



COMPANY OVERVIEW



DEFYING IMPOSSIBLE.

Every day at Luna we challenge convention.

We are innovators, engineers, researchers & developers of technology; allowing for breakthroughs in fields as diverse as aerospace, automotive, energy, defense and telecommunications.

Our potential is limited only by our customers' imagination.

ABOUT LUNA

Who we are

We research, develop and commercialize innovative technologies:

- Strain & temperature sensing
- Test and measurement
- Shape sensing

We conduct applied research for customers in our primary areas of focus:

- Sensing and instrumentation
- Materials
- Health sciences

Why it matters

Our innovations evolve into products and technological solutions that address business challenges for the industries we serve.

OUR HISTORY

Luna Innovations Incorporated (NASDAQ: LUNA) was founded in 1990 and has been successful in taking innovative technologies from the applied research stage to product development and ultimately to the commercial market. In some cases, the successes led to the creation of independent businesses. We have created companies in our area of focus, sold some of them to industry leaders in their fields, raised private capital, formed joint ventures and entered into a number of licensing agreements.

We are a Virginia-based company with a diverse team of scientists, engineers, and business professionals developing and manufacturing a new generation of technologies and products. Operating in four locations across Virginia, we employ a disciplined and integrated business model designed to accelerate the process of bringing innovative solutions to market.

MARKETS WE SERVE

We identify significant market opportunities, build promising intellectual property portfolios and prototypes, and deliver them into highly differentiated commercial applications. We draw on the enormous intellectual property (IP) assets of universities and government labs, and enhance the probability of commercial success through proof-of-concept development funded by government and corporate contract research and development.

Core markets include:

- Aerospace
- Automotive
- Energy
- Composites
- Defense
- Telecommunications
- Industrial

FIBER OPTIC TESTING

We provide diagnostic and test instrumentation for the telecommunications industry, enabling complete characterization of optical components, assemblies and short-haul networks. Our solutions provide substantial cost and time savings in development, production, and maintenance of next-generation optical network equipment. Our instruments provide the most comprehensive, sensitive and accurate component test available on the market today.

- Advanced solutions for fiber optic and photonic test and measurement
- Component analyzers (IL, PDL, GD, CD, PMD, phase, etc.)
- Zero dead-zone, high-resolution reflectometers
- Swept-tunable laser
- Fiber optic switches



COMPONENT ANALYZERS

The OVA utilizes swept wavelength interferometry to characterize any single-mode passive optical device yielding insertion loss, polarization dependent loss, optical phase, group delay, chromatic dispersion, polarization mode dispersion, and more all as a function of wavelength...in a scan that takes less than 3 seconds.



REFLECTOMETERS

The OBR utilizes swept wavelength interferometry to provide the industry's only zero dead-zone, high resolution reflectometer. The OBR allows you to see inside your device or optical path to identify faults, measure individual insertion loss or return loss events, length, skew, group delay and more.



LASERS

Our Phoenix™ C-band swept tunable laser is optimized for linear sweep and power stability.

STRAIN & TEMPERATURE SENSING

FIBER OPTIC SENSING

Our distributed sensing solution utilizes low-cost optical fiber to provide unprecedented sensor density for your strain or temperature sensing application. Our systems can provide hundreds of measurement locations per meter of fiber with resolution of a few microstrain.

With sensors suitable for surface bonding or embedding in composites, this technology can accomplish its objectives either by direct integration during manufacturing or later installation.

- Non-destructive testing
- In-situ strain & temperature monitoring
- Design verification
- Structural load & fatigue testing
- Embedded sensing
- Composite cure monitoring
- Structural health monitoring



ODiSI A

The ODiSI A series is our state-of-the-art instrument for measuring distributed temperature and strain, using optical fiber as the sensor.



ODiSI B

The ODiSI B offers an industry-leading combination of measurement, speed, range and repeatability with extraordinary spatial resolution.



OBR 4600

The OBR 4600 is a high-resolution reflectometer designed for component and short-run network testing and troubleshooting with an option for integrated temperature and strain sensing.

FIBER OPTIC SHAPE SENSING

Our exclusive shape sensing technology can track the position (location) of an optical fiber along its entire length. This “smart fiber” is minimally intrusive, virtually weightless, and can be used to monitor the dynamic 3D shape of a structure to which it conforms. It can also be embedded or attached to a surface to monitor the dynamic 3D shape independent of temperature or load from the environment.

Unique benefits to our approach:

- High-resolution shape measurements in real time
- Measures the shape of a <200 micron diameter optical fiber sensor at every point along the sensor
- Greater than 500 Hz 3D angular measurement in multiple locations (fiber optic encoder)
- Highly accurate measurements of twist and bend at every point along the sensor
- Measurements of highly complex shapes



TESTING SERVICES

Our Testing Services give customers rapid access to the expertise and instrumentation to make measurements in application-specific environments. We are here to provide the measurement so that our customers can stay focused on their core business.



ODISI PLATFORM

We can make distributed fiber optic temperature and strain measurements in off-the-shelf telecom grade fiber, either embedded within composites or surface mounted to a structure, using the ODISI line of instrumentation. This unique technology enables readily configurable sensing locations and gage lengths for ultimate flexibility.



DSS 8600

Using our High Speed Distributed Sensing System we can measure temperature and strain at speeds of up to 667Hz on 4 channels. Thousands of sensors on a single optical fiber will provide a detailed map of the state of a structure as it evolves.



OBR 4600

We can use the latest model of our award-winning OBR product line to make ultra-high resolution reflectometry measurements in a component or short-run network with backscatter level sensitivity. We use the OBR 4600 to test or troubleshoot optical components.

EMERGING TECHNOLOGIES

Our product development and transition begins with innovation in our Technology Development Division, where talented scientists and engineers create intellectual property for Luna and our customers. Through collaboration with our extensive network of experts in academia, federal labs, and industry, we identify problems, generate solutions, and develop technologies with real market potential.

Technology Development for your most challenging applications:

SENSING & INSTRUMENTATION

We are developing advanced, high performance sensors and measurement technologies for a wide array of applications from fiber optic temperature and pressure sensors to corrosion monitoring, with the overall goal of improving safety, reliability, and operating cost.

MATERIALS

We have a core competency in the area of advanced materials and are committed to developing these technologies for both military and commercial use.

HEALTH SCIENCES

With a strong, interdisciplinary team comprising expertise in biomedical engineering, polymer and materials science and engineering, chemistry, biology, microbiology, molecular biology, wound healing and medical device design, we work closely with collaborators in academia, industry, and the government and thinks outside traditional paradigms to find innovative solutions for complex medical problems.

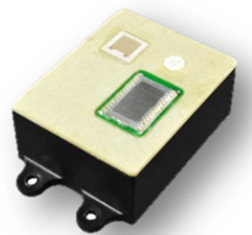
SENSING & INSTRUMENTATION

Fiber optic based sensing

- Fiber optic Distributed Sensing System™ (DSS) technology for making highly multiplexed measurements of temperature and strain
- Fiber optic temperature and pressure sensors capable of operating in extremely harsh environments at temperatures ~ 1000°C
- Modified pressure sensor for operation in a nuclear reactor core

Electrical based sensing elements

- Interdigitated electrodes for measuring uniform, pitting, galvanic, and crevice corrosion
- Crack sensor for characterizing environment assisted cracking under immersion or atmospheric conditions
- Strain and displacement
- Fluid particulate detection
- 5XXX aluminum sensitization detection



Wired or wireless sensors network

- Ultralow power wireless sensor platform for monitoring:
 - Aircraft corrosion, aluminum sensitization, storage tank coating health, and shaft health
- Luna Sensor Suite (LS2A) for measurements of environmental parameters and corrosion of aircraft alloys

Embedded diagnostic and prognostic modeling

- Atmospheric severity classification models
- Lubricant and recirculation system condition
- Rotating equipment condition and load history
- Bridge condition modeling

Accelerated and in-service corrosion testing.

- Corrosion and Coating Evaluation System (CorRES) for determination of coating and alloy performance during accelerated testing
- Small scale crack sensor for measuring susceptibility to hydrogen embrittlement and cracking

Nondestructive sensing

- Ultrasonic inspection of composite and alloy casings and tanks
- Residual stress measurements
- Fatigue damage precursors

MATERIALS

Corrosion prevention

- Substrate protection technologies including novel ion-exchange inhibitors, surface cleaners/modifiers, and advanced chrome-free corrosion mitigating primers and topcoats

EMI Shielding

- Conductive structural adhesives, corrosion control coatings, and sealants
- Charge dissipating conformal coatings

Hydrophobic/Oleophobic Materials

- Transparent inorganic/polymer hybrid coating provides a low permeation barrier for corrosion mitigation on metals
- Ultra-Ever Shield™, a repellant coating for military textiles that provides stain and chemical agent resistance

Conformal Antennas

- Flexible and conformal antennas fabricated from advanced magnetodielectric materials in combination with inkjet printing

Carbon Nanomaterials

- Nanostructured carbon electrodes for advanced lithium-sulfur batteries, ultra-fast supercapacitors, enzymatic biofuel cells, and organic photovoltaic devices
- Exfoliated nanospheres for use as bispectral and spectrally selective military obscurants

HEALTH SCIENCES

Assays

- Rapid assays for coliforms, oxygen demands and total organic carbon in treated wastewater
- Advanced protein purification
- Analytical services for craft breweries
- Reagents and assays for pathogen/toxin detection

Wound Healing

- Delipidator™ for predictable fat grafting
- Biomimetic material for repair of ocular surface injuries
- Surgical adhesion mitigating technologies
- Molecular burn dressings
- Photonic NerveBond™ for sutureless repair

Biopreservation

- Cell-stabilization matrices
- Cell-based biosensors for water toxicity detection
- Enzyme-stabilization matrices
- Marine antifouling coatings
- Biospecimen preservation and transport systems

Medical Simulation

- TrueClot™ simulated clotting blood for hemostatic dressing training
- Simulated blood clots and tissue for moulage training
- Low-cost hemorrhagic wound task-trainers

Nanomaterials

- Next generation MRI contrasting agents, Trimetasphere™ and AtheroMAP™ for early detection of tumors and atherosclerotic plaque
- Novel nanoparticle drug delivery systems



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