The location of The Institute of Optics within the administrative structure of the University has evolved over the years. At present the Institute is an academic department within the School of Engineering and Applied Sciences which is itself a subdivision of the College of Arts, Sciences and Engineering—but as the word “Institute” suggests, The Institute of Optics has a history and a current role that is somewhat different from that of the standard academic department in the University. We will briefly review that history and role, particularly in relation to the formation of the College of Engineering and Applied Science in the late 1950s.

When the Institute of Applied Optics was founded in 1929, it was not given the same status as other academic departments reporting to the dean. Instead it reported directly to the president of the University, Rush Rhees. President Rhees was directly involved. As recounted in earlier essays, he actually traveled to England to personally interview the first two faculty members to join the Institute from outside the University. The new Institute had some special resources available to it, and some special obligations that made it unique within the University structure. Generous corporate support by Eastman Kodak and Bausch & Lomb, including $20,000 in equipment funds and $20,000 per year for five years for operating costs, provided some opportunities for research that were not common in a relatively small teaching college that was just beginning to aspire to become a national research university. The impetus for this support was a perceived national need for scientists and engineers trained in optics and optical instrumentation. There was no other academic department specializing in optics in the United States at the time, so the new department had a special obligation to provide the engineers and scientists for the optics industry, particularly the large fraction of it which was based in Rochester. There was also a special obligation to provide leadership for national organizations in the field of optics, in particular the newly formed Optical Society of America. Simply by being the only department specializing in this field, it took on these responsibilities. In return for the funds, the University agreed that “to a reasonable extent the employees of the companies should be allowed to attend lectures and share other benefits of the existence of an institute of optics.”

The new institute did enjoy a close relationship with the physics department from the beginning. After a first year on the old Prince Street Campus, the Institute was housed on River Campus in the fourth floor of the new Bausch & Lomb building; the other floors were occupied by physics. The first Acting Director, T. Russell Wilkins, was a junior physics professor, and the students took a range of physics courses as a part of the regular curriculum. In the first years most of the research students working in optics were formally graduate students in physics.

The Institute’s unique status was even further enhanced during World War II, as a large fraction of the military optics research in the country was centered in the department,
and the branch of the National Defense Research Council was located here. The faculty and staff grew to approximately fifty.

Following the war the situation changed rather dramatically. The size of the Institute was quickly reduced as the NDRC programs ended, physicists and chemists returned to campus after the war with the prestige of their disciplines greatly enhanced by important contributions to the war effort, and the University began to remake itself into the Ivy League mold of a research university. A research university is generally made up of a series of colleges and professional schools, so the University began to consider how to reorganize itself along these lines. Engineering had been a department in the College of Arts and Sciences; in 1958 it was decided to establish a new College of Engineering and Applied Science including the departments of chemical, electrical and mechanical engineering.

Initially, the Institute maintained its unique status and was not part of the new college; however, a number of events occurred that pushed it in that direction. First, the stature of the new college would be considerably enhanced by adding another department with national and international visibility. Second, the University was gifted with several very talented and ambitious leaders on campus. In addition to Brian O’Brien, there were William Noyes in chemistry and Robert Marshak in physics, both with ideas that required considerable resources. When O’Brien left the Institute in 1954 to go to industry, the Institute lost many of the resources that it had enjoyed. O’Brien had directed the Institute in a very personal fashion. Most of the funds supporting the program had been raised through his personal contacts in industry and government. He had been involved in essentially every aspect of the Institute’s existence for the previous twenty years. Furthermore, a lot of the equipment in the Institute belonged to him personally so that on his departure the program lost a great leader, an extremely able fundraiser, and a goodly fraction of its research facilities. Although the Institute was fortunate to have the very able Robert Hopkins to take over the reins, there were soon rather severe financial pressures. The problems were exacerbated by the administration’s ruling that the income from a small endowment as well as a reserve fund derived from contract overhead charges were committed to O’Brien personally so that they reverted to the University on his departure, and were not available to the Institute.

There were extensive studies and discussions concerning how the Institute could be put into a more stable and conventional way of operating within the University. President De Kiewiet decided to make the Institute an academic department within the College of Engineering and Applied Science while maintaining its historical designation as The Institute of Optics. A regular departmental budget was set up similar to that of other departments. During the 1950s the Institute had established a substantial program in solid state physics with David Dexter, Kenneth Teegarden, and David Dutton. Emil Wolf had joined the faculty in physical optics and coherence theory, Malcolm Savedoff had joined the faculty in astronomy, and Robert Boynton had a joint appointment in physiological optics. When the Institute was moved into the engineering college, Dexter, Savedoff, and Wolf were offered appointments in physics in the College of Arts and Science, Parker Givens was given his choice of an appointment in physics or in optics, and the rest of the faculty were offered the chance to continue their appointments in The Institute of Optics. Boynton’s primary appointment was in psychology so that only his secondary appointment was changed.

The Institute’s temporary financial problems were alleviated and, as can be seen in the essays in this volume describing the events of the past forty years, the Institute prospered in the new college. In fact, faculty members of the Institute have served important leadership roles in the College of Engineering and Applied Science. Rudolf Kingslake served briefly as
acting dean and was followed by Brian Thompson, who served as Dean from 1974 until 1984, when he became Provost of the University. In January 1995 the College of Arts and Science and the College of Engineering and Applied Science were combined into the College, with Engineering remaining as an entity called the School of Engineering and Applied Sciences within the College. Duncan Moore served as the first dean in this new School from 1995 to 1997. In 2003 the College was renamed the College of Arts, Science, and Engineering. The Institute of Optics remains a department in the School of Engineering and Applied Sciences within this college.

Of course, The Institute of Optics is no more an engineering department than it is a physics department; rather it is an optics department that ranges over all subfields of optics from fundamental quantum optics to applied instrumental design and fabrication, from optical properties of materials to medical optics. It is not unusual to have a wide range of sub-fields within a department, any physics or electrical engineering department has a similarly wide range. All of the sub-groups in a physics department generally agree however that the primary goal of their discipline is to develop new fundamental understanding of physical processes. All electrical engineers can similarly agree that their goal is to apply accepted physical principles to develop new technologies that have practical applications. Optics faculty members have no such common criterion for judging the significance of their work. Some are scientists concerned with fundamental knowledge while others are engineers focused on practical applications, inventions and entrepreneurship. Perhaps more remarkable is the fact that many, perhaps most, of the faculty alternate between the two publishing in Physical Review Letters and applying for a patent, occasionally even in the same month!

The current situation is probably ideal with the Institute within the School of Engineering and Applied Science but with six faculty members holding joint appointments in the Institute and the Department of Physics and Astronomy. Students benefit from the breadth of training that this provides and generally are free to decide even after they complete a doctorate in Optics whether they wish to pursue an academic career, perhaps in a physics or electrical engineering department, or pursue an industrial career. They are well prepared for any of these possibilities.