



# IERUS Technologies

## Bringing Value through Technology and Partnership

Founded by engineers as a positive, employee focused work culture for innovation across the defense life cycle:

- Pushing the bounds of science
- Expediting technology transition
- Focusing on today in a strategic context

IERUS is a *small, non-traditional* defense contractor, developing and supporting development of some of today's most critical technologies and systems

Solid business processes

- AS9100D QMS
- CMMI DEV Level III

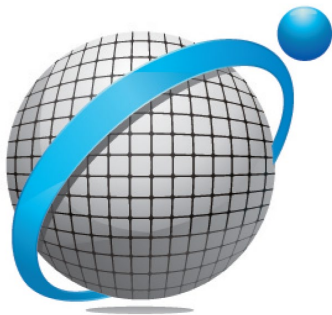
Over 50,000 sqft of facilities

- RF prototyping and Low-rate manufacture
- RF test labs
- Optics integration, test, and production facilities
  - 800 sqft clean room
- Machine shop

IERUS Technologies, Inc.  
2904 Westcorp Blvd Suite 210  
Huntsville, AL 35805  
(256) 426-4502  
<https://www.ierustech.com/>  
[Justin.Greene@ierustech.com](mailto:Justin.Greene@ierustech.com)

# Our Mission Spaces

**Our diverse mission spaces, current and future, are connected and driven by our core competencies**



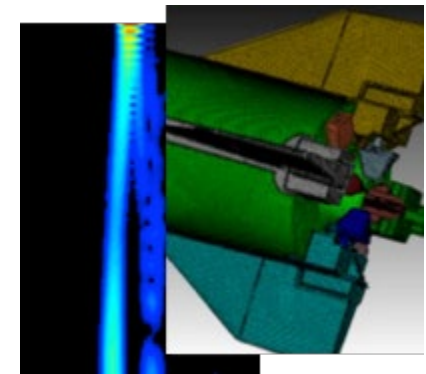
## Integrated Air and Missile Defense

- Radars and Radar Algorithms
- Battle Management / System of Systems
- Interceptors / Kill Vehicles
- Targets
- Directed Energy...



## Strategic Systems

- Hypersonic Glide Vehicles
- Re-entry Systems
- Ballistic Missiles
- Space Systems
- Space-to-Ground Communications...



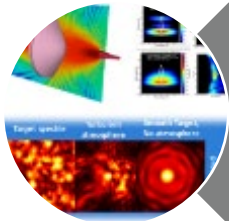
## Emerging Mission Spaces include:

- Unmanned / Autonomous Systems
- Electronic Warfare / Cyber
- Intelligence

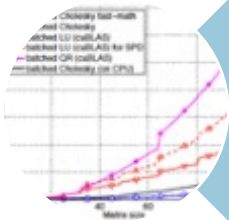
## Low-Observable / Counter Low-Observable

- Advanced Materials
- Materials Characterization
- Sustainment and Production Technologies
- RF and Optical Modeling
- Advanced Waveforms, Algorithms, and Components...

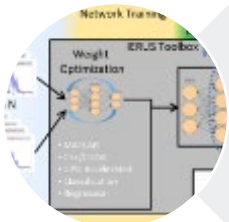
# Our Core Competencies



**Electromagnetics Phenomenology**



**Analytical Computing**



**Weapon Systems Engineering**

**IERUS's Core Competencies provide the foundation on which we build complete solutions to our customers across our**

- **Hardware,**
- **Software, and**
- **Services**

**product areas for our current and future mission spaces**

**Integrated Air and Missile Defense**

**Strategic Systems**

**Low-Observable / Counter Low-Observable**

**Electronic Warfare / Cyber**

**Unmanned / Autonomous Systems**

**Intelligence**

# IERUS Optics Experience Includes:

## Hardware

- **Extremely Accurate Star Tracker:** Lightweight, low power star tracker with accuracy of 40 milli-arcseconds by performing pixel location calibration to better than 10 milli-pixels.
- **UAS:** Imaging Payloads
- **Automated Mosaicking and Georectification (AMG) tool:** mosaics full motion video collected from an aerial vehicle and automatically locates the mosaics by matching to pre-processed features in orthorectified imagery of the region.
- Long wave infrared (LWIR) polarimetric imaging camera
- Optical Path Turbulence Characterization Sensor (**OPTCS**) for conducting path resolved turbulence measurements for SSA applications using our (AerOPT) sensor model to predict the impact of turbulence on image quality.
- Particle filter (PF) based approach for simultaneous target detection and tracking termed Track Before Detect (TkBD)

## Software

- **Aero-Optical Prediction Tool (AerOPT):** Models high-speed munitions aero-optic/aero-thermal effects, as well as atmospheric effects, multiple sensor system types, and optional laser sources. It is applicable from ultraviolet (UV) to long wave infrared (LWIR) and is written in MATLAB with a modular design so that phenomena and sensors may be used, added or replaced as needed.

## Services

- EO/IR signature analysis
- IR/Optical metamaterial design/characterization
- Aero-optical and aero-thermal modeling
- Sensor modeling (including atmospheric effects) and provide statistics and sample imagery/video representative of the sensor output
- Space based imaging sensor background modeling (for example, generating a background image for a sensor tracking ballistic missiles)
- Space situational awareness/space domain awareness modeling and simulation including non-resolved object characterization and orbital modeling using commercial tools like Systems Toolkit (STK)

# Optics Capabilities

- **Optical modeling, simulation and analysis**

- Aerodynamic flow effects
- Sensor modeling
- Sensor-scenario simulations, analysis and trades
- Spectroscopic analysis
- Window Distortion/Emissions

- **Algorithm development**

- Image filtering and pre-processing
- Target detection, discriminating and tracking
- Sensor fusion
- Image processing
- Computer vision

- **Optical design**

- Metamaterials
- Micro-optics
- Photonic bandgap

- **Sensor system development and test**

- Optical, opto-mechanical, software
- Characterization and calibration
- Verification and validation
- Lab and field testing

- **Extremely Accurate Star Tracker**

- **Space Situational Awareness**

- Space Background Modeling

