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The NAUTILUS project: The story of an AMS facility on the move

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NAUTILUS (NAval Ultra-Trace Isotope Laboratory Universal Spectrometer) combines Secondary Ion Mass Spectrometry (SIMS) with a Single Stage 300kV Accelerator Mass Spectrometer system (SSAMS) to produce a single setup unlike any other in the world for spatially resolved trace-element and isotope analysis [1]. Initially designed and built at the United States Naval Research Laboratories (NRL), it was decommissioned only 2 years after becoming fully operational due to a realignment of the research focus of a number of groups at NRL. NAUTILUS was transferred in August 2023 to the University of Notre Dame (ND) to pursue its research "career" in an academic setting broadening its range of research activities. At the start of disassembly NAUTILUS was still 100% functional, all systems were connected to power and the system under vacuum. NAUTILUS was carefully disassembled and fully documented by members of the Institute for Structure and Nuclear Astrophysics (ISNAP) of the University of Notre Dame and crated and shipped to ND where it awaits reassembly.
The University of Notre Dame has approved $1.5M for the construction of a new building north of campus and the hiring of a research faculty to supervise its reassembly and future operations. NAUTILUS will be operated jointly by the Department of Engineering and ISNAP as a University research facility, and will as such support a number of research programs: ranging from actinide research both from the ND Energy Center and the ISNAP AMS group, to the training of the next generation of experts in Nuclear Nonproliferation and the development of new capabilities for the detection, identification and characterization of nuclear weapons development. NAUTILUS will also support a basic Radiocarbon AMS program for the department of Anthropology as well as research programs from NASA meteoritic research groups and other outside users. This talk will present both the challenges of the move as well as present certain aspects of the NAUTILUS future scientific program.

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[1] E. Groopman et al, J. Anal. At. Spectrom., 2020, 35, 600

Student Submission

No

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