

United States Department of the Interior
 National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

DRAFT

1. Name of Property

Historic name: Institute of Geophysics and Planetary Physics (IGPP) Munk Laboratory
 Other names/site number: IGPP Munk Lab
 Name of related multiple property listing: N/A
 (Enter "N/A" if property is not part of a multiple property listing)

2. Location

Street & number: 8800 Biological Grade
 City or town: La Jolla (San Diego) State: California County: San Diego
 Not For Publication: Vicinity:

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ___ statewide ___ local
 Applicable National Register Criteria:
 ___ A ___ B ___ C ___ D

_____ Signature of certifying official/Title:	_____ Date
_____ State or Federal agency/bureau or Tribal Government	

In my opinion, the property ___ meets ___ does not meet the National Register criteria.	
_____ Signature of commenting official:	_____ Date
_____ Title :	_____ State or Federal agency/bureau or Tribal Government

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4. National Park Service Certification

I hereby certify that this property is:

- entered in the National Register
- determined eligible for the National Register
- determined not eligible for the National Register
- removed from the National Register
- other (explain:) _____

Signature of the Keeper

Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

- Private:
- Public – Local
- Public – State
- Public – Federal

Category of Property

(Check only **one** box.)

- Building(s)
- District
- Site
- Structure
- Object

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Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
<u>1</u>	<u> </u>	buildings
<u>1</u>	<u> </u>	sites
<u> </u>	<u> </u>	structures
<u>1</u>	<u> </u>	objects
<u>3</u>	<u>0</u>	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions

(Enter categories from instructions.)

EDUCATION: research facility

Current Functions

(Enter categories from instructions.)

EDUCATION: research facility

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7. Description

Architectural Classification

(Enter categories from instructions.)

MODERN MOVEMENT: Organic

OTHER: Post and Beam

Materials: (enter categories from instructions.)

Principal exterior materials of the property: Redwood

Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The Institute of Geophysics and Planetary Physics (IGPP) Munk Laboratory is located on a coastal bluff at the Scripps Institution of Oceanography (SIO) in La Jolla, California and is part of the University of California, San Diego campus. The property houses laboratories and offices for IGPP and is named for the renowned SIO oceanographer Walter Munk and his wife Judith Munk who were both instrumental in its construction. Designed by San Diego architect Lloyd Ruocco and built in 1963, the laboratory occupies a sloped lot that overlooks the Pacific Ocean. This Mid-Century Modern Post-and-Beam building is two stories in height and includes a full basement below. It is constructed primarily of redwood and sits on a cast-in-place concrete foundation. Cross-axial in plan, the building is capped by a flat roof with projecting eaves, exposed redwood beams, and overhead shade trellises. Exterior wall cladding includes rough-sawn redwood shiplap siding. Operable wood windows and sliding glass doors comprise the building's fenestration. The windows and doors create wide, horizontal expanses of glass and some of the sliding doors open to cantilevered balconies. A pair of glazed entrance doors at the east façade feature louvered transoms and provide access to the central interior corridor. A 1967 addition, designed by UC San Diego architect Robert "Gus" Thorburn, formerly of Ruocco's

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architectural firm, is located at the north end of the laboratory wing, obscured by a hillside. The building is surrounded by a landscape designed by the firm Harriett Wimmer and Joseph Yamada in 1963. The landscape exudes a sense of informality that enhances the building's integration into the environment. *Spring Stirring*, a 1948 black diorite sculpture designed by eminent sculptor Donal Hord, depicts an indigenous man awaking from a long sleep and is prominently displayed in the north landscape. At the behest of benefactors Cecil and Ida Green, the sculpture was purchased and subsequently moved to the property in 1964. Overall, the building, landscape, and sculpture are in excellent condition and have had very little alteration, retaining all aspects of integrity.

Narrative Description

IGPP Munk Lab

One Contributing Building

The Institute of Geophysics and Planetary Physics (IGPP) Munk Lab is located on a coastal bluff at the Scripps Institution of Oceanography in La Jolla, California. The building has an asymmetrical cross-axial floor plan with two long rectangular wings oriented perpendicular to each other (**Photo 1**). The upper, single-story, office wing, measuring 240'6" x 48'6", is oriented east/west and it juts out to the edge of the bluff providing dramatic ocean views to nearby Scripps Pier and the Pacific Ocean (**Figure 2**). The lower wing, measuring 45'6" x 216'6", contains mostly laboratory space and offices. It is two stories in height and oriented north/south, with a full basement below containing additional laboratory spaces and equipment rooms. Due to the naturally sloped topography, all building levels have direct exterior access. The lower laboratory wing has tall sliding glass doors along the east façade leading to an exterior loading and staging area (**Figure 3**). The upper office wing has main entry doors on the east and north façades with numerous secondary entrances for each office along the north and south facades (**Figure 4**).

The building exhibits characteristics of Mid-Century Modern architecture, and specifically of the Post-and-Beam substyle. Constructed primarily of redwood with a cast-in-place concrete foundation, the building is comprised of 6x12 Douglas fir beams spaced six feet on center with 6x6 Douglas fir posts. The primary exterior cladding of the upper wing is glass with full-height redwood framed fixed and sliding glass doors along the entire south façade (**Photo 4**) as well as most of the west and north façades (**Photos 5, 10**). The remaining exterior walls are clad with vertical 1x8 rough-sawn redwood shiplap siding. The preponderance for natural wood on the exterior and interior of the building characterize the influence of the Organic substyle of Modern architecture on Lloyd Ruocco's work.

The lower wing has tall redwood-framed sliding glass doors along the east façade providing direct access to the loading area. The west façade of the lower wing has smaller redwood-framed sliding windows providing natural light and ventilation for the mezzanine level offices, which overlook a double-height laboratory space. Both the upper and lower wings have flat roofs that extend beyond the exterior wall plane creating a wide overhang of approximately eight feet

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on all sides of the building. The overhangs include a 4-foot-wide shade trellis comprised of 2x4 redwood boards spaced four inches on center and oriented vertically creating a linear opening of 2½ inches between each board. A similar shade trellis is located at the outer edge of the cantilevered catwalks on the south, west, and portions of the north facade of the upper wing. Exterior redwood features at IGPP Munk Lab have a clear finish while the Douglas fir post and beams are finished with a dark brown stain. The overall effect, combined with the large expanses of glass, is a strong and harmonious connection between the building and the surrounding landscape.

The original interior layout remains intact with most of the original interior features and finishes unchanged since the building's original construction in 1963. There is a long central corridor on the upper floor, which has vertical 1x8 rough-sawn redwood shiplap siding on the north wall. The south wall has clerestory windows facing the offices on the upper wall with unfinished rough-sawn redwood plywood below. Interior doors leading to the offices from the central corridor are simple wood slab doors with a clear finish. The structural roof framing and tongue-and-groove wood sheathing are exposed at the ceilings throughout. The upper office wing includes eighteen private offices (**Photo 19**) along the south side of the building. The north side of the building has larger shared offices, an administrative office suite, reading room, restrooms, and support spaces.

There is a large conference room on the west end of the building with expansive westerly views toward the Pacific Ocean. The conference room includes several pieces of original furniture custom designed by architect Lloyd Ruocco specifically for the space, including a modular curved chalkboard and modular two-section curved conference table. There is a similar oval four-section conference table in the reading room. The conference room has large sliding wall panels on the west wall to cover the floor-to-ceiling windows when needed and full-height drapes on the west and south walls. The ceiling in the conference room is finished with a redwood lattice over 1" sound insulation for acoustical performance. Tapa cloths, collected at the Tonga islands while Walter Munk and Roger Revelle were on the Capricorn Expedition, provide sound insulation. The cloths also remind scientists, both young and old, that the Capricorn Expedition provided much of the physical data to prove the theory of plate tectonics. Other original interior features include built-in wood bookcases and cabinets in the reading room and in each office.

The lower wing of IGPP Munk Lab contains most of the building's laboratory space. Large double-height laboratory rooms occupy the east side with offices along the west side. The offices are generally smaller than the upper wing offices. They feature many of the same architectural details with rough-sawn redwood plywood paneling, built-in wood bookcases and cabinetry, clerestory windows facing the corridor, and exposed roof framing at the ceilings. The laboratory spaces are finished in the same manner as the offices. The resulting atmosphere conveys a warmth and humanity uncommon for laboratory settings, which are more often sterile and cold. Interior alterations have been very limited, including only minor changes such as replacing carpeting and installing fire sprinklers.

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IGPP Munk Lab was designed in 1962 and built in 1963. A building addition was completed early in the history of the building, in 1967. The addition added twenty-four feet to the north end of the lower wing. UC San Diego archives include a full set of the original construction drawings dated June 1, 1962 as well as the drawings for the addition, which are dated June 8, 1967. The 1962 drawings include Lloyd Ruocco's title block and signature. The 1967 drawings have a standard UC San Diego title block with no architect's stamp or signature, indicating that these drawings were produced in-house by UC San Diego. Although the addition was not designed by Ruocco's office, it was designed by Robert "Gus" Thorburn who was a member of Lloyd Ruocco's staff during the design and construction of IGPP Munk Lab before he accepted a position at UC San Diego. Thorburn was responsible for the design of the 1967 addition and oversaw its construction while working for UC San Diego. The architectural detailing and finishes of the addition are similar to the adjacent original construction. The addition is located at the north end of the laboratory wing, set below the office wing and obscured by a hillside.

Landscape

One Contributing Site

The landscape surrounding IGPP Munk Lab property was designed in 1963 by the landscape architectural firm of Harriett Wimmer and Joseph Yamada with Joseph Yamada as the principal landscape architect. Construction drawings are dated July 1, 1963.

Site paving is comprised of concrete walkways and patios. The existing concrete walkways and patios all appear to be original, matching what is shown on the drawings and in early photographs. The walkways feature exposed aggregate with black beach cobble. A large patio on the north side of the building was originally used for outdoor lectures and gatherings. The patio paving has exposed aggregate concrete with redwood headers. Adjacent to the patio, a lawn area surrounds the Donal Hord *Spring Stirring* sculpture.

The landscape on the north side of the building is evocative of a Japanese style garden, typical of the plant palette and design aesthetic which characterized Joe Yamada's work. Original planting included *Cupressus macrocarpa* (Monterey Cypress), *Melaleuca leucadendra* (Paperbark), *Pittosporum tobira* (Mock Orange), and *Juniperus sabina* 'Tamariscifolia' (Tam Juniper). In contrast, the original landscape on the south side of the building was much less formal and more representative of the native ecology, making use of Mediterranean and native plant varieties such as *Baccharis* sp. (Coyote Bush) and *Rhus integrifolia* (Lemonade Berry) while using a seeded stabilizing matrix on the bluff to preserve the natural slopes. Scattered throughout the site, there were built-in custom-fabricated redwood benches. Each bench was comprised of six 4x4 redwood slats that were laminated and through-bolted to make a solid seat. The bench seat is supported by two pedestals, each comprised of four 4x4 redwood slats that were similarly laminated and through-bolted.

Many elements of the original landscape design remain including mature *Melaleuca* trees, some *Pittosporum* and *Juniper* shrubs, and all of the original concrete walkways and patio paving. The

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original redwood benches have been replaced; the new benches match the original design. Some elements of the original landscape, such as smaller plant material and grass, have been removed and replaced. The landscape remains largely intact and reflects the original design intent, with more water-conscious planting and decomposed granite mulch (**Photo 1**).

Sculpture

One Contributing Object

The original landscape design also included the 1948 Donal Hord sculpture *Spring Stirring* (**Photo 20**). The sculpture was donated by Cecil and Ida Green and installed in 1964. The sculpture is carved from black diorite and stands forty-six inches tall. *Spring Stirring* personifies a huddled figure, partly shrouded, and stirring from sleep. The figure's knees are both raised with the left arm wrapped around both legs. The right arm is crossed over the chest with the right hand at rest on the left shoulder. The figure's head is turned to the left side with eyes closed. Wrapped around the figure is a blanket or garment. At the figure's feet, as though pushing from the earth, are small bean sprouts.¹ According to Hord, the base was composed of a repetition of the bean roots, which were important to the Mexicans and Indigenous people as a staple.² Upon installation at IGPP, the sculpture was mounted on a stone plinth where the top was flattened and hollowed to create a small pool in which the sculpture sits. Laid at the site's northwest garden along a slope, views of the sculpture can be seen from the pedestrian path leading towards the main entry and from the north patio.

Integrity

The IGPP Munk Lab maintains all aspects of integrity. The laboratory, landscape, and sculpture, retain the elements that created the form, plan, space, structure, and style of the property. The Post-and-Beam building has not been moved and retains its basic footprint with an addition made by a former member of architect Lloyd Ruocco's office, and as such, the building exhibits integrity of *location*. The Modern Post-and-Beam *design, materials, and workmanship* remain intact, exemplified through the redwood exterior cladding, flat roof with overhanging eaves, and floor-to-ceiling windows and sliding glass doors. The surrounding landscape and the coastal bluff *setting* of the property within the SIO and UC San Diego campus are intact, contributing to the property's integrity of *feeling and association*.

¹ Elizabeth Noble Shor, "Scripps Institution of Oceanography 1903-1978." *Scripps Institution of Oceanography*. (San Diego, CA: Tofua Press, 1978). <http://ark.cdlib.org/ark:/13030/kt109nc2cj/> (accessed March 23, 2020).

² Smithsonian Archives of American Art, "Oral History Interview with Donal Hord, June 25-30, 1964."

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8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B. Property is associated with the lives of persons significant in our past.
- C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

- A. Owned by a religious institution or used for religious purposes
- B. Removed from its original location
- C. A birthplace or grave
- D. A cemetery
- E. A reconstructed building, object, or structure
- F. A commemorative property
- G. Less than 50 years old or achieving significance within the past 50 years

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Areas of Significance

(Enter categories from instructions.)

ARCHITECTURE

EDUCATION

SCIENCE

Period of Significance

1963-1982

Significant Dates

1963

1964

1967

Significant Person

(Complete only if Criterion B is marked above.)

Munk, Walter H.

Cultural Affiliation

N/A

Architect/Builder

Ruocco, Lloyd, architect

Yamada, Joseph, landscape architect

Hord, Donal, sculptor

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Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Institute of Geophysics and Planetary Physics (IGPP) Munk Laboratory is eligible for the National Register of Historic Places under Criteria A and B in the areas of Education and Science for its contribution to the advancement of physical and acoustical ocean sciences as well as geophysics. IGPP has been the location at which numerous, groundbreaking contributions have been made in physical oceanography and geophysics by noted Scripps Institution of Oceanography (SIO) faculty. IGPP Munk Lab is the property most directly associated with the professional life of the man in whose honor the lab is named. Known as the father of oceanography, Walter Munk was seminal in developing the field of physical oceanography, including wave theory used to plan the D-Day invasion of Normandy Beaches, and acoustic oceanography, including the determination that whales can communicate through sound channels across the oceans. Under Criterion C as the work of master architect Lloyd Ruocco—essential to the development of the local Modern movement in San Diego—the IGPP Munk Lab is one of Ruocco’s greatest buildings and an icon of twentieth century architecture for its organic design and functional attributes that encourage collaboration at all levels. The period of significance is 1963 to 1982, beginning the year primary construction was completed, through the installation of the sculpture and the building addition completed by Robert “Gus” Thorburn, who previously worked under Lloyd Ruocco, closing with the end of Dr. Munk’s tenure as IGPP Director. Dr. Walter Munk’s significance has been recognized by scientists, political and world leaders, and by the academic community. There is ample scholarly research and evaluation of Munk’s significance and contributions, and sufficient historical perspective that his groundbreaking work transformed the field of oceanic and geophysical sciences in the late twentieth and early twenty-first centuries. As such, the IGPP Munk Lab satisfies Criteria Consideration G for properties that have achieved significance or whose period of significance closes within the past fifty years.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

Walter Munk and his wife, Judith Munk, engaged Lloyd Ruocco to design a building that would provide laboratory and office space for scientists at the SIO. The Munks collaborated closely with Ruocco in the development, design, and functional attributes of the IGPP Munk Lab. Inspired by the natural plateaus and contours of La Jolla, Ruocco developed a plan for the complex that embraced its surrounding environment and views. The Mid-Century Modern Post-and-Beam building, which consists of laboratories, offices, and conference rooms, continues to provide an atmosphere that conveys warmth and humanity that is uncommon in the more traditional sterile and cold laboratory settings. No other local functional laboratory building emanates this sense of livability. The landscape reflects the strengths of Joseph Yamada’s interest in allowing the landform to help design the landscape, while Harriett Wimmer’s design esthetic ensured the landscape would provide opportunities for relaxation and conversations. The landscape provides good examples of Modernist landscape design. The property is enhanced by

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an outstanding sculpture by Donal Hord, *Spring Stirring*, a black diorite sculpture first exhibited in the 3rd Sculpture International at the Philadelphia Museum of Art, 1949.

Criterion A and B: Education and Science

The IGPP Munk Laboratory represents the advancement of groundbreaking contributions in the field of physical and acoustic oceanography and geophysical sciences. Since its construction in 1963, numerous, groundbreaking contributions have been made in physical oceanography and geophysics by Dr. Walter Munk and other noted SIO faculty. The well-designed collaborative spaces, offices and laboratories within the resource are key to bringing these scientists together in a unique intellectual atmosphere where they carried out their pioneering research.

Scripps Institution of Oceanography (SIO)

The IGPP Munk Lab is located at the Scripps Institution of Oceanography (SIO), University of California San Diego. Scripps began as a summer research program headed by the University of Berkeley Professor and head of the California Department of Zoology, William E. Ritter in 1891. For the next several years, Ritter proposed a biological survey of the Pacific Ocean and the California coast and spent several early years leading small teams of student researchers in various locations around California. In 1903 at the invitation of Fred Baker, a San Diego medical doctor and amateur malacologist, Ritter agreed to carry out a summer program utilizing a boat house at Hotel del Coronado as a laboratory for a group of ten investigators. It was the second oceanographic laboratory established in the United States.³

By September of that year, Baker was able to solicit support to establish the Marine Biological Association of San Diego. Thirty-four prominent San Diegans joined that first meeting on September 26, 1903. Among them were E.W. Scripps, owner of the Scripps Howard newspapers, and his half-sister, Ellen Browning Scripps. The Scripps siblings enthusiastically provided financial support and business advice for the fledgling program. From 1905-1910, the biological station was in a small wooden building in La Jolla Cove park.⁴ The first permanent building was at the George H. Scripps Memorial Marine Biological Laboratory, named in memory of E.W. and Ellen Browning Scripps' brother.⁵

After some resistance, the University of California accepted the outpost in 1912 and the deed was transferred to the university. Thus, it became known as the Scripps Institution for Biological Research. By this time Scripps was operating year-round, and Ritter had both his director's office and home on the second floor of the laboratory building, until his wife, Dr. Mary Bennett Ritter completed the Director's home in 1913. During this time, research was focused on finding

³ Elizabeth Noble Shor, "Scripps Institution of Oceanography 1903-1978." *Scripps Institution of Oceanography*. (La Jolla, CA: SIO, June 1978).

⁴ Shor, "Scripps."

⁵ "National Register of Historic Places, Scripps, George H., Memorial Marine Biological Laboratory, San Diego, San Diego County, California, National Register #77000330. The laboratory is the oldest continually used oceanographic research facility in the United States.

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biological examples to support Darwin's Theory of Evolution and included publishing the first reliable ecological guide to marine life in Southern California.⁶

Ritter retired as director in 1923, passing the position to T. Wayland Vaughan who had spent most of his career at the U.S Geological Survey. It was he who made the decision to include research on geology as well as physical oceanography. In 1925, the institution's name was changed to Scripps Institution of Oceanography.⁷ Vaughan worked to increase the role of SIO in studies of the Pacific Ocean by establishing a graduate program, securing data collection from Navy and Coast Survey ships, and acquiring a research vessel to use in nearshore research. By the end of the 1920s, SIO grew enough that a second laboratory building, Ritter Hall, was built.

Herald U. Sverdrup became director in 1936, his background was in arctic research and ocean currents. He had been a member of the team that first piloted a submarine under polar ice. Sverdrup inherited the institution during a funding shortage due to the Great Depression and used cooperative programs with outside agencies to stay afloat. He also began offering an oceanography course through the University of California Los Angeles (UCLA) that helped bring students to San Diego.⁸ Sverdrup recognized the shortcomings of the academics at SIO and developed the "Sverdrup curriculum" as a remedy. He required all students to take classes in physical oceanography, marine chemistry, biological oceanography, and marine geology before pursuing subdisciplines. This curriculum became the model for modern graduate programs in oceanography in institutions across North America and Europe.⁹ In the process of developing a general oceanography course from which the curriculum would grow, Sverdrup began working with colleagues Richard H. Fleming and Martin W. Johnson to compile essential knowledge about the field into a book, *The Oceans: Their Physics, Chemistry and General Biology*. The book was published in 1942 and became known as the bible of oceanography. It was so comprehensive that the U.S. Navy labeled it classified information until the end of World War II.¹⁰

During World War II, SIO devoted itself to war efforts. Many faculty members and students enlisted in the military and those who stayed began training Navy and Army meteorologists in swell and surf forecasting. Research was also conducted on sonar technology, mapping, and anti-fouling techniques. Oceanographic knowledge proved essential for victory in the Pacific, North African and European theaters of war and the importance of the discipline was cemented.¹¹ Enrollment of new students and military personnel increased greatly following the war and programming continued to grow.¹²

⁶ Elizabeth Noble Shore, "80 Years: Scripps Institution of Oceanography, A Historical Overview 1903-1983." (La Jolla, CA: SIO, 1983).

⁷ Shor, "80 Years."

⁸ Shor, "Scripps."

⁹ Joe Hlebica, "A Century of Students Scripps Institution of Oceanography." *Explorations*. Vol. 10, No. 1, 2003.

¹⁰ Elizabeth Noble Shor, *Probing the Oceans 1936-1976*. (La Jolla, CA: Tofua Press, 1978).

¹¹ Hlebica, "A Century."

¹² Shor, "Scripps."

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Previously a doctoral student at SIO, Roger Revelle returned to the Scripps in 1948 to serve as associate director. He had served as an officer in the U.S. Naval Reserve during the war researching nuclear warfare. Revelle was able to secure three new research vessels from the U.S. Navy for SIO to create the first oceanographic fleet owned by an institution.¹³ The first cooperative project carried out by the fleet was for California Cooperative Oceanic Fisheries Investigations (CalCOFI) in 1949 to gather data about the California Current and sardine population.¹⁴ The CalCOFI project was the longest continuous sampling program in the world to gather biological, chemical, and physical data along repeatable transects from Baja California thru northern California.

As SIO continued to grow exponentially, Revelle, Walter Munk, and others began to push for the establishment of a general university. At that point, SIO was part of UC Los Angeles and Revelle thought it was missing out on the benefits that would come with an undergraduate university being in close proximity. He recognized that in order to strengthen the oceanography program students should have access to additional chemistry, physics, and biology courses. In 1960, the Regents established a San Diego campus of the University of California (UCSD) to the north of the Institute and SIO became a graduate school associated with the new University.¹⁵ In 1962, at the persuasion of Dr. Revelle, Munk established the IGPP La Jolla campus and served as its first director. He was able to raise funds for the new laboratory and began construction right away.

Numerous advances in the field of geophysics were conceived in the laboratory building. Many of these advances yielded a particularly transformative effect on the field and had a lasting impact on how geophysics was approach. The building was the location where Walter Munk carried out several of his renowned experiments related to tides and ocean currents. The laboratory was where some of the earliest papers were developed on inverse theory and plate tectonics in the 1960s by George Backus, Freeman Gilbert, and others, papers which were considered to represent two especially profound conceptual changes in the field of geophysics. Groundbreaking analyses in the areas of seismology and geomagnetism were carried out in the 1970s and 1980s and led to what became widely accepted models of study such as the moment tensor formulism. Numerous other research advancements have been conceived within the walls of the laboratory over the course of its history.¹⁶

The laboratory was also the location where new oceanographic instruments and tools were developed. Notably, the building was associated with the development of the first digital seismograph, which ended an era of analog data collection; the first successful ocean-bottom seismograph; and the first functional Laser Strain Meter (LSM) for measuring strain in the earth, among others. The institution's reputation as a pioneer in the field of geophysics continues.¹⁷

¹³ Shor, "Scripps."

¹⁴ Shor, "80 Years."

¹⁵ Ibid.

¹⁶ Architectural Resources Group, "University of California San Diego Historic Resources Survey Report," June 10, 2016, Appendix D.

¹⁷ Ibid.

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Early important scientific discoveries and innovations that came out of the SIO campus during the period of significance include the following:¹⁸

- 1965 The Navy's SeaLab II manned underwater habitat operated for forty-five days off Scripps at a depth of 205 feet. From the seafloor, astronaut turned aquanaut Scott Carpenter talked to Gordon Cooper, who was orbiting the earth in Gemini V.
- 1967 Scripps IGPP geophysicists George Backus and Freeman Gilbert developed Inverse Theory for geophysics.
- 1970 Scripps IGPP geophysicist Robert Park subsequently extended the Inverse Theory by adapting it to magnetotelluric data.
- Mid-1970s Scripps IGPP geophysicists deployed Project IDA, which consists of forty seismic stations around the globe. They are maintained by Scripps seismologists who use the data to study how and why earthquakes occur and how they relate to the formation of continents and ocean floors, volcanic eruptions, and tsunamis.
- 1975 Scripps researchers launched the Coastal Data Information Program (CDIP), a network of wave buoys that communicates vital information about waves and other coastal activities along the coast of California and other states.
- 1979 During the RISE expedition to the east Pacific, Fred Spiess and others were the first to discover a sub-seafloor magma chamber and black smokers rising from a hydrothermal field with numerous clams, crabs and other organisms living off sulphur dioxide. They took photographs using the deep-diving submersible Alvin and Deep Tow, an unmanned vehicle.

The IGPP Munk Lab is directly associated with the productive life of renowned oceanographer Walter Munk who was instrumental in the establishment of the IGPP in 1959 and the construction of its laboratory in 1963. He was often referred to as the "world's greatest oceanographer" and the "Einstein of the oceans" due to his continued contributions and pioneering strides in the field of oceanography and, later, geophysics. He spent his entire career at the Scripps Institution of Oceanography serving as Assistant Professor of Geophysics (1947-1949), Associate Professor (1949-1954), and Professor of Geophysics (1954-2019). Dr. Munk was IGPP's first and longest serving director from 1962 to 1982.

As a geophysicist at Scripps Institution of Oceanography, Walter Munk made groundbreaking observations of waves, ocean temperature, tidal energy in the deep ocean, ocean acoustics, and

¹⁸ Scripps Institution of Oceanography, "Key Scientific Discoveries and Accomplishments" www.scripps.ucsd.edu/about/history/accomplishments; "Scripps Timeline" <https://scripps.ucsd.edu/about/timeline> (accessed August 20, 2020).

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the rotation of the earth. As an advocate of science and the broader scholarship, he served as an advisor to presidents and the Pentagon and conferred with public figures including the Dalai Lama and Pope Francis. His convictions led him to refuse to sign a loyalty oath required by the University of California during the peak of anti-communist fever in the early 1950s and his passion helped create the architecture that would become the defining style of the Scripps Oceanography campus.¹⁹

Munk's contribution to science throughout the latter half of the twentieth century and into the twenty-first were measured in both terms of the new knowledge his research yielded and in the quality and diversity of the questions he considered. An ethos he expressed throughout his career was for scientists to take risks, pursue new direction, and embrace the educational value of failure.²⁰

By the 1950s, SIO had become one of the largest centers of oceanographic research in the world and had earned an outstanding international reputation for its interdisciplinary investigation of the oceans.²¹ One of the most influential academics who helped propel the institutional growth of SIO was Walter Munk.

Walter Heinrich Munk was born in Vienna on October 19, 1917, into a cosmopolitan Austrian family. By the time he was 14, he was sent to a preparatory school in New York State in hopes that Munk would establish a career in finance. After working in a banking firm for three years, he decided to leave and enrolled in the California Institute of Technology to study physics.²² He received his bachelor's and master's degrees in physics in 1939 and 1940.

He first arrived in La Jolla in 1939, seeking summer employment at SIO. He was mentored by the distinguished Norwegian oceanographer, Harald Ulrik Sverdrup, and was subsequently admitted as a doctoral student.²³ As a graduate student, he worked with Roger Revelle to establish a system for forecasting surf and breakers on beaches, a technique that became crucial to ensuring military sea vessels could safely land on shore. Munk and Revelle's surf predictions were so successful they began training groups of military meteorologists, who then applied the methods to predict conditions for Allied landings in North Africa, the Pacific theater of war, and the beaches of Normandy.²⁴

Munk received his doctorate in 1947 and officially joined the SIO faculty as an assistant professor. When he became professor of geophysics in 1954, Munk also became associated with

¹⁹ Scripps Institution of Oceanography, "Obituary Notice: Walter Munk, World Renowned Oceanographer, Revered Scientist." February 8, 2019. <https://scripps.ucsd.edu/news/obituary-notice-walter-munk-world-renowned-oceanographer-revered-scientist> (accessed May 1, 2020).

²⁰ Scripps Institution of Oceanography, "Obituary Notice."

²¹ Architectural Resources Group, 36.

²² Deborah Day, "Walter Heinrich Munk Biography." Scripps Institution of Oceanography Archives, August 31, 2005.

²³ Deborah Day, "Walter Heinrich Munk Biography."

²⁴ Architectural Resources Group, 36.

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the intercampus Institute of Geophysics.²⁵ By 1959, Munk was seriously considering leaving SIO for positions at the Massachusetts Institute of Technology (MIT), Harvard, and the Woods Hole Oceanographic Institution. Up until that point he had spent his entire career at Scripps. Roger Revelle convinced him to stay at SIO and to expand its geophysics program by promising to build him a branch of the Institute of Geophysics at Scripps.²⁶

In June 1959, Munk presented a proposal to establish a geophysics branch at the university.

The establishment [of a branch on the La Jolla campus] will benefit the expanded campus at La Jolla the same way it benefited UCLA, by providing opportunities for graduate and postdoctoral research for outstanding young people.... We thus envision an institute located near the Scripps Institution...which by 1964 might consist of a dozen senior investigators and be out about 10 percent the size of Scripps. The combined Los Angeles and La Jolla branches of the state-wide institute would possess a faculty in Earth (and planetary) science second to none in the country.²⁷

Munk's proposal was favorably received by the university and led to the establishment of the La Jolla branch of the Institute of Geophysics in 1960. Munk was appointed director of the La Jolla branch and associate director of the statewide institute, which, also in 1960, added "and Planetary Physics" to the name.²⁸

The earliest members of IGPP staff were scattered throughout the SIO campus and it was increasingly difficult to associate with one another. By the end of its initial year, Munk complained that "we have no home" and subsequently set out to provide one.²⁹ A "sufficiently remote" scenic site was considered for the new laboratory building overlooking the Pacific Ocean. It was near the wooded cottages on the upper slopes of the Scripps campus where Munk had spent his first summer.

Munk and his wife Judith, an architectural designer and sculptor, engaged local architect Lloyd Ruocco, to design the new facility. At the time, Ruocco was a well-respected Modernist architect who inspired a generation of local architects who drew influence from his work.³⁰ Ruocco primarily designed residences that were characterized by exposed redwood exteriors, flat roofs, the expansive use of glass, the incorporation of natural features such as unmilled lumber and large boulders, and a sensitivity to the environment in which buildings seemed to "fit the surrounding environment like a glove."³¹ It was his work at the Design Center in Hillcrest, where

²⁵ Shor, *Probing the Oceans 1936-1976*, 49.

²⁶ Nancy Scott Anderson, "An Improbably Venture: A History of the University of California, San Diego." (La Jolla, CA: The UCSD Press, 1993).

²⁷ Shor, *Scripps*, 151.

²⁸ *Ibid.*, 153.

²⁹ *Ibid.*

³⁰ Todd Pitman, ASLA. "When was Modern New?" *Save Our Heritage Organisation Publication*. Vol. 38, Issue 1, Winter 2007.

³¹ Architectural Resources Group, 155.

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a similarly rustic redwood-and-glass building seemingly “disappeared” into the hillside that inspired the Munks into creating a more humanistic laboratory environment; one that felt like a second home to the researchers while being practically configured. Ruocco worked closely with the Munks on every aspect of the design. According to Munk in an interview in 1997,

Well, the buildings were not little cement blocks, but much more home like. Much more informal. There were several very major decisions on the old IGPP. One was to have laboratories where you could drive trucks in and out, so that the experimental work could be done. In the old Ritter Hall type buildings, you had to move all your gear up and down in twenty-eight boxes by elevator. And when you got out to sea you found that you had forgotten box twenty-five. Whereas what we did at IGPP is to assemble things in the portable laboratory adjoining the permanent lab, and then drive the truck in and pick up the assembled portable lab, all tested and put together. We pioneered—“we” being Frank Snodgrass who worked with me then—the idea of building these portable labs that you use in your permanent labs, and then they were picked up with a forklift, put in a truck, put aboard the ship. Standard procedure nowadays. We were the first to do it. Even our ships now have screw holes in the deck, four on center, and all the labs are built to fit into those.³²

Walter and Judith also worked with Ruocco to come up with custom furniture for the new building. After a trip to the Soviet Union in 1962 where he watched colleagues struggle to give lectures on a tiny and unstable chalk board, Munk came up with the idea to make a chalk board in the conference room long enough to fit an entire lecture. It was Ruocco’s idea to make it curve around the room.³³ The curved chalk board, modular lecture and reading room tables, and built-in shelving remain in situ.

According to Munk, there were a number of initial push backs from university.³⁴

Finding a “sufficiently remote” site was a major consideration. We chose the site of the old Scripps Community House, where, in 1939, I spent my first summer at Scripps. University authorities raised a host of objections the site was too remote from other Scripps activities; Lloyd Ruocco (our choice for architect) had never built a laboratory; it was not possible to build a laboratory out of redwood because it wouldn’t last; it was too close to the cliff. To make the last point, UC retained a soil specialist (at our expense) who took the UC view, using for support a paper on cliff erosion by Scripps Professor Francis Shepherd. Fortunately, I ran into Francis the morning of the review and he told me that he had changed his mind.

Initial plans provided for 50,000 square feet of laboratory and office space. UC agreed to pay half of the estimated cost of \$972,000 if we could come up with the rest of the

³² Ron Doel, Walter Munk interview, January 8, 1997.

³³ Ibid.

³⁴ Shor, *Scripps*, 153.

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money. In 1959, the commander of the US Air Force Office of Scientific Research came to review our work [on the Vela Uniform project] and learned of plans for the laboratory.... He offered \$243,000 provided we could find the other half. The National Science Foundation (NSF) subsequently offered \$121,500, provided we could raise the remainder, and the Fleischmann Foundation offered \$60,750.... We were down to just \$30,000 left to raise when the U.S. Steel Foundation closed the gap.

The laboratory was completed in November 1963—on time and at cost. It cost \$20.86 per assignable square foot. Famed architect I.M. Pei had just completed the Green Geophysical Laboratory in MIT when Cecil Green came to visit us. After a tour, [Green] opined that ours was the more livable structure and insisted to give us [*sic*] a move-in present. Judith Munk said at once, “Give us *Spring Stirring*,” a diorite sculpture by Donal Hord. Ever since, *Spring Stirring* has been sitting outside the seminar room as our guardian angel.³⁵

From the IGPP Munk Lab, Munk continued to work on discoveries that put SIO and the University on the map as a great research institution. He retained his relationship with the US Navy and other military branches throughout his career. He joined JASON, an acronym for July-August-September-October-November, the months this select group of scientists met to advise the Pentagon.³⁶ Munk also served on several panels of the President’s Science Advisory Committee as well as holding the title of Secretary of the Navy Chain in Oceanography until his death.³⁷

One of his tasks on JASON involved anti-submarine warfare and led to Munk turning his attention to marine acoustics. This brought another era of profound advances in the understanding of the oceans as his work led to the creation of acoustic tomography and thermometry through which acoustic data became a vehicle for understanding currents, circulation, and heat content.³⁸

The most famous example of his work might have been a Munk-led experiment to see whether acoustics could be used as a way to estimate ocean temperatures on a global scale and thus, the effects of global warming. In 1991, at a remote location near Heard Island in the southern Indian Ocean, Munk’s team transmitted low-frequency underwater acoustic signals. The location had been chosen because the sound waves could travel on direct paths listening stations in both the Pacific and Atlantic oceans. The premise was validated as stations from Bermuda to New Zealand to the United States West Coast all received the signal. The time signal took to travel was a function of the temperature of the water it traveled through.³⁹

³⁵ Walter Munk, Freeman Gilbert, John Orcutt, Mark Zumberge, and Robert Parker, “Special Issue Scripps Centennial: The Cecil H. and Ida M. Green Institute of Geophysics and Planetary Physics.” *Oceanography*. Vol. 16, No. 4, 2003.

³⁶ Ann Finkbeiner, *The Jasons: Science’s Postwar Elite* (New York: Penguin Group, 2006), Introduction, 38.

³⁷ Scripps Institution of Oceanography, “Obituary Notice.”

³⁸ *Ibid.*

³⁹ *Ibid.*

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Munk's many accolades included election to the National Academy of Sciences in 1956 and the Royal Society of London in 1976. He was a Guggenheim Fellow three times.⁴⁰ In 1983, Munk was honored with the President's National Medal of Science, the nation's highest award for lifetime achievement in scientific research. In 1999, he was awarded the Koto Prize in Basic Sciences for his fundamental contributions to the field of oceanography, the first prize awarded to an oceanographer. In 2001, he was the inaugural recipient of the Prince Albert I Medal in the physical sciences of the ocean, which Prince Rainier of Monaco created in cooperation with the International Association for the Physical Sciences of the Oceans. Among Munk's favorite honors was the 2014 Explorer's Medal from the Explorer's Club, an organization founded in 1904 that includes some of the last century's most famous names in science and exploration among its members.⁴¹ He was also cited in *Britannica* as "Walter Munk, American Geophysicist and Oceanographer."⁴²

The IGPP Munk Lab was directly associated with Dr. Walter Munk from its inception and served as his main office throughout his tenure as IGPP's director from 1962 to 1982. At the laboratory, Walter Munk carried out several of his renowned experiments related to tides and ocean currents. The following documents important scientific discoveries and innovations directly attributed to or associated with Munk during this period.⁴³

From 1965 to 1975, Munk attempted to improve tide prediction with Dave Cartwright. Together, they developed instruments to measure tides in the open sea as part of Mid-Ocean Dynamics Experiment (MODE) and achieved a precision of better than one millimeter in five kilometers of water. Munk also developed instrumentation to study and model internal waves, the Garrett-Munk Spectrum. This facilitated the study of up and down movement of water in the deep sea, at internal boundaries between water masses with distinct temperature and density characteristics.

Beginning in 1975, Munk began experimenting with the use of acoustic tomography. By 1981, Munk found that internal waves affected the propagation of sound through water. He then developed the ocean acoustic tomography technique to study shifting structures within the ocean, features he called "underwater weather." He teamed with Carl Wunsch and Robert Spindel, developer of Ocean Acoustic Tomography (OAT), and recorded these mesoscale features. He cowrote the definitive volume on the subject, *Ocean Acoustic Tomography* in 1995.

At Dr. Munk's retirement as Director, he moved his office to the mezzanine level in 1982 and continued to work at the laboratory until 2000.⁴⁴ As part of his post-directorial work Munk began the Acoustic Thermometry of the Ocean Climate (ATOC) project. The simple underlying idea

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² "Walter Munk American Geophysicist and Oceanographer." www.britannica.com/biography/Walter-Munk.

⁴³ Scripps Institution of Oceanography, "Key Scientific Discoveries and Accomplishments"; "Scripps Timeline" <https://scripps.ucsd.edu/about/timeline> (accessed August 20, 2020).

⁴⁴ In 2000, Munk moved his offices to the IGPP Ellen and Roger Revelle Laboratory.

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was that the travel of time between source and receiver was a measure of the temperature of the intervening waters. Munk organized the Herald Island experiment to decipher how far away man-made signals could be received and decoded.⁴⁵

During the 1990s, Munk became a member of MEDEA, Vice President Albert Gore's environmental task force. This was a group of fifty scientists who advised Gore on scientific matters and suggested ways that data collected for scientific and intelligence purposes could be used to address environmental and other social issues. In 1995, Munk, Peter Worcester, and Carl Wunsch published *Ocean Acoustic Tomography*. Munk, with collaborators including Wunsch and Worcester, published a paper in *Science*, which combined thermometry and satellite altimetry measurements to demonstrate that seasonal and year to year changes in sea level were only part due to thermal expansion, as had previously been widely assumed. Munk also published a paper showing that major contribution to tidal friction was the generation of internal waves at major sea floor topographic features.

By the time of his death in 2019 at the age of 101, Munk's career spanned eighty years and included over 275 published papers and pioneering studies of ocean currents and wave propagation that laid the foundation for contemporary oceanography. Many of these groundbreaking achievements were accomplished while retaining his offices at the IGPP Munk Lab. Although Munk also utilized his home, Seiche, as an extension of his office at IGPP, it was his direct involvement in the concept and design of the actual on-campus laboratory that encouraged an environment of scientific collaboration and advancement in scientific research throughout the years. It was also the location of where most of his documented work and discoveries could be directly attributed, which makes the IGPP Munk Lab the property most associated with Munk's work and accomplishments as a pioneer in the advancement of oceanography and geophysics.

Criterion C: Architecture

The Institute of Geophysics and Planetary Physics (IGPP) Munk Lab is one of the best known and most highly articulated examples of Modern Organic architecture in San Diego utilizing Post-and-Beam construction. The design was a collaborative effort of the era's most recognized San Diego Modernists of the time including renowned architect, Lloyd Ruocco FAIA; noted landscape architect Joseph Yamada FASLA, principal of the firm Harriett Wimmer and Joseph Yamada; and well-recognized artist Donal Hord.

Architecture

According to Virginia McAlester, Modern architectural styles were "divided into early modern (the creatively decorated Prairie, Craftsman, and Modernistic styles); banker's modern (generally grouped into developments of Minimal Traditional, Ranch, and Split-Level houses), and mainstream modern (the modern styles favored by architects)." Most of the Mid-century Modern buildings were either Contemporary or International style, according to McAlester. A small

⁴⁵ Deborah Day, "Walter Heinrich Munk Biography."

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group of architects rejected the orthogonal nature of these two styles and instead designed Organic style buildings, an approach to design united by the use of natural shapes or non-rectilinear geometries.⁴⁶

Per McAlester, Organic architecture (beginning in the 1950s) was based on the coalescence of the built environment with nature, which allowed the design to respond to the natural environment rather than impose on it. While other modern movements more often championed straight lines and orthogonal designs, Organic modernism favored natural shapes and interesting geometries. Designs—conceived as reactive both to the environment and to the building material—were developed organically into one harmonious unit. “The Organic architect would... carefully study the exact site... and then create a design that grew from within, a careful relationship between all parts of a [building].”⁴⁷

The Modern Post-and-Beam architectural substyle is a method of construction in which the structural framing consists of load bearing beams supported by columns rather than solid bearing walls which has been utilized for centuries in wood-frame and heavy-timber construction. In Modern design, post-and-beam construction was used as a means of limiting the need for solid load-bearing walls, which allowed for extensive use of glass along the perimeter of the building where one would normally find an opaque wall. In fact, extensive use of glass including entire walls of floor-to-ceiling glass is a primary characteristic of this style.⁴⁸

Post-and-beam buildings are characteristically rectilinear with open floor plans that are grid-like in layout and based on consistent module or beam length. Floor-to-ceiling glass is also featured in this type of architectural style. The roofs are generally flat and include wide overhangs. Secondary character-defining features include repetitive façade geometry, absence of applied decoration, strong interior/exterior connections, and exterior finish materials usually include wood, steel, and glass.⁴⁹

The IGPP Munk Lab was the first to incorporate the Modern Post-and-Beam style on campus, coming close to establishing a unifying design concept for the Scripps Institution of Oceanography, a campus which before the 1960s tended to construct buildings with dispatch rather than style.⁵⁰ The IGPP Munk Lab retains a high degree of its architectural integrity. It exhibits features of the Modern Post-and-Beam architectural style with its flat roof, wide overhanging eaves, cross-axial massing, and wide expanses of glass doors and windows. It displays many of the essential characteristics of Modern architecture including modular construction, geometric forms, open and flexible floor plans, blurred lines between interior and exterior spaces, and organic landscaping. Its use of redwood enables the resource to seamlessly blend into its surrounding landscape overlooking the ocean.

⁴⁶ Virginia McAlester, *A Field Guide to American Houses* (New York: Alfred A. Knopf, 2017), 655.

⁴⁷ *Ibid.*, 656.

⁴⁸ City of San Diego, “San Diego Modernism Historic Context Statement.” October 17, 2007.

⁴⁹ *Ibid.*

⁵⁰ Deborah Day, “Walter Heinrich Munk Biography.”

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Another example at UC San Diego's main campus includes the Revelle College Provost Office (Simpson and Gerber, 1968). Alterations to the Provost Office include the addition of wood gutters that project from the roof at various points, an addition to the south elevation, and a 1998 addition to the west elevation. Non-original wood trellises were also added to the projecting eaves. Off campus is Seiche, Walter and Judith Munk's 1953 home. The National Register-nominated residence was designed by Judith Munk in the Modern Post-and-Beam style with various changes over the years up until 1985. The historical evaluation completed by UC San Diego proposed a 1953 period of significance to capture Seiche's original construction of the guest house and the main residence. The National Register nomination identified a 1953 to 1971 period of significance, encompassing several of Judith Munk's alterations to the property.

Lloyd Ruocco FAIA

The laboratory is the work of acclaimed architect Lloyd Ruocco FAIA.⁵¹ IGPP reflects the same Modern design philosophy that Ruocco carried throughout his profession and represents his work during the later years of his architectural career. With over 100 projects under his name in San Diego County, Lloyd Ruocco is regarded as one of the city's pioneering post-war modernists whose homes could be found with greatest concentrations in Mission Hills, Mount Helix, Point Loma, and La Jolla.⁵²

Known primarily for his single-family residential designs at the time, Ruocco had never designed a laboratory building when he received the commission for IGPP Munk Lab. Since Walter and Judith Munk intended the new laboratory building to be more home-like, in contrast to the more sterile environments of most research facilities and laboratories, Ruocco's lack of laboratory experience was not a concern to the Munks. The Munks also envisioned redwood as a primary material instead of concrete. This was one of the reasons they chose to engage Ruocco in the design for IGPP. Ruocco was proficient with both materials, and his body of work evoked a strong naturalism that was reflected in his prolific use of wood and glass. Specifically, the use of redwood at IGPP was resultant of Ruocco's design as he had been using it as a primary material since the early 1930s. These were attributes that the Munks sought for SIO.

We thought it should be more like a home than as a hall. More flexible. And the choice of redwood, of course, is connected to that. The choice of the site. We thought Scripps had done a poor job architecturally. I think you will find broad agreement. I think it's fair to say that the two geophysics buildings have really changed the whole Scripps campus. And much of what's gone on since we first started is, an expression of that. That's a compliment to Judy. She really has changed the way the Scripps campus has developed.

...We chose Lloyd Ruocco. Lloyd Ruocco was a local architect. He'd never done a laboratory building. We thought that was a great asset. We didn't want to design around

⁵¹ In 1974, Lloyd Ruocco was elected to the distinguished American Institute of Architecture College of Fellows.

⁵² Todd Pitman, "Lloyd Ruocco." Friends of San Diego Architecture <http://friendsofsdarch.com/lloyd-ruocco-1907-1981> (accessed July 13, 2020).

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plumbing works, which is the usual way you build a laboratory, by starting with plumbing works.⁵³

Lloyd Ruocco's design for IGPP Munk Lab epitomizes the grace and humanity Walter and Judith Munk envisioned for the property. Every detail, down to the curved chalkboard in the Seminar Room (Conference Room), was carefully crafted by Ruocco to create this singularly unique environment, supporting scientific collaboration and creative thought.

The IGPP design became influential in the design of later facilities on the SIO campus including the Hydraulics Laboratory designed in 1964 by architect Frank L. Hope and, almost thirty years later, the IGPP Unit II (Revelle Lab) building designed in 1992 by Liebhardt, Botton & Associates Architects. Fred Liebhardt worked for Ruocco before opening his own architectural practice. Redwood was the primary building material for both buildings and the IGPP Unit II Laboratory exhibits a similar roof form and architectural details including the shade trellises.

Lloyd Ruocco was born in Bangor, Maine in 1907. He was raised in Canada and arrived in San Diego in the early 1920s. His first position was as a draftsman for Richard Requa while he was still attending San Diego High School. After receiving his degree in architecture from UC Berkeley, Lloyd returned to San Diego and began working at the offices of Requa Jackson as well as William Templeton Johnson, both nationally recognized San Diego architects. While there, Ruocco assisted on the County Administration Building.⁵⁴ He also worked under Lillian Rice in developing the community plan for Rancho Santa Fe. Ruocco eventually became dissatisfied with the exclusive use of popular revivalist styles and decided to start his own firm in the early 1930s in hopes of bringing a more modern style of architecture to San Diego.⁵⁵

In 1935 the Federal Housing Association (FHA) along with the planners of the 1935 Exposition in San Diego's Balboa Park, sought to provide an exhibit that showcased cutting edge home design and construction. The exhibit was called ModelTown. Southern California architects were invited to provide three-foot tall scale models of home designs that were both attractive and affordable. Fifty-six models were submitted as part of this program. Many of the designs exhibited traditional, cheaply built homes that would later proliferate in post-war Southern California. A small group of young architects used this opportunity to present Modern concepts in residential design based on models championed by the Bauhaus movement in Europe. With his model 25, Richard Neutra added his considerable talents to the program; his design featured the extensive use of metal, a new concept in residential design. The remaining group of modernist designers were younger and far less established.

Ruocco teamed with architect Kenneth Messenger to form the only local San Diego firm to participate in this program. Ruocco provided six designs for this exhibit. His designs included large panels of floor to ceiling glass as well as rooms that could be divided by curtains allowing

⁵³ Walter Munk, Interview with Ron Doel, January 8, 1997.

⁵⁴ Todd Pittman, "Lloyd Ruocco." Modern San Diego www.modernsandiego.com (accessed July 13, 2020).

⁵⁵ Pitman, "Lloyd Ruocco." Friends of San Diego Architecture.

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for flexibility of space. Ruocco's innovative and decidedly Modern ModelTown concepts went on to guide his future architectural practice.⁵⁶

He received his license in architecture in 1937. His early designs (1937-52) featured flat and shed roofs, exposed redwood, and organic materials like boulders and driftwood.⁵⁷ These designs were considered extremely progressive for the time and the region. In 1944, he married Ilse Hamann, professional interior designer and professor of ceramics and design at San Diego State University (SDSU). She founded the interior design department at SDSU and was the first designer in San Diego to incorporate Scandinavian design into her work.⁵⁸ Together they built the Design Center in 1949, which became ground zero for San Diego's regional style of modernism and housed his firm and Ilse's furniture showroom and design firm.⁵⁹ Emulating the Modern Post-and-Beam architectural style, the Design Center was conceptualized as the perfect creative environment for designers across disciplines. After work, Ruocco was also known to invite other designers and artists to the center to discuss design concepts and local issues.⁶⁰

Beginning in the 1950s, Ruocco began to focus more on modular design. He used standardized dimensions and minimized construction costs to create open floorplans with flexible spaces and sliding walls. His projects were always oriented to maximize views and afford the occupants the most privacy, this often meant that the building would be placed just below the crest of a slope. His designs were "a testament to a specific kind of architecture that seems to fit the environment like a glove. It [reflected] a basic approach to shelter, characterized by simplicity, lack of ornamentation, and a respect for natural, traditional building materials: wood, brick, glass, concrete."⁶¹

In 1953, Ruocco used these same basic concepts that he initially explored at ModelTown in the design of his first "Garden Villa" for the Balboa Park Home Show in San Diego. The Garden Villa was comprised of prefabricated modular pieces within an eight-foot steel frame. Floor plans were customizable and offered many built-in features such as Hi Fi stereo systems. Providing for family growth and flexibility they could be outfitted with dividable rooms separated by optional mobile walls or heavy curtains. The house was even designed so that it could be disassembled, transported, and re-erected on a new site. The steel structure allowed clerestory and transom glass above walls and doors to maximize natural light. These homes were extensively published in major publications of the day including *Time Magazine* and *Arts + Architecture*. The original Garden Villa included an Ilse Ruocco designed interior and Harriett Wimmer, who shared an office at Ruocco's Design Center, designed the landscape and pool. The house was taken apart after the exhibit and stored within the Design Center basement on 5th Ave. The parts were eventually reused to build Ruocco's second home, the extensively published

⁵⁶ Todd Pitman "When was Modern New?" Save Our Heritage Organisation Newsletter, Volume 38, Issue 1, 2007.

⁵⁷ Pittman, "Lloyd Ruocco." Modern San Diego.

⁵⁸ Hillard Harper, "Restored Building a Tribute to Architect," *Los Angeles Times*, July 4, 1988
<https://www.latimes.com/archives/la-xpm-1988-07-04-ca-3946-story.html> (accessed July 27, 2020).

⁵⁹ Todd Pitman, "Influence" www.lloydruocco.com (accessed July 13, 2020).

⁶⁰ Harper, "Restored Building a Tribute to Architect."

⁶¹ Ibid.

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Solari house in Alvarado Estates in 1955.⁶²

Ruocco was the executive architect of the design team for the San Diego Civic Center Concourse and Plaza at approximately the same time that the Munks engaged him for the IGPP design. It was widely reported that Ruocco had frequent disagreements with the City and he felt that his vision for the facility had been compromised. Ruocco's difficulties with the Civic Center Concourse project led to an intense distrust of bureaucratic institutions. These feelings prompted him to initially reject the IGPP commission. It was through Walter and Judith Munk's assurances that he would be given creative license and freedom in the design of the new laboratory, that Ruocco finally agreed to accept the commission.

One key element was that Lloyd Ruocco, who had never built a laboratory before, he originally turned us down when offered the architectural contract, because he was afraid of the university bureaucracy. He said, "I'm not able to stand up to that. I've never worked with big groups." We said, "Well, we will run protection for you. You don't have to worry about that." Then he came in with some design, and he said, "That's not a very good way, but the university will never accept it if we do it in a better way." We said, "What is a better way?" And he would talk about it. But he said, "It's impossible for the university to accept that." So Judy said to him, "Well, would you promise us the first time through to do things the way you think is best, regardless of whether you think it has a chance to be acceptable to the university? Then we can back-track if necessary." There was never anything that had to be given up. A wonderful story. You shouldn't give up on what you want to do because you think it would be too expensive, that there would be people objecting to it.⁶³

Although his office continued to design both commercial and residential projects in the 1960s and had a few project-specific partnerships with San Diego architects Seldon Kennedy, William Rosser, and Herluf Brydegaard, Ruocco began to personally focus his efforts on city planning, creating his unpublished work "Supercity." In 1961, Ruocco also founded Citizens Co-ordinate for Century Three (C3), a group whose aim was to watch government actions and advocate for preserving natural areas of San Diego, such as canyons.

In 1981, Lloyd Ruocco died at the age of 74. A memorial service was held in the Geophysics Garden at the Munk Lab "in the shadow of the building that is one of the finest examples of his belief [that] architecture should blend into nature rather than fight it."⁶⁴

Joseph Yamada FASLA, Wimmer and Yamada

IGPP Munk Lab's surrounding landscape was designed by the firm Harriett Wimmer and Joseph

⁶² Todd Pitman, "Garden Villa," June 11, 2018 www.lloydruocco.com (accessed August 22, 2020).

⁶³ Doel, Interview.

⁶⁴ "Lloyd Ruocco, Noted Architect, Visionary, Dies," *San Diego Union Tribune*, May 12, 1981.

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Yamada.⁶⁵ Landscape and setting had been regarded as an important feature of campus design since the University's conception. Wimmer and Yamada developed a collaborative relationship with the University as consulting and executive landscape architects in the 1960s and 1970s with their earliest work on the campus of SIO.⁶⁶

Harriett Wimmer started her San Diego-based firm in 1954 after receiving encouragement to turn her landscaping favors for friends into a legitimate career. With a degree in landscape architecture from the University of Oregon, coupled with years of practical experience and an endless pool of clientele, the firm became an instant success.⁶⁷ She was one of the earliest to receive a landscape architectural license in the State; number 335. At the time of its inception, the firm was one of four in San Diego and the first and only woman-owned landscape architectural firm. The firm operated out of a space in Lloyd Ruocco's Design Center.

In 1954, Wimmer hired Joseph Yamada as a draftsman who had just graduated from UC Berkeley with a landscape architecture degree. Yamada worked at the firm for several years before deciding to start his own in 1960. Upon hearing of his endeavors, Harriett immediately offered him a partnership, which he accepted. Together they designed many of San Diego's landmark sites including Sea World, the Embarcadero Marina Park, Seaport Village, and the Copley Estate.⁶⁸

During the 1960s and 1970s, the firm secured a contract with UC San Diego as their first consulting and executive landscape architects.⁶⁹ By the time the contract was awarded, Harriett Wimmer was approaching the later years of her career and assumed a lesser role in the firm's operations leaving Yamada as principally responsible for the work performed on the UC San Diego campus for twenty years. By 1967, Wimmer retired from the firm.⁷⁰

Yamada's earliest works at the University could be seen at the SIO campus at Sverdrup Hall and Sumner Auditorium; at Coast Apartments, which was the residential complex for married and graduate students; and at the IGPP Munk Lab. Many of the landscapes that the firm designed for the campus embraced the tenets of the modern environmental movement, which likely had a significant impact on how the firm elected to handle the natural landscape. Their early influence on the campus' landscape helped set precedent for future landscape designs.⁷¹

The landscape component of design at IGPP Munk Lab was developed before the building—a direct reversal of usual procedure. The firm called for pines along the cliffs and gently sloping

⁶⁵ Wimmer and Yamada ASLA Landscape Architects, "University of California San Diego Landscape Plans for Institute of Geophysics & Planetary Physics, University of California San Diego," Construction Documents, July 1, 1963, University of California San Diego Digital Library.

⁶⁶ Architectural Resources Group, 137, 142.

⁶⁷ Carol Greentree, "Harriett Barnhard Wimmer." *The Journal of San Diego History*. Vol. 34, No. 3, Summer 1988.

⁶⁸ Ibid.

⁶⁹ Architectural Resources Group, 138.

⁷⁰ Greentree, "Harriett Barnhard Wimmer."

⁷¹ Architectural Resources Group, 142.

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walkways leading from the parking lots to the building. Small, secluded gardens for contemplation were also integrated into the site. Part of the landscape was the incorporation of Donal Hord's 1948 *Spring Stirring*, a diorite sculpture depicting the figure of spring beginning to emerge from winter. The basin of water in which it sits was designed in collaboration between the Munks, Hord, and Wimmer and Yamada for its placement on the site. They used a large boulder from the same quarry in San Diego County where the diorite stone for the sculpture was originally sourced. The top of the boulder was flattened and hollowed out to create a small pool in which the sculpture sits.⁷²

The sculpture was a gift from Cecil and Ida Green. When asked what kind of gift Walter would like for the IGPP building, Judith Munk suggested *Spring Stirring*, a sculpture designed by artist Donal Hord, with whom she previously studied.

Judy, from the very earliest time, had planned to have a sculpture by Donal Hord called *Spring Stirring*, a big diorite, to go outside of the seminar room. So Judy said, "Yes, give us *Spring Stirring*." It was located in the garden of the sculptor who lived in Pacific Beach. It was late evening, and the sculptor, Donal Hord, had gone to sleep. We drove down, and using a flashlight, we climbed across his fence so Cecil and Ida could look at *Spring Stirring*. Judy was very close to Donal Hord. And Cecil said, "Yes, I like it. I'll give that to you." The cost was \$16,000, for the diorite. It has no connection to geophysics whatsoever. People who come and visit always try and figure out why did we get that statue. The only reason was because Judy liked it... It's one of the known statues of San Diego. And Donal Hord died three years later, and in his will had willed the statue to Judy, so we would have had it anyhow. Whether we would have been sufficiently unselfish to give it to IGPP, I don't know."⁷³

Donal Hord

Donal Hord was an internationally renowned sculptor whose art was publicly displayed throughout the city including in Balboa Park, along the marina, and at San Diego State University. During his life he earned the Award of Merit Medal of the American Academy of Arts and Letters, full Academician of the National Academy of Design, honorary membership of the San Diego Chapter of the American Institute of Architects Fine Arts, and Fellowship of the National Sculpture Society, among many recognitions.⁷⁴

Donal Albert Hord was born February 26, 1902 in Prentice, Wisconsin, to Riley Merton Horr and Laraire Beaudin Horr. After his parents' divorce in 1909, he moved to Seattle, Washington, with his mother. Originally named Donald Horr, his mother supposedly moved the last "d" from his first name and added it to his last name after her divorce.⁷⁵ As a young teen, Hord developed

⁷² Doel, Interview.

⁷³ Ibid.

⁷⁴ Thomas Scharf, "Donal Hord Chronology." *The Journal of San Diego History*. Vol. 31 No. 3, Summer 1985.

⁷⁵ Richard Crawford, "Public Art Sculptor had Soft Spot for Working with Hard Materials," *San Diego Union Tribune*, April 9, 2010.

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rheumatic fever and suffered permanent heart damage. He and his mother moved to San Diego in 1916 with the hope that the Southern California climate would benefit his health.⁷⁶ Because of his health condition he was not able to attend school for most of his childhood and largely educated himself. He became fascinated by ancient cultures especially in the Americas and East Asia and read extensively about their history and art.

Once he was well enough, Hord attended San Diego Evening High School. There he learned basic sculpture from Anna Velentien, a prominent figure in San Diego's Arts and Crafts Movement. Velentien, in turn, had studied under Auguste Rodin, who is widely considered the father of modern sculpture. In 1920, a family friend introduced Hord to sculptor Homer Dana and the two developed a friendship which became a lifelong partnership.

From 1926 to 1929, he studied bronze casting at the Santa Barbara School of the Arts with Archibald Dawson and Amory Simons. In the fall of 1928, Hord received a Gould scholarship that allowed him to spend eleven months in Mexico studying sculpture. He continued to earn scholarships during his academic career and was able to spend a semester at the Pennsylvania Academy of Fine Arts with Walter Hancock as well as a semester at the Beaux Arts Institute in Paris.⁷⁷

Hord was particularly drawn to using sculpting materials used by ancient civilizations like diorite, jade, mahogany, and obsidian. These materials were challenging to work with and were often made more challenging by that fact that he preferred to skip clay modeling stages and carved forms directly into the material based on rough sketches. The form of his sculptures was then able to evolve based on the strengths and limitations of his raw materials. Over time, Hord gravitated more and more toward symbolic imagery and anthropomorphized abstract concepts. He was particularly known for using images of indigenous people as metaphors for natural concepts like fire, thunder, and celestial bodies.

Hord was extremely productive until the end of his life, completing major works every year. He died in 1966 at age 63 from heart disease.⁷⁸ Donal Hord's memorial service was held at the Scripps Institution of Oceanography near his *Spring Stirring* sculpture. Dr. Walter Munk delivered the eulogy to a crowd of more than one hundred people.⁷⁹

Upon its completion, the IGPP Munk Lab became a recipient of an Award of Excellence from the local chapter of the American Institute of Architects. The collaboration of science, art, and architecture are harmoniously interwoven in every aspect of the design of the IGPP Munk Lab, producing a building that befits its environment.

⁷⁶ Scharf, "Donal Hord Chronology."

⁷⁷ Ibid.

⁷⁸ Crawford, "Public Art Sculptor had Soft Spot for Working with Hard Materials."

⁷⁹ "Sculptor Hord Eulogized Here," *The San Diego Union*, July 7, 1966.

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Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____
- recorded by Historic American Landscape Survey # _____

Primary location of additional data:

- State Historic Preservation Office
 - Other State agency
 - Federal agency
 - Local government
 - University
 - Other
- Name of repository: University of California San Diego Digital Collections

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property 1.87

Latitude/Longitude Coordinates

Datum if other than WGS84: _____

(enter coordinates to 6 decimal places)

1. Latitude: 32. 867800 Longitude: -117. 252504

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Verbal Boundary Description (Describe the boundaries of the property.)

The boundary includes the Institute of Geophysics and Planetary Physics (IGPP) Munk Laboratory building, Donal Hord's *Spring Stirring* sculpture, and the surrounding landscape that has historically been part of the IGPP Munk Lab lot, a division of the Scripps Institution of Oceanography at the University of California San Diego.

Boundary Justification (Explain why the boundaries were selected.)

The boundary is congruent with the building lot allocated by Walter Munk for use as a geophysical laboratory for the newly formed institution in 1964. It is a portion of the original 170-acre parcel on which the Scripps Institution of Oceanography is located.

11. Form Prepared By

name/title: Eileen Magno, MA, Principal Architectural Historian; Carmen Pauli, NCARB, Principal Architect; and Camille Jorgensen, Research Assistant
organization: Heritage Architecture & Planning
street & number: 832 Fifth Avenue
city or town: San Diego state: CA zip code: 92101
e-mail: eileen@heritagearchitecture.com
telephone: (619) 239-7888 x117
date: September 2020; Revised December 2020, May 2021

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

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Photo Log

Name of Property: IGPP Munk Lab
City or Vicinity: La Jolla (San Diego)
County: San Diego
State: California
Photographer: Darin Fong (Photos 1, 3, 4) Darren Bradley (Photos 2, 5-18)
Date Photographed: May 2020
Photographer: Carmen Pauli (Photos 19-20)
Date Photographed: August 2020

Description of Photograph(s) and number, include description of view indicating direction of camera:

- 1 of 20 Aerial drone photo, camera facing southeast
- 2 of 20 South façade (right) and west façade (left), camera facing north
- 3 of 20 South façade of the upper wing, camera facing northwest
- 4 of 20 South façade of the upper wing, camera facing west
- 5 of 20 West façade, camera facing south
- 6 of 20 Southwest corner, camera facing west
- 7 of 20 South façade, camera facing north
- 8 of 20 Southwest corner, camera facing northwest
- 9 of 20 Southwest corner, camera facing northwest
- 10 of 20 North entrance, camera facing southeast
- 11 of 20 North entrance, camera facing south
- 12 of 20 North façade at north entrance, camera facing east
- 13 of 20 North façade, camera facing east
- 14 of 20 North patio, camera facing southwest
- 15 of 20 North patio, camera facing southeast

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- 16 of 20 North patio, camera facing northeast
- 17 of 20 North patio, camera facing east
- 18 of 20 Interior, conference room, camera facing southwest
- 19 of 20 Interior, typical upper floor office, camera facing south
- 20 of 20 Donal Hord sculpture, *Spring Stirring*, camera facing north

Paperwork Reduction Act Statement: This information is being collected for nominations to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.). We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

Estimated Burden Statement: Public reporting burden for each response using this form is estimated to be between the Tier 1 and Tier 4 levels with the estimate of the time for each tier as follows:

- Tier 1 – 60-100 hours
- Tier 2 – 120 hours
- Tier 3 – 230 hours
- Tier 4 – 280 hours

The above estimates include time for reviewing instructions, gathering and maintaining data, and preparing and transmitting nominations. Send comments regarding these estimates or any other aspect of the requirement(s) to the Service Information Collection Clearance Officer, National Park Service, 1201 Oakridge Drive Fort Collins, CO 80525.

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Location Map

Latitude: 32.867800

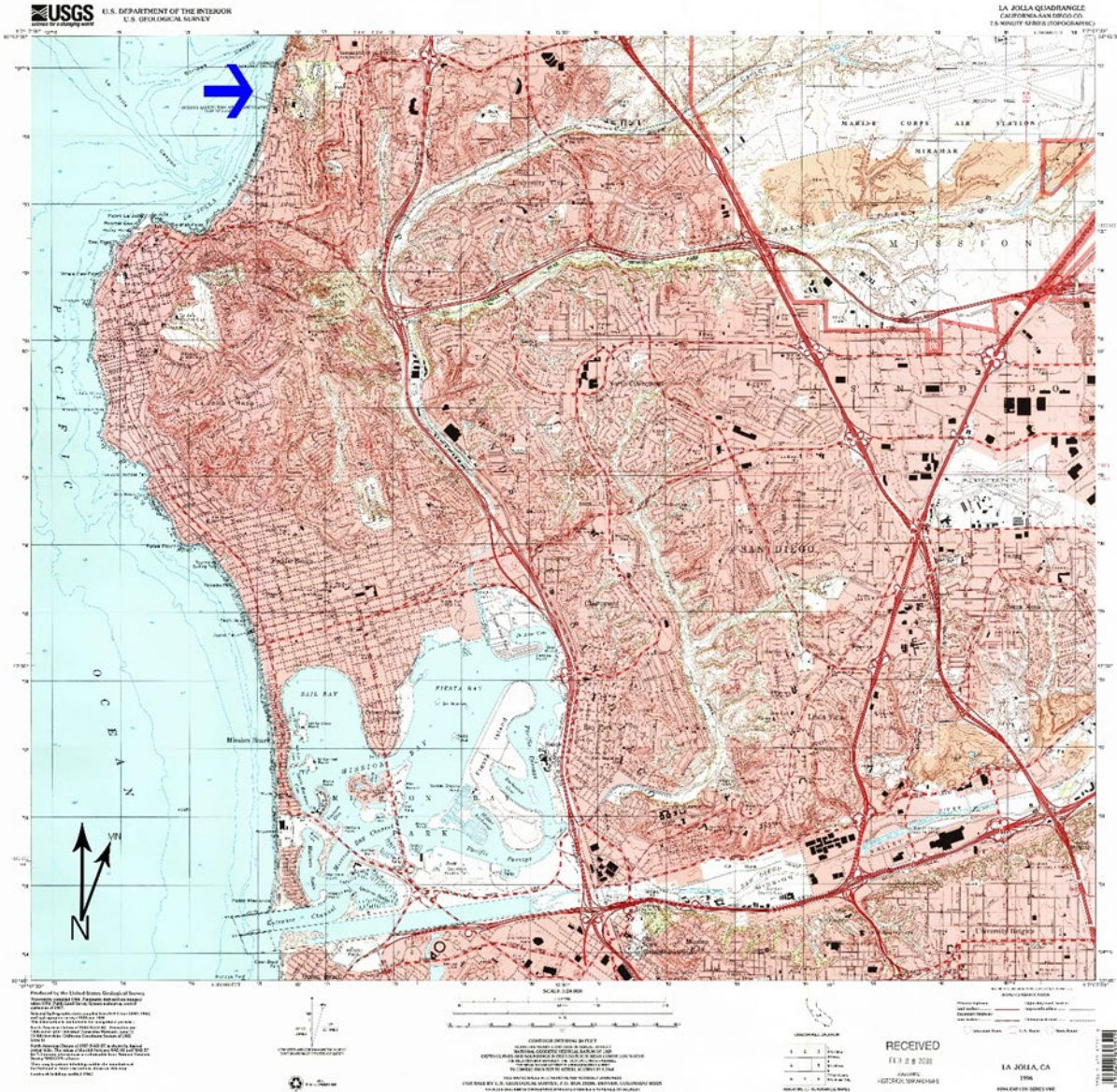
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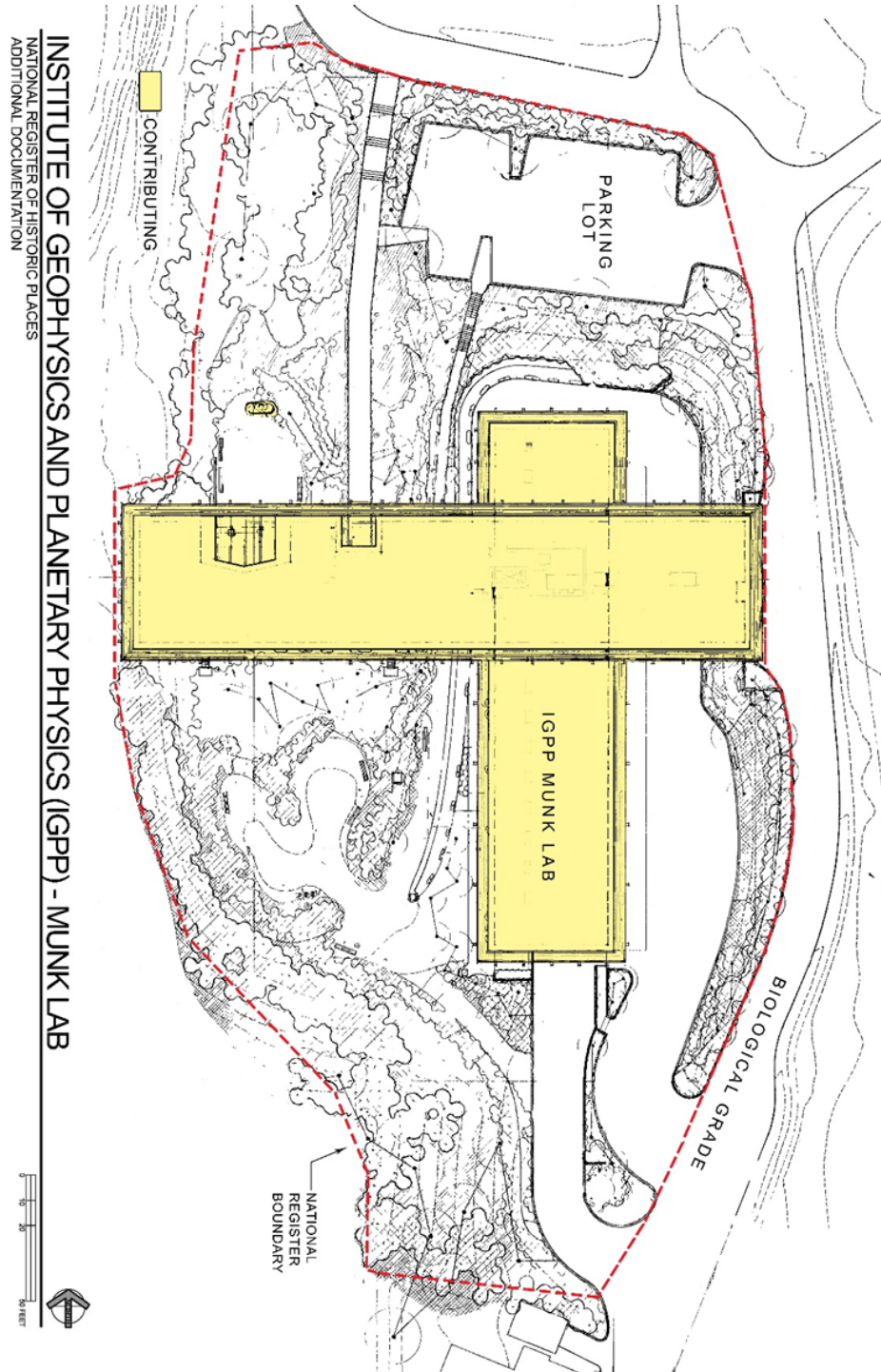
USGS Map



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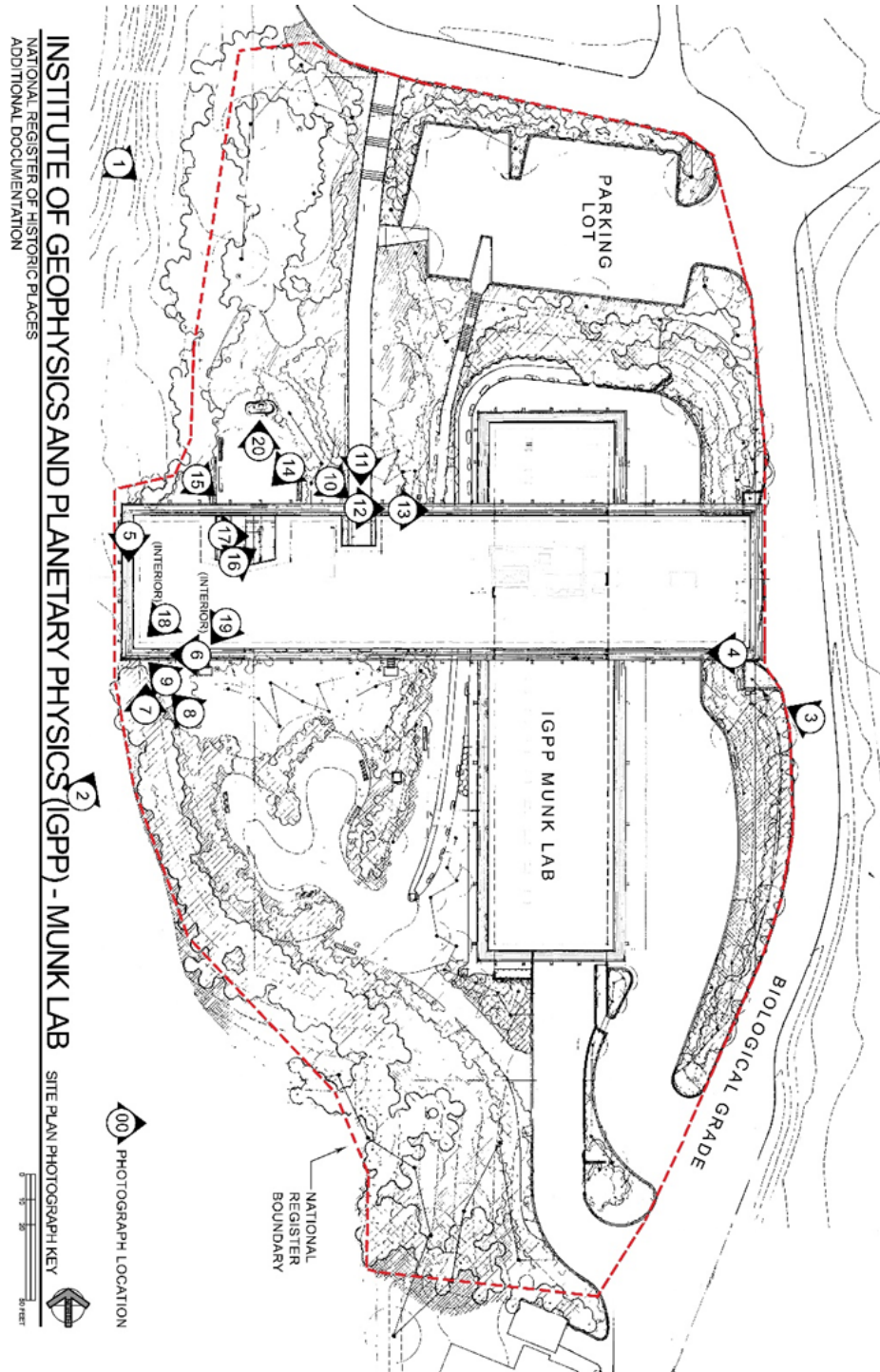
Site Plan



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Sketch Map/Photo Key



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Figure 1 Walter and Judith Munk at IGPP Munk Lab, 1964. Source: UC San Diego IGPP Munk Lab.

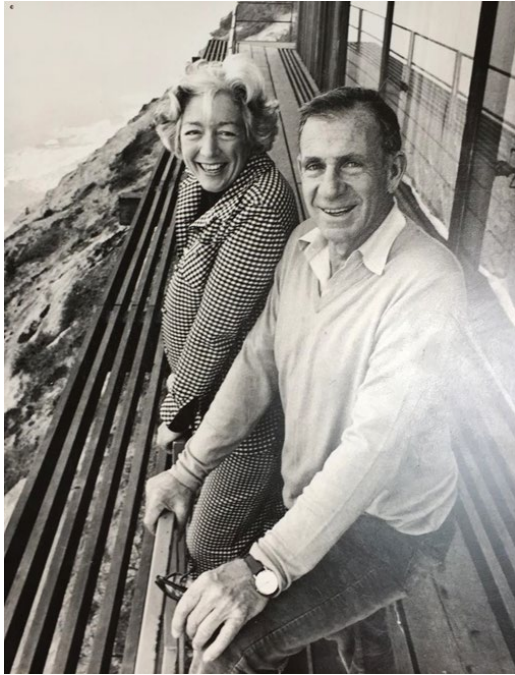


Figure 2 Aerial view looking east at the IGPP Munk Lab, 1965. Source: UC San Diego Digital Archives.



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Figure 3 Aerial view looking north at IGPP Munk Lab, 1965. Source: UC San Diego Digital Archives.



Figure 4 Looking southeast at IGPP Munk Lab with Walter Munk (standing) in the foreground, 1965. Source: UC San Diego Digital Archives.



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Figure 5 View looking north from Biological Grade, 1966. Source: UC San Diego Digital Archives.



Figure 6 Looking southwest from Biological Grade at IGPP Munk Lab, 1966. Source: UC San Diego Digital Archives.



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Figure 7 South balcony featuring the overhead shade trellis and glass sliding doors at IGPP Munk Lab, 1966. Source: UC San Diego Digital Archives.



Figure 8 South view revealing the cross-axial plan at IGPP Munk Lab, 1966. Source: UC San Diego Digital Archives.



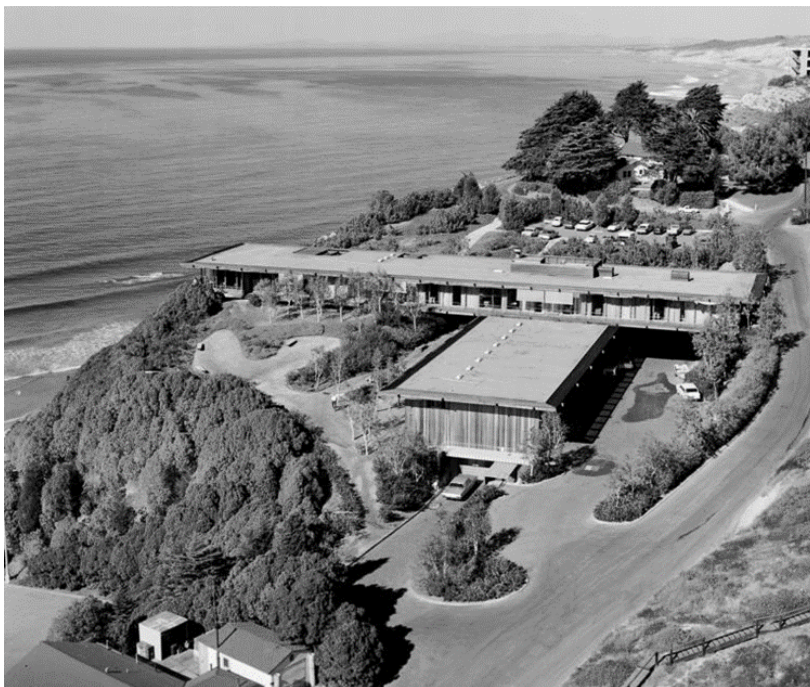
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Figure 9 Collaborative work between Dr. Walter Munk, second from right, and SIO scientists in the IGPP Conference Room. Source: Ansel Adams, Conference Room, IGPP, December 1966, scan from original negative, Sweeney/Rubin Ansel Adams Fiat Lux Collection, California Museum of Photography, University of California, Riverside.



Figure 10 Aerial view looking northwest at IGPP Munk Lab, 1969. Source: UC San Diego Digital Archives.



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Figure 11 Walter Munk at Scripps Institution of Oceanography. Source: *The San Diego Union Tribune*, July 1, 2016.



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Photo 1 Aerial drone photo, camera facing southeast



Photo 2 South façade (right) and west façade (left), camera facing north



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Photo 3 South façade of the upper wing, camera facing northwest



Photo 4 South façade of the upper wing, camera facing west



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Photo 5 West façade, camera facing south



Photo 6 Southwest corner, camera facing west



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Photo 7 South façade, camera facing north



Photo 8 Southwest corner, camera facing northwest



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Photo 9 Southwest corner, camera facing northwest



Photo 10 North entrance, camera facing southeast



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Photo 11 North entrance, camera facing south



Photo 12 North façade at north entrance, camera facing east



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Photo 13 North façade, camera facing east



Photo 14 North patio, camera facing southwest



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Photo 15 North patio, camera facing southeast



Photo 16 North patio, camera facing northeast



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Photo 17 North patio, camera facing east



Photo 18 Interior, conference room, camera facing southwest



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Photo 19 Interior, typical upper floor office, camera facing south



Photo 20 Donal Hord sculpture, *Spring Stirring*, camera facing north

