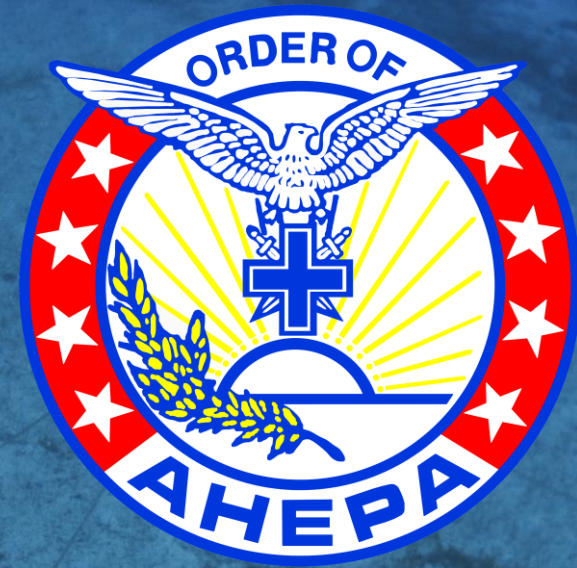


# PROJECT ENIGMA

NEXT GENERATION MARITIME ARCHAEOLOGY

Hellenic Archaeological Exploration Society, an AHEPA National Project



# Hellenic Archaeological Exploration Society



- An AHEPA National Project since 2019.
- 501(c)3 non-profit in the United States and NGO in Greece established in 2022.
- Our mission is to advance research and education in the fields of archaeology and science.
- Our vision is to collaborate with the Greek Ministry of Culture, scientists, universities, and archaeologists with financial support of the adoptions of new technologies, expeditions, content creation and dissemination, and educational and employment opportunities in the fields of sciences and archaeology.
- Our values are to operate in strict accordance with all laws and full transparency to governments, institutions, and donors to maximize the benefits to science and archaeology.



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## Next Generation in Maritime Archaeology (eNiGMA)

- **Mentor Shipwreck Excavation Programme**, September 2023 on the island of Kythera.
- The **first ever** use of high-detail, close-up, ROV-mounted laser scanning technology in underwater archaeology and marine biology.
  - **Laser scanner:** Newton Labs PL3200UW-LW (purchased)
  - **ROV:** VideoRay Mission Specialist Defender (rented)
  - **Navigation Unit:** Sonardyne SprintNav Mini (rented)
  - **GPS:** Hemisphere VS101 (rented)
  - **Control software:** EIVA NaviSuite (temporary license)
- **NORSK Remote Sensing** will be operating all equipment and processing data into 3D point clouds.



VideoRay

NEWTON



EIVA

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# Mentor Shipwreck Excavation Programme

- A project run by Dr. Dimitris Kourkoumelis, Deputy Director of the Ephorate of Underwater Antiquities, and Dr. Alexandros Tourtas almost yearly since 2009.
- Team consists of maritime archaeologists, marine scientists, conservationists, surveyors and other specialists.
- Three additional historical wrecks spanning a time period of over 1000 years will also be included. The shipwrecks are at different depths, in different natural environments, and have different materials (ceramics, organics, metallics, glass and more). This will provide a more thorough evaluation of the laser scanner.
- This technology reduces time required to acquire data, increases amount and resolution of data increases, reduces risk to the fragile historical sites and divers.



# Short Film Documentary to capture history!



- Award winning filmmaker Chris Giatrakos of 8film productions has been hired to capture this leap in technology in underwater research.
- Final film to be distributed online & used in its unedited form by any institution for the purpose of fundraising to purchase the laser scanner & ROV package.

8film

Unknown Journey | Documentary



# Fundraising



- Donor categories that will be recognized for their support in the short film documentary and HAES website:
  - Platinum level: \$50,000 USD and above.
  - Gold level: \$10,000 USD to \$49,999.
  - Silver level: \$5,000 USD to \$9,999.
  - Bronze Level: \$1,000 USD to \$4,999.
- Donations may be made via
  - Online at <https://theHAES.org/donate>.
  - Via check. Contact the HAES at [info@thehaes.org](mailto:info@thehaes.org) or +1-206-830-0397 for mailing address.



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# Current Methods

- Tape measure and photogrammetry
  - Labor/dive intensive
  - For safety reasons, time underwater is limited
  - Requires many dives, often spread over many seasons, to acquire data
  - Photogrammetry models look good from a distance, but not close up
- Laser scanning has not been used due to the logistical complexity and expensive of using submarines
  - Research vessels requiring a large crew
- The future is with automated machines



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# The future of underwater research

- ROV-mounted laser scanners
- Computer controlled ROVs
- One time cost with simple logistics
- Safer for divers as machine time underwater only limited by battery life.
- Incredible submillimeter accuracy!
- No need for upgrading laser scanner.

The future happens in September in Kythera!



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Click on image for video



3D point clouds



# DEMO

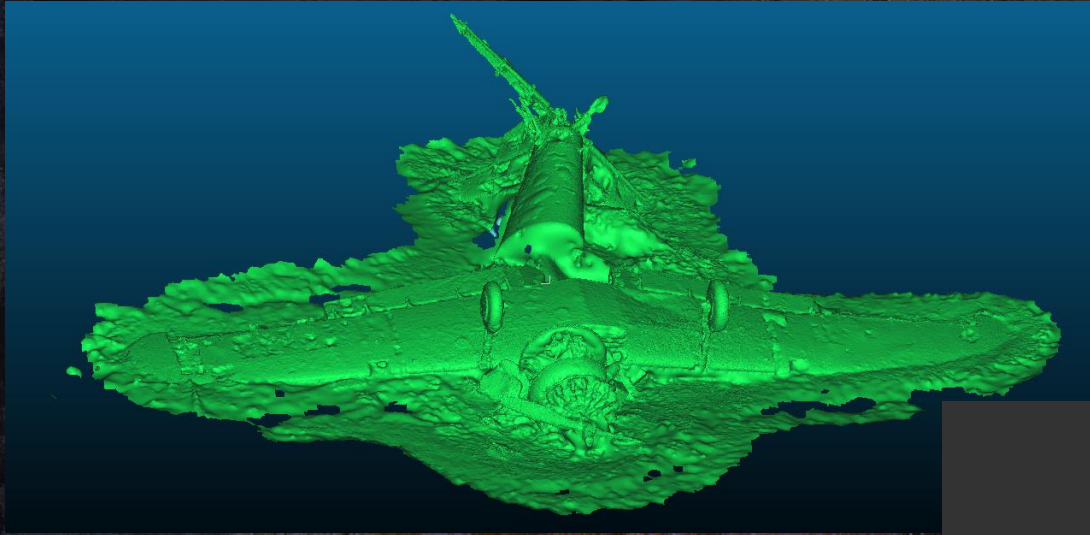
Photogrammetry vs. LiDAR



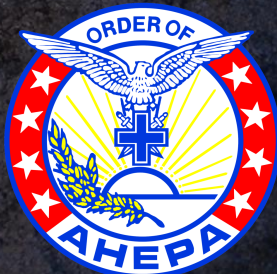
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# Photogrammetry lacks the resolution & accuracy of LiDAR



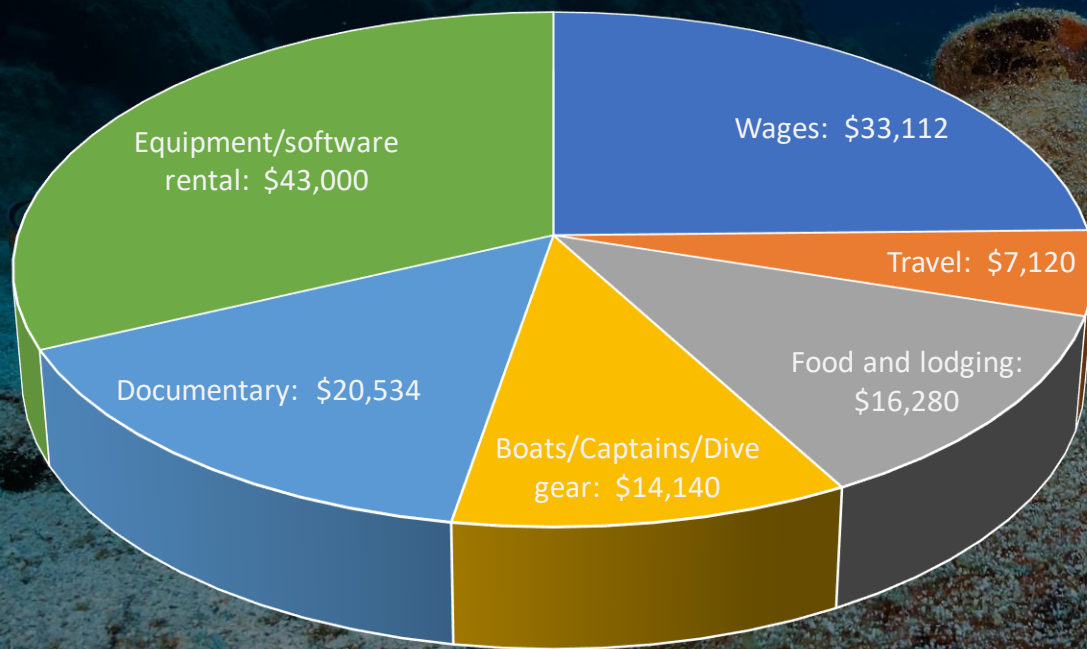
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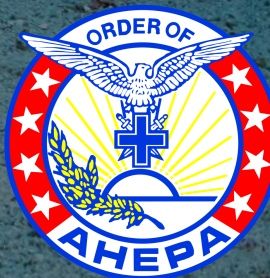


# Budget

- Budget of just under \$135,000 USD.
- HAES has purchased the \$95,000 laser scanner with funds from a member.



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# A special thank you to particular individuals



John Bramblet, CEO of Newton Labs

- Proactive guidance & allocating company resources to assist our project

Brett Kolb, Manager of Commercial Business at VideoRay

- Continuous support & equipment upgrades, discount rental cost.

Jerry Dawson, founder of NORSK Remote Sensing

- Continuous participation and technical guidance from the beginning.

Andreas Zapounidis, AHEPA Marshal, District 28 Europe

- Establishing the NGO, coordinating legal and accounting requirements

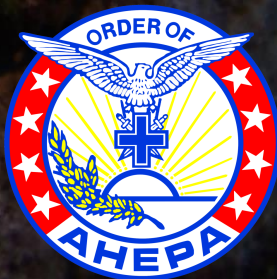


**NEWTON**

**VideoRay**



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# Let's dive into history!

- Thank you for your donation!
- <https://theHAES.org/donate> (or QR code)
- For checks, contact the HAES at [info@thehaes.org](mailto:info@thehaes.org) or +1-206-830-0397 for mailing address.
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