

Anthony K. Hyder
Associate Vice President for Graduate Studies and Research
The Graduate School
University of Notre Dame

Academic Origins

Doctor of Philosophy, Physics, 1971, Air Force Institute of Technology
Dissertation: "An Experimental and Theoretical Investigation of the Odd-Parity Spectrum of the $C1^{34}$ Nucleus"
Master of Science, Physics, 1964, Air Force Institute of Technology
Thesis: "Resonances in the $S^{32, 33, 34} (p, \gamma) C1^{33, 34, 35}$ Reaction for Bombarding Energies in the One to Two MeV Range"
Bachelor of Science, Physics, 1962, University of Notre Dame

Appointments at Notre Dame

(1993-)

Associate Vice President for Graduate Studies and Research, Professor of Physics and Aerospace Engineering (concurrent), University of Notre Dame.

Serves the Vice President for Graduate Studies and Research in executing the Vice President's responsibilities, under the Provost, for the development and academic integrity of all postbaccalaureate work in the University, and for the overall administration of The Graduate School, its programs, courses of study, recruiting and admissions, fellowship, assistantship and stipend allocations, and other wide-ranging activities. In addition, serves the Vice President in exercising the Vice President's responsibilities related to the general supervision, administration, and development of research activities, including all sponsored programs conducted by the University and its faculty. Oversees University compliance with regulations regarding human and animal use in research, and the use of DNA, radiological material, and other hazardous materials in all research activities. Exercises responsibility for the allocation of more than \$1.8 million in University resources committed to cost-sharing of research activities, including the conduct of the Faculty Research Program and the Equipment Renewal and Restoration Program. Serves as a principal participant in the development of The Graduate School Strategic Plan. Performs other duties and exercises other authority as delegated by the Vice President, including serving in his place during the Vice President's sabbatical (January-August 1995).

(1991-1993)

Associate Vice President for Research, Professor of Aerospace Engineering, University of Notre Dame.

Responsible for the development and administration of the research activities of the University; for strategic planning and formulation of University policy related to research, industrial activities, and research compliance issues; for the evaluation of research quality and infrastructure; for decisions related to the commitment of University resources to research activities; and for representing the University on research and associated graduate-studies matters. Assisted the Vice President for Graduate Studies and Research by performing a variety of duties and exercising such authority as was delegated.

(1991-1995)

Research Fellow, Space Power Institute, Auburn University.

(Concurrent with the Notre Dame appointment)

During this period, completed several research-related activities underway at the time of accepting the appointment at Notre Dame, including editing a book on the nature of the space environment; advising graduate students; and investigating space applications of advanced batteries and fuel cells, radioisotope thermoelectric generators, and high-power microwave tubes. The Space Power Institute is the largest and most successful interdisciplinary research center at Auburn University and has been the primary source of support for almost 300 graduate students since its founding.

University Committees at Notre Dame

Committee on Research and Sponsored Programs (1991-)

President's Committee on Scholarship, Research, and Infrastructure (1993-1994)

Chair, Joint Indiana University School of Medicine-University of Notre Dame Committee on the Combined M.D.-Ph.D. Program (1992-1994)

Graduate Council, observer (1993-)

D.C. Strategic Planning Group (1995-)

Jesse H. Jones Program Review Panels (1991-1993)

Faculty Research Program Review Panels (1994-)

Various faculty recruiting activities (1991-)

Office of Information Technologies Strategic Planning Group (1996-)

Finance Committee, University Club (1993-)

Department of Energy-University of Notre Dame Radiation Laboratory Accelerator Readiness Review Team Chair (1994-1995)

Selected Accomplishments at Notre Dame

Served in the place of the Vice President for Graduate Studies and Research in exercising day-to-day oversight of the operation of The Graduate School during an eight-month period, January through August 1995, while the Vice President was on a sabbatical.

Chaired two joint-university committees which led to the establishment of a combined M.D.-Ph.D. program between the Indiana University School of Medicine and the University of Notre Dame. This is the nation's first such public-private program.

Initiated the Equipment Renewal and Restoration Program, which addresses equipment needs related to research and scholarship activities in all colleges.

Instituted the Faculty Research Program (to replace the Jesse H. Jones Fund which for a decade had supported the faculty grant-in-aid program), which has funded the scholarly works of faculty in all colleges of the University.

Organized and conducted five-week courses for faculty on grantsmanship.

Served as a principal architect of The Graduate School Strategic Plan.

Serves on the Office of Information Technologies Strategic Planning Group.

On behalf of the Provost, successfully resolved a number of sensitive personnel issues, issues related to allegations of academic misconduct, budget conflicts, and the definition of the University policy on Congressional earmarking.

Restructured the organization and funding of the Center for Bioengineering and Pollution Control to provide for more interdisciplinary activities across college lines.

Chaired a year-long Department-of-Energy-mandated accelerator readiness review leading to the commissioning of a major new electron accelerator facility on the campus.

Structured the funding for the animal care facility to allow for its autonomous operation, and served as a principal in the planning for expansion of the facility.

Led a successful effort to modernize and expand the services of the Office of Research of The Graduate School, including adding an intellectual property consultant to the staff.

Organized and conducted the first University Research Summit, involving senior industrial research executives exploring the potential for expanded University-industry partnerships.

Initiated discussions with the Development Office for a jointly funded position with The Graduate School focusing on industrial support of research and other scholarly activities.

Hosted scores of first-time visitors representing a spectrum of funding agencies from government and industry. These visits initiated interactions with faculty across the University.

Oversaw the transition of the Office of Research publication, *Notre Dame Research*, from paper copy to the World Wide Web, and moved from biweekly to daily updates on research opportunities and other information of value to the faculty.

Led the development and installation on the Web of the first University Policy and Procedures Handbook devoted to assisting the faculty in submitting proposals and administering awards for research and other scholarly activities.

Worked with all academic units of the University to actively promote hosting national and international conferences and seminars on campus. Initiated discussions for a joint Notre Dame/Oxford University Seminar Series on Science and Society.

Serves as the Acting Director of the joint Notre Dame-Argonne National Laboratory Environmental Research Institute.

Created through the Environmental Research Institute summer internships for Notre Dame undergraduates at the Argonne National Laboratory.

Taught each spring semester in the Department of Aerospace and Mechanical Engineering, and continued a modest, externally funded research program on the applications of micromechanical devices to the autonomous operation of spacecraft.

Participated in several undergraduate activities such as the Hall Lecture Series and the Iceberg Debates.

Selected National Activities

During the past year, served as an external reviewer for the National Academy of Sciences and National Research Council, the National Aeronautics and Space Administration, the American Institute of Aeronautics and Astronautics, and the Institute for Defense Analyses. In previous years, also served as a reviewer for the National Science Foundation, the Air Force Office of Scientific Research, the Army Research Office, the Office of Naval Research, and the Advanced Research Projects Agency.

Chaired the Science Panel of the Air Force Scientific Advisory Board. This panel reviews, for scientific quality, all basic research supported by the United States Air Force. In fiscal year 1994, Air Force support of basic research, principally at universities, exceeded a quarter of a billion dollars.

Awarded the Air Force Award for Exceptional Civilian Service by the Secretary of the Air Force. This is the highest award for service that can be presented to a civilian.

Auburn University is the land-grant institution for the State of Alabama. The University has an enrollment of 22,000 students, of whom more than 3,000 are in the Graduate School. Auburn is a Carnegie Research II university with expenditures for research currently exceeding \$80 million dollars. Prior to 1987, the Vice President for Research served also as the Dean of the Graduate School.

(1984-1991)

Associate Vice President for Research, tenured faculty appointments in Physics and Aerospace Engineering, Auburn University.

Responsible for developing the research capabilities of the university-at-large, for strategic planning and formulation of policy related to research, and for the administration of the university's research programs. Represented the university and the Vice President for Research on and off the campus on all research-related issues. In fiscal year 1990, awards for research grants and contracts reached \$27 million and expenditures for research exceeded \$64 million.

(1989-1991)

Auburn University Director, NASA Space-Grant College Program for Alabama.

Auburn is a member of a five-university consortium designated as a Space-Grant Consortium by the National Aeronautics and Space Administration. Each campus director is responsible for all space-grant activities on the respective campus, including administration of the space-grant fellowship program, curriculum development, research initiatives, and extension activities. The five campus directors constitute a board of directors responsible for the day-to-day activities of the consortium.

(1986-1990)

Founding Director, Center for Advanced Technologies, Auburn University.

The center was established as the primary umbrella organization on campus for interdisciplinary research through a \$10 million-dollar, four-year research contract, the largest in the university's history. The center established an international collaboration of 11 universities and supported research in space-rated materials, space-qualified microelectronics, and space-environment simulation. Prepared the proposal on the basis of which the center grant was renewed in 1991.

(1985)

Founding Director, Space Power Institute, Auburn University.

The Space Power Institute is an interdisciplinary research center formed with an initial four-year base funding in excess of \$8 million. Annual funding has averaged more than \$5 million per year. The institute has simultaneously involved more than 60 faculty and graduate students in the study of technologies related to high-power electrical systems for use on spacecraft. At the time the award was made, it was the largest single research contract in the history of the university.

(1982-1984)

Director of Contract and Grant Development, Office of the Vice President for Research and Dean of the Graduate School, and Associate Professor of Physics, Auburn University.

Responsible for the development of research in all schools and colleges of the university. Expenditures for research on campus grew from \$6 million in fiscal year 1981 to more than \$34 million in fiscal year 1985.

University Committees at Auburn University

- Graduate Research Committees, Colleges of Science and Engineering (1983-1991)
- University Committee on Salaries and Compensation (1986-91)
- University Grant-in-Aid Committee (1982-1991)
- University Distinguished Lecture Committee (1986-1990)
- External reader, Ph.D. dissertations, various universities
- Search Committees, Colleges of Science, Engineering, and Agriculture (1988-1990)
- Various internal committees of the Departments of Physics and Aerospace Engineering (1982-1991)
- Faculty search committees in 10 of the university's colleges

Selected Accomplishments at Auburn University

- Served on the research committees of five Ph.D. candidates.
- Taught one course each year in the Department of Physics (mechanics, modern physics, electricity and magnetism, optics, thermodynamics), or in the Department of Aerospace Engineering (the space environment). In recognition of teaching excellence, was selected by the Auburn University Circle of Omicron Delta Kappa, the national leadership honor society, as one of four faculty members inducted in 1986.
- Founding Director of the University Center for Advanced Technologies, which united 25 faculty members and graduate students from six academic departments of the university and faculties of 11 other universities in an interdisciplinary research program focused on the behavior of systems in the space environment. Auburn was the leader of this international consortium which also included York University and the University of Toronto in Canada and, in the United Kingdom, the Royal Holloway and Bedford New College of the University of London, Aston University, University of Kent, St. Andrews University, Oxford University, Strathclyde University, University College of Swansea, University of Newcastle, and the Scottish Research Center.
- Founding Director of the University Space Power Institute, which initially drew together more than 20 faculty and 40 graduate students in eight academic departments and 10 universities worldwide. Since 1984, the institute has received more than \$47 million in research awards and has supported the work of 300 students. More than 150 master's theses and 60 Ph.D. dissertations have been completed through institute support.
- Initiated and served as primary author of Auburn University's first long-range plan for research and graduate education. School, college, and department strategic plans were subsequently developed as extensions of the university plan. Auburn University research awards grew from \$5.8 million to more than \$25 million annually. Research expenditures grew from \$24 million to more than \$75 million annually.
- Selected as the State of Alabama nominee for the Congressional 1987 Department of Commerce Medal of Technology. (One of only 50 nominees nationwide)
- Served as the university representative to a five-university consortium which developed a successful proposal to the National Aeronautics and Space Administration to be designated a Space-Grant University Consortium.
- Served for five years (1986-1991) on the Board of Directors of the Southeastern Universities Research Association, which designed, is constructing, and will operate the Continuous Electron Beam Accelerator Facility (now the Thomas Jefferson National Accelerator Laboratory.) CEBAF is a \$600-million high-energy electron accelerator operating in Newport News, Virginia, for the Department of Energy.
- Authored the successful State of Alabama proposal to the Department of Energy EPSCoR (Experimental Program to Stimulate Competitive Research) program.
- Gained funding for extensive satellite links to support the Foreign Language Laboratory.

Appointments at Other Organizations and Institutions

(1981-1982)

Scientific Advisor to the Director for Research, Office of the Secretary of Defense (Research and Advanced Technology), Washington, D.C.

The Office of the Secretary of Defense (Research and Advanced Technology) developed policy and oversaw implementation of all basic research supported by the Department of Defense, a program which exceeded \$700 million in fiscal year 1982. This office also established policy for the \$1-billion Defense Industrial Research and Development Program.

Designed, in 1981, the Department of Defense University Research Instrumentation Program, which has provided more than \$150 million directly to universities for research equipment upgrades each year since 1982.

(1980-1982)

Physics Program Manager, Air Force Office of Scientific Research, Washington, D.C.

Established the national program of basic research supporting the advanced accelerator technology base, space-based power systems, plasma physics, and pulsed-power technologies. Established program goals in multidisciplinary research areas and exercised complete management authority for selecting and monitoring more than \$6 million in basic research at more than 30 research institutions, primarily universities.

Established and coordinated multimillion-dollar, multidisciplinary research program for the federal government involving 40 university faculty at 25 academic institutions to advance fundamental research in accelerator design and plasma physics.

(1975-1979)

Chief, Atmospheric Branch, United States Air Force Technical Applications Center, Cocoa Beach, Florida.

Managed a major scientific component of the U.S. Atomic Energy Detection System. Directly managed a worldwide network of sensors, collection equipment, analysis laboratories, and evaluation groups involving more than 100 scientific personnel. Supervised 13 scientists and managed an annual budget of \$5 million.

(1975-1979)

Adjunct Professor of Physics, Florida Institute of Technology; Adjunct Professor of Physics, Rollins College.

At the Florida Institute of Technology, taught graduate-level courses in physics and served on the thesis committee for three students. At Rollins College, taught undergraduate courses in mathematics and physics. Created three successful undergraduate science courses, based on the history of physics and the study of physics as a liberal art, which consistently attracted non-technical majors.

(1972-1975)

Associate Professor of Physics, United States Air Force Academy.

Promoted to the tenured faculty position in 1975. At that time, each academic department was limited to one tenured faculty member in addition to the department chair. Originated two advanced laboratory courses for physics majors and taught eight undergraduate physics courses: engineering physics, quantum mechanics (two semesters), electricity and magnetism (two semesters), third-year physics laboratory, classical mechanics, and modern physics.

Developed safe and accurate methods of detecting covert obesity in humans and monitoring fluid loss in burn patients.

Developed methods for the rapid, accurate assay of nanogram quantities of deuterium in support of the national laser fusion program.

Received the United States Air Force Research and Development Award for 1974. (No more than five awards are made annually.)

Selected twice to be a Summer Research Associate at the Los Alamos National Laboratory.

(1972-1975)

Director, Radiation Laboratory, United States Air Force Academy.

Created a series of nuclear-physics experiments suitable for undergraduates. Constructed a 500-keV Van de Graaff accelerator and devised a laboratory course for undergraduates based on proton scattering and proton capture. Constructed a Cf^{252} neutron activation facility for faculty research and undergraduate laboratory experiments.

(1972-1975)

Director of Research, Department of Physics, United States Air Force Academy.

Developed the research plan for a 35-member faculty, evaluated program goals and progress, assisted faculty members in securing research funding, coordinated research funding for faculty and student programs, and established the policies and procedures governing faculty research activities.

Outside funding tripled and faculty and student publications doubled during the subsequent two-year period.

(1964-1972)

Staff Scientist, Aerospace Research Laboratories, Dayton, Ohio.

Designed and performed experiments in proton-capture and nuclear-structure physics, and performed theoretical calculations based primarily on the nuclear shell model. Directed maintenance and scheduling for a two-MeV particle accelerator facility. Installed and was responsible for the acceptance testing of an eight-MeV ICT tandem accelerator. (*Historical note: This was the last machine Robert Van de Graaff designed before his death.*)

Published hallmark experimental and theoretical studies of the structure of medium-mass nuclei and the properties of nuclear isotopic-analog states in s-d shell nuclei.

Professional Activities

As the Director or Co-Director of the Conference

NATO Advisory Group on Aerospace Research and Development Symposium on Multispectral Sensing and Data Fusion, Lisbon, Portugal (1998)

NATO Advanced Studies Institute on High-Brightness Accelerators, Pitlochry, Scotland (1986)

NATO Advanced Studies Institute on the Behavior of Systems in the Space Environment, Pitlochry, Scotland (1991)

NATO Advanced Studies Institute on Defense Conversion Strategies, Pitlochry, Scotland (1995)

Proposed NATO Advanced Studies Institute on Multisensor Data Fusion (1999)

The NATO Advanced Studies Institutes Program of the NATO Science Committee is a unique and valuable forum under whose auspices one thousand international tutorial meetings have been held since the inception of the program in 1959. The ASI is an intense teaching activity at the postdoctoral level at which a carefully defined subject is presented in a systematic and coherently structured two-week program. The subject is treated in considerable depth by lecturers eminent in their field and of international standing. Classes are limited to 65 participants who either already have specialized in the field or possess an advanced general background. The director's responsibilities are broad: organize the overall activity, define the topic, determine the agenda, contact the lecturers, arrange for the meeting venue, secure adequate funding (typically \$200,000), and publish the results of the Institute in the ASI Science Series.

NATO Advisory Group on Aerospace Research and Development Symposium on Multisensor Systems and Data Fusion for Telecommunications, Remote Sensing, and Radar, Instituto de Defesa Nacional, Lisbon, Portugal (1997)

First Air Force Conference on Research Needs in Space Prime Power (1982)

Fifth Tamarron Conference on Foreign Switch Technology (1984)

Sixth Tamarron Conference on High-Current EML Switches (1986)

First Prospector Conference on Issues Pacing Space Technology (1990)

Army Research Office Conference on Mobile Power Systems (1990)

As a Member of the Technical Committee

NATO Advisory Group on Aerospace Research and Development 45th Anniversary Symposium on Future Aerospace Technology of Service to the Alliance, Ecole Polytechnique, Paris, France (1997)

NATO Advisory Group on Aerospace Research and Development Symposium on Remote Sensing, Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, Toulouse, France (1996)

American Institute of Aeronautics and Astronautics 34th Aerospace Sciences Meeting (1996)

International Topical Conference on Electron and Ion Beam Research and Development (Fifth, 1982; Seventh, 1987)

International IEEE Pulsed Power Conference (Third, 1981; Fourth, 1983; Fifth, 1985; Sixth, 1987; Seventh, 1989; Eighth, 1991; Ninth, 1993; Tenth, 1995)

Tenth International Conference on High-Power Particle Beams (1994)

Second Tamarron Conference on Diffuse Discharge Switches (1982)

Third Tamarron Conference on Spark Gap Switches (1983)

Seventh Tamarron Conference on EML Diagnostic Techniques (1987)

Eighth Tamarron Conference on High-Power Spacecraft Electrical Systems (1988)

NATO Advanced Studies Institute on Fast Electrical and Optical Diagnostics Techniques, Castlevecchio, Italy (1983)

NATO Advanced Studies Institute on Radiative Processes in Discharge Plasmas, Pitlochry, Scotland (1985)

The First International Conference on the Applications of Diamond Films and Related Materials, Auburn University (1991)

National and International Advisory Panels

North Atlantic Treaty Organization Advisory Group for Aerospace Research and Development (1994-1998)

The Advisory Group for Aerospace Research and Development (AGARD) is a NATO agency with headquarters in Paris, France. AGARD is a unique transatlantic forum which strives to bring research and development organizations in NATO to a common level of knowledge of the state-of-the-art and the trends in technologies relevant to aerospace systems. The eight panels of AGARD are composed of selected representatives of industry, government, and academia who work together to guide research and development programs on both sides of the Atlantic. Panel members include the vice presidents of Rockwell International, Thompson CSF, and British Aerospace; academics from Italy, Spain, Belgium, Greece, and Turkey; and major laboratory directors from Germany, Norway, Netherlands, and France.

National Research Council Committee on the Definition of a Research Program to Support UAV Technologies (1997-1998)

National Research Council Committee on the TOPAZ II International Program (1995-1996)

National Research Council Reviewer on the Space Station Project (1995)

The National Research Council, founded by Congress in 1916, has become the operating arm of the National Academies of Science and Engineering and the Institute of Medicine. The charters of these organizations dictate that they "shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art..."

Oak Ridge Associated Universities, Board of Directors (1994-)

Oak Ridge Associated Universities, Chair, CEO Search Committee (1996-1997)

Oak Ridge Associated Universities, Board Committee on Compensation (1996-)

Oak Ridge Associated Universities, Committee on Strategic Planning (1994- 1996)

Oak Ridge Associated Universities, Committee on Data Base Networks (1989-1991)

Oak Ridge Associated Universities Council of Sponsoring Institutions (1992-1994)

Oak Ridge Associated Universities Science and Technology Policy Committee (1992-1994)

ORAU, established in 1946, is a private, not-for-profit corporation and a consortium of 88 doctoral-granting universities. The member institutions of ORAU collectively awarded about 30 percent of all technical doctorates in the United States last year. ORAU's mission is to work with and for academia, the government, and the private sector to foster capabilities critical to the nation's well-being and economic security, particularly in science, technology, and graduate education. ORAU manages more than \$80 million in programs, including the NSF Graduate Research Fellowship Program. In the most recent fiscal year, ORAU managed 230 graduate and undergraduate fellowships and more than 800 postgraduates serving in 75 locations around the nation. Board members include the deans of graduate schools from North Carolina State, Tulane, and VPI; the executive officer of the National

Academy of Sciences; the provost of Southern Illinois; the president of the National Action Council for Minorities in Engineering; and eight senior faculty from member institutions.

Air Force Scientific Advisory Board, member (1990-1994)

Chair, Science Panel, Air Force Scientific Advisory Board (1993-1994)

Chair, Panel on Technology Investments to Improve National Space Launch Capabilities, Air Force Scientific Advisory Board (1993-1995)

Advisor, Committee on Space Power Technology, Air Force Scientific Advisory Board (1989-1990)

The Air Force Scientific Advisory Board, composed of 50 members, was established in 1944 by Professor Theodore von Karman of Caltech. Its purpose, then as now, is to provide independent scientific, engineering, and technical advice to the Secretary of the Air Force and the Chief of Staff of the Air Force. It serves this purpose by reviewing and evaluating the Air Force research plans, by reviewing and offering comments on promising scientific developments and discoveries, and by conducting special studies as requested by the Chief of Staff. Board members are selected on the basis of their preeminence in scientific fields of interest to the Air Force. Eight members of the SAB are current members of the National Academy of Science or Engineering.

Defense Intelligence Agency Scientific Advisory Board (1993-1997)

The Defense Intelligence Agency Scientific Advisory Board is composed of 24 members representing academia, industry, and government. The board provides the director independent scientific, engineering, and management advice on all aspects of the agency's functions, including the operation of the Joint Military Intelligence College, an accredited graduate school operated under the director. Two members of the SAB are current members of the National Academy of Science or Engineering. Board members include the home secretary of the National Academy of Engineering; several vice presidents from industry; an astronaut; a current chancellor (IU-PU, Ft. Wayne) and a former chancellor (University of Texas System); and a physician from academia (Illinois Medical School).

American Institute of Aeronautics and Astronautics (AIAA) Technology Management Committee (1997-)

The Air University Spacecast 2020 Advisory Board, Chairman (1993-1994)

The Air University Air Force 2025 Advisory Board, Chairman (1995-1996)

The Air University, the professional education arm of the United States Air Force, includes a broad range of schools, from introductory courses in management to technical doctorates awarded through the Air Force Institute of Technology. All Air Force ROTC programs are a part of the Air University. Each year more than 100,000 students are enrolled in the AU, whose annual operating budget exceeds \$150 million. The two studies mentioned above, requested by the Chief of Staff, attempt to define the alternative social, economic, and world political futures that the United States may face and make projections regarding the technologies that will be important in the next quarter century. The Advisory Boards consist of 15 members representing commerce, academia, and industry. Board members include the president of Lockheed Martin; vice president of AT&T; associate administrator of NASA; members of the social science and engineering faculties of North Carolina and MIT; and the senior research fellow of the LANL.

Institute for Defense Analysis, Air Force Laboratory Consolidation Advisory Group (1997)

Executive Committee, Power Systems Review Panel, Chair (1992-1994)

Technology Investment Strategy Planning Group (1995-1996)

National Technology Transfer Center, Office of Technology Applications, Technology Panel Chair (1989-)

Advisory Board on Space Environmental Effects, California Institute of Technology Jet Propulsion Laboratory (1990-1995)

Board of Directors, Southeastern Universities Research Association (1986-1991)
Board of Directors, Alabama Space-Grant Consortium (1989-1991)

Professional and Honor Societies

Air Force Institute of Technology Ph.D. Fellow
Institute of Electrical and Electronics Engineers, Senior Member
American Institute of Aeronautics and Astronautics, Senior Member
National Council of University Research Administrators
Council of Graduate Schools
Society of Research Administrators
American Physical Society (1962-1987)
American Association for the Advancement of Science
National Association of College and University Business Officers
Sigma Xi (Research Honor Society)
Tau Beta Pi (Engineering Honor Society)
Sigma Pi Sigma (Physics Honor Society)
Omicron Delta Kappa (Leadership Honor Society)

Consulting Activities

National Research Council, Academies of Science and Engineering, Washington, D.C.
California Institute of Technology Jet Propulsion Laboratory
Institute for Defense Analysis, Washington, D.C.
National Technology Transfer Center, Wheeling Jesuit College, W.V.

Major Research Grants

North Atlantic Treaty Organization, Scientific Affairs Division, principal director, “to organize and conduct an Advanced Studies Institute on high-brightness accelerators,” 1.9 million Belgian Francs, plus \$65 thousand from the Office of Naval Research and \$50 thousand from the Advanced Research Projects Agency (1985-1986)

Department of Defense, project director, “to establish the Auburn University Space Power Institute and to conduct interdisciplinary research related to the generation, transport, conditioning, and storage of electrical power aboard a spacecraft,” \$5.7 million (1985-1990)

Department of Defense, project director, “to conduct a broad-based, interdisciplinary, and interinstitutional research program on space-rated materials, space-qualified microelectronics, and space-environment simulation,” \$9.9 million (1986-1991)

NASA Center for the Commercial Development of Space, principal author, “to establish a Center for the Commercial Development of Space Power which will identify technologies critical to the economic deployment of power systems and advance the state-of-the-art of those technologies,” \$5 million (1988-1992). Renewed 1992-1997.

NASA Space-Grant College, co-principal director, “to establish in the State of Alabama a consortium of universities collectively identified as space-grant institutions with the objective of promoting the contributions of the arts, humanities, science, and engineering disciplines to the national space agenda,” \$1.6 million (1989-1994)

North Atlantic Treaty Organization, Scientific Affairs Division, principal director, “to organize and conduct an Advanced Studies Institute on the behavior of systems in the space environment,” 800 thousand Belgian Francs, plus \$100 thousand (1990)

Department of Energy EPSCoR planning grant, principal director, “to develop a strong statewide academic and research infrastructure that will enhance and support the Department of Energy mission, primarily by improving the number of qualified, skilled students who enter and complete graduate programs in areas of critical need to energy-related research and improving the capability of the Alabama institutions to support the DoE goal of supplying the nation with the energy resources, technologies, and information needed for economic progress and national security,” \$20 thousand (1991)

Department of Energy EPSCoR Graduate Fellowship Grant, principal director, “to establish graduate student fellowship grants designed to support and enhance graduate education in energy-related areas within the State of Alabama,” \$250 thousand (1991)

NASA research grant, principal investigator, “to conduct research on the application of micromechanical technologies to the autonomous operation of spacecraft,” \$30 thousand (1993)

North Atlantic Treaty Organization, Scientific Affairs Division, principal director, “to organize and conduct an Advanced Studies Institute on Defense Conversion Strategies with special emphasis on states of the former Soviet Union,” 2.1 million Belgian Francs, plus additional support from the Office of Naval Research, \$50 thousand; European Office of Aerospace Research and Development, \$10 thousand; the British Ministry of Trade and Industry, £6.3 thousand; Army Research Office, \$10 thousand; ICI Environmental, Inc., \$10 thousand; and the National Technology Transfer Center, \$60 thousand (1995-1996)

Argonne National Laboratory, principal director, “to implement promising strategies of defense conversion and assess the validity of the conversion activity within the framework of environmental issues,” \$15 thousand (1995)

Publications

Papers in Refereed Journals

- “Novel Techniques for the Thermal Management of Space-Based, High-Power Microwave Tubes,” co-authors M.F. Rose, R. F. Askew, L. Chow, A. S. Gilmour, and A. Faghri, *IEEE Transactions on Electron Devices*, Vol. 38, No. 10, October 1991.
- “Repetitive Phenomena in Dielectrics,” co-authors M. Trevenor and J. Laghari, *IEEE Transactions on Electrical Insulation, EI-22*, No. 4, 517 (1987).
- “Prime Power for High-Energy Military Space Systems,” co-author P. J. Turchi, *Aeronautics and Astronautics*, September 1982.
- “Simplified Body-Composition Analysis Using Deuterium Dilution and Deuteron Photodisintegration,” co-author M. J. Stansell, *Aviation, Space, and Environmental Medicine*, 47, 839 (1976).
- “Nondestructive Fuel Assay of Laser Targets II. Photonuclear D (g, n) Method,” co-authors J. T. Caldwell, H. F. Atwater, E. H. Farnum and R. J. Fries, *Nuclear Instruments and Methods*, 126, 293 (1975).
- “A High-Precision Neutron Time-of-Flight Facility,” co-authors D. W. Glasgow et al., *Nuclear Instruments and Methods*, 114, 541 (1974).
- “Properties of Levels in $C1^{34}$,” co-author G. I. Harris, *Physical Review C*, 4, 2046 (1971).
- “Properties of P^{30} Levels from the Reaction $Si^{29}(p, \gamma)P^{30}$: II,” co-authors G. I. Harris and J. Walinga, *Physical Review*, 187, 1413 (1969).
- “Reaction $S^{36}(p, \gamma)C1^{37}$ and Properties of $C1^{37}$,” co-authors G. I. Harris, J. Perrizo and F. Kendzioriski, *Physical Review*, 169, 899 (1968).
- “Properties of P^{30} Levels from the $Si^{29}(p, \gamma)P^{30}$ Reaction: I,” co-author G. I. Harris, *Physical Review*, 157, 958 (1967).
- “Isobaric Analog States with the $1f_{7/2}$ Configuration in $C1^{37}$,” co-author G. I. Harris, *Physics Letters*, 24B, 273 (1967).
- “A Second O^+ , $T+1$ Level in P^{30} ,” co-author G. I. Harris, *Physics Letters*, 25B, 210 (1967).
- “The Study of Nuclear Excited States by Means of the (p, γ) Reaction,” *OAR Research Review*, 6, No. 4, p. 4, August 1966.
- “The 1505-keV Resonance in $Si^{29}(p, \gamma)P^{30}$ and Properties of P^{30} Levels,” co-author G.I. Harris, *Physics Letters*, 22, 159 (1966).

Papers Appearing in Proceedings

- “Innovations and Pitfalls in International Technology Transfer,” co-authors J. Angelo, R. Post, and M. Wacks, *SPECTRUM '92*, Boise, Idaho, 1992.
- “Space Power Education,” co-authors L. Gordon and F. Rose, *Proceedings of the Seventh International IEEE Pulsed Power Conference*, Monterey, California, 1989.
- “Report on the International Conference on Plasma Science and Technology, Beijing, China,” co-author M. Kristiansen, *Office of Naval Research Far East Scientific Bulletin*, 12, No. 1, January 1987.
- “Report on the Sixth International Conference on High-Power Particle Beams, Beams '86,” co-author M. Kristiansen, *Office of Naval Research Far East Scientific Bulletin*, 12, No. 1, January 1987.
- “Research Issues in Power Conditioning,” co-authors M. Gundersen et al., *Proceedings of the 1986 (Seventeenth) Power Modulator Symposium*, Hyatt Seattle, Seattle, Washington, June 1986.
- “Pulsed Power Education,” co-authors M. Kristiansen et al., *Proceedings of the Fourth International IEEE Pulsed Power Conference*, Albuquerque, New Mexico, 1983.

- “Modular Instructional Material in Pulsed-Power Technology,” co-authors M. Kristiansen et al., *Proceedings of the Third IEEE International Pulsed Power Conference*, Albuquerque, New Mexico, June 1981.
- “Deuterium Assay Using Deuteron Photodisintegration,” co-authors A. Toich and K. Smith, *Journal of the Colorado-Wyoming Academy of Science*, 7, No. 6 (1975).
- “The USAF Academy Van de Graaff Accelerator Facility,” co-authors D. Blessinger and V. Webb, *Journal of the Colorado-Wyoming Academy of Science*, 7, No. 6 (1975).
- “A Compton Scattering Student Laboratory Using Coincidence Techniques,” co-authors D. Clements, J. Racher and B. Webb, *Journal of the Colorado-Wyoming Academy of Science*, 7, No. 6 (1975).
- “A 4- π Neutron Detector for Deuterium Assay Studies,” co-authors J. G. Baker and C. R. Fraime, *Journal of the Colorado-Wyoming Academy of Science*, 7, No. 5 (1974).
- “Gamma- and X-Ray Studies in Ho^{164} ,” co-authors M. Hallada, K. Smith, J. Clifford, and J. Head, *Journal of the Colorado-Wyoming Academy of Science*, 7, No. 5 (1974).
- “The Beta-Decay End-Point Energies of Ho^{164} ,” co-authors J. Debes, R. Echard and H. Clifford, *Journal of the Colorado-Wyoming Academy of Science*, 7, No. 5 (1974).
- “Shell-Model Calculations in Mass 34 Nuclei,” co-authors S. Maripuu and G. I. Harris, *Bulletin of the American Physical Society*, 17, 91 (1972).
- “The $\text{S}^{33}(\text{p}, \gamma)\text{C}1^{34}$ Reaction and Properties of Levels in $\text{C}1^{34}$,” co-author G. I. Harris, *Bulletin of the American Physical Society*, 16, 59 (1971).
- “Shell-Model Calculations of Odd-Parity Levels in Mass 33 and 34 Nuclei,” co-author G. I. Harris, *Bulletin of the American Physical Society*, 16, 59 (1971).
- “Elastic and Inelastic Scattering of 8.0-MeV Neutrons from Calcium,” co-authors J. C. Manthuruthil, J. D. Brandenberger, and K. C. Chung, *Third Conference on Neutron Cross Sections and Technology*, March 1971.
- “Odd-Parity Levels in $\text{S}^{34}/\text{C}1^{34}$ for the Shell Model,” co-authors S. Maripuu and G. I. Harris, *Bulletin of the American Physical Society*, 16, 1166 (1971).
- “Levels in $\text{C}1^{37}$ from the $\text{S}^{36}(\text{p}, \gamma)\text{C}1^{37}$ Reaction,” co-authors G. I. Harris and F. R. Kendziorski, *Bulletin of the American Physical Society*, 12, 92 (1968).
- “Properties of P^{30} Levels,” co-authors G. I. Harris and J. Walinga, *Bulletin of the American Physical Society*, 13, 1372 (1968).
- “Energy Levels of P^{30} ,” co-author G. I. Harris, *Bulletin of the American Physical Society*, 12, 73 (1967).
- “Properties of P^{30} Levels Determined by Angular Correlation Measurements in the $\text{Si}^{29}(\text{p}, \gamma)\text{P}^{30}$ Reaction,” co-authors L. W. Seagondollar and G. I. Harris, *Bulletin of the American Physical Society*, 11, 65 (1966).
- “Gamma-ray Measurements at Resonances in the $\text{S}^{36}(\text{p}, \gamma)\text{C}1^{37}$ Reaction,” co-authors F. R. Kendziorski, G. I. Harris, and J. J. Perrizo, *Bulletin of the American Physical Society*, 11, 80 (1966).
- “A Novel Method for Accumulating Background-Free, Gamma-Ray Spectra,” co-authors D. V. Brietenbecher and D. D. Watson, *Bulletin of the American Physical Society*, 11, 605 (1966).
- “Resonances in the $\text{S}^{36}(\text{p}, \gamma)\text{C}1^{37}$ Reaction for Proton Energies in the 800-1800 keV Range,” co-authors J. J. Perrizo, G. I. Harris and F. R. Kendziorski, *Bulletin of the American Physical Society*, 11, 604 (1966).
- “Resonances in the $\text{S}^{32, 33, 34}(\text{p}, \gamma)\text{C}1^{33, 34, 35}$ Reactions,” co-authors W. A. Anderson and G. I. Harris, *Bulletin of the American Physical Society*, 9, 440 (1964).

Representative Technical Reports

- “Technology Challenges to Improve National Space Launch Capabilities,” principal author, Air Force Scientific Advisory Board Ad Hoc Panel Study, Washington, 1995.
- “Information Systems Architectures,” co-author, Air Force Scientific Advisory Board Summer Study, Newport Beach, California, 1993.
- “Proceedings Workshop on Applications of Microelectromechanical Devices,” with C. Johnson et al., Auburn University Space Power Institute Special Report, Park City, Utah, 1993.
- “Advanced Technology Options for Delay and Denial,” co-author, Air Force Scientific Advisory Board Ad Hoc Panel Study, Washington, 1992.
- “Proceedings of Prospector III: Radioisotope Thermoelectric Generator Power Application Workshop,” with M. F. Rose et al., Auburn University Space Power Institute Special Report, Park City, Utah, 1992.
- “Proceedings of Prospector II: High-Energy-Density Power Sources,” co-author with M. R. Rose et al., Auburn University Space Power Institute Special Report, Auburn, Alabama, 1992.
- “Technology Investment Options to Support the Strategy of Global Reach-Global Power,” co-author, Air Force Scientific Advisory Board Summer Study, San Diego, 1992.
- “Air Force Space Power Technology Options,” co-author, Air Force Scientific Advisory Board Ad Hoc Panel Study, Washington, 1991.
- “Proceedings of Prospector I: Key Issues in Space Technology. Thermal Management of Space-Based High Power RF Sources,” with M. F. Rose, Space Power Institute Special Report, Auburn University, 1990.
- “Proceedings of the Workshop on Mobile Power Sources,” co-author with M. F. Rose, Auburn University Space Power Institute Special Report, Duke University, 1990.
- “Thermal Management of Space-Based, High-Power Microwave Tubes,” co-authors M. F. Rose et al., U. S. Air Force Rome Air Development Center, Rome, New York, 1989.
- Publications related to the U.S. Atomic Energy Detection System of the U. S. Air Force Technical Applications Center during the period 1975-1980 were classified and thus not available in the open literature.
- “Experimental Studies Utilizing Radioactive Nuclides and Neutron Activation Experiments,” co-author V. H. Webb, Frank J. Seiler Research Laboratory Technical Memorandum 76-1, U. S. Air Force Academy, March 1975.
- “Nondestructive Fuel Assay of Laser Targets II. Photonuclear D (γ , n) Method,” co-authors J. T. Caldwell, H. F. Atwater, E. H. Farnum and R. J. Fries, Los Alamos Scientific Laboratory Report LA-UR-74-1496 (1974).
- “Percent Body Water Measurement Using *In Vivo* D₂O Dilution and Deuteron Photo-disintegration,” co-authors M. J. Stansell and J. T. Caldwell, Frank J. Seiler Research Laboratory Technical Report 74-0019, U. S. Air Force Academy, August 1974.
- “A Primer in Strategic Command and Control Communications,” co-authors J. B. Tindall, C. M. Glass, N. G. Gionis, J. H. Head, and R. W. Kopka, U. S. Air Force Academy Research Report 73-5, June 1973.
- “Computer Programs for the Analysis of High-Resolution Gamma-ray Spectra,” co-authors H. Willmes and D. D. Watson, Aerospace Research Laboratories Technical Report 70-152, August 1970.
- “Computer Programs for the Analysis of Angular Correlation Measurements,” co-author D. D. Watson, Aerospace Research Laboratories Technical Report 67-168, August 1967.

Invited Papers at Conferences

- “The Development of Future Space Policy,” Keynote Address, NSIA Symposium of Space, Washington, 1994.
- “The Needs of U. S. Industry to Effectively Compete in High-Technology Markets,” testimony delivered to the Subcommittee on Energy and Technology and Competitiveness of the

Committee on Science, Space, and Technology, United States House of Representatives, August 28, 1992.

- “The Space Environment and Its Interaction with Spacecraft Power Systems,” *Proceedings of the United Kingdom Pulsed Power Association*, AEA Culham Laboratories, Oxfordshire, 1990.
- “Advanced Accelerator Concepts”(invited review paper), co-author Denis Keefe, *Proceedings of the XI All-Union Conference on Particle Accelerators*, Dubna, USSR, October 1988.
- “Research Profile: Prime Power for High-Energy Space Systems,” co-authors P. Turchi and H. Pugh, *Proceedings of the Fourth International IEEE Pulsed Power Conference*, Albuquerque, New Mexico, 1983.
- “The Development of the Whole Scientist in the National Defense Environment,” *Proceedings of the VIII SPAR Conference*, Albuquerque, New Mexico, 1983.
- “Electrical Systems in the Space Environment,” Kyoto University, Kyoto, Japan, 1983.
- “High Voltage Systems in the Space Environment,” Institute of High Voltage of the Chinese Academy of Science, Beijing, 1983.
- “Defense Requirements for Diffuse Discharge Opening Switches,” co-author M. Rose, *Proceedings of the Second Tamarron Conference on Opening Switches*, Texas Tech University Press, Lubbock, Texas, January 1982.
- “Power for Space Applications,” 1982 IEEE High Voltage Workshop, Anaheim, California, February 1982.
- “Energy Conversion Challenges for Space Power,” co-authors L. Caveny and S. Wax, *Proceedings of the 1983 IEEE International Conference on Space Science*, Ottawa, Canada, May 1982.

Book Chapters

- “The Applications Matrix,” co-authors M. Rose and M. Kristiansen, in *Fast Optical and Electrical Diagnostics Principles and Techniques*, Nijhoff Press, Dordrecht (Netherlands), 1986.

Books and Proceedings

- Spacecraft Power Systems*, co-author D. Flood, R. Wiley, Imperial College Press, London, in preparation. To be published in 1998.
- Defense Conversion Strategies* (NATO Advanced Studies Institute Science Series), co-editors R. Dundervill, P. Gerity, and L. Luessen, Kluwer Academic Publishers, Dordrecht, 1996.
- The Behavior of Systems in the Space Environment* (NATO Advanced Studies Institute Science Series), co-editors R. DeWitt and D. Duston, Kluwer Academic Publishers, Dordrecht, 1993.
- High-Brightness Accelerators* (NATO Advanced Studies Institute Science Series), co-editors A. Guenther and M. Rose, Plenum Press, New York, 1988.
- Proceedings of the Sixth Tamarron Conference on EML Opening Switches*, co-editors E. Clothiaux and M. Kristiansen, Space Power Institute, Auburn University, 1986.
- Fast Optical and Electrical Diagnostics Principles and Techniques* (NATO Advanced Studies Institute Science Series), principal editors J. Thompson and L. Luessen, Nijhoff Press, Dordrecht (Netherlands), 1986.
- Proceedings of the Fifth Tamarron Conference on Foreign Switch Technology*, co-editor M. Kristiansen, Texas Tech University Press, Lubbock, Texas, March 1984.

Personal

Married, four children

Birthdate: April 10, 1940

Hobbies: clock restoration, reading world history, and travel

Business Address

The Graduate School
312 Main Building
Notre Dame, Indiana 46556
(219) 631-8591
(219) 631-6630 facsimile
e-mail: hyder.2@nd.edu

Residence

51963 S. Shoreham Ct.
South Bend, Indiana 46637
(219) 271-1804