

Richard John Jacob
Professor Emeritus of Physics
Department of Physics and Astronomy
Arizona State University

CURRICULUM VITAE

Ph.D. in Physics, University of Utah, 1963 (Dissertation: "The Decay of Bound Muons in Elements of Intermediate Z")

Employment and Professional Experience

- September 1978 - May 2001: Professor of Physics, Arizona State University.
- July 1985 - June 1990: Chairman, Department of Physics, Arizona State University.
- September 1979 - June 1985: Associate Chairman, Department of Physics, Arizona State University.
- September 1978 - August 1979: Visiting Research Professor, University of Kaiserslautern, Kaiserslautern, West Germany.
- September 1969 - August 1978: Associate Professor of Physics, Arizona State University.
- January 1973: Visiting Research Professor, University of Kaiserslautern.
- Summers 1972, 1969, 1966: Associated Western Universities Faculty Summer Participant, Los Alamos Scientific Laboratory.
- July 1967 - June 1972: Member of Board of Education and Lecturer in Medical Physics, Good Samaritan Hospital, Phoenix, Arizona.
- September 1970 - July 1971: Guest Professor, Institute for Theoretical Nuclear Physics, University of Karlsruhe, Karlsruhe, West Germany.
- September 1963 - September 1969: Consultant, Motorola Semiconductor Products Division, Phoenix, Arizona.
- Summer 1965 - 1973: Visiting Staff Member, Los Alamos Scientific Laboratory, Los Alamos, New Mexico.
- September 1963 - September 1969: Assistant Professor of Physics, Arizona State University.
- September 1961 - June 1963: NSF Cooperative Fellow, University of Utah.
- September 1958 - June 1961: Teaching Assistant, University of Utah.

Awards and Grants

- Department Outstanding Teacher Award, 1998-99.
- National Science Foundation Pre-College Teacher Development in Science Program Grant: 1977 (\\$49,258).
- Arizona State University Faculty Research Grant: 1980 (\\$2400), 1976 (\\$2400), 1973 (\\$1800), 1971 (\\$1800), 1967 (\\$1500), 1964 (\\$1500).
- Associated Western Universities: 1972, 1969, 1966 (summer stipends).
- Research Corporation: 1964 (\\$2,650).
- National Science Foundation Cooperative Fellowship: 1961-62, 1962-63.
- Ford Foundation Scholarship: 1954-58.

Administrative Experience

- Founding Dean of The Emeritus College, Arizona State University (11/2004 - 7/2007) (*pro bono*)
- Chairman, Emeritus College Steering Committee (11/2003 - 11/2004)
- Chairman, Department of Physics, Arizona State University (7/1985-6/1990)
- Deputy Chairman, Technical Committee of the Arizona SSC Task Force (1985 - 1989).
- Chairman, University Club Steering Committee (1985 - 1988).
- Associate Chairman, Department of Physics, Arizona State University (1979 - 1985).
- President, Faculty Association at ASU (January 1982 - June 1983).
- Director, Honors Program, College of Liberal Arts, Arizona State University (1976 - 1978).
- Supervisor, Portal School Program in Energy (1975 - 1978).

Courses Taught (* indicates courses originated by RJJ.)

Graduate Courses

- Electrodynamics
- Quantum Theory
- Relativistic Quantum Fields

- Elementary Particle Physics
- Methods of Mathematical Physics*
- Differential Geometry for Physicists*

Undergraduate Physics Major Courses

- Quantum Mechanics
- Nuclear and Elementary Particle Physics
- Modern Physics
- Mathematical Methods in Physics*
- Applied Relativity*
- Thermal Physics
- University Physics I, II (calculus based)

Undergraduate Non-major Courses

- Einstein's Legacy* (Honors College course)
- The Concepts and Social Impact of Modern Physics* (Honors course)
- The Energy Crisis*
- 20th Century Astronomy

Public Courses

- Modern Cosmology (Tempe Connections)
- Einstein's Legacy (OSHER Lifelong Learning)

University Committees and Service (since 1979)

- University Club Board of Directors (1988-1991; 2001-2004)
- Academic Senate Personnel Committee (1999-2000)
- ASU Ombudsperson (1998-2001)
- Performance Assessment and Salary Adjustment Committee (1986 - 1988)
- University Club Steering Committee (1985-1988)
- Physical Science Building Design Committee (1985 - 1990)
- University Grievance Committee (1984 - 1986)

- Faculty Merit Pay Committee (1983 - 1984)
- University Research Council (1980 - 1981)

College of Liberal Arts and Sciences Committees (since 1979)

- Dean's Administrative Council (1985 - 1990)
- Dean's Advisory Council (1984 - 1985)
- Committee on Committees (1982 - 1985)
- Standards Committee (1978 - 1981, 1999 - 2001)

Department of Physics and Astronomy Committees (since 1979)

As a faculty member, Associate Chairman and Chairman, I have served on all major department committees. I also chaired the Department Bylaws Committee (1995 - 1998) and the Department Decennial Review Committee (1996-1997). I have served several terms as Department Senator on College and Academic Senates.

Professional Service

- Resource Letters Review Committee (AAPT/AJP) (2004)
- Associate Editor, American Journal of Physics (2000 - 2003)
- Graduate Education Area Committee (American Association of Physics Teachers): Chair (1990-1996, 2004 - present)
- Gemant Award Committee (APS) (1999 - 2002)
- NRC Committee on the Doctoral and Postdoctoral Study in the Mathematical Sciences (9/1990-12/1991)
- Introductory University Physics Project (IUPP) (APS/AAPT/AIP sponsored): Steering Committee (1989-1996)

Professional Affiliations

- American Physical Society
- American Association of Physics Teachers
- American Association for the Advancement of Science
- Sigma Xi

Graduate Students - Thesis and Dissertation Directed

- David C. Moir (1975). Dissertation: “Low Energy Pion-Nucleon Phenomenology with Interior Dispersion Relations.”
- Robert McClaskey (1978). Dissertation: “Interior and Hyperbolic Dispersion Relation Studies of Pion Photoproduction.”
- Johannes Bauer (1992). Thesis: “Pion Photoproduction Amplitudes at Threshold Obtained with Hyperbolic Dispersion Relations.”

Refereed Publications

1. "High-Energy Photoproduction Branching Ratios in the Regge-Pole Model," A. Ahmadzadeh and RJJ, Physical Review 160, 1359-1362 (1967).
2. "Possible Classification of Exchange Degenerate Trajectories," A. Ahmadzadeh and RJJ, Physical Review 176, 1719-1723 (1968).
3. "Exchange Degenerate Conspirators in π^+ Photoproduction," A. Ahmadzadeh, RJJ and B.P. Nigam, Physical Review 178, 2284-2287 (1969).
4. "Boundary Dispersion Relations," G.E. Hite and RJJ, Physical Review D5, 422-427 (1972).
5. "Extension of Boundary Dispersion Relations," G.E. Hite, RJJ and F. Steiner, Physical Review D6, 3333-3335 (1972).
6. "Sum Rules from Boundary Dispersion Relations," G.E. Hite and RJJ, Nuclear Physics B 55, 587-600 (1973).
7. "Couplings of the ρ' in the Quark-Pair-Creation Model," W.B. Kaufmann and RJJ, Physical Review D10, 1051-1053 (1974).
8. "An Interior Dispersion Relation Determination of the $\pi - N$ σ -Term," G.E. Hite and RJJ, Physics Letters 53B, 200-202 (1974).
9. "Spin Content of Crossed-Channel Contributions and Interior Dispersion Relations," RJJ and G.E. Hite, Physical Review D11, 2466-2470 (1975).
10. "A Determination of the Pion-Nucleon Coupling Constant," G.E. Hite, RJJ and D.C. Moir, Physical Review D12, 2677-2683 (1975).
11. "Determinations of the $\pi - N$ σ -Term and s-Wave Scattering Lengths," D.C. Moir, RJJ and G.E. Hite, Nuclear Physics B 103, 477-496 (1976).
12. "Test of the Partial Conservation of Axial-Vector Current Limit in Pion-Nucleon Scattering," G.E. Hite, RJJ and M.D. Scadron, Physical Review D14, 1306-1310 (1976).
13. "Applications of Interior Dispersion Relations to Pion Photoproduction Near Threshold," R. McClaskey, RJJ and G.E. Hite, Physical Review D18, 660-669 (1978).
14. "The $I=0$, s-Wave $\pi - \pi$ Scattering Length," G.E. Hite and RJJ, Nuclear Physics B 134, 291-308 (1978).
15. "The Isosinglet and Isovector $\pi - \pi$ Scattering Lengths," R. Mueller, G.E. Hite and RJJ, Zeitschrift fuer Physik C 8, 199-204 (1981).
16. "Current Algebra, $\pi - \pi$ Scattering Lengths, and the $S^*(980)$ Background Contribution," RJJ and M.D. Scadron, Physical Review D 25, 3073-3074 (1982).

17. "New Evaluation of the $\pi - N \Sigma$ Term," G. E. Hite, W. B. Kaufmann and R. J. Jacob, Phys. Rev C71, 065201 (2005)

Nonrefereed Publications, Book Chapters and Oral Presentations

1. "Bound Muon Decay," L.C. Nielsen, RJJ and J.W. Keuffel, Bull. Am. Phys. Soc. 7, 265 (1962).
2. "Bound Muon Decay," RJJ, L.C. Nielsen and J.W. Keuffel, Bull. Am. Phys. Soc. 8, 481 (1963).
3. "Regge-Pole Model of Quark Amplitudes," RJJ and A. Ahmadzadeh, Bull. Am. Phys. Soc. 12, 115 (1967).
4. "Response Functions for Forward Active Transistors with Gaussian Doping," RJJ, Motorola Internal Report (1968).
5. "Observed Negative Length-Width Correlation in Diffused Resistors," RJJ, Motorola Internal Report (1968).
6. "Linear Vector Spaces," Chapter 1 of Physical Chemistry, Vol. 11A (Mathematical Methods), Henry Eyring, Douglas Henderson and Wilhelm Jost, eds., Academic Press, Inc., New York (1975), 79 pages.
7. "Interior Dispersion Relation Analyses of Threshold and Subthreshold $\pi - N$ Scattering Parameters," RJJ, W. B. Kaufmann and G. E. Hite, Bull. Am. Phys. Soc. 41, 940 (1996).
8. "Resonance Singularities of Scattering Amplitudes," G. E. Hite, RJJ and W. B. Kaufmann, Bull. Am. Phys. Soc. 41, 940 (1996).
9. " $\pi - \pi$ Resonances via Dispersion Relations," W. B. Kaufmann, RJJ and G. E. Hite, Bull. Am. Phys. Soc. 41, 940 (1996).
10. "A Math Methods Workshop Course," RJJ, AAPT Announcer 27, 117 (1997).
11. "A Computer-Based Tutorial Module for the ASU Mathematical Methods Course," RJJ, William C. Mead, Richard R. Silbar and Robert A. Williams, AAPT Announcer 28, 72 (1998).
12. A Computer-Based 'Laboratory Course' in Mathematical Methods for Physics: the Legendre Polynomials Module," RJJ and R. R. Silbar, International Conference on Mathematics/Science Education and Technology, San Antonio, Texas, March 1 - 4, 1999.
13. η and η' Photoproduction at CEBAF, A. Godber, M. Dugger, J. Ball, B. G. Ritchie, R. Jacob, and W. Kaufmann. Poster session 6P, Fall Meeting DNP, APS, Asilomar. 20-23 October 1999.

14. "The Emeritus State: Some Critical Points in a Phase Transition," (Invited), AAAS 2006 Winter Meeting, Anchorage, AK, January 25, 2006
15. "Einstein's Legacy," lecture to New Frontiers, Mesa, AZ, February 10, 2006.