

International Congress on Nuclear Sizes and Density Distributions

Held at Stanford University, December 17–19, 1957

IN this issue of the *Reviews of Modern Physics* are collected the principal papers delivered at an International Conference on Nuclear Sizes and Density Distributions held at Stanford University, Stanford, California, on December 17, 18, 19, 1957. It is believed that this was the first international conference on the subject of Nuclear Sizes. The Sponsors of the Conference were the National Science Foundation and Stanford University. Transportation grants were provided by the Office of Naval Research and the Office of Scientific Research of the Air Force. The last session of the Conference was held in association with the American Physical Society which met at Stanford on December 19, 20, 21, 1957.

The program of the Conference was drawn up by the following Steering Committee: H. A. Bethe, S. Fernbach, H. Feshbach, J. W. M. DuMond, A. O. Hanson, D. L. Hill, R. Hofstadter, J. E. Mack, L. J. Rainwater, D. S. Saxon, G. M. Temmer, C. H. Townes, and D. R. Yennie. A Local Committee, consisting of E. A. Edelsack, S. Gartenhaus, R. Hofstadter, F. V. L. Pindar, and L. I. Schiff, was of great help in arranging preliminary Conference matters. The technical management of Conference details was handled effectively by Mr. F. V. L. Pindar with the assistance of Miss L. Becker, Miss A. L. Berg, Mrs. M. E. Jensen, and Mrs. E. McWhinney. Dr. E. A. Edelsack, of the Office of Naval Research, and Dr. S. Gartenhaus, Stanford, were extremely helpful in facilitating the smooth running of the Conference. Drs. S. Drell, Stanford, L. I. Schiff, Stanford, and W. A. Nierenberg, University of California, assisted in many phases of the Conference planning.

A Conference banquet was held on Tuesday evening, December 17, 1957, and was preceded by a cocktail party. Principal speaker at the banquet was Professor E. U. Condon, Washington University, who set the style for the successful after-dinner speech. Professor Condon presented personal recollections of the early development of Quantum Mechanics, and it is a pity that his remarks were not recorded for readers of this journal. The humor and the gracious style of the talk will be long remembered. Other banquet speakers delivered short messages of greetings from various nations represented at the Conference.

On the second evening of the Conference, a reception, under the joint auspices of Mr. and Mrs. F. Bloch, Mr. and Mrs. M. Chodorow, Mr. and Mrs. R. Hofstadter, and Mr. and Mrs. L. I. Schiff, was held

at the home of the Hofstadters. Without doubt this cocktail party will be remembered for the high density, good spirits, and close packing of those attending the festivities.

Twenty-two physicists from 10 foreign nations were represented at the Conference, and 239 individuals signed the registration blanks. It is estimated that 300 or more physicists attended each of the various Conference sessions. Regular Conference sessions were held in the newly completed Physics Lecture Building, which was thus happily initiated as a conference site. The final session of the Conference was combined with a major session of the American Physical Society and required the use of the new large Dinkelspiel music auditorium. It is estimated that 700 or more people attended the final session.

The program of the Conference was as follows:

Tuesday morning, December 17: Welcome, by Provost F. E. Terman, Stanford University; *Chairman*, H. A. Bethe, Cornell University, "Sizes from Nuclear Methods"; S. Fernbach, University of California, "Nuclear Density Distributions from Low- and High-Energy Neutron Scattering"; A. E. Glassgold, University of California, "Nuclear Density Distributions from Proton Scattering Experiments"; J. O. Rasmussen, University of California, "Nuclear Radii from Alpha-Particle Scattering and Alpha-Radioactivity."

Tuesday afternoon, December 17: *Chairman*, L. I. Schiff, Stanford University, "Sizes from Electromagnetic and Other Methods"; D. G. Ravenhall, University of Illinois, "Charge Densities from Electron Scattering"; E. M. Henley, University of Washington, "Nuclear Radii from Mesonic Atoms"; O. Kofoed-Hansen, Danish Atomic Energy Commission, Copenhagen, Denmark, "Mirror-Nuclei Determinations of Nuclear Size"; J. E. Leiss, National Bureau of Standards, "Mass Density Determinations from Coherent Neutral Pion Production."

Wednesday morning, December 18: *Chairman*, I. I. Rabi, Columbia University, "Sizes of Nucleons"; M. L. Goldberger, Princeton University, "Theoretical Ideas of Nucleon Size"; L. L. Foldy, Case Institute of Technology, "The Neutron-Electron Interaction"; R. Hofstadter, Stanford University, "Proton and Neutron Size Determinations from Electron Scattering."

Wednesday afternoon, December 18: *Chairman*, C. H. Townes, Columbia University, "Angular Shapes and Other Methods of Studying Nuclear Density Distributions"; G. M. Temmer, Carnegie Institution of Wash-

ington, "Angular Shapes of Nuclei"; G. Breit, Yale University, "Theory of Isotope Shift"; P. Brix, University of Heidelberg, "Isotope Shift Studies of Nuclei"; R. L. Shacklett, Fresno State College, Fresno, California, "Investigations of the Effect of Nuclear Size on X-Ray Fine Structure"; V. Jaccarino, Bell Telephone Laboratories, "Magnetic Hyperfine Structure Anomalies."

Thursday morning, December 19: Chairman, E. Teller, University of California, "Nuclear Surfaces"; L. Wilets, Los Alamos Scientific Laboratory, "Review of Theories of Nuclear Surfaces"; E. Segrè, University of California, "Antiproton Cross Section Investigations"; R. L. Cool, Brookhaven National Laboratory, "Pion Investigations of Nuclear Surfaces."

Thursday afternoon, December 19: Chairman, K. K. Darrow, Secretary, American Physical Society, "General Nuclear Size Problems"; K. A. Brueckner, University of Pennsylvania, "Relation of Nuclear Size to Saturation and Nuclear Compressibility"; K. M. Watson, University of California, "Qualitative Aspects of Nuclear Saturation"; A. E. S. Green, Florida State University, "Nuclear Sizes and the Weizsäcker Semi-Empirical Formula"; H. A. Bethe, Cornell University, "Attempt at Correlation of Different Information on Nuclear Sizes."

Other short communications were made by K. K.

Seth, Duke University, L. I. Schiff, Stanford University, W. K. H. Panofsky, Stanford University, L. B. Okun, Moscow, D. Blokhintsev, Moscow, and L. R. B. Elton, London.

Many lively discussions followed the main papers, and an expert always seemed to be at hand when a particular problem arose. Although the experts were ever-present, many fundamental questions were left unanswered, and the reconciliation of the different methods of measuring nuclear sizes must await still further knowledge. Generous steps were made in the direction of consolidating our present knowledge of nuclear sizes, and these led to a timely and admirable review of the Conference proceedings by H. A. Bethe, Cornell University. New findings, experimental and theoretical, were presented on the structure of nucleons. Here again lively discussions followed a number of the papers.

Speaking for the Steering Committee, the undersigned is grateful to the editors of the *Reviews of Modern Physics* for providing a medium of publication for the Proceedings of the Conference. He also wishes to acknowledge sincere appreciation to the sponsors of the Conference for their generous support and encouragement, and particularly to J. H. McMillan of the National Science Foundation.

R. HOFSTADTER