NAWCWD Quick Facts
China Lake & Point Mugu, CA NAVAIR

Michelson Laboratory

Chemistry, Clean Rooms, Composites & Plastics, Electroplating, Environmental Testing, Foundry, Heat Treatment, Integrated Battlespace Arena, Machine Shop, Measurements, Physics, Sidewinder, Teleconferencing

Mission. Michelson Laboratory was designed to accommodate a staff of about 600. Michelson Laboratory is equipped for basic and applied research in physics, chemistry, aerophysics, metallurgy, and ballistics, as well as for development work in propulsion, fire control, and guidance systems for rockets and other missiles.

Unique Features. When it was dedicated in 1948, it was one of the most complete research facilities of its kind in the world! Today, the facility remains a valuable asset to the Weapons Division and houses a wide variety of specialized laboratories for work in physics, chemistry, simulations, prototyping, and environmental testing.

Combat Support. Since it first opened, Michelson Laboratory has supported our warfighters directly or indirectly in every major conflict. A few examples are described here.

9/11 Attack. When America was attacked, part of the Weapons Division's immediate response was to set up a command center known at the Warfighter Response Center (WRC), then located at the north end of Michelson Laboratory. Since then, this facility has served our troops in a multitude of ways on an around-the-clock basis. In addition, the Engineering Prototype Facility (Machine Shop) won a Warfighter award for outstanding contributions to **Operation Iraqi Freedom**. During **Operation Enduring Freedom**, the BLU-116 hard-target deep penetrator was used in the GBU-24G/B weapon system. The bomb was designed by China Lake, and prototypes were manufactured by the Michelson Laboratory machine shop. During the **Korean War,** an urgent request came from the field for a weapon to defeat 13-inch tank armor. Within 29 days, China Lake produced and developed a shaped-charge warhead to match with the 5-inch high-velocity aircraft rocket (HVAR) motor and produced Rolling Airframe Missile (RAM), a 6.5-inch ATAR. The Michelson Laboratory hall was turned into a crash production facility for RAM fuzes. RAM was designed, tested, documented, and produced at China Lake and put in service in Korea.

Size / Description / Scope. 540,000 SF at China Lake. The building contains more than 9 ½ acres of floor space. The structure is made up of 16 monolithic concrete units and joined in such a way as to prevent possible earthquake damage. Its long horizontal lines parallel the planes of the desert. The massive, sprawling laboratory is air-conditioned throughout. Michelson Laboratory is centrally located at Main Site. **Original Cost:** $7M. **Plant Value:** $242M+. Since its inception, the laboratory has grown; numerous wings have been added including the IBAR, Video Teleconference Center, Fiber Optic Trunk System Hub, Solid State Wing, and the Intel Library.

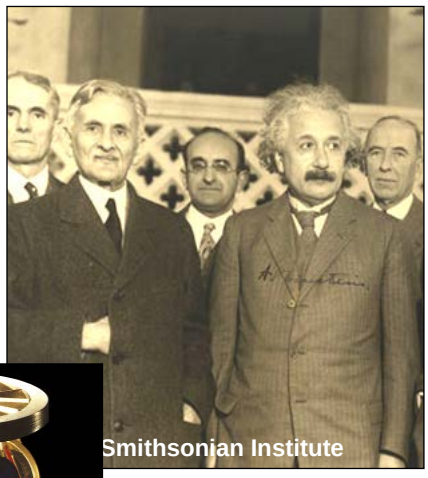
Main Facilities. The main building includes a chemistry wing; physics wing; composites and plastics laboratory; engineering prototyping facility (machine shop); Integrated Battlespace Arena (IBAR); physics laboratories; multiple video teleconferencing centers; foundry; standards of measurement, materials testing, heat-treating, and electroplating shops; environmental testing facilities; and numerous clean rooms. Most of these facilities are described individually in other fact sheets.

Nearby Buildings Within the Complex. AMRAAM HWIL, Combustion Sciences**,** Composites Laboratory, Computer Laboratories, Engineering Laboratory, ESSM HWIL, HWIL Laboratory, IBAR facilities, Propulsion Research Laboratory, Technical Library, Weapons Systems Center for Integration.

Unique or Historic Tests

Michelson Laboratory Engineers Build One of the World's First Advanced Computers to Support Advanced Weapons Development. In the early 1940s, telemetry film assessment work required a phalanx of detail-minded employees to sit hour after hour peering at test-film footage through microscopes, laboriously counting pulses and writing down measurements. Workers complained of tedium and ruined eyesight. In 1946, the world's first fully electronic computer, the Electronic Numerical Integrator And Calculator (ENIAC), was invented, and NOTS staff was anxious to adapt the new machines to their needs. In 1950, two chemists designed and constructed an analog computer made of old radar and radio parts. The computer dramatically reduced the time necessary to calculate the theoretical performance characteristics of certain propellant compositions. China Lake's first centralized computer began operation in October 1951 when the new Reeves Electronic Analog Computer (REAC) was set up in the hallway in Michelson Laboratory. This is a clumsy device by today's standards—requiring about 3,000 vacuum tubes to make it work—REAC was a marvel of efficiency back then and was used to perform early Sidewinder simulations.

Interesting Facts. Michelson Laboratory is named after Albert Abraham Michelson, the first American recipient of the Nobel Prize in Physics in 1907. Early in his career, he was appointed by President Grant to the U.S. Naval Academy where he eventually became an instructor in physics and chemistry. Michelson was one of the first to measure the speed of light and the diameter of a star, and he became known as "the man who taught the world to measure." Michelson had academic and personal connections to the founding fathers who established China Lake in the early 1940s, and his work and inventions contributed to the technology used in weapons and other systems subsequently developed at China Lake. Although Michelson never worked directly at China Lake, his influence was strongly felt.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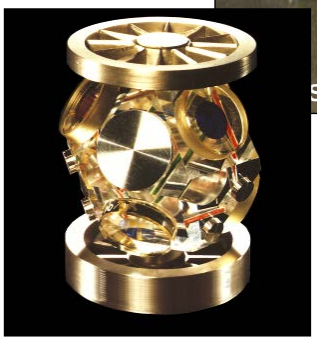

Historical Significance. May 8, 1948, was a significant day for NOTS. It marked the third anniversary of Germany's defeat in World War II, and the station was embarking on its third year of peacetime operations. The official Michelson Laboratory dedication, one of the most impressive research buildings of its kind, showcased the continued growth and success of NOTS. The event was attended by a host of dignitaries including the assistant Secretary of the Navy for Air, as well as NOTS legends including Captain S.E. Burroughs, Dr. Charles C. Lauritsen, and Dr. L.T.E. Thompson. Special guests included Dr. Robert A. Millikan, intimate associate of Dr. Michelson for 25 years and fellow Nobel Prize winner. In his remarks, the Assistant Secretary said, "If there is to be another war, the shape of it first will be visualized here at China Lake. Each time I come here, I have an impression that I am being given a look into the future. Here, many of the weapons of the next war will have taken shape first in the minds of some of you now present."