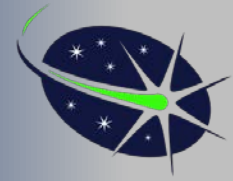


ASTRALiTe

Lidar Bathymetry



Application areas:

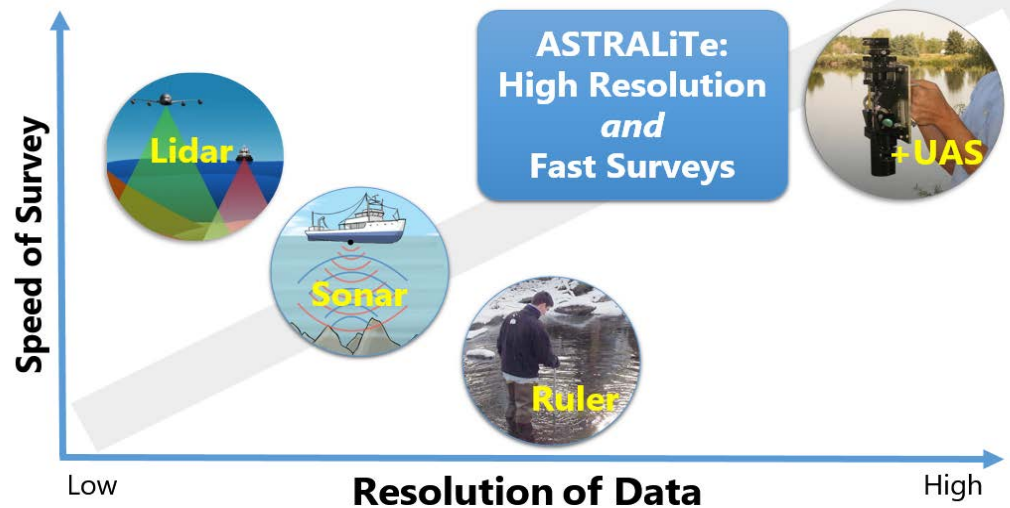
- Coastal mapping
- Survey inland bodies of water
- Dredging surveys
- Hydraulic engineering
- Submerged object detection
- Reef studies
- Benthic environments
- River morphology
- Channel morphology
- Reservoir sedimentation
- Bridge support scouring
- Flood extent
- Disaster assessment
- Chemical spills
- Shipwreck studies

Critical Features:

- Portability
- Scalability
- Affordability
- Safety

Lidar is advantageous over other bathymetry techniques by easily allowing measurements from above the water, avoiding dangerous hazards in the water, overcoming inaccessible locations, and enabling noncontact measurement of depth of hazardous solutions (e.g. chemical spills). This approach is also conducive for aerial surveys (including UAV / UAS), which are efficient for covering large areas very quickly.

Competing Technology – Speed & Resolution

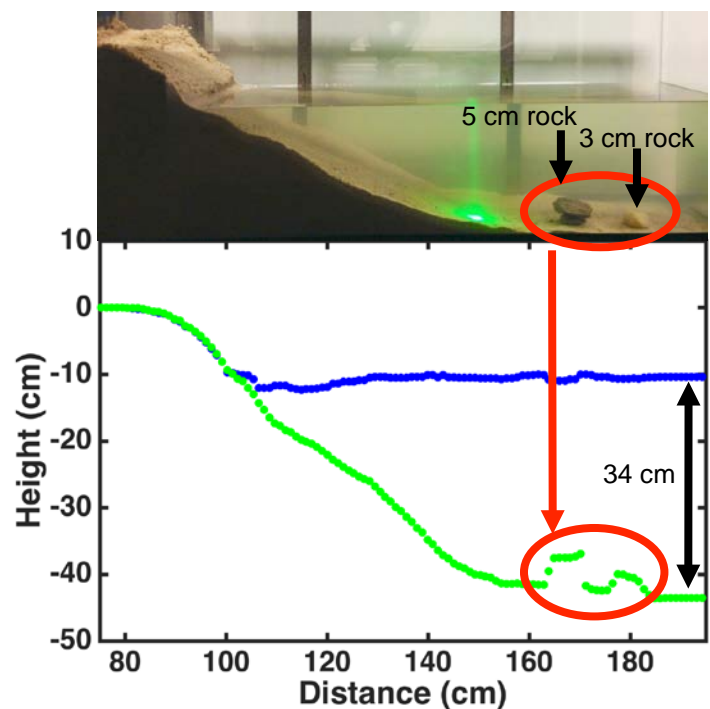


ASTRALiTe's INPHAMIS

(INtrapulse PHase Modification Induced by Scattering) technique successfully addresses issues that have previously limited lidar systems.

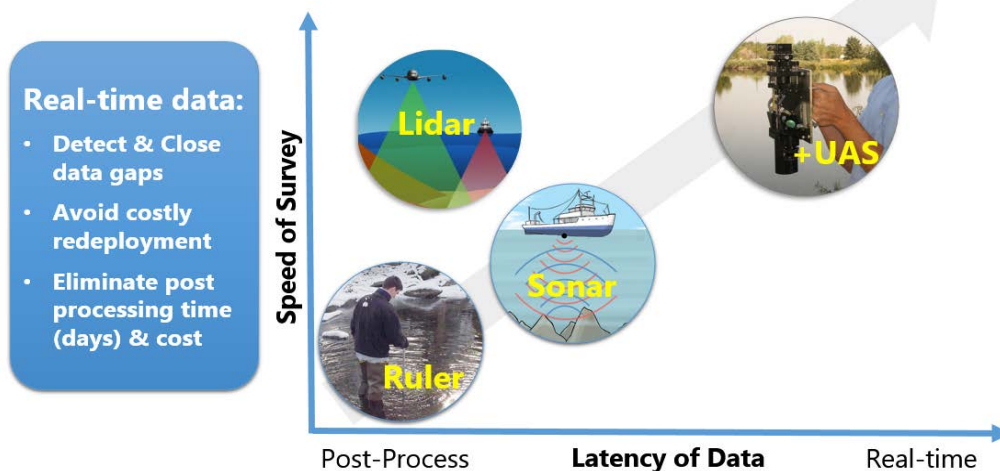
Our patented technology provides unprecedented depth resolution applied to any semitransparent media in a simpler, lighter, less expensive solution scalable from hand-held units to large airborne systems.

This radical innovation in lidar is poised to revolutionize the surveying industry.



ASTRALiTe has developed a handheld lidar bathymetry device with unprecedented resolution (1 cm), opening a new capability in shallow water mapping, while reducing complexity and cost. Lidar provides a noncontact, mobile solution for mapping water depth, underwater terrain, and submerged objects. Lidar water depth measurements work by transmitting laser pulses from above the water and recording the time-delay between top and bottom reflections. Our patented INPHAMIS technique provides real-time, high-precision measurements of depth and subsurface terrain.

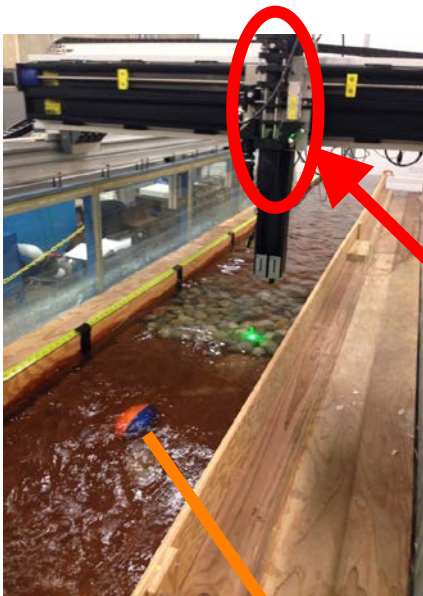
Competing Technology – Real-time Data



PROVEN BENEFITS

- 1 cm depth and underwater terrain resolution enables accurate identification and location of even the smallest subsurface features and infrastructure.
E.g., identify small underwater features like communication cables in a harbor dredging project, or a salmon redd for a wildlife survey, or cracks in bridge pilings or dams.
- Use of this instrument on a UAV/UAS allows rapid aerial survey rather than a labor-intensive, expensive manual examination of underwater infrastructure.
- Real-time data collection enables immediate verification of data, reducing costly redeployments to reacquire missing data, and eliminates post processing time for faster survey results.
- Seamless transitions from land - to shallow - to deep water enables completing a multi-terrain survey in a single deployment with a single instrument, saving time and money.
- Noncontact, remote measurement technique allows conducting surveys in difficult to reach areas, while also decreasing the risk to personnel.
- Easy to use instrument reduces setup time & improves data quality over traditional lidar.
- Works even in wavy and turbid conditions allowing schedule flexibility rather than waiting for perfect environmental conditions thus reducing costs and down-time.

Validation

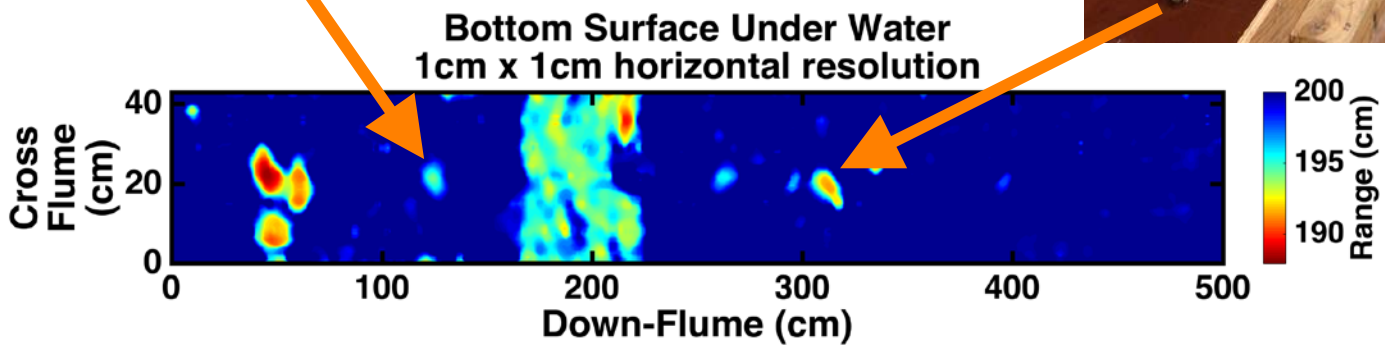
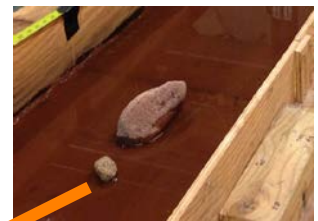


The USGS operates an indoor river in their Geomorphology and Sediment Transport Laboratory in Golden, CO

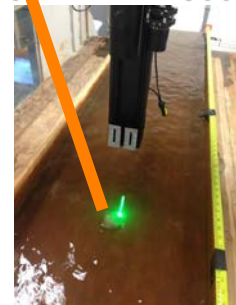
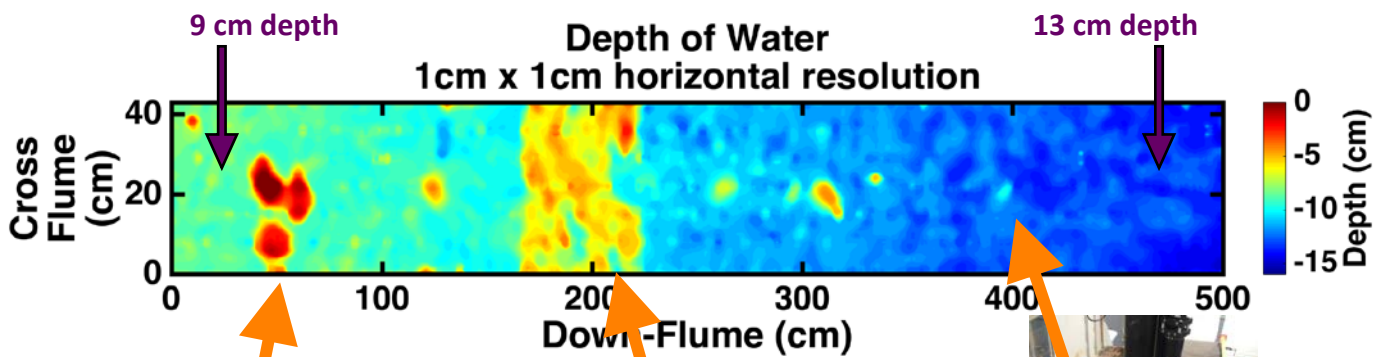
ASTRALiTe mapped the bottom of the channel with 1 cm resolution under flowing water



Demonstrated ability to detect small underwater objects



Water Flow



Prototype Specifications



	Prototype Specification	Anticipated Product Specification
Power Consumption	< 100 W	< 50 W
Min Range	1 m	1 m
Max Range	10 m	30 m
Max Depth	1 Secchi Depth	1.3 Secchi Depth
Range Resolution	< 1 cm	< 1 cm
Water Depth Resolution	< 1 cm	< 1 cm
Laser rep rate	8 kHz	20 kHz
Laser wavelength	532 nm	532 nm
Laser footprint	5 cm at 5 m	5 cm at 20 m
Dimensions (L x W x H)	30 x 30 x 30 cm	30 x 15 x 15 cm
Weight	10 kg	3 kg
Data rate	300 kB/s	500 kB/s
Data latency	0.1 s	0.1 s
Additional Sensors	IMU	Can incorporate scan system, IMU, camera, etc.
System Design	Handheld Unit Aircraft Unit	UAS/Airborne Platforms Watercraft Platforms Handheld Units
Measurement type	Geiger mode Time of Flight	Geiger mode Time of Flight

FEATURES:

Portability

Scalability

Affordability

Safety

Patented Technique | Accepting Licensing Inquiries