
FOREWORD:

DESIGNING IN A VACUUM

*Anthony J. Schnarsky
Associate Professor
UWM School of Architecture and Urban Planning*

With great interest I attended a meeting hosted by the Dean of our School, Carl Patton, which introduced members of the faculty to an aero-space company, Astronautics Corporation of America, with corporate headquarters in our state. The managers and engineers that sat at the table with the academics had already put hardware into space, some of it even reaching the moon's surface. What could an architecture program add to the complex, highly technical methodology of building structures in the vastness of space?

At this first meeting, most of the attending faculty asked about human factors and environment-behavior topics of space. I soon realized there is a lot work to be done in this new environment. Vast amounts of data and literature already exist, but represent just a beginning for the enormous effort of inhabiting the moon's surface and the planets beyond. The managers described missions that would require structures for housing science, mining, and manufacturing for periods greater than one year and for groups up to 20 people on the lunar surface. According to the timetable - a seemingly remote 25 years from now, the first-phase landing parties will begin arriving on the lunar surface. As we sat there, no human had been in space quite as long as the proposed durations.

Finally, the discussion turned to computers and design. Engineers use computers. Architects view themselves as designers. Could this be an opening? At that point, I promised to run my very next computer studio with the topic being habitation on the lunar surface of the moon in the year 2025. It just shows how little I knew at the time.

That was in the spring of 1987. I began to kick myself daily for the remainder of the semester. What kind of students would be interested in space architecture? How many of them would meet the CAD prerequisite for the course? When I advertised the course referring to such literary giants as Ray Bradbury, Robert Hein-

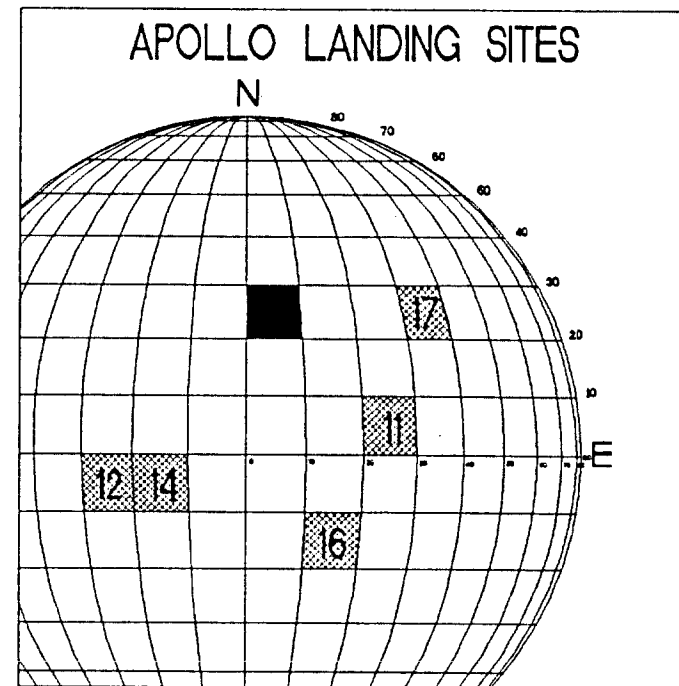
lein, Isaac Asimov, Frederick Pohl, and Andre Norton, I wondered how many would recognize their books? I felt the big vacuum. Either today's students do not read science fiction, or worse, they want studios for corporate architecture only. Besides, earth has enough problems to challenge architects for years. What could I promise?

Luckily, a visitor named Larry Bell stopped by the school during the summer. He is a dedicated teacher at one of the strongest institutes for extra-terrestrial environments in the nation, the University of Houston. He had just arrived from a visit to Astronautics Corporation's Technology Center in Madison where they had told him of my foolish decision to offer a lunar studio.

Larry was a great source of knowledge and experience about the extraordinary design conditions of space architecture. He understood my ambivalence. After all, how many students will find work in this rarified kind of construction? He considered my uneasiness healthy. Larry enumerated the many indirect benefits emanating from space studies done by students and institutions of higher learning. We decided such a design problem is rich for future architects because of the following:

- (1).It gives practice in working on huge projects involving many other disciplines.
- (2).It gives practice in working with an enormous database including researched programmatic information.
- (3).It gives experience with very technical construction and interior systems.

Larry pointed out the timeliness of getting involved with NASA's thinking during the lull following the Challenger accident. The main prediction he made was that the students would benefit most from the completely stark nature of the program and the relentless technical forces that bear upon space architecture. And, for a change, architects would not be considered the master builders. In fact, he predicted, we would experience a serious role reversal with our engineering colleagues. In short, we might feel that the aesthetic values of normal studio education, would be, for the most part, made irrelevant by the nature of the problem before us. The students would help plan and design the most technically understood objects on and off the earth, and they would come to know that they are not the lead discipline that they traditionally have assumed.



The reassurances helped me. The studio however, remained an idea. In fact, preregistration led to only one student. Thus the last hurdle remained -- the students needed to conduct the studio were missing; eight more were needed, to be exact.

Things worked out. Half the students in the class were from more than 120 degrees longitude from Wisconsin. And half were not CAD literate. But they were there opening the class. Men and women from Nigeria, Malaysia, France, Iowa, and Wisconsin. We all wondered what we would contribute. It was a very invigorating opening. And I must say that for the entire semester I'd never seen such design development and learning brought on by such a challenging condition.

Herein lies the major point of this foreword. Space architecture has such a strong and deterministic nature about it that one is constantly humbled by it as an individual. And properly understood, this has great virtue in developing general design skills appropriate to the studio format.

The second insight is that architects employ unique ways of approaching design problems -- ways not common in this engineering dominated realm. With due respect to my engineering colleagues, the architectural design process has important holistic value for the future of space environments.

I propose that there are three components in space design methodology:

- (1) engineering and technology application
- (2) science and physics,
- (3) human/environmental planning.

I suggest that because of the nature of our times, each of these specialized components seem to have their own terms and methods for getting systems into place and assuring that the environment will function and that humans will survive and thrive. Architects are not regular participants in space, however, the lunar program statement now includes words that have been the domain of architects -- words such as habitation, master plan, construction sequence, modularity, and interiors. What I propose is that scientists use art, engineers design, and architects plan. For something as profound as the colonization of other planets, each field should combine their unique talents and abilities to arrive at the best solution possible. Later, in a section called "Lunar Base Studio Design Process," I will

describe several distinct phases in this unique studio's life and will continue my argument for inclusion of the architect's approach to design in the total process of a lunar base development.

After months of struggling with the forces and issues in the studio process, one comes to places where no one has ever been before - design horizons where no one has time to think about the program, the forms, and the long amounts of time that future space personnel will experience. In our studio, this occurred in a remarkably short period of time with totally unprepared students and faculty. One of the reasons for this studio's success was the effective integration of computer-aided design (CAD); another is the balance of reading with design synthesis. Both are represented in later sections written by one of the students.

Despite the overwhelming number of pages of data and material available about space habitations and design requirements - to which we hope this report will make some small contribution -, we are all still on the edge of design that has little previous published precedence. We remain humbled by the vastness of the task of designing for space that lies before us.