Co-Founders Recount Early Days of Institute's History

IREAP is currently one of the leading research institutes at the University of Maryland, College Park, with grants totaling more than $6 million annually, 18 research labs, a research faculty of 54, and, at present, 68 graduate students. That's a far cry from its inception in 1978. As we near our twenty-fifth anniversary, co-founders Hans Griem and Martin Reiser reminisced about the early days when Professor Griem's Plasma Physics group teamed up with Professor Reiser's Charged Particle Beam group to form what would eventually become IREAP.

Hans Griem

Plasma Physics

"In September 1957, when I took up my appointment at the University of Maryland, plasma physics was not yet recognized as a scientific discipline," Griem says. "Fortunately, the chairman of the Physics Department, John Toll, had been an assistant of Lyman Spitzer on the Matterhorn stellerator project at Princeton. We all benefitted from the Sputnik crisis; the Air Force Office of Scientific Research was offering support for laboratory research on shock waves in plasmas."

They began their research in Room 007 in the basement of the Physics building with one post-doc and four graduate students. Over the course of the next ten years, they were joined by a number of the researchers who still work at IREAP, in particular Derek Boyd, Rick Ellis, Ray Elton, George Goldenbaum and Chuan Sheng Liu, and several researchers who have made notable careers elsewhere, including A Trivelpiece, N. Krall, and Ron Davidson. "Our small group became quite a powerhouse," Prof. Griem remembers. "We wrote books, began to do a lot of research now also on non-neutral plasma and micro-instabilities, and graduated several Ph.D.s a year."

As the group outgrew its space in the Physics building, they moved into the Heavy Research Building, the "old wing" of IREAP's current quarters, the Energy Research Facility. "The laboratory space problem did not get any easier," said Griem. Although we lost some faculty members, others joined, and the experiments got bigger. So in the early 1970s, the energy crisis encouraged our Provost at that time to ask for a separate Energy Research building, and to suggest the formation of the Laboratory for Plasma and Fusion Energy Studies jointly with Martin Reiser's Particle Beam group."

Martin Reiser

Charged Particle Beams

In the fall of 1961, Martin Reiser joined the faculty of Michigan State University and began collaborating with Henry Blosser on the design of a second-generation isochronous cyclotron for the acceleration of protons and heavy ions. "This new cyclotron paved the way for the establishment of the National Superconducting Cyclotron Laboratory (NSCL) and MSU in the 1980s," Reiser notes.

When offered a joint appointment in the Electrical Engineering and Physics departments at UMCP in 1965, the position appealed to Reiser on two counts. "It was expected that I would help the Physics department with the design of the then most

advanced variable-energy, multi-particle isochronous cyclotron, under the direction of Harry Holmgren. At the same time, the cyclotron project would provide an opportunity for establishing a graduate program in accelerator design and charged particle dynamics in the Electrical Engineering department. Particle accelerator science was at that time not yet a recognized discipline within the professional societies of IEEE and APS, and accelerator courses were taught at only a few universities associated with large dedicated facilities such as Berkeley, Cornell, and Stanford."

An important change in the focus of their research came in the late 1960s with the news that Russian scientists at Dubna had developed a new type of "collective" ion accelerator. "The news created great excitement in the West, and Electron Ring Accelerator (ERA) projects were started at Berkeley, the Max-Planck Institute in Garching and at Karlsruhe," Reiser recalls. "Together with Hogil Kim and Gus Zorn of the Physics department, I formed an ERA study group and we came up with a new idea for the Ring formation that differed from that of the other labs." Their project received funding from the National Science Foundation in 1969. "The ERA was, next to the cyclotron, one of the largest research projects on the Maryland campus at that time," Reiser continues. "It greatly enhanced our visibility and recognition and represented a major step in the development of a first-class electrical engineering graduate program in accelerator design and charged particle beam research."

The ERA project's initial home, though, was anything but first-class: they were housed in a remodeled Quonset hut situated near the Animal Sciences Building. But they set about building a pulsed-power electron beam generator in collaboration with the Naval Research Laboratory, and assembling a top-notch technical staff, including three researchers who are well-known to the University of Maryland. Charles Striffler joined them as a newly appointed assistant professor of Electrical Engineering; Moon-Jhong Rhee (Professor, Electrical and Computer Engineering) and William Destler (Provost, UMCP) joined the group as post-docs.

The Institute Takes Shape

The core of what would become IREAP was formed in the early 1970s when Reiser joined Griem in petitioning the state for support of a new laboratory as a major addition to the Heavy Research Building, which was then housing Griem's Plasma Physics group. "After intense lobbying, especially by Hans Griem, funding was approved," Reiser notes. Ground was broken on July 19, 1979 for this new wing, and in 1982 construction of the renamed Energy Research Facility was completed.

IREAP has gone through a number of name changes in its twenty-plus years of existence, as Reiser recalls. "Even before we could move into [the Energy Research Facility], we had already formed, in 1980, an umbrella organization for our two groups, the Laboratory for Plasma and Fusion Energy Studies, with Hans Griem as its first director. Later, as the energy crisis of the 1970s subsided, the name was changed to the Laboratory for Plasma Research and then the Institute for Plasma Research."

The Institute Today

In July 2001, the institute became the Institute for Research in Electronics and Applied Physics. Research in plasma physics and charged particle beams continues, and our research focus has been broadened as new faculty have joined. Many of our graduate students and former colleagues have gone on to establish notable careers both here at UMCP and at major research laboratories in the US and abroad, and our new faculty members are initiating research programs that are on the leading edge in their fields.

We would like to thank our two co-founders and all those who have contributed to IREAP's success during this, our first 25 years.