opportunities and Challenges, by David Leach, ATC Manufacturing
1:00 - 2:30pm	Track 3	Market Overview	Overview of Additive Manufacturing (AM) Market: State of the Art, Current Challenges and Opportunities, and Path Forward, by Ahmed Arabi Hassen, Peeyush Nandwana and Vidya Kishore, Oak Ridge National Laboratory
2:30 - 4:00pm			Market Overview of eVTOL and Urban/Advanced Air Mobility (UAM/AAM), by Johnny T. Doo, Devonshire Holdings, Inc.
4:00 - 6:00pm	Welcome Reception		

ROBOTICS TOUR

See for yourself how GrayMatter Robotics makes AI-Brains for robots by taking commercially available robots and connecting them to artificial intelligence software, creating smart robotic assistants for high-mix surface treatment applications. **Tour attendance is limited to 50 registrants, register today.** Visit materialsinnovationforum.org/tour.

VENUE & LOCATION — HUNTINGTON BEACH, CA

The forum will be held at the **Kimpton Shorebreak Resort**, 500 Pacific Coast Highway, Huntington Beach, CA 92648. Book your room at materialsinnovationforum.org/hotel-registration. Huntington Beach is located in Southern California, within driving distance to numerous manufacturing companies and offers a plethora of activities for visitors — live entertainment, iconic bonfire pits, beautiful sandy beaches, and oceanfront dining year-round.



SEATS ARE LIMITED. REGISTER AT:

materialsinnovationforum.org

FORUM SPEAKERS & PRESENTATIONS

THURSDAY, JANUARY 27, 2022

SESSION 1 — CHALLENGES

8:10am - 9:40am

- Air Mobility - Economy of Scale, *John Geriguiz and Nobuya Kawamura*
- Recycling and Circular Economy of Automotive Composite Parts, *Hendrik Mainka*
- Composite Material Opportunities and Challenges for Air Mobility and Unmanned Systems, *Robert Yancey*



John Geriguiz,
Joby Aviation



Nobuya Kawamura,
Toyota Motor North
America, Inc.



Hendrik Mainka,
Volkswagen Group
of America, Inc.



Robert Yancey,
Hexcel

SESSION 2 — SYNERGIES

10:00am - 12:00pm

- Synergy of Aerospace and Wind Energy Composites Technologies, *Wendy Lin*
- Pultrusion with Design Freedom
- Advances in Manufacturing Carbon-Carbon Composites for High Temperature Applications, *Matthew Parkinson*
- Part Throughput is one of the Most Limiting Factors When Working in the Composite Industry, *Adam Rawlett*
- Alternate Methods For Increasing Composite Part Throughput, *Sam Tollefsen*



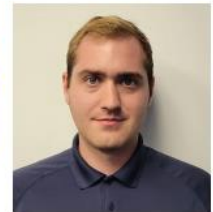
Wendy Lin,
GE Renewable
Energy



Matthew Parkinson,
BASF Performance
Materials



Adam Rawlett,
US Army Research
Laboratory



Sam Tollefsen,
Toray Composite
Materials America,
Inc.

SESSION 3 — ADVANCEMENTS

1:30 pm - 3:00pm

- Rapid Large-Scale Structural Thermoplastic Parts, *Michael Assadi*
- NCC's Digital for Composites (D4C) – From Right First Time to Right Every Time, *Enrique Garcia*
- Aerospace Integral Structures by LRI Based in Automated Lamination of Fabrics with ADMP, *Peio Olaskoaga*



Michael Assadi,
Electroimpact Inc.



Enrique Garcia,
National Composites
Centre



Peio Olaskoaga,
IDEKO Research
Center

SESSION 4 — SIMULATION/SOFTWARE CONTRIBUTORS

3:30 pm - 5:20pm

- AI-Based Production Scheduling And Process Optimization Drive Manufacturing Agility And Efficiencies, *Avner Ben-Bassat*
- How Credible Simulation Significantly Reduces Product Development Time and Cost, *Javad Fatemi*
- Software Platform Solutions for Composites Design, Manufacturing and Simulation 4.0, *William Ramroth*
- Efficient Manufacturing for 21st Century Composite Structures, *Alex Rubin*



Avner Ben-Bassat,
Plataine



Javad Fatemi,
Airbus Defence and
Space



William Ramroth,
Dassault Systemes



Alex Rubin, The
Boeing Company