

PATRICK J. MCDANIEL
Research Professor
Department of Chemical and Nuclear Engineering
University of New Mexico
Associate Director
Institute for Space and Nuclear Power Studies
University of New Mexico
(505)277-4950 – office
(505)280-0983 - cell

Dr. McDaniel began his career as a pilot and maintenance officer in the USAF. After leaving the Air Force and obtaining his doctorate at Purdue University he worked at Sandia National Laboratories in fast reactor safety, integral cross section measurements, nuclear weapons vulnerability, space nuclear power, and nuclear propulsion. He left Sandia to become the technical leader for Phillips Laboratory's (became part of Air Force Research Laboratory) Satellite Assessment Center. After 10 years at PL/AFRL he returned to Sandia to lead and manage DARPA's Stimulated Isomer Energy Release project, a \$10M per year effort. While at Sandia he worked on the Yucca Mountain Project and DARPA's classified UER-X program. Having taught at the University of New Mexico in the Graduate Nuclear engineering program for 25 years, when he retired from Sandia in early 2009, he joined the faculty at the University of New Mexico full time. He has worked on multiple classified and unclassified projects in the application of nuclear engineering to high energy systems.

ACADEMIC EDUCATION:

Bachelor of Science in Engineering Science, USAF Academy 1965
Master of Science in Mechanical (Nuclear) Engineering, Caltech 1966
Doctor of Philosophy in Nuclear Engineering, Purdue 1977
Master of Science in National Resource Strategy, ICAF 1997

PROFESSIONAL EDUCATION:

Industrial College of The Armed Forces (ICAF), 1997
DOD Senior Acquisition Course, 1997
Air War College, 1996(Seminar)
DOE Nuclear Weapons engineering Course (SNL), March 1984
Squadron Officers School, 1972
Aircraft Maintenance Officer, 1971
Undergraduate Pilot Training, 1967

PROFESSIONAL ACTIVITIES:

Chairman/Technical Chairman (Co-Founder) Space Nuclear Power Conference, Albuquerque, NM 1984-1992
Chairman, Trinity Section, American Nuclear Society, 1982-83

Publication Chairman, ANS/ENS Operability Conference, Albuquerque, NM, October, 1986

AWARDS:

Science and Technology Intelligence Committee Award for Excellence, 1998

ICAF Excellence in Writing Award, 1997

Distinguished Graduate, USAF Academy, 1965

Carl F. Greene Award (Top Student In Mechanics), 1965

AEC Fellowship, 1965-66

AEC Traineeship, 1973-74, 1975-76

CERTIFICATIONS:

APDP Level III in Systems, Planning, Research, Development, and Engineering

Professional Engineer (Indiana) - 1977

Commercial Pilot -1967

Reactor Operator PUR-1 (Purdue University) – 1975

MAJOR PUBLICATIONS:

Refereed Journals

1. Collins, C.B., F. Davanloo, A.C. Rusu, M.C. Iosif, N.C. Zoita, D.T. Camase, J. M. Hicks, S.A. Karamian, C. A. Ur, I.I. Popescu, R. Dussart, J.M. Pouvesle, V.I. Kirischuk, V.I. Strilchuk, P. J. McDaniel, and C. E. Crist, "Emission from the 31-yr isomer of ^{178}Hf induced by x-ray irradiation", *Phys. Rev. C*, Vol. 61, 054305.

2. Collins, C.B., F. Davanloo, M.C. Iosif, R. Dussart, J.M. Hicks, S.A. Karamian, C.A. Ur, I.I. Popescu, V. I. Kirischuk, J.J. Carroll, H.E. Roberts, P. McDaniel, and C.E. Crist, "Accelerated Emission of Gamma Rays from the 31-yr Isomer of ^{178}Hf Induced by X-Ray Irradiation", *Phys. Rev. Lett.*, Vol.82, No.4, 25 Jan 1999, pp695-8.

3. Collins, C.B., F. Davanloo, M.C. Iosif, R. Dussart, J.M. Hicks, S.A. Karamian, C.A. Ur, V. I. Kirischuk, J.J. Carroll, H.E. Roberts, P. McDaniel, and C.E. Crist, "Evidence for the Forced Gamma Emission from the 31-Year Isomer of Hafnium-178", *Laser Physics*, Vol.9, No.1, 1999, pp1-4.

4. Connell, L.W., P.J. McDaniel, A.K. Prinja, and F. W. Sexton, "Modeling the Heavy Ion Upset Cross Section", *IEEE Transactions On Nuclear Science*, Vol. 42, No. 2, April 1995, pp. 73-82.

5. Wills, E., N. J. Roderick, and P. J. McDaniel, "A Finite Element Projection Method For the Solution Of Particle Transport Problems", *Nuclear Science And Engineering*, 93, July, 1986.

6. McDaniel, P. J., J. M. Harris, and D. H. Widman, "A Theoretical Analysis Of The Effect Of Thermal Neutron Absorbers On Dual-Detector Porosity Log Measurements", *24th Annual Logging Symposium, SPWLA*, June 27-30, 1983, Paper LL.

7. Harris, J. M., P. J. McDaniel and D. H. Widman, "Thermal Neutron Absorption From Reactivity Measurements Of Selected Geological Materials", *24th Annual Logging Symposium, SPWLA*, June 27-30, 1983, Paper VV.
8. Harris, J. M. and P. J. McDaniel, "Small Sample Thermal Cross Section Determination From Reactivity Measurements, 23rd Annual Logging Symposium, SPWLA, July 6-9, 1982, Paper HH.
9. Farnsworth, A. V., M. M. Widner, M. J. Clauser, P. J. McDaniel, and K. E. Lonngren, "Self-Similar Power Driven Expansion Into A Vacuum", *Physics Of Fluids*, May, 1979.
10. McDaniel, P. J. and H. E. Hungerford, "An Alpha Recoil Spectrometer", *Nuclear Instruments and Methods*, 165, 1979.

Conference Publications and Technical Reports

11. McDaniel, P., W. Kemp, C. Crist, M. Helba, J. Kirtland, and R. Tittsworth, "Triggered Isomer Proof(TRIP) Test", SAND2007-2690, January 2008.
12. Pelaccio, D.G., M.S. El-Genk, and P.J. McDaniel, "Uncertainty Associated With Laser Heating of Materials Exposed to Space", AIAA 98-2757, *7th AIAA/ASME Joint Thermophysics and Heat Transfer Conference*, June, 1998.
13. Pelaccio, D.G., M. S. El-Genk, and P.J. McDaniel, "Thermal Response of a Slab During Laser Heating", AIAA 96-1817, *31st AIAA Thermophysics Conference*, June, 1996.
14. McDaniel, P. J., "Do Reusable Orbital Transfer Vehicles Make Sense?", *Proceedings Of The NASA Lewis Conference On Space Exploration*, NASA Lewis Research Center, Cleveland, OH, September, 1991.
15. Lee, J. H., Jr., J. A. Cleveland, and P. J. McDaniel, "Inherently Safe Space Reactors", *Proceedings Of The 3rd Symposium On Space Nuclear Power Systems*, Orbit Book Company, Malabar, Florida, 1987.
16. Barattino, W. J., A. T. Hopkins, P. J. McDaniel, and P. E. Nielsen, "Directed Energy Effects On Materials", *Sixth DOD Conference On DEW Vulnerability, Survivability, and Effects*, Washington DC, May, 1987.
17. McDaniel, P. J., J. M. Harris, and P. S. Lysne, "Application Of The FEMP Codes To Well Logging Problems", *ANS Transactions*, Dallas, June, 1987.
18. Lazo, Maximo L., D. M. Woodall, and P. J. McDaniel, "Radiation Damage Analysis For State-Of-The-Art Micro-electronics", *Proceedings of the 3rd Symposium On Space Nuclear Power Systems*, Orbit Book Company, Malabar, Florida, 1987.

19. Voss, S. S., P. J. McDaniel, and D. M. Woodall, "Burnup Vs. Criticality Limitations For A Potential Space Reactor Design In The 1 To 100 MW(t) Range", *Proceedings of the 3rd Symposium On Space Nuclear Power Systems*, Orbit Book Company, Malabar, Florida, 1987.
20. Baranttino, W. J., M. S. El-Genk, and P. J. McDaniel, "A Coupled Radiation Transport-Thermal Analysis Of The Radiation Shield For An SP-100 Type Reactor", *Proceedings of the 2nd Symposium On Space Nuclear Power Systems*, Orbit Book Company, Malabar, Florida, 1985.
21. Gover, J. E., P. J. McDaniel, and J. R. Browning, "Future Hardening Requirements For Microelectronics", *1985 Heart Conference*, Monterrey, California, July, 1985.
22. Lee, J. H., Jr. and P. J. McDaniel, "Principles Of Nuclear Safety", *Space Nuclear Propulsion Workshop*, Los Alamos National Laboratory, NM, December, 1984.
23. Harris, J. M., and P. J. McDaniel, "Small Sample Thermal Neutron Cross Section Determination From Reactivity Measurements", *ANS Transactions*, San Francisco, November, 1983.
24. McDaniel, P. J., and J. M. Harris, "A Theoretical Analysis Of The Effect Of Thermal Neutron Absorbers On Dual-Detector Porosity Log Measurements", *ANS Transactions*, San Francisco, November, 1983.
25. McDaniel, P. J. and S. A. Wright, "Fuel Motion Unfolding Based On Point Detector Responses", in *A Review Of Sensitivity And Uncertainty Analysis*, ORNL(RSIC)-24, Oak Ridge, Tennessee, June, 1979.
26. Scott, W. H., Jr., P. J. McDaniel, J. H. Renken, and S. A. Wright, "Sensitivity Analysis Applied To The Calculation Of Detector Response Kernels", in *A Review Of Sensitivity And Uncertainty Analysis*, ORNL(RSIC)-24, Oak Ridge, Tennessee, June, 1979.
27. Wright, S. A., P. J. McDaniel, J. E. Powell, and W. H. Scott, Jr., "The SPR-III 7-Pin In-Core Fuel Motion Detection Feasibility Experiments", in *Proceedings Of The International Meeting On Fast Reactor Safety*, Seattle, August, 1979.
28. McKenzie, J. M., J. P. Holmes, L. K. Gilman, J. A. Schmitz, and P. J. McDaniel, "Surveillance Instrumentation For Spent Fuel Safeguards", SAND78-1262, August, 1978.
29. McDaniel, P. J. and H. E. Hungerford, "Unfolding An Alpha Recoil Spectrum", *ANS Transactions*, New York, June, 1977.
30. McDaniel, P. J. and H. E. Hungerford, "Spectrum Unfolding Based On A Singular Value Decomposition", *ANS Transactions*, San Francisco, June, 1976.