MUTUALLY BENEFICIAL:

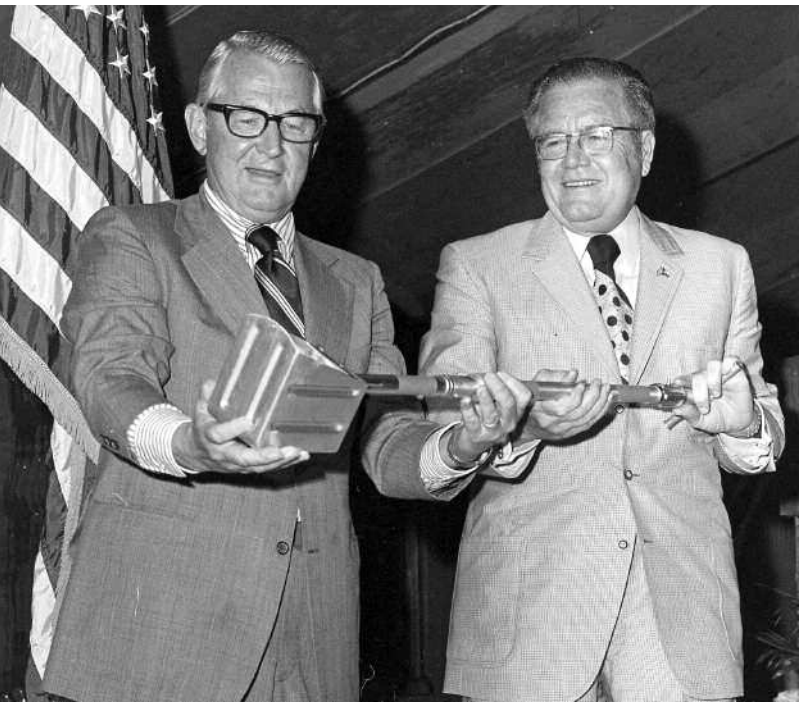
UNIVERSITY OF HOUSTON – CLEAR LAKE AND NASA JOHNSON SPACE CENTER

By Shelly Henley Kelly

On September 19, 1961, NASA announced that the Manned Spaceflight Center (MSC) would be located in Harris County (Houston) just off the shores of Clear Lake. As the Clear Lake City community around MSC evolved and the University of Houston at Clear Lake City (UH/CLC) was created, a symbiotic relationship between the university and Johnson Space Center (JSC) formed in two distinct periods, under two different visions.

Early in the MSC development, a demand for graduate work grew within NASA and the nearby space-related industries. MSC Director Dr. Robert Gilruth recognized the need for continuing education, knowing that offering graduate education would serve as an inducement in recruiting. As NASA's primary contact between MSC and the educational community, Paul Purser achieved an academic first, persuading Rice University, the University of Houston, the University of Texas at Austin, and Texas A&M University to accept graduate credits from each other's programs, as well as credits MSC employees had earned earlier at Virginia universities.[1]

UH Chancellor Dr. Philip Hoffman (left) and Texas Governor Dolph Briscoe use a moonscoop for the university's groundbreaking, May 1, 1974.



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The University of Houston began offering selected graduate courses at MSC in the fall of 1964; the MSC sponsored employees whose classes were needed to substantially improve job performance.[2] In the first year, more than five hundred MSC employees enrolled in graduate and undergraduate courses at UH. Faculty taught physics, math, and various engineering courses in MSC conference facilities though these rooms were not suitable for permanent use and were urgently needed for engineering office space. On September 10, 1965, MSC Director Robert Gilruth formally requested "that the University of Houston give immediate consideration to the establishment of a permanent graduate and undergraduate educational facility in the Clear Lake area." Gilruth recognized that, "The availability of the best educational opportunities for our employees is vital to the accomplishment of our Center's mission objectives."[3]

UH Chancellor, Dr. Philip Hoffman, replied that "…it would be difficult for us to be unresponsive to vital needs of the MSC and its staff," but indicated that "the acquisition of appropriate land in the Clear Lake City area would be of crucial importance to this project."[4] Plans were already in motion, as their correspondence was copied to Dr. Charles Jones, president of Humble Oil & Refining Company, and M.W. Hankinson, president of Friendswood Development Company. Dr. Jones wrote that he was "pleased to inform [Dr. Hoffman] that Humble Oil & Refining Company is prepared to donate fifty acres of land in Clear Lake City to the University of Houston for the establishment of a permanent undergraduate and graduate facility…contingent upon the University's willingness to construct and operate a substantial educational facility on the property." A total of 487 acres would be donated from the Friendswood Development Corporation to become The University of Houston at Clear Lake City.[5]

With the original fifty acre donation, the University of Houston pursued approval from the Coordinating Board and Texas Legislature to construct the Clear Lake Graduate Center (CLGC), which opened for classes in January 1973. By that time

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Dr. Alfred R. Neumann (left) served as the first Chancellor at UHCL. He was appointed by UH Chancellor Dr. Phillip Hoffman (right).

however, plans were already underway to develop a second, separate and independent, UH campus adjacent to the CLGC. In 1968, the Coordinating Board, Texas College and University Systems (now the Texas Higher Education Coordinating Board) had called for the creation of a new campus in Clear Lake to offer upper-division and graduate-level programs. Four years later, the 62nd Texas Legislature passed House Bill 199, establishing in Harris County "…a coeducational institution of higher education to be known as the University of Houston at Clear Lake City."[6]

Dr. Hoffman appointed his Dean of Arts and Sciences, Dr. Alfred R. Neumann, as the founding chancellor of the new institution. Although the birth of UH/CLC came from the need for graduate engineering programs at UH, the primary focus for academic programs at UH/CLC would be more community-based: business and management, education, public affairs, literature, human sciences, and the humanities. As founding chancellor of UH/CLC, Dr. Neumann strove to provide the new institution with its own sense of identity, to be separate and to fulfill a need in the area without stepping on the toes or interfering with the plans of the central campus. He firmly believed in the upper-level and graduate institution's charge "to extend the educational opportunities of students who have completed two or more years of college; to provide non-traditional curricula in response to the needs of contemporary society; and to meet the continuing and often specialized educational needs of the unique population of the Bay Area." Excellent teaching was his paramount focus.[7]

Charter faculty and future Dean of Sciences and Computer Engineering Charles McKay years later reminisced, "Dr. Neumann believed that a major role of our university was to humanize the high-tech Neanderthals who roamed the corridors of Clear Lake…he was very interested in bringing improved opportunities in the humanities, in the fine arts, and other things to the community."[8]

Because Dr. Neumann focused on teaching and the humanities—developing programs for the community of Clear Lake, rather than the engineering needs of MSC—his involvement with NASA has largely been overlooked or forgotten. The very cultured chancellor, a former professor of German literature and an accomplished musician, preferred to leave the details of developing programs with the newly renamed Johnson Space Center (JSC) to his provost and school deans. Correspondence from his office reflect a more reserved, formal connection with JSC Director Christopher Kraft (1972-1982) while UH/CLC Provost Dr. Lou Rodriguez communicated with JSC Director of Administration and Program Support Philip Whitbeck.

During the formative years, UH/CLC and JSC reached out to one another to find a mutually beneficial relationship. In late 1975, Dr. Neumann assigned a faculty committee to explore the possibility of establishing an Institute on Educational Applications of Space Research, to find ways in which the new knowledge generated by NASA could be applied in the educational process at all levels. The committee, chaired by Dr. Christopher Dede, prepared a report detailing methods to reach three major types of clients: educators, local industries (non-engineering sectors), and specialized meetings in Houston (conventions, conferences). They envisioned workshops, courses, briefs, and supplemental curriculum to promote the social benefits of aerospace research. The committee only lasted a few years before disbanding in October 1977 due to a lack of funding.[9]

Through a series of NASA Cooperative Agreements, UH/CLC set up a Laboratory Preceptorship Program (internships) and received over $613,000 of specialized equipment loaned or donated by JSC. In 1979, a Graduate Internship Program Memorandum of Understanding replaced the earlier Laboratory Preceptorship Program

agreement to better facilitate a university graduate internship program, allowing university graduate students the opportunity to use JSC facilities. A separate Cooperative Education Program allowed students to work at the center for one semester and attend the university on a full-time basis the next. There were normally two or three students per semester enrolled in this program.[10]

The most successful early program with JSC was the Management Development Program, a management training and education program specifically directed at mid-level, high-potential employees. In May 1974, NASA contacted UH formally requesting two management courses per semester for three years, with onsite registration and coursework, for trainees to receive a Masters in Public Administration degree. UH forwarded the request to UH/CLC and Dr. Rodriguez visited JSC to explore a "number of complementary endeavors that I hope will develop between NASA and the University of Houston at Clear Lake City." In addition to speaking to over one hundred interested students about business and industry, public affairs, and business administration programs, he was also looking to attract potential faculty.[11]

Dr. Rosemary Pledger, Dean of Professional Studies, worked out the details with Phil Whitbeck, offering four courses each semester in areas such as organizational behavior, organization theory, and theory and management of systems. At least one class was taught at JSC each semester, and in the summer one faculty would conduct research on a mutually acceptable topic at JSC.

In July 1980, Dean Pledger expressed her concern about the lack of women participating in the program. JSC Personnel Officer Jack Lister shared her frustration and requested any suggestions from her for increasing participation that despite informal contacts made with "eligible, highly qualified" women to encourage their application, only three had applied for the program since its inception. Over one hundred employees were graduated from this special two-year program before it was cancelled in 1981 by mutual agreement because nearly all of the employees who met the criteria had participated.[12]

Rodriguez later commented that JSC "really needed our management program more than probably anything else." Business degrees were in high demand among JSC employees who came to UH/CLC, though JSC students grilled the faculty over credentials, demanding to know where they had studied, what they had published, and how many years of teaching experience they had.[13]

Dr. Neumann enjoyed the cordial relationship with JSC, and noted "…that a large number of NASA employees have returned to school here on a part-time basis to upgrade their skills in

Chancellor Alfred R. Neumann serves as master of ceremonies at the dedication of the Clear Lake Area Bicentennial Time Capsule at UH/CLC on July 20, 1976. Providing contents for the capsule were area government agencies, organizations, businesses, and the Johnson Space Center.

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Houston Mayor Kathryn J. Whitmire along with NASA JSC Director Gerald D. Griffin (left) and UHCL Chancellor Dr. Thomas Stauffer at the world premiere of "The Artist and the Space Shuttle," held at the UHCL campus in October 1983.

management, public affairs, business or just general liberal arts."[14] Records from the fall of 1978 to the spring of 1982 indicate that NASA and contractor sponsored students made up about four percent of the enrollment, though there are no statistics showing the number of students who were NASA employees not receiving tuition reimbursement.

Neumann's emphasis on strong business and humanities programs for the "community university" helped to develop a relationship with NASA and that relationship, in turn, would later help UHCL recruit future faculty. By 1982, UHCL had attracted seven faculty in business, science & technologies, and public affairs from NASA or contractors, including Phil Whitbeck, who retired from NASA in 1981.

NASA even became involved in physical campus development. In 1977, UH/CLC announced plans for a new prototype solar-powered building to be built next to the former CLGC, now known as the Arbor Building. The Developmental Arts Building would contain multipurpose areas for dance classes, recreation, a gym, racquetball courts, classrooms, and physical fitness labs. A grant from the Department of Energy (DOE) and NASA provided the cutting-edge solar energy heating and cooling system. A series of 616 solar collectors in three heights were installed over 18,000 square feet of the roof. Solar heated water could be stored in a 21,000 gallon tank, while cooling would be provided by a specially designed Carrier 75-ton solar operated absorption chiller. The grant specified that DOE/NASA would furnish and install the complete air and water heating systems and would provide monitoring and maintenance for a two-year period.

Unfortunately, the experimental project never worked properly. The solar panels lining the roof were removed and replaced by another NASA energy-efficient project, a modified roof comprised of a UV light protective coated foam. However, it soon became evident that this material trapped moisture in the roofing system and pervaded the building's structure. In 1995, the building was renovated and reopened as the Delta Building.[15]

In August 1982, JSC Director Christopher C. Kraft and UH/CLC Chancellor Dr. Alfred R. Neumann both retired from their respective agencies. Their replacements would enjoy a more casual, personal friendship.

Dr. Thomas Stauffer, UH/CLC's second chancellor, a young, self-confident, energetic man of limited teaching experience, had worked for the American Council on Education as vice president/director of External Affairs. The proximity of NASA's JSC was an immediate attraction to him, and he wasted no time in contacting the new JSC Director Gerry Griffin to develop a friendship and shared vision. Stauffer remembers that when he came to UH/CLC the university "was oriented more toward the humanities and social sciences," and he deliberately set out to develop a particular expertise in technology and information science. As a sign of the coming changes, the university name was shortened to University of Houston – Clear Lake (UHCL).[16]

Griffin invited the new chancellor to the launch, landing, and welcome home of STS-6, the first flight of the Space Shuttle *Challenger* in April 1983. Dr. Stauffer thanked him profusely, adding, "although it was not why I was chosen for my current post, the fact is that I have been a wildly enthusiastic 'space fan' for the past quarter century or so. If you ever need a chancellor to inspect the needs for higher education in Earth orbit, I would certainly be the logical candidate."[17]

About the same time, the two men agreed to honor NASA's twenty-fifth anniversary in October 1983 with the world premier of "The Artist and the Space Shuttle," a Smithsonian Institution traveling exhibit on tour from the National Air & Space Museum. The exhibit highlighted seventy works by thirty-five artists commissioned by NASA over the past twenty years to render their impressions of the development of the Space Transportation System (STS) or Shuttle Program. The reception on October 14 was attended by such notables as Houston Mayor Kathy Whitmire, JSC and contractor senior staff, university faculty, astronauts, artists, and the recently widowed Selma Neumann.[18]

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UHCL Chancellor Dr. Thomas Stauffer (left) and Dr. Charles McKay promote the Ada partnership.

The April launch activities also gave Dr. Stauffer and Griffin an opportunity to discuss their desire to establish mutually beneficial ties between UHCL and JSC. After meeting with faculty and administrators, Dr. Stauffer outlined four operational principles toward future collaboration with JSC: that UHCL's academic programming and research must be sensitive to JSC priorities and mission requirements; that the campus atmosphere must be welcoming to JSC employees and contractors; that the academic integrity and mission of UHCL must be protected in its relationships with all other agencies; and that the university and JSC must only engage in those collaborative activities that can be done well. Stauffer envisioned a regular communication of data, experience, and concepts leading to in-depth studies.[19]

Perhaps the most significant development with JSC during Dr. Stauffer's era was the selection of UHCL as the first beta test site for the Ada Programming Support Environment (ASPE) and Ada Language System. In 1979, the Department of Defense adopted a set of requirements to establish a single, high-level, language intended primarily for systems programming applications that could be used for mission and safety-critical computer applications. That same year, JSC released a two-volume report analyzing the concept of a shuttle serviced, permanent, manned facility in low-Earth orbit called the Space Operations Center, now known as the Space Station Program.

UHCL, the first public university to teach Ada as a regularly scheduled course, opened its High Technologies Laboratory in September 1982 to conduct cooperative research and problem-solving services focusing on the Space Operations Center, ASPE, and Electro-Optical communications, guidance, and control. It brought together numerous researchers from multiple aerospace and electronics corporations across the country, including NASA, and it brought in grant funding.

In 1983, UHCL became the first campus worldwide named an APSE Beta Test Site to establish a set of standards and policies covering the design, development, and management of future flight data systems, including the Space Station. Part of NASA's justification statement for the Memorandum of Understanding with UHCL stated that, "University staff and students …are recognized experts in the Ada arena, especially associated with the design and development of distributed data systems and networks. The University has been chosen by commercial firms with a vested interest in application," and "JSC requires outside technical expertise to integrate with the flight systems expertise within the center."[20]

The joint NASA/JSC and UHCL APSE Beta Test Site earned and received accolades and recognition from the international community of participants and spectators. UHCL emerged as a recognized leader in software engineering.

Dr. McKay recalled another step in the partnership. "NASA looked down the road…and said, 'You know, this is an example of a really good thing. This is an example of a community working in close collaboration with a university on projects that matter to NASA. Let's broaden it beyond a finite project, and let's

open up a whole spectrum of programs ... that would be helpful for our university, and other universities, and other people from industry to collaborate on, that would benefit NASA.'"[21]

The Research Institute for Computing and Information Systems (RICIS) opened in May 1986 to allow faculty and students to work for and with JSC on advanced data processing systems and to help with technical and management information systems needed for future missions. RICIS conducted, coordinated, and disseminated research in computer information systems, serving as a focal point for joint programs. NASA management, scientists, and engineers worked directly with the university in five areas: computer systems and software engineering, information management, mathematical and statistical analysis, artificial intelligence and expert systems, and education and training.[22]

On February 19, 1987, representatives of UHCL and JSC announced the establishment of the NASA funded Software Engineering Research Center (SERC), the first publicly supported software engineering facility for non-military research in the nation. SERC researchers would identify and verify software engineering advancements and work to integrate and transition them into practice. UHCL and JSC continued to offer joint meetings and symposium, and these collaborations eventually led to the development of several new programs at UHCL, including degrees in computer systems engineering and biotechnology.[23]

In 1986, Dr. Stauffer, the self-proclaimed 'space fan' who witnessed the inaugural launch of the orbiter *Challenger*, found himself in a unique position to give back to the NASA community. In the days following the January 1986 *Challenger* explosion, Dr. June Scobee, a UHCL faculty member with the School of Education and widow of the *Challenger* commander Dick Scobee, contacted President Stauffer to ask him to meet with the other widows and family members. Stauffer had known all of the *Challenger* crew except one.

"We met on the floor; I remember it was a shag-carpet floor in her living room. This was just a few days after the accident, and tears were flowing all over the place. I was wondering what I was doing there. The whole topic was on what we should do to memorialize the *Challenger* crew," he recalled. During those early months, Dr. Stauffer freely supplied the families with university office space and equipment. After the families created the founding board of directors for what would become known as the Challenger Center for Space Science Education, they invited Dr. Stauffer to serve on the board of directors, where he held the office of secretary, and later succeeded June Scobee as chairman of the board.[24]

In the years since Dr. Stauffer and Gerry Griffin departed the university and the space center, the leaders that followed continued to build on the solid foundation formed between the two institutions. After a relatively formal beginning, UHCL and JSC discovered mutually beneficial collaborations, not only between themselves, but also in the economic growth and development of their community. ★

The University of Houston–Clear Lake (UHCL) continues to service the space community and NASA Johnson Space Center (JSC) by providing care and access to the JSC History Collection at the UHCL Archives and by offering library services through the Alfred R. Neumann Library.

By law, inactive federal records determined to have enduring historical value are retired and transferred to the National Archives and Records Administration (NARA) along with all legal custody. In February 2001, NASA, NARA, and UHCL signed a ten-year renewable Memorandum of Understanding to house over 2,500 linear feet of historical documents at the UHCL Archives. This memorandum allows the early flight program records to be readily available for use in current and future project planning, while also permitting the records to be accessible to the general public.

The JSC History Collection consists of approximately 1.5 million documents collected by the NASA JSC History Office as they worked on chronologies and histories of each manned spaceflight program. The large collection amassed for their "historian source files" covers the Apollo, Apollo-Soyuz Test Project, Skylab, Shuttle, and the Space Station Programs. In addition, the collection includes a General Reference Series and [Johnson Space] Center Series. Another major component of the Collection is the Oral History Series, consisting of over 1,000 interviews and other audio and/or transcribed data collected under the Oral History Project.

The JSC History Collection arrived at UHCL in several installments throughout Fall 2001 and Spring 2002. Since opening to the public, UHCL has assisted over 800 patrons in person and answered over 1,200 e-mail requests from all over the world.

In 2002, JSC negotiated a contract for the Alfred R. Neumann Library to provide library services, including reference and interlibrary loan, to JSC personnel and contractors. Throughout 2003, books and journals were transferred from JSC to UHCL and processed into the Neumann Library collection. Services have been expanded to provide JSC onsite book and document delivery via the JSC Scientific and Technical Information Center, and to allow JSC patrons to request books from other UH-System libraries. Over 4,000 requests have been handled since June 2002, predominantly interlibrary loan and article delivery.