

## **Chapter Nine**

### **Expanding Physics Program Charles Whitmer (1952-1959)**

#### **Rutgers University**

President Lewis Webster Jones devoted his seven years in office (1951-58) to strengthening the relationship between the University and the State, and to expanding the University to meet the increasing numbers of students seeking higher education. The most significant event during his period of service was the reorganization of the University's governing structure in 1956. After 190 years, the Board of Trustees finally recommended turning over control of the University to the State. The path to State control began in 1864 when the State Legislature named the Rutgers Scientific School as the land-grant college of New Jersey, or The New Jersey College for the Benefit of Agriculture and the Mechanic Arts. This designation was enhanced when the Legislature designated the Rutgers Scientific School as the State University of New Jersey in 1917. Then, in 1929, following a deterioration of relations between Rutgers and the State, the Legislature repealed the title of State University of New Jersey, which had been approved in 1917 for the Rutgers Scientific School. After an improvement in the relations with the State, some public officials were added to the Board of Trustees in 1945, and all of the units of Rutgers were designated as the State University of New Jersey. Then, in 1956, control of the University was transferred to the Board of Governors, which was created as the governing body of the University. The new Board of Governors consisted of eleven voting members, six appointed by the Governor of the State of New Jersey, and five elected by the Trustees. The Board of Trustees continued to function in an advisory capacity, to manage endowed funds, and to act as a "watchdog" over educational standards. At the time of this reorganization, the corporate title of Rutgers was changed

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from “The Trustees of Rutgers College in New Jersey” to “Rutgers, the State University.”<sup>1</sup>

While Jones was President there was a major building program at the University. The new buildings included Alexander Library, the River dormitories (named after past Presidents Frelinghuysen, Hardenbergh, and Campbell), and Waksman Hall, the first building on the Busch Campus. Programs and facilities were expanded in Newark and Camden. The College of Pharmacy, started in Newark in 1892, had become a part of Rutgers University in 1927. University College had begun enrolling students in Newark in 1934. The University of Newark, with its College of Arts and Sciences, School of Business Administration, and Law School merged with Rutgers in 1946. In 1950, the College of South Jersey in Camden became a part of Rutgers University. A nursing curriculum was introduced in 1952, which became the College of Nursing four years later. The Graduate School of Social Work and the Graduate School of Library Service were established in 1954. President Jones resigned, somewhat abruptly, in August 1958 to accept the presidency of the National Conference of Christians and Jews. He retired to Florida in 1965, where he died in 1975.<sup>2</sup>

Mason Welch Gross (1911-1977) became the sixteenth president of Rutgers in February 1959. Gross attended Cambridge University, where he earned his bachelor's and master's degrees in the classics. He then went to Harvard where he received the Ph.D. in philosophy in 1938. He taught for a time at Columbia, before enlisting in the Army Intelligence Corps where he rose to the rank of captain. He returned to Columbia for a year, before coming to Rutgers in 1946 as Assistant Professor of Philosophy and Assistant to the Dean of Arts and Sciences. The following year he was promoted to Assistant Dean and Associate Professor. In 1949 Gross was named to the new position of Provost, which became the Chief Academic Officer of the University. When President Clothier resigned in 1951, Gross had been the choice of many faculty members to succeed Clothier as President. The Trustees, however, selected Lewis Webster Jones as the next President. In 1958 Gross took on the additional title of

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<sup>1</sup>“Presidents,” *Journal of the Rutgers University Library*, v. 53, June 1991.

<sup>2</sup>Ibid.

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Vice-President, and he became Acting President with the resignation of President Jones.<sup>3</sup>

#### Physics and Astronomy

Following the strident end of Frank Dunnington's Chairmanship in 1952, Charles Whitmer took over as Chairman of the Physics Department. Whitmer was well liked by his faculty colleagues who welcomed his style of leadership. He brought the faculty into the decision making process in the Department, and he brought the faculty together socially at regular "open houses" in his home. At the time he assumed the position of leadership in the Department, it had developed a significant physics research program and was on its way to become one of the major physics departments in the country. There was an active research program in nuclear magnetic resonance, electronic paramagnetic resonance, and low temperature physics. The research was supported by the Office of Naval Research and RCA at the level of \$45,000 per year, and by the University at the level of \$25,000.<sup>4</sup>



Figure 30 Charles Whitmer

There continued to be changes in the faculty. In 1952 Nelson Alpert left the Department after four years, and Charles Reynolds left after

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<sup>3</sup>"Presidents," *Journal of the Rutgers University Library*, v. 53, June 1991.

<sup>4</sup>Physics Archives.

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three years. Alpert went to the White Development Corp., and then on to other industrial jobs. Reynolds went on to an academic career at the University of Connecticut. Alpert and Reynolds were replaced by Assistant Professors Herman Carr and Ernest Lynton, maintaining at 11 the number of faculty members at the rank of Assistant Professor or above (Dunnington, Torrey, Whitmer, Professors; Freeman, Greenlees, Serin, Weiss, Associate Professors; and Carr, Lynton, Porter, and Weidner, Assistant Professors). In 1952-53 a second instructor was hired (James Anderson, Ph.D., Syracuse), to join Jonathan Gittleman (Ph.D., Rutgers, 1952), who had also been an instructor in 1951-52.<sup>5</sup>

Herman Carr was born in Alliance, Ohio, in 1924. He received the B.S. (1948), M.S. (1949), and Ph.D. (1953) degrees from Harvard University. His thesis, under Edward Purcell, incorporated many ingenious refinements and extensions of free precession techniques in nuclear magnetic resonance. One of these techniques became widely known as the Carr-Purcell multi-echo sequence. Carr's 1952 thesis described other innovative experiments, including what is believed to be the first example of magnetic resonance imaging. At Rutgers he continued this work on nuclear magnetic resonance, developing some new techniques, such as Driven Equilibrium and Steady State Free Precession, while initiating fundamental studies of fluid xenon and its liquid-vapor coexistence region. These experimental techniques laid the important groundwork for the development of fast imaging, so important to present day magnetic resonance imaging.

Ernest Lynton was born in Berlin, Germany, in 1926. He received the B.S. (1947) and M.S. (1948) degrees from the Carnegie Institute of Technology, and the Ph.D. degree from Yale University (1951). His research was in the area of low temperature physics. After receiving his Ph.D. he spent a year (1951-52) at the University of Leiden as an Atomic Energy Commission Fellow. At Rutgers he continued his work in low temperature physics.

In 1953 the Instructors, James Anderson and Jonathan Gittleman, were replaced by Instructors Peter Lindenfeld and Robert Sells, who went on to become permanent members of the faculty.

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<sup>5</sup>*American Men and Women of Science*, 1967 and 1989 editions; *Rutgers College Catalogues*.

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Peter Lindenfeld was born in Vienna, Austria, in 1925. He received the Bachelor of Applied Science and Engineering (1946) and Masters of Applied Science and Engineering (1948) from the University of British Columbia, and the Ph.D. degree (1954) from Columbia University. The research for his Ph.D. degree was in the area of experimental elementary particle physics, but he turned to low temperature physics research when he came to Rutgers. Over a long and distinguished career at Rutgers Lindenfeld supervised a large number of graduate students and made significant contributions to the Department, University, and Physics Community at large. The low-temperature physics group at Rutgers, consisting of Serin, Lynton, Lindenfeld, and McLean, did some very significant work, and had an outstanding group of postdoctoral fellows and graduate students.

Robert Sells was born in Lancaster, Ohio, in 1925. He received the B.S. (1948) degree from the University of Michigan and the Ph.D. (1953) degree from Notre Dame. His area of research was theoretical atomic and nuclear physics, and solid-state physics. He made special contributions to the instructional program at Rutgers. However, because he did not have an active research program, he was denied membership in the Graduate Faculty. As a result he had to stop teaching the graduate course in mathematical physics that had become very popular with the students, causing resentment in the Department.<sup>6</sup>

In 1954 Bruce Alter joined the faculty as Instructor. Then, in 1956 David Porter retired after 33 years of service in the Department, and Alter left the Department after two years of service. They were replaced by Assistant Professor Elihu Abrahams and Instructor Allen Robbins.

Abrahams came to the Department with recommendations as one of the most promising young theoreticians in solid state physics in the country, made independently by three of the outstanding authorities in the field. He came to fulfill this promise with significant accomplishments in research. These accomplishments were recognized by his election to the National Academy of Sciences, joining Joel Lebowitz who holds a joint appointment with the Department of Mathematics. Elihu Abrahams was born in 1927. He received the A.B. (1947) and Ph.D. (1952) degrees from the University of California at Berkeley. After receiving his Ph.D. he

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<sup>6</sup>*American Men and Women of Science*, 1989 edition.

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spent a year at Berkeley and three years at the University of Illinois before coming to Rutgers.<sup>7</sup>

Robbins came to the Department with an interest in developing research in nuclear physics. The Department hoped to be able to start research in this field on a modest scale by taking advantage of the facilities of the high-energy accelerator being built at Princeton. The Department was interested in building a research program in nuclear physics, which together with solid state physics, made up the fields of greatest activity in physics research at the time. Allen Robbins was born in New Brunswick, New Jersey, in 1930. He received the B.Sc. (1952) degree from Rutgers and the M.Sc. (1953) and Ph.D. (1956) degrees from Yale University. His thesis research at Yale was experimental low-energy nuclear physics with Ernest Pollard.

Between 1956 and 1958, Phillip Alley, Stanley Charap, and Melvin Schwartz served briefly as Instructors. Alley and Charap received their Ph.D. degrees from Rutgers in 1958 and 1959, respectively, and Schwartz received his Ph.D. degree from Iowa in 1958. Although there is another well known Melvin Schwartz, the Melvin Schwartz who was at Rutgers, eventually became a member of the physics faculty at St. Johns University. Keichi Nishimura and Elihu Boldt were hired in 1957 and 1958, respectively, as assistant professors.

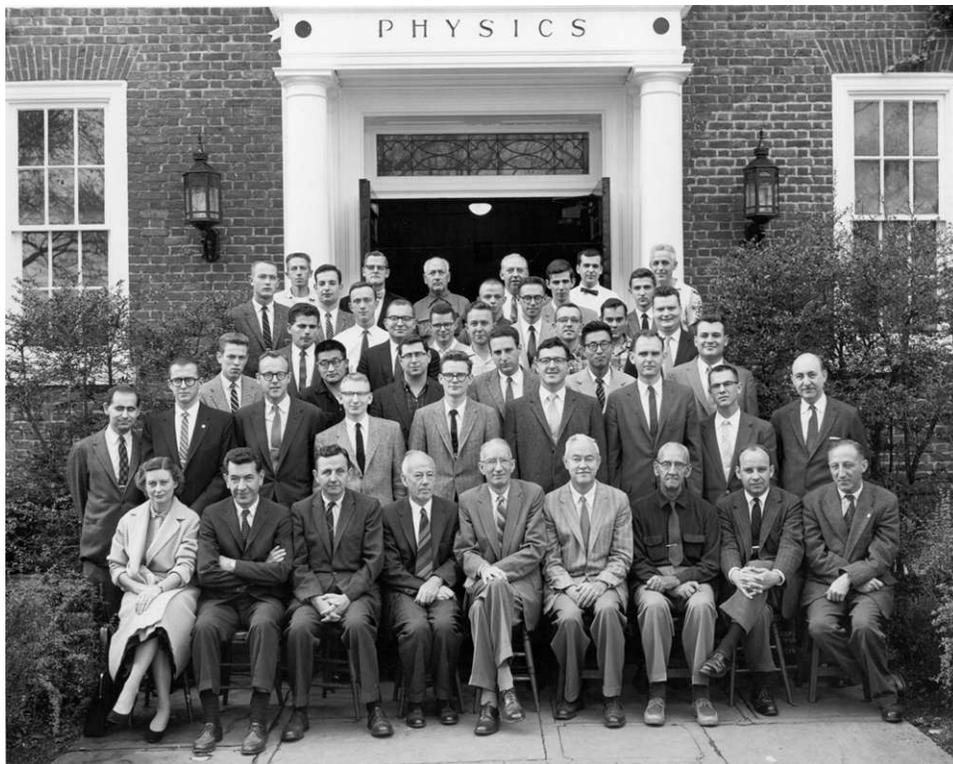
Nishimura, born in Japan, received his Ph.D. degree from the University California in 1957. His area of research was elementary particle theory. Boldt, born in New Brunswick, New Jersey, received the S.B. degree (1953) and Ph.D. degree (1958) from M.I.T. He was initially interested in cosmic ray experiments, worked with the group at the Princeton-Penn accelerator, and did research at Saclay.

For several years it had been noted that faculty salaries at Rutgers were very low compared with industry and even low compared with those at other universities. The Department expressed its concern that the low salaries would make it difficult to attract and retain good physics faculty members. This concern was addressed, to some extent, when the University increased faculty salaries in 1952.

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<sup>7</sup>Physics Archives.

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**Figure 31 Physics Department in 1958**

Bottom Row: H. Schneider, P. Weiss, H. Torrey, A. Greenlees, F. Dunnington,  
C. Whitmer, R. Campbell, R. Weidner, J. De Nobel.  
Second Row: P. Lindenfeld, W. Picciano, H. Carr, P. Teichman, E. Hunt,  
S. Charap, E. Abrahams, R. Sells, I. Freeman.  
Third Row: T. Moody, D. Kim, K. Schick, D. Silverman, K. Nishimura, R. Turoff.  
Fourth Row: H. Blech, R. Gayley, L. Teichman, W. Pennebaker, G. Schacker,  
A. Miller, P. Kissinger, W. Joiner, D. West.  
Fifth Row: R. Krisciokaitis, P. Kramer, G. Braun, C. Tsipis, R. Streever.  
Top Row: C. Latham, A. Hoornbeck, W. Wolff, E. Wilson, R. Webb, A. Siemons.

In 1954 the Department recognized the need to increase the size of the faculty. Six of the faculty members active in research had been on calendar-year appointments for at least eight years (Dunnington, Serin, Torrey, Weidner, Weiss, Whitmer). It was argued that there should be an additional faculty member over and above the minimum teaching needs, so that some of the research faculty members could be given a sabbatical

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leave of at least a semester for study at one of the other solid state physics research laboratories. Although a few faculty members did go on leave, it would be some time before there would be any significant increase in the size of the physics faculty. The 1950s were a low point for the University. Student enrollments dropped as the veterans graduated. The State was not at all generous in its appropriations to the University, and the University lost a crucial bond issue in 1948.<sup>8</sup>

The problem of salaries arose again in 1955 with a recognition that there was still a disparity between industrial and academic salaries. This disparity continued to present a challenge to maintain a competent research faculty in the Arts and Sciences Physics Department. It would be some time before there would be substantial improvement in faculty salaries. In 1956-57 new assistant professors were being offered \$5,500 to \$6,000. New Instructors were being offered substantially less.

In 1953 there was an interest in adding new courses in physics. The Department noted that it had not given any instruction in astronomy in the College of Arts and Science for several years, and that it should be reactivated. It would be several years more before a course in astronomy was again given at the College of Arts and Sciences, although a course in astronomy was being offered in the Mathematics Department at N.J.C. There was also interest in a course in nuclear physics for chemists and engineers. The University Committee on Radioisotopes proposed a service course for those using radioisotopes as a research tool. This course and its laboratory were supported by New Jersey industries and taught for several years as a joint venture of the Physics and Chemistry Departments by Peter Lindenfeld and Seymour Zenchelsky.

In addition to its teaching and research, the Department sponsored a number of professional activities. Bernard Serin organized the weekly colloquium, and James Anderson directed a journal club with research reports by graduate students. Lloyd Greenlees sponsored a Physics Club for undergraduate physics majors, and the faculty participated in a State Science Day. David Porter presented a closed-circuit television series of demonstration programs in physics for Highland Park and New Brunswick schools. Frank Dunnington served on the Governor's Advisory Committee on Radiation Protection, and was later a member of the Commission on

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<sup>8</sup>Physics Archives.

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Radiation Protection, and agency of the New Jersey State Department of Health.<sup>9</sup>

After 27 years as the New Jersey College for Women, the Rutgers Trustees changed the name of the College in April 1955 to Douglass College, in honor of the founder and first dean of the College. In 1954-55 the physics courses at Douglass College were taught by Wilfred Jackson, Associate Professor Agnes Townsend, Assistant Professor Harold Stolov, Lecturer Katherine Van Horn Peret, and Lab Technician Diane Moskowitz. In 1956 Peret left the Department after 16 years of interrupted service, and Moskowitz left the Department after three years. They were replaced by two teaching assistants from the Arts and Sciences Physics Department. In 1957-58 Stolov was on leave, and Assistant Professor Frank McGar, Lecturer Kazen Omidvar and Assistant Instructor Alison Smith joined the Douglass College Physics Department.

In 1956-57 the enrollment in the beginning physics courses at the College of Arts and Sciences was nearly 700. In that year the weekly grading of all homework in the introductory courses was replaced by weekly ten-minute quizzes in the recitation sections. This change was to persist for more than 40 years, although it was believed that the weekly checking of homework might be a more desirable pedagogical tool. In later years the Department would “spot check” homework assignments.

In 1957-58 an undergraduate course in solid state physics was added, a field of rapid development in general, and a special field of research within the Department. In that year, the Department also instituted a plan of rotation or alternation of instructors in the undergraduate courses. This was done in order to avoid assigning a single faculty member continually to elementary courses, and made each elementary course a cooperative effort between at least two faculty members.

In 1958-59, the last year of Whitmer's Chairmanship, there were 49 graduate students, 29 of them in residence and 20 who were part-time students from surrounding industrial laboratories. The graduate curriculum was reorganized so that basic courses, formerly taught in alternate years, were to be given annually. Graduate courses in nuclear physics were added for students beginning work in that field. A Summer Institute in Physics, sponsored by the National Science Foundation was initiated. The

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<sup>9</sup>Physics Archives.

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objective of the institute was to familiarize high school teachers with the new materials for modernizing and upgrading physics instruction that had been developed in a national study by the Physical Science Study Committee.

The solid-state physics research program continued to grow in size and reputation. Serin and Lynton continued to study the properties of superconductors, and Lindenfeld made measurements of specific heat at low temperatures. Torrey continued his experimental and theoretical work in nuclear magnetic resonance, and Carr developed a steady-state free precession nuclear magnetic resonance technique. Weidner studied the temperature dependence of the spin-lattice relaxation time in paramagnetic salts at liquid helium temperatures.

In addition to the research in solid-state physics, the Department initiated research in nuclear physics and high-energy. Robbins continued his measurements of the polarization of elastically scattered protons at the University of Birmingham, and Robbins and Dunnington began a nuclear physics research program using the Princeton cyclotron. Their work was supported by the Rutgers Nuclear Science Center and a contract from the Air Force. Boldt worked on high-energy physics experiments at Saclay in France. Nishimura made a theoretical determination of the spin and size of the  $\Lambda^0$ , and worked on the interpretation of the polarization of nucleons elastically scattered by nuclei. It was felt that these additions to the research program promised to provide the Department with a well-rounded program in the most active areas of current interest in physics research. It was becoming clear, however, that the expanding research program would require additional building space for the Physics Department, and urgent calls were made for new space.

As Charles Whitmer finished his period as Department Chairman in 1959, he outlined a department plan for the coming years. This plan included:

1. Strengthening the solid state physics program with the addition of Gerald Rothberg, who was doing postdoctoral work at Leiden, and with the return of Serin from a year at Illinois.
2. Strengthening the low energy nuclear physics program by obtaining an ion accelerator, which would make possible significant nuclear structure research and provide training

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facilities for graduate students. The Department was in the process of developing an accelerator proposal to be presented to the Rutgers administration. Robbins had joined the Department in 1956 and had begun a nuclear physics research program, first at the Princeton cyclotron, and then at the University of Birmingham. He and Peter Weiss worked on the development of this proposal, which eventually led to the acquisition of a Tandem Van de Graaff accelerator.

3. Development of the high-energy physics program, which was aimed at utilizing the Penn-Princeton accelerator upon its completion at the Forrestal Laboratory. Boldt, who joined the faculty in 1958, was involved with one of the group projects at Princeton.
4. Expansion of the laboratory facilities. In the preceding year a classroom and a chemical stockroom were converted to research laboratory space. An additional room was required for research in the coming year, leaving only three classrooms in Van Dyck Hall. With additional needs for instructional laboratories, it was clear that additional space was desperately needed at the earliest possible date, pending construction of an adequate building at the University Heights (Busch) Campus.

While Whitmer was Chairman, there was a strong sense of community in the Department. It was still a relatively small department and the faculty were fairly close. Whitmer had frequent open houses at his home in Highland Park, which gave members of the Department an opportunity to get together and enjoy each other's company. In 1959 Charles Whitmer stepped down after seven years as Chairman of the Physics Department. Whitmer stayed on for a year in the Department and then went to the National Science Foundation to head the Course Content Improvement Section.