

Hermann Nann

In 1979 when Hermann Nann joined the growing community of nuclear physicists at Indiana University, his interests meshed well with those of us who were dedicated to establishing the Indiana University Cyclotron Facility (IUCF) as an important national resource in the new field of intermediate-energy nuclear physics. Born in Cologne in 1940, Hermann grew up in postwar West Germany and received his formal training in the German academy. As a physics major at J. W. Goethe University in Frankfurt-am-Main, he earned a diploma in 1965 and a Doctor of Natural Philosophy (*summa cum laude*) in 1967. Hermann completed his habilitation degree in 1974, working with Professor Erwin Schopper on "Two Nucleon Transfer Reactions." For this work he won a one-year fellowship that allowed him to study nuclear physics abroad in the United States. A theoretical collaborator on his thesis, Hobson Wildenthal, invited him to the Michigan State University Cyclotron Laboratory, where his one year of support led to three more as a visitor. Next, at Northwestern University, Hermann was a senior research associate stationed at the newly operating Los Alamos Meson Physics Facility.

At IU in the 1980s Hermann applied his skills in designing experimental apparatus and interpreting nuclear reaction models to the task of extracting new nuclear structure information from the high-precision measurements of reaction products now possible at IUCF. Initially he used IUCF's unique combination of high-precision, polarized beams at intermediate energies to measure the properties of high-spin excited states for nuclei in the vicinity of iron in the periodic table. Hermann was also looking for a way to measure absolute nuclear spectroscopic factors by making precision comparisons between reactions involving hadronic probes ($d, ^3\text{He}$ or proton pickup) and electromagnetic probes ($e, e'p$ or proton knockout).

Hermann maintained close ties with his European colleagues. He collaborated with them on experiments at IUCF and at NIKHEF, in Amsterdam, the Netherlands. In addition he spent several sabbatical leaves at the Institut für Kernphysik in Jülich, West Germany. When the IUCF Cooler came into operation, Hermann focused on studying those meson production processes that were now accessible with the new storage ring. He also helped organize a new series of international conferences on particle production near threshold that were held here and in Europe every other year.

In the final years of Cooler operations Hermann made important contributions to the development of a fundamental symmetry experiment at the storage ring to search for the charge-symmetry-violating reaction in which two deuterons fuse to form a helium nucleus and a neutral pi-meson. The existence of this reaction had been sought since the 1950s when the cyclotrons developed by Ernest Lawrence at Berkeley first had enough energy to produce the unstable pi-mesons in nuclear collisions. Since the probability of this reaction's occurrence was expected to be very small, Hermann helped in the design of a magnetic channel to gather and allow detection of the forward-going helium particles. The successful outcome of the search was a fitting end to the Cooler experimental program.

After nuclear physics research at the local IUCF accelerators ended, Hermann devoted part of his research effort to a long-term experiment at Los Alamos to search for the weak interaction between the neutron and the proton, a very small (part-per-billion) asymmetry in the gamma rays emitted from the neutron capture on a proton. Hermann was involved both in the development of a high-rate gamma ray detector (more than a ton of cesium iodide) and in the design of a large target of liquid hydrogen. Since the safety requirements when using large amounts of hydrogen are extremely stringent, Hermann made major contributions to the design, safety analysis, and documentation of the liquid hydrogen target and played an important role in a number of reviews by Los Alamos staff leading to its successful and safe operation. He was also involved in the design of the Low Energy Neutron Source (LENS) at IU. In developing this first university-based, cold neutron research facility in the United States, it was essential to know the mechanisms of neutron

production using a beryllium target. Hermann used his knowledge of nuclear reaction physics to construct a reaction model that could be used in crucial Monte Carlo simulations of the expected LENS neutron intensity. These intensities were later measured and found to be in agreement with Hermann's estimates.

Hermann's contributions to IU physics are expected to live well beyond his retirement. The liquid hydrogen target system he designed and analyzed will be used for several experiments at the Oak Ridge Spallation Neutron Source (SNS), and the IU LENS facility is a unique neutron source that will provide an educational opportunity for a number of students in the future.

As a member of the IU physics department, Hermann has taught most of the courses for our undergraduate majors. He taught the introductory course taken by premedical students on a number of occasions, but his greatest pleasures came from teaching courses at the junior level, including the modern physics course where students first encounter relativity and quantum mechanics, and a modern optics course where he developed a number of laboratory experiments.

Hermann's talents in organizing and documenting safety practices were also of great benefit when he developed the first modern safety manual for the department. He was also involved each year with outreach to the community through the annual Open House. Hermann contributed regularly to committees at the university level as well, including those charged with overseeing both the faculty and student review boards, sabbatical leaves, and professional staff promotions.

In the future, while Hermann will continue with his research activities at IUCF and SNS, he intends to spend more time with his extended family. Hermann and his wife, Judy, have just completed building a new home in Legendary Hills, Martinsville, where he will be able to devote more time to hobbies that include gardening and woodworking. We wish them well.

Andrew D. Bacher