Artium Technologies Inc.
Phase Doppler Interferometers (PDI)

- Modular optics
- Compact PDI systems
- Flight probes

3D PDI with computer-controlled Traverse
First to use Diode Pumped Solid State (DPSS) lasers
- Allows compact modular designs
- Self-contained optical systems
- High stability, long lifetime

Patented Auto-Setup systems
- Ease of use
- Fast optimization to spray conditions
- Computer-controlled size range selection

Advanced Signal Analyzer (ASA)
- Quadrature sampling and complex FFT
- Adaptive sampling
- Computer-based signal analysis

Automated Traversing system, high resolution, high position resolution

Granite base for stability
ASA-3

- Optical fiber link to PC for speed and noise immunity
- Increased ADC sample size up to 100,000 for each Doppler signal event
- Longer sampling records to deal with dense sprays
- Use software algorithm to parse out the individual Doppler signals

Separate Signals using
- Signal peak amplitude
- Changes in SNR
- Changes in frequency
- Changes in phase
- Expected signal duration

Coincident signal detection can be rectified
Artium is the leading supplier of Inkjet Droplet Measurement Instruments

- OLED inkjet development and quality control
- 3D printing in healthcare areas

Easy Spray and Aerosol Measurements

- Factory configurable to fit the measurement tasks
- No adjustments, no field alignment needed

US Patent No. 7,126,694
High Precision, High Accuracy Measurements
Demonstrated precision and accuracy to better than 0.1 μm
PDI Flight Probes for Aircraft Icing Research and Certification

Features:
• 2 PDI instruments in one package
• Extended range of 1 to 1500 mm
• De-icing heaters
• High speed capability
High Speed Imaging
• Modular optics
• Compact PDI systems
• Flight probes
High Speed Imaging
• Multi-Beam Illumination
  • Minimizes effects of optical path obscuration
  • Improves illumination quality
  • Allows use of compact light sources – diode lasers
• Single and dual range systems
  • Size range of 5 to 5000 µm
High Speed Imaging

- Multi-Beam Illumination
  - Minimizes effects of optical path obscuration
  - Improves illumination quality
  - Allows use of compact light sources – diode lasers
- Single and dual range systems
  - Size range of 5 to 5000 μm
High Speed Imaging

- Mixed phase conditions in the NASA PSL
- Super-cooled water droplets and frozen particles
- Droplets attached to drops due to Collisions and Coalescence
Artium Research and Development Team Recognition

<table>
<thead>
<tr>
<th>Lefebvre Award:</th>
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<tbody>
<tr>
<td>2012: Distinguished, continuing, and encouraging contributions to</td>
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<td>the field of atomization and sprays</td>
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<thead>
<tr>
<th>Marshall Awards:</th>
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<tr>
<td>1999: Use of Small Probe Volumes with Phase Doppler Interferometry</td>
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<td>1998: Fuel Droplet Temperature Measurements in a Spray Flame</td>
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<th>Tanasawa Awards:</th>
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<td>2018: Transition from droplet evaporation to miscible mixing at diesel engine</td>
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<td>conditions</td>
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<tr>
<td>2000: Characterization of Liquid-Liquid Mixing in Sprays using Rainbow</td>
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<tr>
<td>Refractometry</td>
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<td>1991: Advances in Diagnostics for Complete Spray Characterizations</td>
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<tr>
<th>ILASS:</th>
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<tr>
<td>1990-2013 Board Member, Treasurer, Vice Chairman, Chairman</td>
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<th>NASA:</th>
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<td>Numerous Certificates of Recognition</td>
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