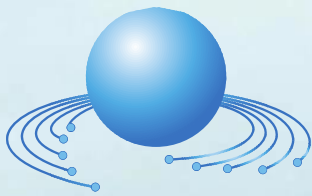


35th ANNUAL CONFERENCE



ILASS-Americas

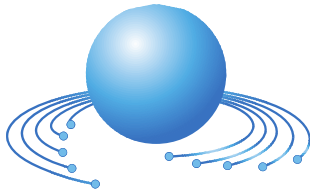
Institute for Liquid Atomization and Spray Systems



2025 CONFERENCE BOOK

18-21 May 2025, Bozeman, MT

35th ANNUAL CONFERENCE



ILASS-Americas

Institute for Liquid Atomization and Spray Systems



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SPONSORS

ILASS-Americas is a non-profit organization committed to providing state-of-the-art spray information to our annual conference attendees and especially to our student attendees. Thanks to our sponsors, we are able to significantly reduce conference registration fees for students each year.



BOARD OF DIRECTORS



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TECHNICAL COMMITTEE MEETING LEADERS



Technical Committee Meeting Liason

Mark Owkes
Montana State University

Aerospace Propulsion

Monday, May 19



Ethan Hanson
Advanced Atomization Technologies



Brandon Sforzo
Argonne National Laboratory

Industrial & Agricultural Sprays

Monday, May 19



Michael Cloeter
Dow Chemical (retired)



Andy Thistle
mdot technologies

Physics of Atomization

Tuesday, May 20



Alan Kastengren
Argonne National Laboratory



Mario Trujillo
University of Wisconsin-Madison

Reciprocating Engine Injection

Tuesday, May 20



Lyle Pickett
Sandia National Laboratories



Roberto Torelli
Argonne National Laboratory

Spray Measurements & Instrumentation

Tuesday, May 20



Chad Sipperley
Step 2 Consulting, Inc.



Julien Manin
Sandia National Laboratory

Computation & Modeling

Tuesday, May 20



Xiaoyi Li
RTX Technology Research Center



Fabien Evrard
University of Illinois Urbana-Champaign

CONFERENCE MAPS

The ILASS-Americas 2025 conference will be held in Norm Asbjornson Hall at Montana State University. Please see the map below which highlights the rooms which will be used for the conference.



CONFERENCE AND PROGRAM NOTES

These are some helpful notes for your time during ILASS-Americas 2025.

Registration takes place on Sunday, May 18 from 5 – 7 pm in Norm Asbjornson Hall 201.

A Welcome Reception will take place on Sunday, May 18 from 5 – 7 pm in Norm Asbjornson Hall 201, followed by a **Reception Lecture** at 7 – 8 pm in Norm Asbjornson Hall 165.

Breakfast (Continental) will be served every morning from approximately 7:30 – 8:30 am in Norm Asbjornson Hall 201. Exhibitor booths will be open during this time.

Lunch will be served on Monday and Tuesday in Norm Asbjornson Hall 201. Lunch on Wednesday will be provided as a to-go box lunch.

The ILASS-Americas Annual Business Meeting will be held during lunch on Tuesday, May 20. All conference attendees are encouraged to attend.

Technical Committee Meetings will be held on Monday afternoon and Tuesday. Conference attendees are strongly encouraged to join the technical committee discussion(s) that match their interests. The meetings are open to all conference attendees.

The Atomization and Sprays Editorial Board Meeting will be held on Monday during lunch in Norm Asbjornson Hall 359; this is closed meeting for editorial board members only.

Exhibitors' Displays are available each day from the start to the end of each day in Norm Asbjornson Hall 201.

Poster Session There is no poster *session* at the the 2025 conference, but posters may be on display.

Program changes will be announced every morning and noted on the schedule poster outside each presentation room as the need arises.

The Conference Banquet and Awards Ceremony will be held at the Rocking TJ Ranch (651 Lynx Ln, Bozeman, MT 59718), on the evening of Tuesday May 20. Bussing will be provided with departures from the Marriott Element Bozeman and Hyalite Hall at 4:40 pm.

Paper numbers are provided in the List-of-Papers (page 26) of this conference book, as well as in the Index of Authors (page 30).

Paper PDFs are provided for all registered conference attendees though an online repository during the conference. Accessed at the site: <https://ilass.org/ConferencePapers/2025> Links to the papers are available in the **Program** and **List-Of-Papers** sections of this book. Access during the conference is password protected. Use password: **oldfaithful**

SPONSORS

ILASS-Americas is a non-profit organization committed to providing state-of-the-art spray information to our annual conference attendees and especially to our student attendees. Thanks to our sponsors, we are able to significantly reduce conference registration fees for students each year.

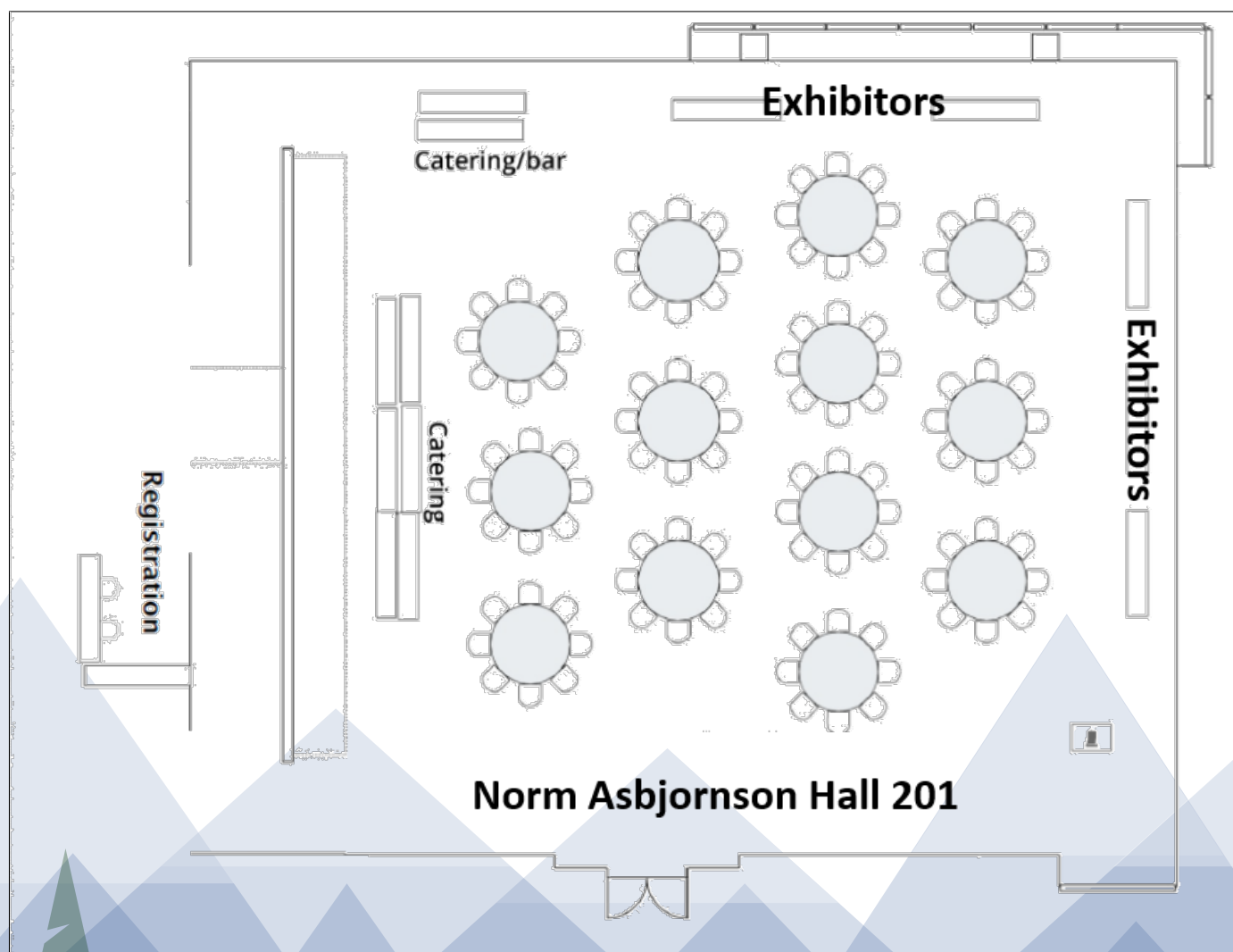


EXHIBITOR INFORMATION

The exhibitors at this year's conference offer an array of diagnostic instrumentation, services, software, and equipment and they look forward to discussions with the conference participants in the exhibitor showcase and break area. Specific details are outlined on the following pages with statements from each exhibitor.

The exhibitors at this year's conference are:

Oxford Lasers	11
Spraying Systems Co.	12
Sympatec	13
Energy Research Consultants (ERC)	14
Dantec Dynamics	15





**FireBIRD 1000W
Laser Illumination**



**FireFLY 500W
Laser Illumination**



**VisiSize P15+ Portable
Particle Sizing System**



**VisiSize N60 High-Velocity
Particle Sizing System**

Providing Advanced Technology for High-Speed Imaging Solutions

Oxford Lasers have been at the forefront of laser innovation for over 45 years. Oxford Lasers' Imaging Division continues to be a leader in the development of high-speed imaging techniques and technologies with the FireBIRD and FireFLY short-pulsed laser illumination products, and VisiSize particle/spray characterisation systems, VisiSize P15+, VisiSize N60 and VisiSize N60maX.

High-Speed Imaging: FireBIRD and FireFLY Short-Pulsed Laser Illumination

Our powerful FireBIRD and FireFLY short-pulsed laser illumination systems synch with high-speed cameras to create high-definition images of difficult-to-capture events such as high-speed imaging of sprays and atomization processes. The laser systems are ideal for Back and Front illumination in the imaging and analysis of particles in flight. Our laser illumination systems also enable Schlieren and PIV advanced imaging techniques to evaluate fluid dynamics and other highly dynamic processes.

Particle and Spray Characterisation with VisiSize Systems

The VisiSize systems use advanced imaging technology and software to provide detailed particle and spray characterisation. The VisiSize P15+ system is a portable particle sizing system with IP67 Ingress Protection rating that can be used infield, on the shop floor or in the lab for measurement of size, velocity and distribution of sprays and droplets. VisiSize N60 and N60maX Class 1 laser-safe systems are high-powered systems for analysis of high velocity sprays. They provide the most advanced real-time analysis of particle /droplet size and velocity of fast-moving, high-volume or high-density sprays.

Solutions and Insight into Spray and Atomization Processes

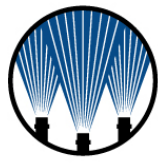
All our systems have simple intuitive controls and provide greater insight into the characterisation and analysis of sprays and droplets. We also provide imaging contract services, system rentals, R&D and technical support to create a complete imaging solution.

Contact Us

www.oxfordlasers.com | enquiries@oxfordlasers.com

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2 Shaker Road, Unit A101
Shirley, MA 01464, USA
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Tel: +1 800 222 3632 (Toll free)

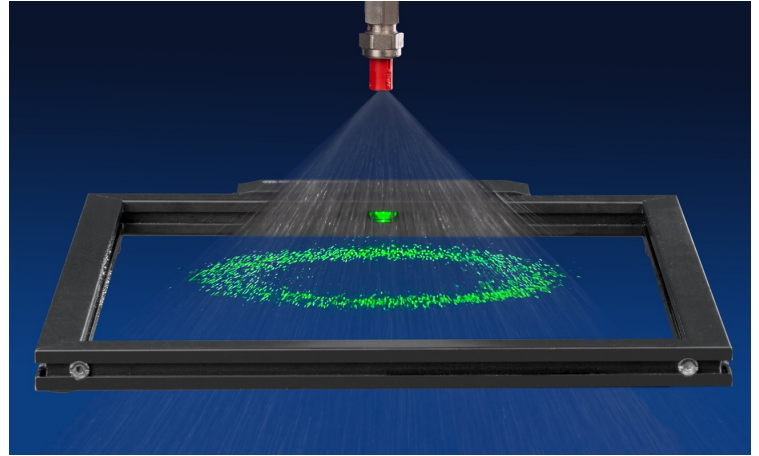
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11 United Kingdom
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Experts in Spray Technology

Spraying Systems Co. is the world's leading manufacturer of spray **nozzles**. Every day, our local spray technology experts help customers optimize operations and create more sustainable manufacturing practices. With tens of thousands of standard products, we have the right nozzle for your application – and we ship most standard products in one day. If you need a special product or material, contact us! We develop hundreds of custom nozzles, injectors and headers every year. Our engineering and manufacturing resources can help solve your toughest spray technology challenges.



Spray Analysis and Research Services

The **Spray Analysis and Research Services** group at Spraying Systems Co. offers contract testing and modeling services to predict and validate spray performance. Understanding spray performance in operations such as gas cooling, spray drying and coating can help you increase production, reduce operating costs, enhance sustainability and reduce costs. At our state-of-the-art laboratories located in Chicago and around the world, we offer access to commercial and proprietary instrumentation to characterize spray drop size, velocity, surface impact, coverage and distribution, material rheology, and nearly any other parameter. To do this, we utilize Phase Doppler, Laser Diffraction, High Speed Video, CFD, and other methods which can be combined with support facilities such as wind tunnels, spray material heating, and conveyor motion. Contact us at Spray.Analysis@spray.com to learn more or to discuss a project with one of our engineers.

SPRAYSCAN[®]

The **SprayScan Suite** of products was developed after decades of laboratory testing for our many customers. The use of a wide range of commercial R&D instruments demonstrated but a strength, but a large overhead in cost and user expertise. The SprayScan systems are designed to be easy-to-use, fast to set up, and lower cost. These diagnostic devices are able to characterize critical spray parameters such as: the flow rate, pressure, and temperature of the spray material (SprayScan mSM), 2D spray distribution (SprayScan mPT, shown above), spray impact, and drop size. Additionally, some of the SprayScan products are designed allow real-time monitoring of in-process sprays with very little user interaction and an online dashboard to view the current status (SprayScan mSM and SprayScan ePT). Please visit our website (below) or contact us at Spray.Analysis@spray.com to discuss how SprayScan may be able to help you in the lab, or in your process.

Particle Measurement | Laser Diffraction

Particle Size and Droplet Size Distribution

0.1 Microns to 8,750 Microns



Sympatec Technology for Spray Particle Size and Droplet Distribution



HELOS/BR & SPRAYER

0.25 μm – 875 μm



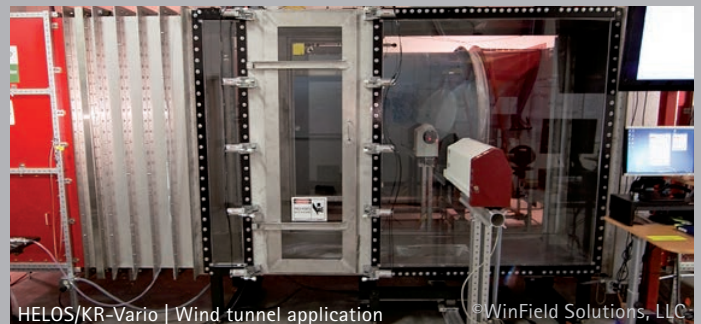
HELOS/BR & SPRAYER & ROTOR

0.25 μm – 875 μm



HELOS/KR-Vario

0,1 μm – 8,750 μm



HELOS/KR-Vario | Wind tunnel application

WinField Solutions, LLC

Sympatec develops, manufactures, sells, services and supports an innovative range of modular instruments for particle size and shape analysis in laboratory and process applications for customers worldwide. Typical applications comprise dry powders, granules, fibres, suspensions, emulsions, gels, sprays and inhalants – spanning a size range from 0.5 nm up to 34,000 μm .

Our instruments reliably supply highly precise and reproducible results in very short measuring times and with excellent system-to-system comparability. The open measuring zone of our laser sensors is most suitable for the analysis of extended sprays provide a wide variety from technical spray applications like agricultural sprays to pharmaceutical applications like nasal sprays.

FDA conforming characterization of spray dynamic due to description of formation phase, stable phase and dissipation phase methods guarantees conformity with the pharmaceutical product approval. A team of highly-qualified service employees provides support for Sympatec instruments worldwide, and can also perform preventive maintenance and assist in system qualification.

Laser diffraction

The modular system concept of our proven HELOS laser diffraction sensors covers a wide range of dry and wet applications. Configurations for spray applications allow measurement of spray particle and spray droplet size distributions for more efficient product development of sprays and aerosols. It delivers valid

and reproducible droplet size data from finest to coarse droplets.

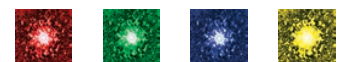
Particle and droplet size characterisation within spray cones

Particles to be analysed as nebulae clouds of droplets or spray cones remain assigned to dry dispersion as long as air or gas is the continuous phase around the disperse systems. Together with the flexible SPRAYER adapter, the compact laser diffraction sensor HELOS/BR offers meaningful and reproducible analysis of the size distribution of droplets or solid particles in pump sprays, metered dose inhalers (MDI) and other pressurised sprays in the range from 0.25 μm to 875 μm . The adapter can be flexibly used for a wide range of different atomizer types and simulates the manual application of the relevant spray

with a force or trajectory actuator.

HELOS/KR-Vario is the preferred model for application with extended particle clouds ranging from 0,1 μm to 8,750 μm . The open measuring zone, which can be varied in its width, supports the flexible adaptation of the optical measurement system to individual customer requirements in challenging technical applications in laboratories or pilot plants such as wind tunnels.

Sympatec Inc.
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Energy Research Consultants (ERC) was founded in 1990 to address a demand for application of state-of-the-art experimental and numerical modeling tools to problems associated with transportation, propulsion, and energy generation and use. Projects which require fast and confidential answers via advanced research

tools which are not otherwise readily available are conducted by experienced personnel using a fully equipped research laboratory. Both experimental and numerical studies are conducted for clients that are addressing mission oriented, time critical projects. In addition, customer on-site work can be accommodated.

ERC has extensive experience with a wide variety of fluid dynamic, combustion, and spray system applications. In particular, ERC maintains expertise in the characterization of non-reacting and reacting flows such as those found in automotive combustion chambers and exhaust after-treatment systems, as well as those found in spray and gas fired gas turbine combustion systems and industrial processes. The expertise ranges from the basic science of liquid injection and sprays associated with a wide array of applications to study of complex practical configurations for atomization and spray formation, fuel/air mixing and combustion, swirl generation, and associated pollutant and particulate formation and operability performance and control.

Specialized measurement services are offered to both commercial and government clients. Available spray diagnostics include Phase Doppler Interferometry, Laser Diffraction, Planar Liquid Laser Induced Fluorescence (PLIF with continuous and pulsed lasers with intensified CCD cameras), planar and global OH* LIF, optical patterning, particle image velocity, tunable diode laser spectroscopy, liquid film thickness measurements, and high speed visualization. ERC has extensive experience applying these methods to wide array of customer systems. Other capabilities include CFD modeling, test facility development, and test plan development and execution using statistically designed experimental methods.

In addition to measurement services, ERC has also developed standalone design tools (for example, Advanced Spray Injection Phenomena Simulator—ASIPS; Flame Response Sensitivity Tool—FRST) and image analysis tools (for example, Automated Feature Extraction and Analysis Tool—AFEAT). ERC has also developed other products such as a specialized imaging system for inspection inside high temperature environments and a turn-key reference burner for calibration of laser diagnostics. Gaseous and liquid fired burners are also available.

Contact Information:

Christopher Brown, Research Manager, Business Manager, Co-Owner

23342 South Pointe Drive, Suite E

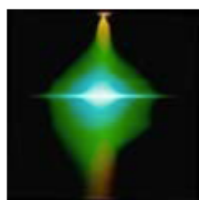
Laguna Hills, CA 92653-1422

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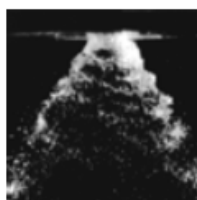
Fax: (949) 583-1198

Email: Brown@ERC-Ltd.com

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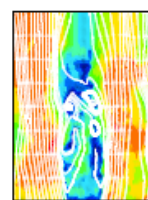
Phase Doppler
Interferometry



High Speed
Video



Reacting Spray
Visualization



Particle Image
Velocimetry

Figure 1 – Sample Data Sets (Many Other Measurements Are Available, Please Inquire).

Scientists and Engineers in fluid dynamics and solid mechanics rely on measurements to make breakthroughs in applied research, technology development, and quality assurance.

Dantec Dynamics specializes in the development, manufacture and application support of measurement systems that acquire and analyze data of physical properties in fluids and in solid structures.

We deliver turnkey and customized solutions built on high-end laser optics, imaging, and sensor technologies. Our user-friendly software performs advanced data analysis and produces real-time results. Furthermore, we pride ourselves in providing our clients superior technical application support worldwide.

You gain accurate measurement results easily and quickly which help you accelerate the pace of discovery, innovation, quality control or NDT. Our distinct competence and experience in integrating measurement methods and technologies into the right solution for you, is unique.

Partnering with Dantec Dynamics helps you gain crucial knowledge from any test or measurement campaign.

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Dantec Dynamics, Inc.

750 Blue Point Road

Holtsville, NY 11742

United States

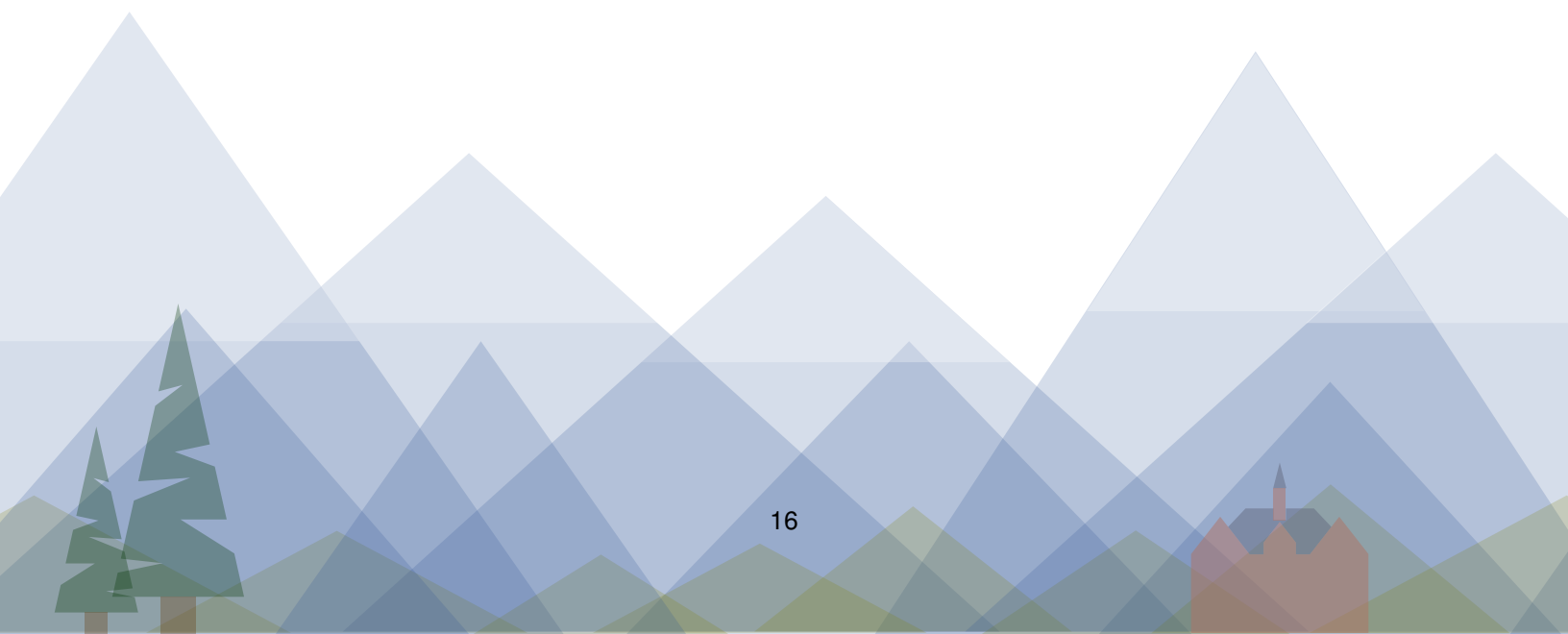
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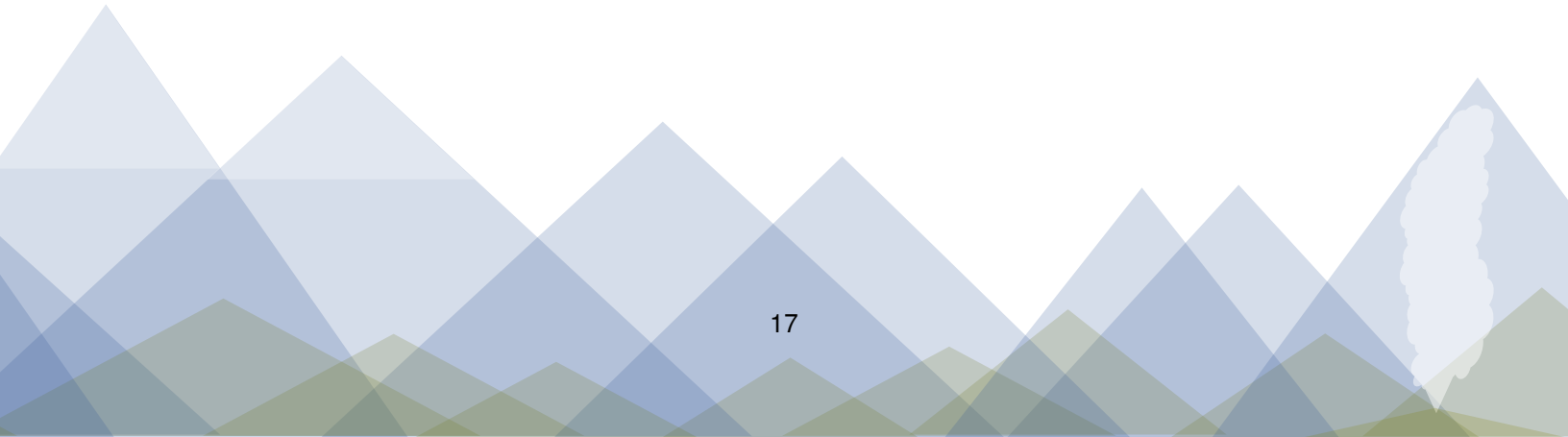
Email: USA@dantecdynamics.com

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Detailed Program



Session Time (MDT)	Sunday, May 18, 2025	
5:00 PM - 7:00 PM	Registration Open Welcome Reception with the Exhibitors	Norm Asbjornson Hall 201
7:00 PM - 8:00 PM	Reception Lecture Wildfire Management and Research Jason Forthofer, Rocky Mountain Station, Fire, Fuel, and Smoke Science Program	Norm Asbjornson Hall 165
8:00 PM	Adjourn	



Session Time (MDT)	Monday, May 19, 2025	
7:30 AM - 8:30 AM	Breakfast with the Exhibitors	Norm Asbjornson Hall 201
8:30 AM - 8:45 AM	Opening Remarks	Norm Asbjornson Hall 165
8:45 AM - 9:45 AM	Keynote Lecture Droplet Breakup at Hypersonic Conditions: Modeling Interfacial Instabilities Jacob McFarland, Texas A&M University	Norm Asbjornson Hall 165
9:45 AM - 10:20 AM	Exhibitor Showcase	Norm Asbjornson Hall 165
10:20 AM - 10:40 AM	Break with the Exhibitors	Norm Asbjornson Hall 201
10:40 AM - 12:00 PM	Advances in Numerical Methods I Chairs: Olivier Desjardins & Steven Lin Norm Asbjornson Hall 137	Spray Applications: Agricultural & Industrial Chairs: Andrew Thistle & Paul Vesely Norm Asbjornson Hall 153
10:40 AM - 11:00 AM	Paper 65: Transport of high-order moments of fluid in gas-liquid flow simulations Fabien Evrard University of Illinois Urbana-Champaign	Paper 58: Multiphase flow dynamics of spraying agricultural quadcopters Orr Avni, Amir Loyevsky, Yuval Dagan, Roberto Zenit Brown University, Technion – Israel Institute of Technology
11:00 AM - 11:20 AM	Paper 12: Reconstructing Multi-Scale Volume of Fluid Interfaces using Scientific Machine Learning Andrew Cahaly, Fabien Evrard, Olivier Desjardins Cornell University, University of Illinois at Urbana-Champaign	Paper 24: Generating controlled rain conditions to meet standardized test specifications James Tribble, Kyle Bade, Rudi Schick Spraying Systems Co.
11:20 AM - 11:40 AM	Paper 67: Assessment of AMR for fully resolved realizations of phase interfaces in a hybrid LES-DNS approach Nihar Thakkar, Marcus Herrmann Arizona State University	Paper 44: Agricultural UASS Design and the Effects on Deposition Andrew Thistle mdot technologies
11:40 AM - 12:00 PM	Paper 47: A-priori analysis of subgrid interfacial area in two-phase flows Luis Hatashita, Ahmed Elnahhas, Suhas Jain Georgia Institute of Technology, Stanford University	Paper 54: End-to-End design model for compressed gas aerosol products Ke-Ming Quan, Juli Hipp, Mohamed Abou Dbai Procter & Gamble Company
12:00 PM - 1:00 PM	Lunch Norm Asbjornson Hall 201	Atomization and Sprays Editorial Board Meeting Norm Asbjornson Hall 359

1:00 PM - 2:20 PM	Advances in Numerical Methods II Chairs: Lyle Pickett & Fabien Evrard Norm Asbjornson Hall 137	Spray Characterization and Measurements Chairs: Kyle Bade & Julien Manin Norm Asbjornson Hall 153
1:00 PM - 1:20 PM	Paper 62: Semi-Lagrangian Pressure Solver for Accurate, Consistent, and Conservative Volume-of-Fluid Simulations Julian Fox, Mark Owkes Montana State University	Paper 36: Influence of Airfoil Trailing Edge Shape and Thickness on Atomization of Liquid Film in a High Speed Flow Safiullah, Vincent McDonell, Soichiro Tabata, Shigeki Senoo UC Irvine, Mitsubishi Heavy Industries
1:20 PM - 1:40 PM	Paper 26: A Volume-Filtered Framework for Simulating Multiphase Compressible Flows Chase Lee, Olivier Desjardins Cornell University	Paper 53: Effect of cavity expansion and collapse on droplet size distribution from backscatter of a cranial surrogate model Labiba Imtiaz Kaya, Dulce Resendiz, William Jackson, Sarah Benteil, James Michael Iowa State University, Auburn University
1:40 PM - 2:00 PM	Paper 27: A fully conservative scheme for simulating incompressible two-phase flows Zonghao Zou, Olivier Desjardins Cornell University	Paper 14: Fire Hazards from Aerosol Cans: Exploring the Dependency on Surface Tension and Viscosity Alexander Brown, Alvaro Cruz-Cabrera, Marc Armijo, Jacob Boissiere Sandia National Labs
2:00 PM - 2:20 PM	Paper 9: Simulation of Cavitation Processes Adopting Lagrangian Particle Tracking Method Francesco Duronio, Andrea Di Mascio, Marina Prisciandaro, Alessandro Montanaro, Luigi Allocca, Valentina Innocenzi Università degli studi dell'Aquila, Istituto di Scienze e Tecnologie per l'Energia e la Mobilità Sostenibili (STEMS)	Paper 74: Image scale-space analysis as a platform for noise-robust, system-agnostic, threshold-free particle/droplet image analysis (PDIA) Eric Johnson, Paul Strykowski, Alison Hoxie University of Minnesota, University of Minnesota Duluth
2:20 PM - 2:40 PM	Break with the Exhibitors Norm Asbjornson Hall 201	

2:40 PM - 4:20 PM	Focus Session - Reference Geometry Chairs: Brandon Sforzo & Vince McDonell Norm Asbjornson Hall 137	Spray Applications - Automotive Chairs: Mario Trujillo & Christopher Powell Norm Asbjornson Hall 153
2:40 PM - 3:00 PM	Paper 42: Towards efficient and accurate modeling of pressure swirl atomization using sub-grid scale modeling of thin liquid films Joseph Giliberto, Zonghao Zou, Olivier Desjardins Cornell University	Paper 23: Investigations of Cylinder Volume Utilization and Combustion Image Velocimetry of Reacting Diesel Sprays Interacting with Piston Sections in an Optical Combustion Vessel Russell Fitzgerald, Srinath Subramanian, Zhihao Zhao, Glen Martin, Kenth Svensson, Chad Koci Caterpillar Inc.
3:00 PM - 3:20 PM	Paper 66: Advanced Characterization and Open Database of Non-Proprietary Gas Turbine Engine Atomizer Using X-Ray Diagnostics Brandon Sforzo, Angela Kimber-Ehlich, Ashwini Karmarkar, Chi Young Moon, Alan Kastengren, Christopher Powell Argonne National Laboratory, Woodward	Paper 8: Effervescent Breakup Modeling in Lagrangian Simulations of Realistic Fuel Sprays Francesco Duronio, Anqi Zhang, Le Zhao, Angelo De Vita Università degli studi dell'Aquila, Aramco Americas
3:20 PM - 3:40 PM	Paper 38: Numerical investigation of fuel effects on the near-nozzle spray behavior of a non-proprietary pressure-swirl atomizer Austin Han, Ashwini Karmarkar, Brandon Sforzo, Christopher Powell, Lorenzo Nocivelli Argonne National Laboratory	Paper 45: Modeling Flash-Boiling Sprays and Subsequent Wall Interaction of Methanol Direct Injection Steven Luna, Lyle Pickett, Zachary Buen, Meghna Dhanji, Rafael Clemente-Mallada Sandia National Laboratories
3:40 PM - 4:00 PM	Paper 35: Real Time Imaging of Conical Liquid Film Breakup from a Research Simplex Atomizer as Viewed from the Spray Centerline Lars Kufferath-Sieberin, Vincent McDonell, Safiullah, Carsten Mehring UC Irvine, University of Stuttgart	Paper 2: Microscopic-Imaging Measurement of Droplet Size Distribution of Diesel Fuel Spray Qing Wu, Yu Jin, Keiya Nishida, Yoichi Ogata Research Institute for Automotive Engineering and Powertrain Systems Stuttgart, Jiangsu University, University of Hiroshima
4:00 PM - 4:20 PM	Paper 68: Characterizing the impact of near nozzle spray morphology on the downstream atomization and spray development using x-ray diagnostics Ashwini Karmarkar, Chi Young Moon, Angela Kimber-Ehlich, Alan Kastengren, Christopher Powell, Brandon Sforzo Argonne National Laboratory, Woodward	Paper 50: The Impact of Nozzle Hole Manufacturing on the Spray Characteristics of Multi-Hole Gasoline Fuel Injector Under Vaporizing Conditions Scott Parrish, Ronald Grover General Motors R&D
4:20 PM - 4:30 PM	Break	
4:30 PM - 5:20 PM	Technical Committee Meeting: Aerospace Propulsion and Power Chairs: Ethan Hanson & Brandon Sforzo Norm Asbjornson Hall 137	Technical Committee Meeting: Industrial and Agricultural Sprays Chairs: Michael Cloeter & Andy Thistle Norm Asbjornson Hall 153
5:20 PM	Adjourn	

Session Time (MDT)	Tuesday, May 20, 2025	
7:30 AM - 8:30 AM	Breakfast with the Exhibitors Norm Asbjornson Hall 201	
8:30 AM - 8:45 AM	Opening Remarks Norm Asbjornson Hall 165	
8:45 AM - 9:45 AM	Keynote Lecture Airtanker: A Large Scale Spraying System Dominique Legendre, IMFT/INP Toulouse Norm Asbjornson Hall 165	
9:45 AM - 10:10 AM	Break with the Exhibitors Norm Asbjornson Hall 201	
10:10 AM - 11:10 AM	Focus Session - Aerial Firefighting I Chairs: Fabien Evrard & Andrew Thistle Norm Asbjornson Hall 137	Focus Session - Sustainable Fuel Sprays Chairs: Chad Sipperley & Scott Parrish Norm Asbjornson Hall 153
10:10 AM - 10:30 AM	Paper 52: Rapid Prediction of Trajectory and Coverage of Aerially Delivered Fire-Retardants Aditya Parik, Domique Legendre, Tadd Truscott, Som Dutta Utah State University, IMFT/INP Toulouse, King Abdullah University of Science and Technology	Paper 11: Time-resolved liquid and vapor mixing measurements of methanol and ethanol sprays via diffuse back-illumination extinction imaging and Rayleigh scattering Kevin Wan, Junghwa Yi, Lyle Pickett, Julien Manin Sandia National Laboratories
10:30 AM - 10:50 AM	Paper 19: Large scale fragmentation of a liquid column dropped by an airtanker Dominique Legendre, Carl Khoneisser, Mathieu Landreau, Julien Sebilleau, Sébastien Cazin, Catherine Colin, Frédéric Risso IMFT/INP Toulouse, CNRS - IMFT	Paper 64: Parcel Simulations of Flash Boiling Liquid Ammonia Sprays Aman Kumar, Arianna Roots, Noah Van Dam University of Massachusetts Lowell
10:50 AM - 11:10 AM	Paper 57: Atomization of liquid released from quadcopters: preliminary insights Roberto Zenit, Orr Avni Brown University	Paper 71: Assessing the Impact of Atomization Changes on Gas Turbine Combustor Performance Debolina Dasgupta, Sibendu Som Argonne National Laboratory
11:10 AM - 11:20 AM	Break	
11:20 AM - 12:10 PM	Technical Committee Meeting: Physics of Atomization Chairs: Alan Kastengren & Mario Trujillo Norm Asbjornson Hall 137	Technical Committee Meeting: Reciprocating Engine Injection Chairs: Lyle Pickett & Roberto Torelli Norm Asbjornson Hall 153
12:10 PM - 1:10 PM	Lunch / ILASS-Americas Annual Business Meeting Norm Asbjornson Hall 201	

1:10 PM - 2:10 PM	Focus Session - Aerial Firefighting II Chairs: Mark Owkes & Dominique Legendre Norm Asbjornson Hall 137	Atomization and Spray Simulations Chairs: Marcus Herrmann & Julien Manin Norm Asbjornson Hall 153
1:10 PM - 1:30 PM	Paper 20: Are we able to correctly predict airtanker drop pattern using CFD? Corentin Calbrix, Axelle Cadière, Benoit Roig, Dominique Legendre IMFT/INP Toulouse, CHROME Nimes University, KEPPLAIR Evolution	Paper 43: Impact of viscoelasticity on liquid deformation in two-phase flows Joseph Giliberto, Olivier Desjardins Cornell University
1:30 PM - 1:50 PM	Paper 51: Numerical Study on Large Droplet Breakup Mechanisms for Aerial Firefighting Brendan Christensen, Mark Owkes, Dominique Legendre Montana State University, IMFT/INP Toulouse	Paper 69: Computational Study of Liquid Ammonia Atomization Characteristics with Phase Change in an Injector Nozzle Jun Ishimoto Tohoku University
1:50 PM - 2:10 PM	Round Table Discussion on the Role of the ILASS Community for the Support of Aerial Fire Fighting Moderated by Dominique Legendre and Mark Owkes	Paper 5: Numerical Characterization of Breakup Processes in Triplet Injectors with Applications to Rotating Detonation Kayla Gatsonis, Devin Johnson, John Grunewald, Mikaela De Gracia, Austin Webb, Chris Fugger, Terrence Meyer, James Braun North Carolina State University, Purdue University, Spectral Energies
2:10 PM - 2:35 PM	Break with the Exhibitors	Norm Asbjornson Hall 201
2:35 PM - 3:25 PM	Technical Committee Meeting: Computation & Modeling Chairs: Xiaoyi Li & Fabien Evrard Norm Asbjornson Hall 137	Technical Committee Meeting: Spray Measurements and Instrumentation Chairs: Chad Sipperley & Julien Manin Norm Asbjornson Hall 153
3:25 PM - 4:40 PM	Meeting Adjourn / Break	
4:40 PM - 5:00 PM	Departure to Banquet Pickup in front of Marriott Element Bozeman and Hyalite Hall	
5:00 PM - 9:00 PM	Banquet and Awards Ceremony Rocking TJ Ranch	
9:00 PM	Departure to Hotel To Marriott Element Bozeman and Hyalite Hall	

Session Time (MDT)	Wednesday, May 21, 2025	
7:30 AM - 8:30 AM	Breakfast with the Exhibitors	
8:30 AM - 8:40 AM	Opening Remarks	
8:40 AM - 10:20 AM	Shock-Droplet Interactions Chairs: Chad Sipperley & Jett Langhorn Norm Asbjornson Hall 137	Spray Modeling Chairs: Joseph Gilliberto & Brendan Christian Norm Asbjornson Hall 153
8:40 AM - 9:00 AM	Paper 40: On Drop Aerobreakup at High Mach Number and High Weber Number Conditions Alex Dworzanczyk, Manuel Viqueira-Moreira, Jett Langhorn, Michael Libeau, Christoph Brehm, Nicholas Parziale Stevens Institute of Technology, University of Maryland, Naval Surface Warfare Center Dahlgren Division	Paper 1: Measurement and modeling of liquid length in turbulent n-dodecane and DME sprays Lyle Pickett, Junghwa Yi, Kevin Wan, Julien Manin Sandia National Laboratories
9:00 AM - 9:20 AM	Paper 4: Detonation Driven Droplet Breakup Calvin Young, Andrew Cook, Jacob McFarland Texas A&M, Lawrence Livermore National Laboratory	Paper 41: A Near-field Lagrangian Dispersion Model: Implementation in LE Simulations Michael A. Mason, Mario F. Trujillo University of Wisconsin - Madison
9:20 AM - 9:40 AM	Paper 25: Experiments on Unsteady Acceleration Shock-Driven Droplet Breakup Jacob Keltz, David Miller, Praveen Ramaprabhu, Jacob McFarland Texas A&M University, University of North Carolina at Charlotte	Paper 49: Efficient Geometric and Topological Data Analysis of Atomization Simulations Brendan Christensen, Mark Owkes, Jack Ruder, Alex McCleary, Brittany Fasy Montana State University
9:40 AM - 10:00 AM	Paper 72: Three-Dimensional Numerical Simulation of Shock-Driven Breakup of Liquid Droplets Michael Ullman, Ral Bielawski, Venkat Raman University of Michigan, University of Central Florida	Paper 15: The Role of Radiation in the Heating of Internally Injected Particles in a Plasma Spray Scenario Alexander Brown, Andrew Vackel Sandia National Labs
10:00 AM - 10:20 AM	Paper 13: Mach Number Effects on Shock-Driven Acetone Droplets Letice Bussiere, Prashant Tarey, Jacob McFarland, Praveen Ramaprabhu University of North Carolina at Charlotte, Texas A&M University	Paper 7: Analytical model of droplet motion in rotating packed bed Ondrej Hajek, Milan Maly, Michal Blatkiewicz, Malgorzata Majdzik, Maciej Jaskulski, Miroslav Jicha Brno University of Technology, Lodz University of Technology
10:20 AM - 10:45 AM	Break with the Exhibitors	
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10:45 AM - 11:45 AM	Droplet Phenomena Chairs: Som Dutta & Austin Han Norm Asbjornson Hall 137	Spray-Wall Interactions Chairs: Noah VanDam & Ashwini Karmarkar Norm Asbjornson Hall 153
10:45 AM - 11:05 AM	Paper 39: Revisiting the Maximum Entropy Formalism for Droplet Breakup Ahmad Faraz, Mario Trujillo University of Wisconsin - Madison	Paper 10: A unified framework for spray-wall interaction modeling applied to an ignition assistant device Hao-Pin Lien, Surya Kaundinya, Roberto Torelli, Ashwini Karmarkar, Brandon Sforzo, Alan Kastengren, Christopher Powell, Kenneth Kim, Eric Mayhew, Jacob Temme, Chol-Bum 'Mike' Kweon Argonne National Laboratory, U.S. Army DEVCOM Army Research Laboratory
11:05 AM - 11:25 AM	Paper 55: Effect of Viscoplasticity on the Threshold of Drop Fragmentation Adita Parik, Randy Ewoldt, Tadd Truscott, Som Dutta Utah State University, University of Illinois Urbana-Champaign, King Abdullah University of Science and Technology	Paper 59: Determining hot wall impact and heat transfer regimes using a fast surface thermocouple for impingement of single drops and dilute sprays Vijayananda Devananda, Eric Mayhew, Kenneth Kim, Chol-Bum Kweon, James Michael Auburn University, DEVCOM Army Research Laboratory
11:25 AM - 11:45 AM	Paper 33: Droplet Impact on Thin Liquid Films: A Two-Color LIF Investigation of the Influence of Surface Tension Gradients on Species Transport Hatim Ennayar, Jeanette Hussong Technical University of Darmstadt	Paper 16: A numerical and experimental study of free-spray evolution and spray-wall interactions of methanol under flash boiling and non-flash boiling conditions Hao-Pin Lien, Roberto Torelli, Rafael Clemente-Mallada, Lyle Pickett Argonne National Laboratory, Friedrich Alexander University Erlangen-Nuremberg, Sandia National Laboratories
11:45 AM	Boxed Lunch / Exhibitor Passport Drawing / Meeting Adjourn Norm Asbjornson Hall 201	

KEYNOTE SPEAKERS

Sunday Reception Lecture

“Wildfire Management and Research”



Jason Forthorer

Rocky Mountain Research Station
Fire, Fuel, and Smoke Science Program

Monday Keynote

“Droplet Breakup at Hypersonic Conditions: Modeling Interfacial Instabilities”



Jacob A. McFarland

Associate Professor
Texas A & M University

Tuesday Keynote

“Airtanker: a large scale spraying system”



Dominique Legendre

Professor
IMFT/INP Toulouse

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Lyle Pickett
2. Microscopic-Imaging Measurement of Droplet Size Distribution of Diesel Fuel Spray
Qing Wu, Yu Jin, Keiya Nishida, Yoichi Ogata
4. Detonation Driven Droplet Breakup
Calvin Young, Andrew Cook, Jacob McFarland
5. Numerical Characterization of Breakup Processes in Triplet Injectors with Applications to Rotating Detonation
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7. Analytical model of droplet motion in rotating packed bed
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9. Simulation of Cavitation Processes Adopting Lagrangian Particle Tracking Method
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