

The AMP logo is rendered in a stylized, white, multi-lined font. The letters are composed of horizontal bars of varying lengths, creating a sense of depth and a digital or technical aesthetic. The background of the slide features a teal-to-blue gradient with faint, circular technical diagrams and scale markings.

# AMP RESEARCH INC.

AMON-HEN PROPOSER'S DAY CONFERENCE

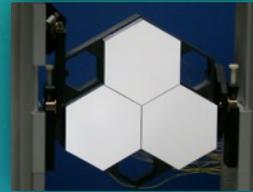
MAY 11, 2017

[WWW.AMPRESEARCH.COM](http://WWW.AMPRESEARCH.COM)

- *FOUNDED 1989*
- *BASED IN NAPLES, FL*
- *SMALL HIGH-TECH COMPANY - WOMAN-OWNED*
- *PI: DR. S. ENGUEHARD*
- *NUMEROUS PRIME AND SUBCONTRACTS WITH:*  
ARMY, NAVY, AF, NASA, DOE, SDIO / BMDO / MDA, CTTSO, NIJ

# RELATED PROGRAM & PROJECT EXPERIENCE

- ❖ High-energy Laser Projects (that involve atmospheric propagation)
  - ✓ GBFEL (SDIO)
  - ✓ MTHEL (Army)
  - ✓ SBL (BMDO)
  - ✓ ABL (AF)
  - ✓ SELENE (NASA)
- ❖ Computer generated Holographic Imaging (NASA & AF)
- ❖ Microscanning (image enhancement technique to increase resolution)(AF)
- ❖ SOPHI - Segmented Optics Phase Integration (NASA HQ)
- ❖ LENS - Library of Enhanced Night/Day-vision Software (HASC through ARMY)
- ❖ iLIVE - inLine Instant Video Enhancement (CTTSO)
- ❖ CSHIPS - Covert Ship Hull Inspection Protection System - Underwater Vision Enhancement (CTTSO)



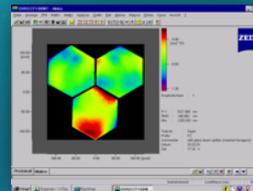
Segments and baseplate made from Cesium



Active optics actuators (side)



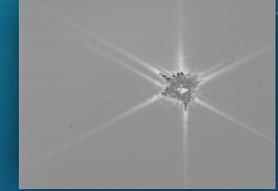
Laboratory test stand



Interferogram of phase segments



Active optics actuators (back)



Magnified image of a white light point source when segments are phased.

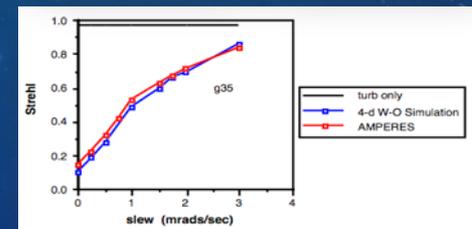
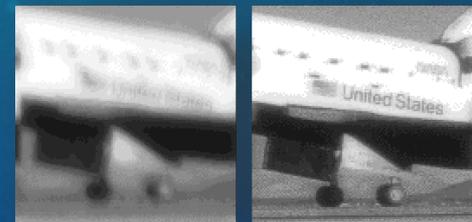
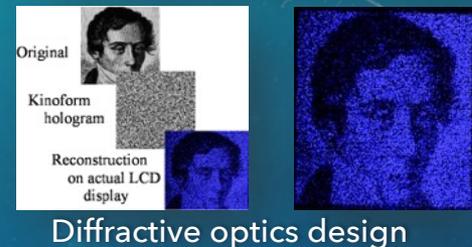
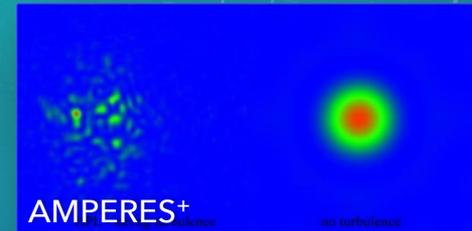


# EXPERTISE

- ❖ Theoretical & Mathematical Physics
- ❖ IR Astronomy
- ❖ Electronics RTD&E
- ❖ Atmospheric Propagation
- ❖ Atmospheric Optics and Speckle Imaging
- ❖ Adaptive Optics
- ❖ Diffractive and Holographic Optics
- ❖ Photonic Crystal Design
- ❖ Image and Video Enhancement
- ❖ Real-time Hardware-based Image and Video Enhancement
- ❖ In-house Custom Printed Circuit Board Design
- ❖ Embedded System Programming (including FPGA)
- ❖ Digital Night Vision
- ❖ Mac, Windows, Linux, iOS, Android App Development
- ❖ Computational Electromagnetics
- ❖ Low-light Sensor & Camera Design
- ❖ Electro-optics and Laser System Design
- ❖ 3D Printing Design & Implementation
- ❖ Exact analytical solution to the physics problem of the interaction of thermal blooming and atmospheric turbulence (with and without adaptive optics)
- ❖ Exact analytical solution to the adaptive optics control problem for segmented optics
- ❖ AMPERES Computational Electromagnetics Design Tool and Simulation Suite
  - ✓ Full wave-optics atmospheric propagation simulation for imaging and directed energy applications and missions
  - ✓ Desktop design tool for segmented adaptive optical telescopes
  - ✓ Desktop design tool for diffractive optics (scalar and vectorial diffraction regimes)
  - ✓ Directed energy systems analysis model for thermal blooming based on functional scaling

# ATMOSPHERIC OPTICS AND IMAGING PROJECT HIGHLIGHTS

- ❖ SOPHI - Segmented Optics Phase Integration
  - ✓ Adaptive segmented mirror fabrication and control
  - ✓ <https://www.sbir.nasa.gov/SBIR/successes/ss/8-057text.html>
- ❖ iLIVE - inLine Instant Video Enhancement
  - ✓ Plug-n-play real-time video enhancement: your camera, your display
  - ✓ Real-time image and video enhancement and analytics
  - ✓ Implements aspects of our LENS (Library of Enhanced Night/day-vision Software)
  - ✓ [http://www.cttso.gov/?q=iLIVE\\_Video\\_Enhancement\\_System](http://www.cttso.gov/?q=iLIVE_Video_Enhancement_System)
- ❖ CSHIPS - Covert Ship-Hull Inspection/Protection System: Underwater Vision Enhancement
- ❖ Color, Digital night vision, on-board video computer
- ❖ IP68 3D-printed housing
- ❖ 6 separate circuit boards for power, camera sensor, FPGA camera control and real-time image enhancement, display, all done in-house

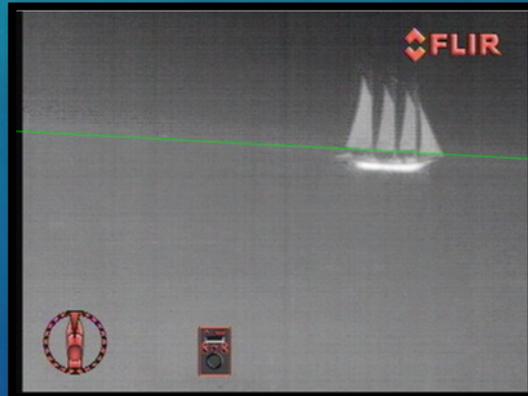


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In-house custom video-in video-out (ViVo) and DSP circuit board



Real-time image analytics: horizon finder



Real-time image analytics: edge detection and evaluation

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