


OPTICAL SYSTEM DESIGN

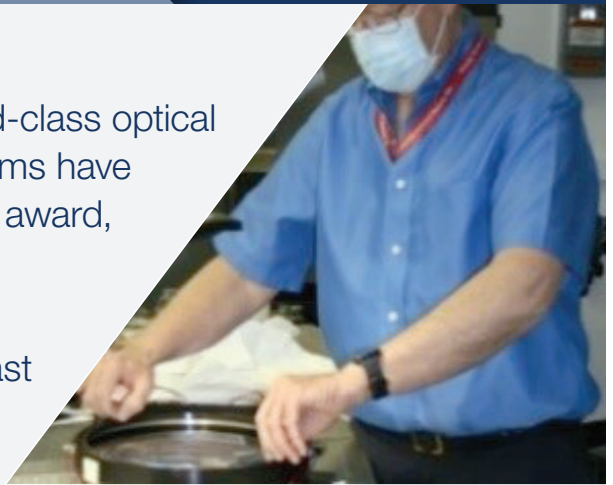


Argus Fisheye Prob: Hundreds of continuous rays of data points per experiment (R&D 100 finalist).

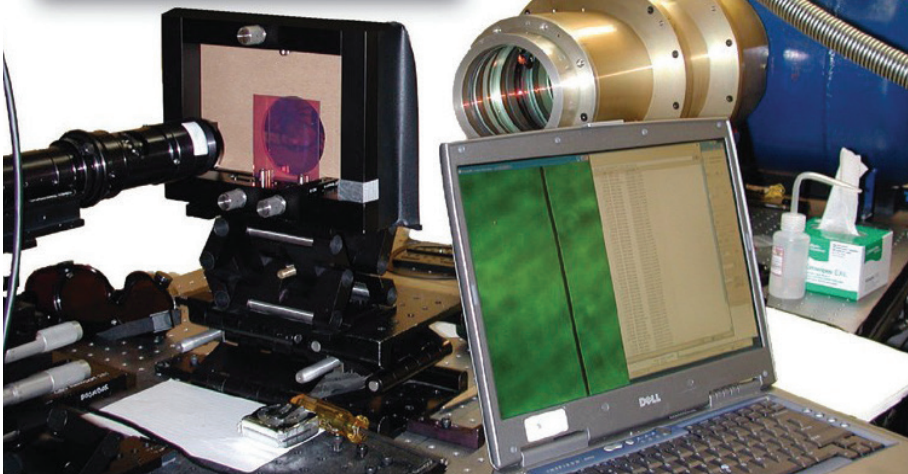
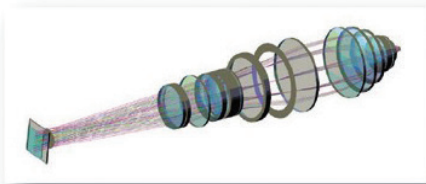
Optical Diagnostic System Design

The Nevada National Security Site (NNSS) designs world-class optical diagnostic systems. The NNSS optical diagnostics systems have won multiple awards including Lockheed Martin's NOVA award, R&D 100 award and R&D 100 finalist awards.

The NNSS designs, fabricates, and tests and fields sophisticated optical diagnostic systems including ultrafast electro-optic imaging and high-speed recording systems for capturing fast transient signals.



Installing a newly coated Cygnus Zooms Lens 12" lens element.



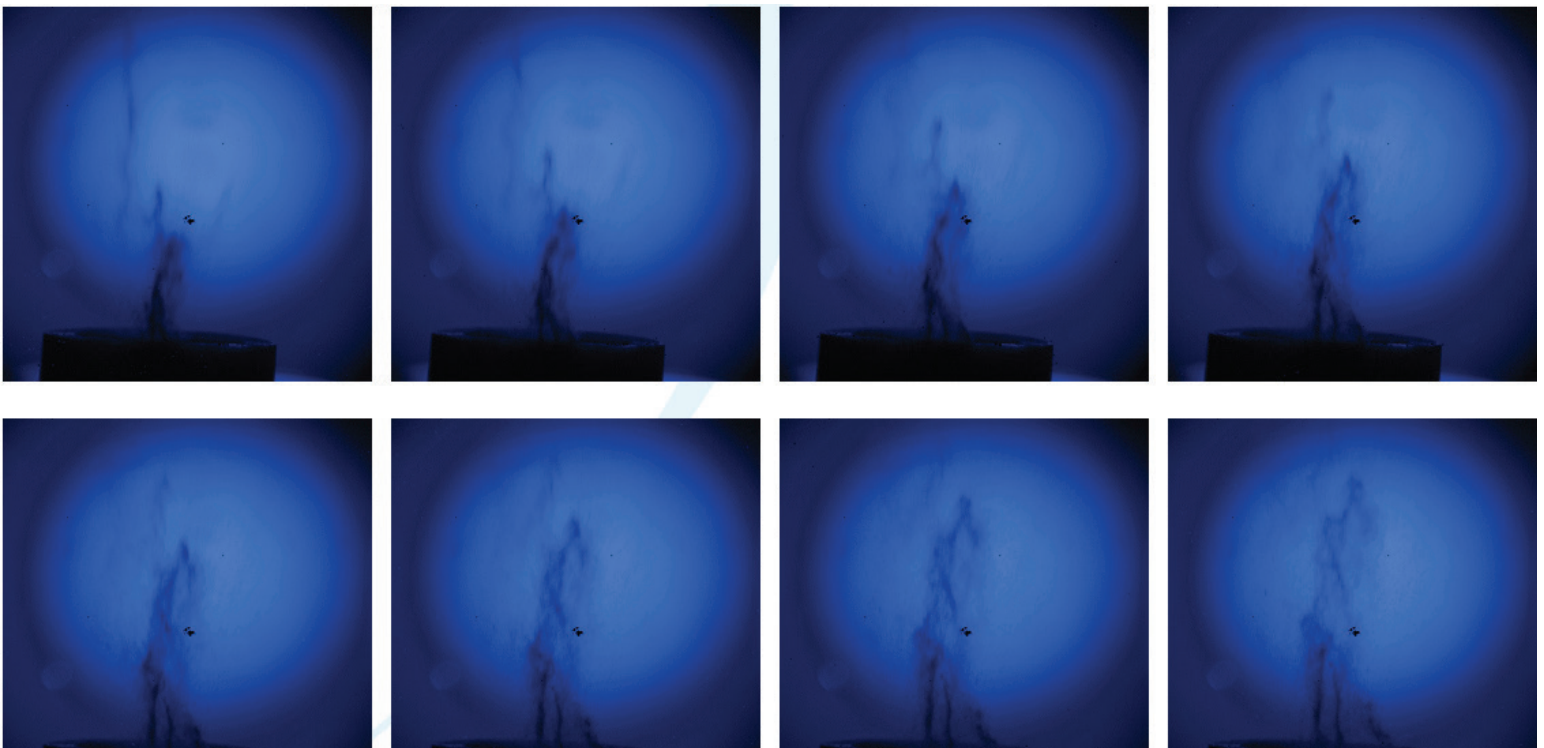
The high-resolution UV relay lens makes particle size measurements for shock physics under a variety of high-pressure conditions with each hologram storing up to 4.5 terabytes of data (R&D 100 winner).

Optical Systems/System Design

- Lens and illumination design
- Radiation imaging and detection
- Probe design
- Optomechanical tolerancing
- Optical characterization
- System assembly
- Alignment, calibration and radiometry labs
- Optical Field support

Precision Mechanical Design

- Full optomechanical support
- Precision mechanism design
- Automation for high-radiation environments
- Electronics packaging
- Engineering analysis: mechanical, multiphysics and electro-magnetics



Kraken: Blue spectrum (420 nm) images, Nikkor 105 mm lens, 8-frames (30 μ s exposures)

Electro-optics

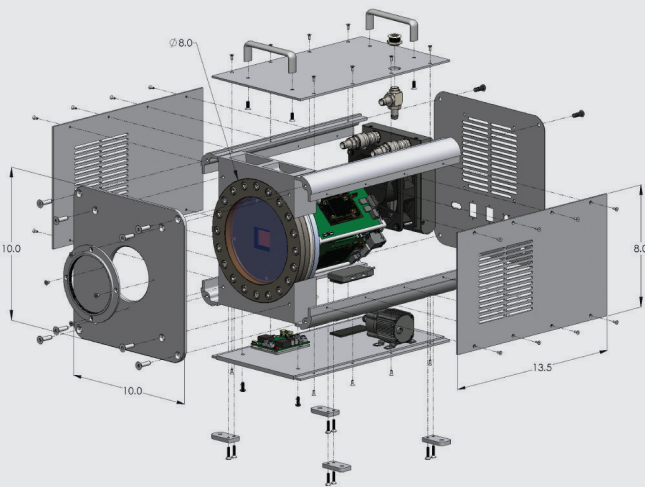
- High-speed, low-light level detection
- Streak and framing camera systems
- Timing and firing integration
- Printed circuit board and radio-frequency design
- Fiber-optic and optical sensor design, fabrication and testing

Dynamic Experiments

- Require imaging from multiple sources
- Optical designs combine x-ray imaging with shadowgraph imaging at two different laser wavelengths

Liquid Scintillator (left)

- Light is collected by a five-inch diameter photomultiplier tube
- Light collection efficiencies and time response is calculated for a variety of surface finishes



Kraken Camera: 8-frame, low-noise, 800 x 800 pixel imaging system.

